

# E-service Adoption: The Three Q Model

Margaret Meiling Luo<sup>(✉)</sup>

Department of Information Management, National Chung Cheng University,  
No. 168, Sec. 1, University Rd., Min-Hsiung Township,  
Chia-yi County 621, Taiwan, ROC  
luo@mis.ccu.edu.tw

**Abstract.** Previous studies on information technology (IT) acceptance have focused on instrumental beliefs as the drivers of behavioral intention. The factors influence adoption decisions are perceived ease of use and perceived usefulness [1]. Wixom and Todd [2] integrated the user satisfaction and the technology acceptance literatures to theorize about and account for the influence of the information technology artifact on usage. In their research, information quality (IQ) and system quality (SysQ) were found to be precursors of information satisfaction and system satisfaction which in turn predict behavioral intention. Xu, Benbasat, and Cenfetelli [3] argued that service quality (SQ) is critical to the success of e-service and has to be added into Wixom and Todd's [2] model. They assert that the adoption decisions have to factor into account of the three Qs: information quality, system quality, and service quality. This study takes a theory building approach to further develop the concepts appeared in adoption and IS success research. Xu et al.'s [3] model does not take into account the affective aspect of IT usage which found to be crucial to Web-based adoption decisions. We then proposed the 3Q model which contains the information quality, system quality, service quality, instrumental beliefs (i.e. ease of use and usefulness), affective factors (i.e., enjoyment and cognitive absorption), and flow. The 3Q model builds upon the current research efforts and advances the theories by including both cognitive and affective aspects of human judgment; by doing so, we advance the knowledge of adoption in Web context; therefore the theories can be continuously developed and refined along with the development of IT artifacts that are used in consumer contexts. Online surveys were conducted to test the 3Q model. The results with Partial least squares (PLS) analysis show the structural relationships with the 3Q model. Managerial implications were discussed.

**Keywords:** Information quality · System quality · Service quality · Adoption · Affect · Satisfaction · Hedonic value · Utilitarian value

## 1 Introduction

In today's digital economy, information technology (IT) represents an opportunity for businesses to acquire customers, especially with the provision of e-services for customers [4]. Understanding the acceptance of e-services is an increasingly crucial issue because the value of these services can be realized only when they are used by customers in a manner that contributes to businesses' goals. Compared to IT use as a

significant aspect of achieving work performance, issues related to IT use in a consumer context have been studied yet well-understood by information systems (IS) researchers. Several theoretical models have been proposed to better understand the acceptance of IT in consumer contexts [5–9].

We propose a 3Q model, which encompasses factors that is well-developed in IS literature: the 3Qs (information quality, system quality, and service quality), affective measures (satisfaction, enjoyment, and cognitive absorption), and flow. The proposed 3Q model resolved few issues yet been addressed in Xu et al.’s model.

## 2 Literature

### 2.1 What Is an E-service?

E-services range from the electronic provision of traditional services, such as banking (e.g., E\*TRADE), investing (e.g., [chase.com](http://chase.com)), and airline ticketing (e.g., [expedia.com](http://expedia.com)), to intelligent interactivity in post-sales product support (e.g., dell.com and Internet service providers) [10]. They also include hedonic e-services like on-line gaming and music downloading (e.g., [blizzard.com](http://blizzard.com) and iTunes) and socially oriented services like virtual communities and social networking sites (e.g., Second Life, MySpace, and Facebook). Wareham, Zheng, and Straub defined e-service as “the provision of some kinds of services that are substantially differentiated from traditional retailing, such as professional services, entertainment or education” [11, p. 3].

**Trends in E-services.** Along with the IT development, e-services are more diverse. E-services bundling with mobile devices (like smart phones, tablet PCs, and other handheld devices) provide new use experiences ever. Users have more options and immerse in an online environment. Below are some E-services that is currently have large user groups.

*Mobile Apps and Online Stores.* A mobile application (App) store is an e-service allows users to browse and download software applications for use on their mobile devices [12]. These Apps are designed exclusively for users mobile devices such as iPhones, Android phones, and BlackBerrys; apps are also available for tablet devices and personal computers. Currently, Apple’s App Store, Android Market (rebranded as Google Play in 2012), and App World for BlackBerry users are considered as the most successful and best-known application stores. Since January 2007, Apple released the first iPhone, it has been a mania that users are crazy about the smart phones. More than 100B mobile applications have been downloaded since the launch of the Apple iOS and Google Play stores [13]. Today Apple is the top one of the world’s most valuable brands (Forbes, 2014) and it remains to be a brand having high potential in near future. During the past 18 months (from 2013 to mid 2014), all the statistics for app stores have grown dramatically especially the number of users and the download counts. Apparently, the size of the audience for mobile apps is continuous growing and it exhibits great business opportunities [14].

## 2.2 3Qs: Information Quality, System Quality, and Service Quality

**Information Quality.** IQ is a user's evaluation of the system's conveyance of semantic meaning and/or communication of knowledge. Information quality is shaped by four dimensions: completeness represents the degree to which the system provides all necessary information; accuracy represents the user's perception that the information is correct; format represents the user's perception of how well the information is presented; and currency represents the user's perception of the degree to which the information is up to date [2].

**System Quality.** SysQ is a user's evaluation of the technical capabilities of the system and its usability, while perceived. There are five dimensions for system quality: reliability refers to the dependability of system operation, flexibility refers to the way the system adapts to changing demands of the user, integration refers to the way the system allows data to be integrated from various sources, accessibility refers to the ease with which information can be accessed or extracted from the system, and timeliness refers to the degree to which the system offers timely responses to requests for information or action [2].

**Service Quality.** There are five dimensions for service quality: tangibles, service reliability, responsiveness, assurance, and empathy. Tangibles refers to physical, facilities, equipment, and appearance of personnel, service reliability refers to ability to perform the premised service dependably and accurately, responsiveness refers to willingness to help customers and provide prompt service, assurance refers to knowledge and courtesy of employees and their ability to inspire trust and confidence, and empathy refers to caring, individualized attention the service provider give its customers [15]. These five dimensions specify the service quality in organizational context. When applied in e-service context, they need to be revised. We therefore use the conceptual definitions and adopt the measures that have been used in previous studies.

## 2.3 Cognitive and Affective Aspects of E-service Use

Previous studies have conceptually separated cognitive and affective behaviors and evaluations. For information systems, the foci of adoption decisions have been on instructional beliefs and how organizational efforts can accelerate system adoption to increase organizational effectiveness and performance. In IS, researchers believe that information behaviors involve three aspects: cognition, affects, and sensori-psychomotor [16]. System designs that follow the guidelines for building cognitive systems for problem solving and reasoning have been developed into affective/emotional systems, where system design considers human affection and emotions [17]. Similar ideas have been proposed since the 1990s on organizational behaviors. Scholars (e.g., [18, 19]) have noted that work events at the workplace serve as causal agents for positive and negative affective states that result in either satisfaction or dissatisfaction at work. Similarly, Westbrook [20] on marketing, proposed that consumers form two summary affect states (positive and negative), and that both are significantly related to satisfaction in the expected direction.

## 2.4 Utilitarian and Hedonic Value

Values are motivational constructs that serve as a standard or criterion for guiding the selection or evaluation of actions or things. Values are higher-level goals in the MEC hierarchy that motivate and direct consumers' behaviour and decision-making. For repeat/experienced customers, value judgments are derived from the past consumption experiences that facilitate (or block) the achievement of their shopping goals [21]. Hedonic and utilitarian values are important outcomes influencing future consumer decisions through feedback loops into the consumer decision processes. Accordingly, consumers should have a greater repeat purchase intention towards an online store when the store can provide higher utilitarian and hedonic values. Prior research has also shown the importance of utilitarian and hedonic values in driving repeat purchase intention [22, 23].

## 3 Research Questions

To test the explaining power of our research model, we ask the following research questions:

- **RQ1:** How well do information, service, system quality explain beliefs and in turn influence the intention to use e-services?
- **RQ2:** How well do intrinsic factors (cognitive absorption, flow, enjoyment) explain beliefs and in turn influence the intention to use e-services?
- **RQ3:** How well do hedonic and utilitarian values explain the intention to use e-services?
- **RQ3:** To what extent do the perceived risk mediate the effect of hedonic and utilitarian values and have direct effect to the intention to use e-services?

## 4 Method

A survey design was used for data collection. The study was performed in Fall, 2016 in a major Taiwan university. Students who enrolled in a 400 level IT course and grad students participated the online survey. They receive extra credits for participation. A total of 70 subjects were recruited for our study. The questionnaire developed through pre-validated measures (see Table 1 for sources of measures) and was further developed via a pretest. The English version of questionnaire was translated into Chinese and then back translated into English. The Chinese version of questionnaire was tested with 35 undergrad students and 24 graduate students. They were asked to read along the questions and then note down the sentences/phrases which they do not understand. The questionnaire items were reworded based on the results of the pretest. An online version of the survey was then developed by using the Google doc. An email message with the URL of survey was sent to subjects and the data were collected in a week.

### 5 Results and Discussion

A partial least squares (PLS) analysis using PLS Graph (Version 3.0) was conducted to examine the reliability and validity of the measures. In first study, the loading pattern was highly consistent, with most loadings above .70. In second study, all loadings were above .70. Figure 1 show the regression coefficients and variance explained. In the research model, satisfaction is postulated to have effect on trust which in turn predicts repurchase intention to online group buying. The Moderating role of perceived risk is significant.

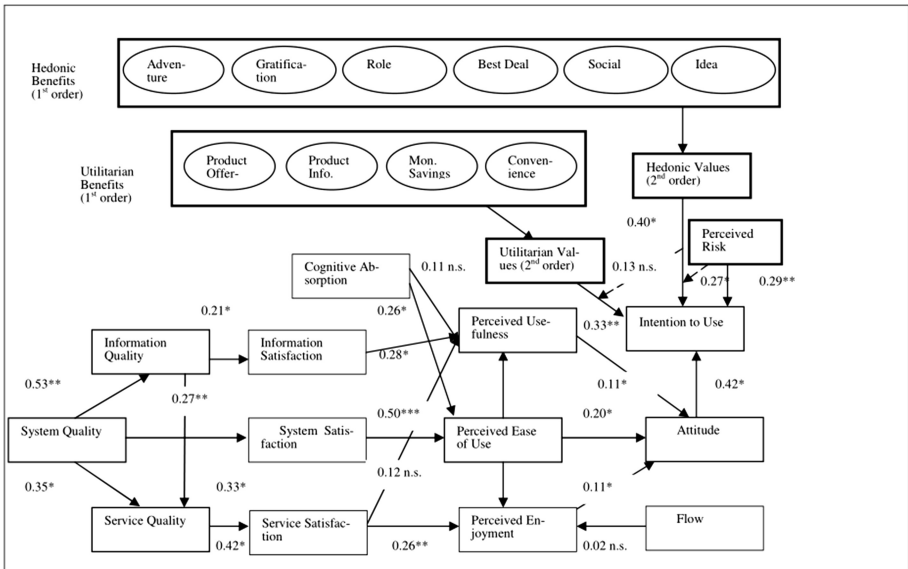


Fig. 1. Study results

### 6 Conclusion

The primary intellectual merit of the study rests on developing and testing a research model which advance the knowledge of e-service adoption behaviors. Testing the model with a variety of samples simulating a real-world situation where the Internet-based information service is being adopted will help us to pursue the goal of bring new theoretical perspective from social theories to IS. As we pursue this goal, we demonstrate that this study have significant broader impacts. First, the theoretical model under investigation benefit practitioners in continuously developing functionalities that provide the most meaningful impacts towards the e-service adoption behaviors. In particular, system developers shall pay great attention to deliver services that provide both hedonic and utilitarian values. Secondly, the study can serve as a critical starting point for future scientific investigation of technologies in customer context as the electronic commerce revolution continues to grow.

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