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6-18-2013

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CONSUMER E-SERVICE EVALUATION IN HONG KONG ONLINE MUSIC SUBSCRIPTION SERVICE INDUSTRY

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Abstract

This study investigates into factors affecting the success of E-service using a research model grounded on the Updated DeLone and McLean Information System Success Model (DeLone & McLean, 2003). Fourteen factors originated from four constructs, i.e., system quality, information quality, service quality, and vendor dimensions, are included in our research model. Using the online music subscription industry in Hong Kong as the platform of our investigation, we examine the associations between these four constructs and customer preference in the online music subscription service industry in Hong Kong. We collected data from 135 college students from Hong Kong to test our model using the Analytical Hierarchy Process (AHP). We show that each E-business success construct in our model has different levels of importance in E-service success in the online music subscription service industry. Our findings provide decision makers of E-business firms with useful insights to enhance their E-service quality.

Keywords: Online Music Subscription Service, DeLone and McLean Information System Success Model, Analytical Hierarchy Process (AHP), E-service, E-commerce.

1   INTRODUCTION

Nowadays, the ubiquitous Internet bandwidth available all over the world facilitates providers from various industries to delivery E-service to their consumers without a barrier. E-service, which is a new paradigm for E-commerce (Rust & Kannan, 2003), enables providers to enhance their service provided to their users and improve user satisfaction in using their E-service. In recent years, we have seen providers from some industries, such as, cloud storage service industry, enjoy a rapid growth in their respective markets (Wortham, 2012). However, some industries experience problems to develop a suitable business model to migrate their existing services into sucessful E-services. Thus, this study is designed to investigate into those factors which lead to the success of E-service.

In this study, we choose the online music subscription service industry as the candidate of our investigation. The online music subscription service industry is one of the industries, which experiences a significant impact from the recent development of E-service. There is a shift of music delivery format from physical media, such as CDs, to digital format which allows consumers to download or stream and listen to the music they liked from the Internet at any time and from anywhere (Rust & Kannan, 2003). This change of the music product delivery method has an impact on the revenue model of the industry. While music industry used to gain their revenue through selling CDs, they now earn their revenue through a combination of selling the music online and selling advertising space in their E-service Websites. While this revenue model works well for the industry in different parts of the world, it is not successfully in the Asia Pacific, including Hong Kong (Synovate, 2005). Hence, we decide to use the online music subscription service industry in Hong Kong as a platform for our study and hope to find out those factors leading to the success of the industry, which no prior research studies have been conducted to investigate into this problem.

This study contributes to the information systems (IS) theory by extending the application of DeLone and McLean Information Systems Success Model, D&M Model (DeLone & McLean, 1992, 2003), into the E-service research. This study also has a methodological contribution by showing that Analytical Hierarchy Process (AHP), a decision support technique, is a suitable technique for studying the impact of E-service success factors on the decision making process of users. AHP has been used for resolving complex alternative selection models in more than 1,000 research studies (Forman & Gass, 2001), and is suitable for studying the importance of E-service success factors and consumers' preference of online music subscription service. The last but not least, this study also has an important managerial implication as it helps the online music subscription service industry to gain a better understanding on their current consumers' preference and construct a systematic framework to assist the industry to develop a better business strategy.

The layout of this paper is as follows. We briefly review the literature in online music subscription service research, E-commerce success factors, and D&M Model in Section 2 to provide some background information about our theoretical framework. Section 3 describes the theoretical framework and our research model; and our methodology is presented at Section 4. Section 5 presents our data analysis, and discusses the results, the contributions and limitations of this study, and future research direction. Section 6 concludes the paper.

2   LITERATURE REVIEW

2.1   Online Music Subscription Service

Music is an information and experience goods, which its true value is realized only after the consumer consumed it, i.e., listen to the music (Clemons et al., 2003; Gopal et al., 2006). With the help of the advanced technology, music producers and online consumers can easily upload, download or change their creations and share digital music files with others through the Internet (Lee et al., 2005). Granados et al. (2005) suggest that record labels need to redevelop their business strategies because of the reduction of transaction costs in electronic market. In the past few years, the music industry starts to provide digital music via online music subscription service by combining legal music listening

and/or download, Websites and mobile applications. This kind of service is fuelled by advertising or using "Freemium" model which online consumers can download or listen to the music for free and they only need to pay for additional services, such as removing the advertisements in the Website (Anderson, 2009). Plus, Cusumano (2007) reports that the monthly fee with unlimited steaming music is the major business model, which is well accepted by online consumers.

2.2   E-Commerce Success Factors

Business-to-Consumer (B2C) E-commerce consists of Web-based information systems and marketing activities, which is proved to be an effective way to conduct business transactions through the Internet technology (Ranganathan & Ganapathy, 2002). Prior studies suggest that the fundamental factors of setting a successful Website are marketing service and information systems design, which are used to obtain customer information and satisfaction (Yim et al., 2002). Park and Kim (2003) also suggest that factors like a well-designed user interface, convenient service provided by the Website, customized information for users, a variety of product information available in the Website, and competitive pricing, affecting the success of B2C E-commerce. Other researchers (Liu & Arnett, 2000; Janda et al., 2002) suggest that improving the overall quality of online retailers in the rapidly growing world of B2C E-commerce is critical to customer satisfaction and loyalty. Plus, Zhang et al. (2000) suggest that the quality of content on the Web system such as features, functions as well as design of cover page, has an impact to the success of B2C E-commerce. Other factors, such as usability, the use level, and users' satisfaction and acceptance in interacting with E-commerce systems (Henneman, 1999; Nielsen, 1999), the overall effectiveness of E-commerce systems and its relationship in organizational performance (Kardaras & Karakostas, 1999; Schubert & Selz, 2001), information and systems quality factors (McKinney & Yoon, 2002), and factors such as ease of use, perceived usefulness, price savings, reliability, and time (Devaraj et al., 2002) are E-commerce success factors.

2.3   DeLone and McLean Information Systems Success Model

DeLone and McLean (1992) develop the DeLone and McLean Information System Success Model by conceptualizing and operationalizing the findings of studies related to IS success from 1970s to 1980s. Since then, the D&M Model becomes one of the commonly used models for investigating into the success factors of information systems (Grover et al., 1996; Saarinen, 1996; Seddon, 1997). The D&M Model suggests that system quality and information quality affect user satisfaction of an information system and the use of the information system. Plus, user satisfaction of an information system and the use of information system bring an impact to individual, and then bring further impact to the organization (DeLone & McLean, 1992). However, the model neglects the role of human interactions with the information systems (Seddon, 1997). Thus, it cannot allow IS researchers to use it to fully probe into the IS success factor study. Based on further research conducted by DeLone and McLean (2003), they present the Updated DeLone and McLean Information Systems Success Model by including service quality as an extra independent variable, and reducing the final dependent variable to net benefit of using the information system. Nowadays, many IS studies using this updated model to investigate into various information systems (Cao et al. 2005; Lin, 2007; Petter & McLean, 2009).

3   THEORETICAL FRAMWORK AND MODEL DEVELOPMENT

3.1   E-Service Success Constructs

In this study, the scope of our research is to investigate into how different E-service success factors affect the E-service selection process of users. Thus, we are not studying the adoption process of an E-service, which should be investigated using the Technology Acceptance Model. As discussed at Section 2.3, the Updated D&M Model is a model for investigate into this type of problem (Grover et al., 1996; Saarinen, 1996; Seddon, 1997). As a result, we develop our research model based on the Updated D&M Model (DeLone & McLean, 2003). As suggested by Molla and Licker (2001) as well as in the Updated D&M Model, E-commerce success factors include *information quality*, *service*

quality, and *system quality* as the major independent variables. As E-service is a type of E-commerce (Rust & Kannan, 2003), we conjecture the Updated D&M Model is also be applied to E-service research. In addition, trust between a consumer and the service provider in the online environment is crucial and it affects whether a consumer adopts a particular E-service (Ahn et al., 2007). Therefore, we include *vendor dimension* as one of the constructs in our research model when we study how customers choose their preferred E-service. In this study, we use Analytic Hierarchy Process to investigate into the decision making process of consumers when they face a decision-making problem, i.e., selection of a suitable online music subscription service provider. By analyzing the decision making process of consumers, we can gain insight on how consumers weigh the importance of different E-service success factors in their E-service selection process.

3.1.1 Information Quality

Information quality is a measure of information system output. In E-service content, it is a measure of the degree of customers' perceptions of the service produced by a Website. In this study, we measure information quality based on three different aspects, i.e., adequacy, timeliness and understandability. *Information adequacy* refers to the degree of the information shown on the E-service Website in relations to the information needed by users to decide whether they would like to use the E-service. Huizingh (2000) suggests that it is impossible for a firm to provide a single set of information online to serve different types of users. Plus, the information provided online should include certain information and background for users to understand the service and system provided to facilitate their decision making (e.g., the information related to how the online transaction will be conducted). Sometimes, users may need other peripheral services, such as professional advice provided in the Website, hyperlinks to relevant Web pages, contact information, etc. (Cho & Park, 2001; Riel et al., 2001). In online music subscription service perspective, information adequacy relates to whether adequate and relevant information are provided to users in the Website.

Information timeliness is another information quality factor, which we include in our research model. Doll and Torkzadeh (1998) define information timeliness as whether users can get the information in time and whether the information provided is up-to-date. Prior IS research studies have shown that information timeliness is an important factor for IS success and end-user satisfaction (DeLone & McLean, 2003; Doll & Torkzadeh, 1998). In online music subscription service perspective, users relate information timeliness to whether up-to-date information of albums and feedbacks from other consumers are available in the Website.

Information understandability measures the style of presentation of information and whether information is provided in an easy-to-understand format. Wang and Strong (1996) define information understandability (i.e., they call it "data quality" in their paper) whether the system presents information to users in an easy-to-understand format and enables them to use information system effectively. In E-service aspects, the E-service system has to be able to reduce the level of uncertainty of users in using the service. Since the interaction between users and organization is done through the Internet, there is no physical link between the two entities in most cases. The users have to believe what the E-service system is presenting. To reduce the customers' uncertainty on the E-service concerned, the content of the Website has to be designed in a way that users can easily understand the information the organization is tend to deliver (Molla & Licker, 2001). Chen and Wells (1999) find that the quality of the content is one of the determinants of positive user attitudes towards Websites. In online music subscription service perspective, information understandability is whether different kinds of information, for example, the guidelines of how to obtain songs from the Website, the information of albums, and feedbacks from other consumers, are ease to read and comprehend by users.

3.1.2 Service Quality

In online shopping environment, service quality is defined as the measure of overall support delivered by the Website that facilitates efficient and effective online shopping, purchasing, as well as product delivery (Zeithaml et al., 2002). One of the quality service frameworks, which IS researchers are using for measuring IS service quality is SERVQUAL (Landrum & Prybutok, 2004; Watson et al.,

1998). There are five aspects in SERVQUAL, i.e., reliability, assurance, tangibility, empathy, and responsiveness (Zeithaml et al, 1988). While we use SERVQUAL to measure service quality of E-service in this study, we only include empathy, reliability, and responsiveness in our research model. As suggested by Devaraj et al. (2002), as assurance and empathy both imply to show caring, guarantee and attention to customers by online retailers, they are highly correlated. Therefore, we decide to only include empathy in our empirical model. In online music subscription service context, *empathy* refers to whether the service provided by the online music subscription service meets customers' interest.

Two other SERVQUAL factors, i.e., reliability and responsiveness are included in our research model. In online music subscription service context, *reliability* refers to whether the functions and features provided in the online music subscription service are trustworthy, accurate, and credible; and *responsiveness* refers to whether the online music subscription service provides real-time service and personalized information to help its users. However, we exclude tangibility in our model because it refers to the appearance of physical equipment and facilities, which is irrelevant to the context of E-service.

3.1.3   System Quality

System quality is the measure of the quality of information generated from the information processing system itself. In E-commerce and E-service contexts, system quality is measured by factors such as Website design, access convenience, and ease of use (Bharati & Chaudhury, 2004; DeLone & McLean, 2003). Here, we measure system quality based on five factors, i.e., efficiency, navigation, response time, personalization, and security. *Efficiency* is defined as the ease of use and ease of locating data. System quality has been represented in other studies by ease of use (Seddon & Kiew, 1996; Rai et al., 2002), which is defined as the degree to which an E-service system is user friendly (Doll & Torkzadeh, 1988) or using it is free of effort (Davis, 1989). In addition, search ability is an important feature in E-service nowadays, which helps users to quickly locate what they want in the E-service Website by typing their needs into the search engine embedded as suggested by Shin (2003). In online music subscription service perspective, efficiency refers to whether the Website has a simple layout and a clear design, which minimizes the efforts to be taken by users to input the data required to use the system.

As suggested by Palmer (2002), ease of *navigation* is another aspect of system quality, which is the ease of obtaining useful information in the online music subscription service Website. *Response time* (DeLone & McLean, 2003), i.e., the loading time of the Website (Weinberg, 2000), is also a system quality factor for E-commerce and E-service, such as online music subscription service. *Personalization* is another factor of system quality, which refers to whether users are able to tailor the Web pages in accordance with the affinity tendency (Colin et al., 1997). Here, we define personalization as the extent to which the E-service Website can be tailored to individual customers' preferences and browsing histories. In online music subscription service perspective, it refers to whether the online music subscription Website can provide individualized interface and customized service which fits the needs of users. The last but not least, as many consumers worry about the issue of identity theft and Internet fraud (Palmer, 2002; Vijayasarathy, 2004), *security* is considered to be an important factor affecting system quality. For online music subscription service industry, Website security is directly related to information privacy, i.e., how the online music subscription service providers collect and protect the personal and financial information of their subscribers; and Internet security, i.e., whether the data communication method is encrypted and the online payment method is well protected by encryption, etc.

3.1.4   Vendor Dimension

Prior research studies have shown that factors such as brand awareness (Markus, 1994), reputation (Melnik & Alm 2002; Ruyter et al., 2001), and price (Chen & Dubinsky, 2003), affect the success of E-commerce and E-service. *Awareness* of the E-service Website is the degree that people know and want to access to the Website, and the ability to remember or identify the Website across a reference in their online and offline environment (Simeon 1999, 2001). Awareness has an impact to brand

loyalty and create network effects (Adamic & Huberman, 2000). Thus, many E-commerce vendors and E-service providers invest millions of dollars in advertisements and promotions to increase the awareness of their Websites by their potential users. *Reputation* of the Website is another factor affecting the success of E-commerce and E-service, which prior research studies show that users are more willing to use the E-service provided by an online vendor with a higher reputation (Ruyter et al., 2001). *Price* is another critical and obvious factor affecting the success of E-commerce and E-service (Chen & Dubinsky, 2003). For online music subscription service perspective, as different service providers are providing the same digital files of the online music and video, the service provided by these providers are commodity. Therefore, users are expected to be price sensitive. Based on these reasons, we include these three vendor dimension factors into our model.

3.2 Development of Research Model for Analytical Hierarchy Process

3.2.1 Analytical Hierarchy Process (AHP)

Based on literature, we note that the above three E-service success constructs, i.e., information quality, service quality and system quality, and vendor dimension, are factors affecting the success of E-service. In this study, we aim to further probe into these factors through investigating into how consumers weigh the importance of these factors in their E-service selection process. As the decision making process involves benchmarking of alternatives, i.e., different E-service success constructs, for determining the advantage of the various alternatives, it cannot be handled as a simple decision making process. Prior studies have shown that Analytic Hierarchy Process, AHP, is a suitable analytical method for analyzing this type of complex issues (Saaty, 2008). By organizing and analyzing alternatives within a hierarchy structure of multifaceted objectives, researchers can use AHP to conduct pair-wise comparisons to consider a set of criteria and sub-criteria, find weightings of each criterion and sub-criterion, and seek the best solution to fit the ultimately goal and evaluate potential alternate solutions. By using this method, we can probe into the complex decision making process of E-service users and discover how these users rank the impact of different E-service success constructs and factors. In recent years, IS researchers employ AHP to study decision making and selection problems related to manufacturing systems (Shang & Sueyoshi, 1995), telecommunication systems vendors (Sasaki et al., 2012; Tam & Tummala, 2001), IT project investment (Chen & Huang, 2004), as well as E-business (Bellman et al., 1999; Ngai, 2003). It is our understanding that this study is one of the first studies using AHP to study E-service selection problem. As the research issue of this study is a service selection problem, AHP has an edge over other statistical methods, such as structural equation modeling (SEM), in studying this problem. The result of AHP can tell us the impacts of different criteria and sub-criteria towards the decision making process of the users. It can allow researchers to compare the results across different choices by simply comparing the scores generated by AHP, which other statistical methods, such as SEM, usually cannot allow researchers to conduct such comparisons directly. Plus, based on the nature of our research question, which is a service selection problem, it is not feasible to develop hypotheses to predict the final outcome of the selection process. Instead, we need to develop a research model and use AHP to analyze the data collected, and find out the ranking of the selection criteria and sub-criteria defined in our research model.

3.2.2 Research Model Development

In this study, we use the selection problem of online music subscription service to demonstrate how AHP can be used to study E-service selection problem. Therefore, we need to build a research model for constructing a hierarchical model to assess the problem. The criteria and sub-criteria used in developing the hierarchical model (i.e., our analytic hierarchy) are E-commerce success constructs and the practical measurement of each construct. The fundamental assumption of this hierarchy is the relationship between criteria and sub-criteria in each level are not overlapped, additive as well as redundant. It is because the measurement of performance cannot only depend on an exact factor but also need to consider the specification of its competitive context (Meredith et al., 1994).

The research model of this study is developed by including the three E-service success constructs in the Updated D&M Model, i.e., information quality, service quality and system quality, and vendor dimension, as the first level of our analytical hierarchy. In the next level, we include the measurements of each E-service success construct. For the lowest level of our hierarchy, we have the online music subscription service providers. The three major online music subscription service providers in Hong Kong, i.e., KKBOX, MOOV and Musicholic™ (see Table 1) are included in the lowest level of our hierarchy. These online music subscription service providers are in the hot positions of App Stores, Android marketing and local major search engines. Figure 1 shows our analytic hierarchy.

	KKBOX	MOOV	Musicholic
Established	2004	2006	2009
Headquarters	Taiwan	Hong Kong	Hong Kong
Company	KKBOX Taiwan, Co. Ltd.	PCCW	CSL New World Mobility
Major service	Downloading and streaming music unlimitedly in online and offline modes		
Price	HK$49 / month	HK$49 / month	HK$48 / month
Number of songs in the database	1.5 millions	20 millions	1 million
Langauges supported	Chinese	Chinese and English	Chinese and English

Table 1.   Background Information of the Three Music Subscription Service Providers in Hong Kong.
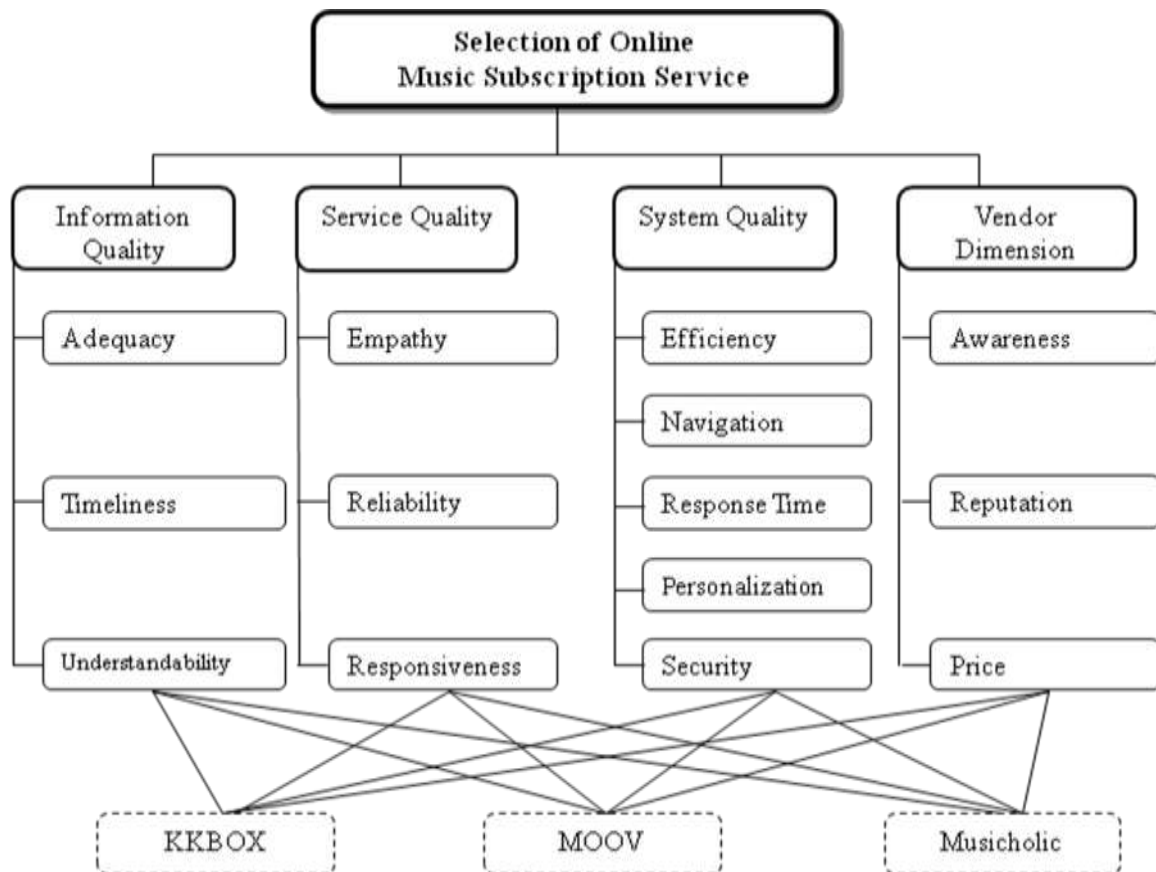

Figure 1.   The Research Model of Analytic Hierarchy.

4   METHODOLOGY AND DATA COLLECTION

We conducted a survey to collect feedbacks from online music subscription service users about how they evaluate those measurement items in respect of each of the three online music subscription

service providers. Before we conducted our survey, we conducted a pre-test with five potential subjects. The survey form was slightly revised based on the comments from our pre-test subjects.

The survey was conducted in the residential hall of a local university, with the residents, i.e., college students, as subjects. The duration of each interview was around 30 minutes. We choose college students as our subjects because they are the targeted customers of online music subscription service as suggested by the vendors. 135 college students are interviewed and their demographic information is presented at Table 2.

Demographic	Statistics
Age	✧ 18-20: 54 ✧ 20-25: 81
Gender	✧ Male: 58 ✧ Female 77
Frequency in assessing online music service	✧ Daily: 39 ✧ 4-5 days per week: 52 ✧ 2-3 days per week: 43 ✧ 0-1 day per week: 1

Table 2.   Demographic Information of Subjects.

5   RESULTS AND DISCUSSION

5.1   Data Analysis

The data collected are analyzed by Expert Choice, which is an objective decision support tool based on AHP. We first compute the mean value of the responses of each item in the survey. Afterwards, we input the mean values into the hierarchy in the software. Then, the local and global weights, ranking of each alternatives and performance analysis are generated by the software. The result of the data analysis is presented at Table 3.

E-business Success Construct	Local Weight	E-business Success Factor	Local Weight	Global Weight	Online Music Subscription Service		
					KKBOX	MOOV	Musicholic
Information Quality	0.415	Adequacy	0.500	0.207	0.529	0.279	0.192
		Timeliness	0.347	0.144	0.490	0.289	0.221
		Understandability	0.153	0.063	0.492	0.302	0.206
Service Quality	0.243	Empathy	0.543	0.132	0.489	0.301	0.210
		Reliability	0.321	0.078	0.526	0.282	0.192
		Responsiveness	0.136	0.033	0.545	0.273	0.182
System Quality	0.220	Efficiency	0.368	0.081	0.531	0.284	0.195
		Navigation	0.266	0.058	0.509	0.271	0.220
		Response Time	0.182	0.040	0.463	0.317	0.220
		Personalization	0.106	0.023	0.500	0.333	0.167
		Security	0.078	0.017	0.500	0.313	0.187
Vendor Dimension	0.122	Awareness	0.424	0.052	0.500	0.327	0.173
		Reputation	0.349	0.043	0.488	0.326	0.186
		Price	0.228	0.028	0.483	0.310	0.207
				Total Score:	**0.509**	**0.295**	**0.201**
				Overall Rank:	**1**	**2**	**3**

Table 3.   The Local and Global Weights of E-business Success Constructs and Factors, Overall Results of the Comparative Study.

5.2   Comparison of E-business Success Constructs and Factors

We first analyze the effect of our selection criteria and sub-criteria to the overall goal by assessing the importance of these selection criteria and sub-criteria using pair-wise comparisons. After computing the AHP model, we develop five matrices, with their consistency ratios were not larger than 0.1. This mean the results of our AHP model are consistent and reliable. The five matrices developed report the

local weights of the four E-business success constructs of the first level of our analytical hierarchy, and the local weights of the measurements of each of the four E-service success constructs. As shown in Table 3, information quality (0.415) has the highest weight in the first level of our analytical hierarchy, followed by service quality (0.243), system quality (0.220), and vendor dimension (0.122). Plus, the top five E-business success factors for the selection of online music subscription service are adequacy (0.207), timeliness (0.144), empathy (0.132), efficiency (0.081), and reliability (0.078).

Based on the weights of four constructs, we note that information quality is the most important E-business success construct among the four constructs in our model. As mentioned, information quality is to measure the output of information systems. Thus, our result suggests that consumers are very concerned about whether the online music subscription service Website can provide adequate and relevant information for them to select the music files that they like from the E-service Website. In particular, they are more concern about adequacy (0.500 of local weight) and timeliness (0.347 of the local weight) of information provided in the Website. This result echoes the nature of music industry. In Hong Kong, the popular period of a song is usually around six months and a lot of new songs are published in every month. Therefore, consumers may regard the rapid turnover of pop songs and the up-to-date information (i.e., timeliness) and the richness of information provided by the Website (i.e., adequacy) are important E-business success factors.

Service quality and system quality are the second and third E-business success constructs affecting the selection of online music subscription service. In the context of online music subscription service industry, service quality is the measure of the overall support delivered by the Website, which facilitates efficient and effective selection of online music from the E-service Website. Our subjects are more concerned about empathy (0.543 of local weight) and reliability (0.321 of local weight) of the service quality. This result implies that tailored service which meets consumers' need (i.e., empathy), and trustworthy, accurate, and credible service (i.e., reliability) are key of E-business service in respect of service quality.

System quality is the measure of the information processing and usefulness of the E-service Website. Our result reflects that consumers of online music subscription concerned about the support and the design of the service Website. In particular, they are more concerned about efficiency (0.368 of local weight) and ease of navigation (0.266 of local weight) in respect to system quality. We conjecture consumers of online music subscription service prefer to master the E-service within a short period of time (i.e., efficiency) and without official guidance (i.e., ease of navigation).

Surprisingly, vendor dimension is the least important construct among the four E-business success constructs. It is likely that as the online music subscription market is still a developing market, and consumers have limited knowledge in it. Therefore, users are unable to distinguish the difference between these service providers. Plus, the pricing and payment methods used by these online music subscription service providers are nearly the same, which make consumers have difficulty to compare them based on the pricing scheme. Thus, an illusion of unimportance of vendor might be developed when they choose their ideal service. Therefore, online music subscription service providers are suggested to enhance their brand awareness (0.424 of local weight) and reputation (0.349 of local weight) in the market to make their firms standout in the market. This can help their consumers to recognize the difference among the service provided by different service providers (Scott & Lane, 2000).

5.3 Comparison of the Music Subscription Service

Table 3 also presents the comparison of online music subscription service providers, which includes a summary of the normalized relative weights of the three online music subscription service providers with respect to the 14 sub-criteria, and the overall weights for the three service providers and their ranks are reported in the last two roles, respectively. Based on the response of our subjects, we noted that KKBOX obtained the highest score (0.509) for overall ranking, followed by MOOV (0.295) and Musicholic (0.201). We note that KKBOX has the highest local weights in all the criteria, and has all the normalized relative weights close to 0.500. This indicates that KKBOX is the predominant player in the online music subscription service industry in Hong Kong. This reason may probably due to the

fact that KKBOX is the forerunner of the online music subscription service among the top three players in Hong Kong, which has developed the best Website to provide its service to the consumers.

5.4 Contributions, Limitations, and Future Research

This research contributes the IS theory by extending the updated DeLone and McLean Information Systems Success Model (DeLone & McLean 1992, 2003) to study E-service. We use data collected from target consumers of online music subscription service industry in Hong Kong (i.e., college students) to conduct our analysis. We incorporate three E-business success constructs, i.e., information quality, service quality and system quality into our research model, which include 11 E-business success factors. We also include vendor dimension, which is measured by three factors, as one of the constructs in our research model. We show that information quality has the strongest influence in the selection of online music subscription service Website by users, and adequacy and timeliness of information are the most significant factors among the 14 factors investigated in this study. At the same time, our result also has a significant managerial implication as it shreds light for online music service provider to gain a better understanding on the different levels of impact of E-business success factors on the selection of service provider. Thus, we suggest these service providers to focus on developing Websites which provide high level of information quality.

The success of using Analytical Hierarchy Process as a method to study E-service research is the methodological contribution of this study. In this study, we develop a method to investigate into the E-service selection problem using an AHP-based research model. If our method is not feasible, the AHP would be unable to generate the matrices for computing the local and global weights, ranking of each alternatives, as well as the performance analysis for the pair-wise analysis. Using the research model developed based on the Updated D&M Model, we apply AHP to rank the level of influence of different E-business success factors in the context of online music subscription service. This method has an edge over other traditional statistically method, such as SEM, which does not involve the pair-wise comparison of constructs and factors in the research model and cannot provide a direct comparison, as well as ranking, of factors included in the research model. The success of this study paves way for future E-service research to employ similar methodology to study the influence of E-business success factors for other types of E-service.

Similar to other research, this study has some limitations. First, we do not investigate into whether there is a difference on the ranking of selection criteria between experienced consumers (i.e., those consumers who are current users of online music subscription service) and inexperience consumers which prior studies have indicated such differences exists (for example, Ho (2011)). Second, we do not investigate into the impact of gender type (Venkatash et al., 2003) on the ranking of selection criteria, which prior IS studies have shown that gender type has a significant impact on information systems adoption. Therefore, we suggest that future research should investigate into these two issues.

6 CONCLUSION

This study applies and extends the Updated D&M Model to E-service research using online music subscription service in Hong Kong as the research platform. We employ an integrated approach to resolve E-service selection problem by consideration of criteria for E-business success factors into the selection of E-service. Through using AHP as our analytical technique, we successful show that AHP is a suitable methodology to rank the level of importance of these factors in the context of the selection of online music subscription service provider.

References

Adamic, L. and Huberman, B. (2000). The nature of markets in the World Wide Web. Quarterly Journal of Electronic Commerce, 1 (1), 5-12.

Ahn, T., Ryu, S. and Han, I. (2007). The impact of Web quality and playfulness on user acceptance of online retailing. Information & Management, 44 (3), 263-275.

Anderson, C. (2009). Free: The Future of a Radical Price. Hyperion, New York, NY.

Bellman, S., Lohse, G. and Johnson, E. (1999). Predictors of online buying behavior. Communications of the ACM, 42 (12), 32-38.

Bharati, P. and Chaudhury, A. (2004). An empirical investigation of decision-making satisfaction in Web-based decision support systems. Decision Support Systems, 37 (2), 187-197.

Cao, M., Zhang, Q. and Seydel, J. (2005). B2C E-commerce Web site quality: An empirical examination. Industrial Management & Data Systems, 105 (5), 645-661.

Chen, C. and Huang, C. (2004). A multiple criteria evaluation of high-tech industries for the science-based industrial park in Taiwan. Information & Management, 41 (7), 839-851.

Chen, Z. and Dubinsky, A. (2003). A conceptual model of perceived customer value in E-commerce: A preliminary investigation. Psychology and Marketing, 20 (4), 323-347.

Chen, Q. and Wells, W.D. (1999). Attitude toward the site. Journal of Advertising Research, 39 (5), 27-37.

Cho, N. and Park, S. (2001). Development of electronic commerce user-consumer satisfaction index (ECUSI) for Internet shopping. Industrial Management & Data Systems, 101 (8), 400-406.

Clemons, E.K., Gu, B. and Lang, K.L. (2003). Newly vulnerable markets in an age of pure information products: An analysis of online music and online news. Journal of Management Information Systems, 19 (3), 17-41.

Colin, G., Harrison, A. and Caglayan, K. (1997). Agent Sourcebook. John Wiley & Sons, New York, NY.

Cusumano, M. (2007). The changing labyrinth of software pricing. Communications of the ACM, 50 (7), 19-22.

Davis, F.D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. MIS Quarterly, 13 (3), 319-340.

DeLone, W. and McLean, E. (1992). Information systems success: The quest for the dependent variable. Information Systems Research, 3 (1), 60-95.

DeLone, W. and McLean, E. (2003). The DeLone and McLean Model of information systems success: A ten-year update. Journal of Management Information Systems, 19 (4), 9-30.

Devaraj, S., Fan, M. and Kohli, R. (2002). Antecedents of B2C channel satisfaction and preference: Validating E-commerce metrics. Information Systems Research, 13 (3), 316-333.

Doll, W. and Torkzadeh, G. (1988). The measurement of end-user computing satisfaction. MIS Quarterly, 12 (2), 259-274.

Forman, E. and Gass, S. (2001). The Analytic Hierarchy Process: An exposition. Operations Research, 49 (4), 469-486.

Gopal, R., Bhattacharjee, S. and Sanders, G. (2006). Do artists benefit from online music sharing? The Journal of Business, 79 (3), 1503-1533.

Granados, N., Gupta, A. and Kauffman, R. (2005). Identifying facilitators and inhibitors of market structure change: A hybrid theory of unbiased electronic markets. In Proceedings of the 38th Annual Hawaii International Conference on System Sciences. Island of Hawaii, HI.

Grover, V., Jeong, S. and Segars, A. (1996). Information systems effectiveness: The construct space and patters of application. Information & Management, 31 (4), 177-191.

Henneman, R. (1999). Design for usability: Process, skills, and tools. Information Knowledge Systems Management, 1 (2), 133-144.

Ho, K.K.W. (2011). Impact of prior usage experience on the intention to adopt 3G mobile service for the youth in Hong Kong. International Journal of Strategic Information Technology and Applications, 2 (4), 1-19.

Huizingh, E. (2000). The content and design of Web sites: An empirical study. Information & Management, 37 (3), 123-134.

Janda, S., Trocchia, P. andGwinner, K. (2002). Consumer perceptions of Internet retail service quality. International Journal of Service Industry Management, 13 (5), 412-431.

Kardaras, D. and Karakostas, V. (1999). Measuring the electronic commerce impact on customer satisfaction: Experiences, problems and expectations of the banking sector in the UK. In Proceeding of the International Conference of the Measurement of Electronic Commerce. Singapore.

Landrum, H. and Prybutok, V. (2004). A service quality and success model for the information service industry. European Journal of Operational Research, 156 (3), 628-642.

Lee, J., Downie, J. and Cunningham, S. (2005). Challenges in cross-cultural/multilingual music information seeking. In Proceedings of the Sixth International Conference on Music Information Retrieval. London.

Lin, H. (2007). The impact of Website quality dimensions on customer satisfaction in the B2C E-commerce context. Total Quality Management and Business Excellence, 18 (4), 363-378.

Liu, C. and Arnett, K. (2000). Exploring the factors associated with Web site success in the context of electronic commerce. Information & Management, 38 (1), 23-33.

Markus, M. (1994). Electronic mail as the medium of managerial choice. Organization Science, 5 (4), 502-527.

McKinney, V. and Yoon, K. (2002). The measurement of Web-customer satisfaction: An expectation and disconfirmation approach. Information Systems Research, 13 (3), 296-315.

Melnik, M. and Alm, J. (2002). Does a seller's ecommerce reputation matter? Evidence from eBay auctions. The Journal of Industrial Economics, 50 (3), 337-349.

Meredith, J., McCutcheon, D. and Hartley, J. (1994). Enhancing competitiveness through the new market value equation. International Journal of Operations & Production Management, 14 (11), 7-22.

Molla, A. and Licker, P. (2001). E-commerce systems success: An attempt to extend and respecify the DeLone and McLean Model of IS success. Journal of Electronic Commerce Research, 2 (4), 131-141.

Ngai, E. (2003). Selection of Web sites for online advertising using the AHP. Information & Management, 40 (4), 233-242.

Nielsen, J. (1999). Designing Web Usability: The Practice of Simplicity. New Riders Publishing, Indianapolis, IN.

Palmer, J. (2002). Web site usability, design, and performance metrics. Information Systems Research, 13 (2), 151-167.

Park, C. and Kim, Y. (2003). Identifying key factors affecting consumer purchase behavior in an online shopping context. International Journal of Retail & Distribution Management, 31 (1), 16-29.

Petter, S. and McLean, E. (2009). A meta-analytic assessment of the DeLone and McLean IS Success Model: An examination of IS success at the individual level. Information & Management, 46 (3), 156-166.

Rai, A., Lang, S.S. and Welker R.B. (2002). Assessing the validity of IS success models: An empirical test and theoretical analysis. Information Systems Research, 13 (1), 50-69.

Ranganathan, C. and Ganapathy, S. (2002). Key dimensions of Business-to-Consumer Web sites. Information & Management, 39 (6), 457-465.

Riel, A. van, Liljander, V. and Jurriens, P. (2001). Exploring consumer evaluations of E-services: A portal site. International Journal of Service Industry Management, 12 (4), 359-377.

Rust, R. and Kannan, P. (2003). E-service: A new paradigm for business in the electronic environment. Communications of the ACM, 46 (6), 36-42.

Ruyter, K. de, Wetzels, M., and Kleijnen, M. (2001). Customer adoption of E-service: An experimental study. International Journal of Service Industry Management, 12 (2), p.184-207.

Saarinen, T. (1996). An expanded instrument for evaluating information system success. Information & Management, 31 (2), 103-118.

Saaty, T.L. (2008). Decision making with the analytic hierachy process. International Journal of Services Sciences, 1 (1), 83-98.

Sasaki, M., Yamaguchi, A., Yamazaki, K. and Imagaki, Y. (2012). Evaluation of communication system selection applying AHP algorithm in heterogeneous wireless networks. In Proceedings of Computing, Communications and Applications Conference 2012, p. 334-338.

Schubert, P. and Selz, D. (2001). Measuring the effectiveness of electronic commerce Websites with the Web assessment method. In E-commerce & V-Business (S. Barnes and B. Hunt Eds.), p. 83-102). Butterworth Heinemann, Oxford, UK.

Scott, S. and Lane, V. (2000). A stakeholder approach to organizational identity. Academy of Management Review, 25 (1), 43-62.

Seddon, P.B. and Kiew, M.Y. (1996). A partial test and development of DeLone and McLean's Model of IS success. Australian Journal of Information Systems, 4 (1), 90-109.

Seddon, P. (1997). A respecification and extension of the DeLone and McLean Model of IS success. Information Systems Research, 8 (3), 240-253.

Simeon, R. (1999). Evaluating domestic and international Web-site strategies. Internet Research: Electronic Networking Applications and Policy, 9 (4), 297-308.

Simeon, R. (2001). Evaluating the branding potential of Websites across borders. Marketing Intelligence and Planning 19 (6), 418-424.

Shang, J. and Sueyoshi, T. (1995). A unified framework for the selection of a flexible manufacturing system. European Journal of Operational Research, 85 (2), 297-315.

Shin, B. (2003). An exploratory investigation of system success factors in data warehousing. Journal of AIS, 4, 141-170.

Synovate (2005). Synovate survey reveals 70% of Asians don't pay for digital music downloads. Accessed on 2012/11/13 at: http://stagecurious.mysiteup.com/news/article/2005/10/synovate-survey-reveals-70-of-asians-don-t-pay-for-digital-music-downloads.html?request_locale=en_US

Tam, M. and Tummala, V. (2001). An application of the AHP in vendor selection of a telecommunications system. Omega, 29 (2), 171-182.

Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003). User acceptance of information technology: Towards a unified view. MIS Quarterly, 27 (3), 425-478.

Vijayasarathy, L. (2004). Predicting consumer intentions to use on-line shopping: The case for an augmented Technology Acceptance Model. Information & Management, 41 (6), 747-762.

Watson, R., Pitt, L.and Kavan, C. (1998). Measuring information systems service quality: Lessons from two longitudinal case studies. MIS Quarterly, 22 (1), 61-79.

Weinberg, B. (2000). Don't keep your Internet customers waiting too long at the (virtual) front door. Journal of Interactive Marketing, 14 (1), 30-39.

Wortham, J. (2012). Dropbox passes 100 million users. The New York Times (2012-11-13). Accessed on 2012/11/13 at: http://bits.blogs.nytimes.com/2012/11/13/dropbox-quadruples-user-base-passes-100-million-users/

Wang, R.Y. and Strong, D.M. (1996). Beyond accuracy: What data quality means to data consumers. Journal of Management Information Systems 12 (4), 5–34.

Yim, B., Hong, W. and Tam, K.Y. (2002). E-service environment: Impacts of Web interface characteristics on consumers' online shopping behavior. In E-Service: New Directions in Theory and Practics, p. 108-128. M.E. Sharpe, Armonk, NY.

Zeithaml, V.A., Berry, L.L. and Parasuraman, A. (1988). Communication and control processes in the delivery of SQ. Journal of Marketing, 52 (2), 35-48.

Zeithaml, V., Parasuraman, A. and Malhotra, A. (2002). Service quality delivery through Web sites: A critical review of extant knowledge. Journal of the Academy of Marketing Science, 30 (4), 362-375.

Zhang, X., Keeling, K. and Pavur, R. (2000). Information quality of commericial Web site home pages: An explorative analysis. In Proceedings of the International Conference on Information Systems 2000, p. 164-175, Association for Information Systems, Brisbane, Queensland, Australia.