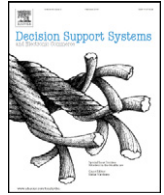




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# The impacts of information quality and system quality on users' continuance intention in information-exchange virtual communities: An empirical investigation

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## ABSTRACT

An information-exchange virtual community (VC) is an IT-supported virtual space that is composed of a group of people for accessing, sharing and disseminating topic-related experiences and knowledge through communication and social interaction [36,43]. With the increasing number of VCs and low switching cost, it is challenging to retain existing users and encourage their continued participation. By integrating the IS post-adoption research and IS Success model, we propose a research framework to investigate VC users' continuance intention from a quality perspective. Based on a field survey, we find that information and system quality directly affect perceived individual benefits and user satisfaction, which ultimately determine user continuance intention to consume and to provide information. Furthermore, by modeling information quality and system quality as multifaceted constructs, our results reveal key quality concerns in information-exchange VCs. Implications for VC design and management are also discussed.

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## 1. Introduction

An information-exchange virtual community (VC) is an IT-supported virtual space that is composed of a group of people for accessing, sharing and disseminating topic-related experiences and knowledge through communication and social interaction [36,43]. Examples include online forums, message boards, news groups, etc.

Due to the prevalent Internet access and increasingly advanced Web 2.0 applications, the growth of information-exchange VCs has been phenomenal and millions of people have become VC users in recent years. For example, Yahoo Groups has 115 million users and formed 10 million groups<sup>2</sup> (eWeek.com). IMDB (Internet Movie Database) has attracted over 4 million users with more than 13 million posts as of January 2012 ([www.big-boards.com](http://www.big-boards.com)).

A user decides his participation based on his individual needs and experiences of using a VC. Should he find that a VC does not satisfy his needs, he can stop using the VC or switch to another VC of the same type, if available. However, retaining existing users is critical for a VC's long-term development [35,71]. According to marketing research, existing customers may exhibit voluntary citizenship behaviors (e.g., helpful, constructive behaviors) that are valued or appreciated by the organization, in addition to consumption of pre-paid products or

services [31]. It is found that continued membership positively increases members' identification with the organization [8] and reduces the likelihood of lapsing [7]. Furthermore, according to the theory of network externalities [38], if a VC can maintain a large pool of existing users, it will attract more new users. Individuals are more likely to join larger VCs than smaller ones, as larger VC are assumed to have more information sources [32]. The presence of network externalities also enables VCs to leverage economies of scale to operate and grow in a cost-effective way and provide more benefits to users [29]. Therefore, it is important to understand *what factors drive the continuance intention to participate in VCs*.

Although a number of information systems (IS) studies have examined user participation behaviors in VCs [13,36], a limited number of studies have paid special attention to user retention and continued participation [15,71]. It is a challenging issue given that user participation is voluntary. Ma and Agarwal [48] reported that not many VCs were successful in retaining users and motivating their continued usage, which ended up with membership loss.

To address this issue, we investigate users' continuance intention to participate in VCs by examining the role of information quality and system quality. Butler [13] argued that the amount of information on its own is not enough to retain users, unless it is transferred to benefits for users, leading to a sustainable VC. Gu et al. [32] found that the value of a VC increases with the number of high-quality postings, which helps users achieve individual benefits and meet their needs. Users are more likely to adopt high-quality information as it provides judgment-relevant content [72]. High-quality information also enhances the reputation of a VC and user loyalty, and can serve as a competitive weapon to attract and retain members [45]. Furthermore, user participation is

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<sup>2</sup> <http://www.eWeek.com/c/a/Search-Engines/Yahoo-Refreshes-Upgrades-Some-Products-775120/>. Retrieved on 2/28/2012.

largely facilitated through an effective technical infrastructure [50]. Due to the limited information processing capability of human beings, an excess increase in information volume is likely to cause information overload, discourage active participation and, ultimately, lead to membership loss [13,36]. VCs need to implement good filtering or organization mechanisms to minimize users' efforts on processing information. When a VC provides easy and flexible ways for users to browse/post information and interact with others, it will be more likely to encourage users' involvement, making participation interactive and enjoyable. In these regards, we argue that the *quality* of both the information itself and the technical infrastructure matter. Ultimately, quality can be used as a strategy to “lock-in” users [32].

As the focus of this study is the impact of quality on continuance intention, the selection of information-exchange VCs helps to minimize confounding factors salient in other types of VCs. For instance, in social networking sites, users' continuance intention to participate could be driven by not only information and system quality but also by personal relationships developed offline, etc.

Recently, a number of researchers have investigated quality in VCs. Lin and Lee [46] argued that information quality influences user satisfaction and intention to participate, which will determine their loyalty to a VC. Cheung et al. [16] found that the relevance and comprehensiveness of electronic word-of-mouth influence information usefulness and, subsequently, the users' information adoption decisions in a food VC. In their study of a Korean stock message board, Park et al. [54] indicated that higher perceived quality leads to higher perceived usefulness of the community, which impacts users' seeking and sharing behaviors. Lin [45] found that higher information quality and system quality increases user satisfaction, leading to more member loyalty. Zhang and Watts [72] showed that both information and system quality have a positive relationship with information adoption from a cognitive perspective in two online forums. In a study of social networking sites, Zhang [71] found that information quality plays a substantial role in developing sense of community, while system quality does not.

While the IS studies reviewed above have examined IS quality in VCs, the majority of them treated quality as an abstract and aggregated concept. Prior research has widely agreed that IS quality is a multifaceted concept with a variety of dimensions [52,63]. These quality dimensions have been extensively examined in the context of organizational IS and E-commerce websites. Unfortunately, they have not been fully understood in the VC context. Although Zhang [71] investigated both information and system quality from multi-dimensional perspectives, this study differs from Zhang's paper as follows. First, we explicitly differentiate consumption intention from provision intention. Second, we focus on continuance intention, not frequency of usage analyzed by Zhang [71]. Third, this study examines information-exchange VCs instead of social networking sites studied by Zhang [71].

We draw on two research streams to develop our model. The IS post-adoption literature helps us understand what factors directly affect users' intention to continue using a system. The IS Success model provides us a guideline to investigate system usage from a quality perspective. The integration of the two streams enables us to better understand the impacts of quality on users' future participation in VCs. Based on a field survey, we find that information and system quality directly affect perceived individual benefits and user satisfaction, which ultimately determine user continuance intention to consume and to provide information. Furthermore, by modeling information quality and system quality as multifaceted constructs, our results reveal key quality concerns in information-exchange VCs.

The remainder of this paper is organized as follows. In Section 2, we present the theoretical background. Section 3 highlights the special features of VCs that call for extension of prior studies. The research model and hypotheses are proposed in Section 4. Section 5 discusses methodology and data collection, followed by analysis and results in Section 6. Discussion, contributions, limitations and future research are presented in Section 7, with concluding remarks in Section 8.

## 2. Theoretical background

### 2.1. IS post-adoption research

The IS post-adoption literature [9,37,55] extends the research on individual technology acceptance research [22,62] to examine user beliefs and attitudes after initial IS use. Research on initial IS adoption is well studied under the framework of the Technology Acceptance Model (TAM and TAM 2) [22], the United Theory of Acceptance and Use of Technology (UTAUT) [62] and other related models. There are a number of key factors that determine initial adoption such as, perceived usefulness, perceived ease of use, subjective norms/social factors/image, perceived behavioral control, etc. This research stream has studied how and why individuals adopt new IS [62]. In contrast, research on IS post-adoption attempts to understand how and why individuals continue using IS after the initial adoption. IS post-adoption studies emphasizes that continuing IS usage is driven by conscious decisions from past experience [9,39], mainly based on two aspects: perceptions of usefulness and affective or emotional responses to the use of IS. *Perceived usefulness* refers to a user's ex-post expectations and beliefs about system effectiveness and the net benefits of system use from past experience [9]. Affective or emotional responses to the use of technology, called *user satisfaction*, is a user's emotional or psychological state following IT use experience [22].

A number of studies have shown that initial IS adoption and post-adoption are different, as perceptions and beliefs about IS usage change over time and individuals get used to the system. Bhattacharjee [9] developed the IS continuance model in which perceived usefulness and user satisfaction are the two direct predictors of IS continuance intention. Following the same logic, Kim and Son [39] found that perceived usefulness and satisfaction serve as mechanisms of commitment leading to continued use of the same online service. Karahanna et al. [37] found that behavioral beliefs about using an IS (*perceived usefulness*) determine the intention to continue using it, whereas subjective norms from top management, supervisor and peers only influence an individual's decision on initial adoption, NOT continued usage in the later stage. *Perceived ease of use* has been excluded from the IS-post adoption studies discussed above. The core premise is that perceived ease of use may become insignificant in predicting future use as an individual gains experiences by keeping using the system [9,10]. Hence, we do not include *perceived ease of use* in the model.

### 2.2. The IS success model

The IS Success model, initially developed by DeLone and McLean [23], provides a clear taxonomy for conceptualizing and operationalizing IS success. The model includes six dimensions of IS success: information quality, system quality, use, user satisfaction, individual impact, and organizational impact. In the updated version of the IS Success model [24], individual impact and organizational impact are collapsed with other impacts (e.g., consumer impact, societal impact) into one category, called net benefits. Service quality is added as another dimension to reflect the effectiveness of the service provider, such as the IS department of an organization or customer service of an e-commerce website.

### 2.3. The integration of the IS post-adoption research and IS success model

The primary reason for integrating the IS post-adoption literature and IS Success model is to deepen our understanding of the role of quality in the IS post-adoption stage. IS post-adoption research has widely agreed that continuance intention is directly determined by affective characteristics of the system such as perceived usefulness and user satisfaction based on past experiences [9,37,39]. However, it does not specifically discuss the role of quality. As DeLone and McLean [24] suggested, net benefits “cannot be analyzed and understood without ‘system quality’ and ‘information quality’ measurements” (pp. 25). Hence,

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