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The Contribution of IT Features to Increase Trust and Participation in Online Communities: An Empirical Analysis

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THE CONTRIBUTION OF IT FEATURES TO INCREASE TRUST AND PARTICIPATION IN ONLINE COMMUNITIES: AN EMPIRICAL ANALYSIS

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Abstract

Despite the fact that online communities (OCs) enjoy a growing number of members, their success is regularly impaired by infringements of user trust by either the community operator or other users. Since previous research studies have focused their investigation of the effects of single IT factors on user trust and participation in OCs, the field lacks an integrative view on how a comprehensive set of IT factors affect trust and participation from a user perspective. This study aimed to address this limitation in the IS literature by conducting an online-survey among 364 members of general-interest OCs. The results show that the four clusters of IT factors (usability, transparency, quality assured content, and security/privacy) investigated in this study vary in their impact on trust factors and participation. Interestingly, usability was the sole IT factor to significantly influence both trust and participation. While transparency had only a significant effect on trust variables, quality-assured content and security/privacy-related IT factors were significantly related only to participation. Our findings offer a variety of theoretical and practical contributions that shed light on the design of online communities and on strategies that can be used to attract new users by investing money in appropriate IT mechanisms.

Keywords: Online communities, system and interpersonal trust, usability, transparency, quality assured content, security/privacy, participation

1 INTRODUCTION

In online communities (OCs), where the lack of face-to-face interaction creates perceived and behavioral uncertainty, trust plays a fundamental role in building social relationships and exchanging information. In recent times, users' trust has been put to the test extensively by community operators as well as by other community members. Facebook, for example, has faced criticism on a range of privacy concerns. A research project conducted at the Massachusetts Institute of Technology revealed that Facebook does not take adequate steps to protect the privacy of its users (BBC, 2008). Firms are abusing Facebook for marketing purposes, and intruders are exploiting security holes to actively record private user information. Besides users, advertising companies are also concerned about using OCs. Vodafone and Virgin Media, for example, withdrew their advertisements from Facebook to protect their brands, as they were afraid of placing their ads adjacent to information that was inconsistent with their marketing messages (BBC, 2008). MySpace was accused of missteps in handling data as well, when several security gaps in the system facilitated phishing attacks on MySpace users (McMillan, 2006). Members of US communities are not the only ones to complain about shortcomings in the security and privacy policy of community operators. Many German communities do not appear to follow an integrated privacy concept either. The OC StudiVZ, for example, faced a severe user revolt against their plans to use private data for personalized ads (Lischka, 2007). The trust violations in OCs are no longer just a private concern, but also a governmental affair. Several governmental institutions publish user warnings or even block the access for their employees to OCs for fear of divulging confidential information in these OCs (e.g., (CTV, 2007)).

Exposed to such severe consequences, community operators have reacted swiftly to make amends. Facebook responded to criticisms by readjusting several system features with the aim of enhancing trust (BBC, 2008; McCarthy, 2008). MySpace reacted by implementing anti-phishing and anti-spam measures. StudiVZ tried to enhance trust by overhauling several technical features (such as communication widgets and navigational cues) on its platform. These efforts demonstrate that community operators increasingly rely on IT factors to (re)gain user confidence. Without including the users' perspective on which IT factors actually affect trust and participation, however, uncertainty still remains about whether community operators are pulling the right levers. Even though several research efforts have been undertaken in the context of OCs, these studies have focused on single IT factors and their influence on either trust or participation. As a consequence, there is still a lack of research in providing an integrative view on how a *comprehensive set of IT factors* affect trust *and* participation.

With our study, we attempt to address this research gap by combining different complementary research streams into one conceptual model, which we call the Technology-Trust-Participation (TTP) Model. This model allows us to analyze what types of IT factors really affect trust factors and user participation in OCs. In particular, we address the following research questions:

(1) What IT factors affect trust-building and user participation in online communities?

(2) What can operators of OCs do to better address user trust and increase participation by using IT?

To address these research questions, this paper is structured as follows. First, we review the relevant literature on trust and OCs. Second, we develop our Technology-Trust-Participation Model that includes hypotheses on the relationships between IT factors, trust variables and participation. Third, we outline our empirical method comprising an online-survey to investigate users' perceptions on trust and participation. Finally, we present the results of our empirical analyses based on structural equation modelling. The paper concludes with a discussion of the theoretical and practical contributions of our work, its shortcomings, and future research directions.

2 TRUST AND PARTICIPATION IN ONLINE COMMUNITIES

Trust is a multidimensional construct whose causes and effects have been studied in various scientific disciplines. In IS research, trust has gained a prominent position, since transactions and social relationships between human beings are mediated by information technology. In these so-called computer-mediated operators increasingly rely on IT factors to create trust between the involved parties as a means of compensating for the lack of face-to-face interaction. In this context, IT factors are defined as a bundle of IT- features that provide functionalities and/or visual cues on the user interface of OCs and thus collectively exert an impact on trust-related dimensions. Trust, which is defined as "*the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other party will perform a particular action important to the truster*" (Mayer et al., 1995), is usually thought to consist of three dimensions. First, *system trust* depends on an individual's perceptions of the institutional environment that serves as the context of the interaction (Pennington et al., 2003) and is based on the perceived structural characteristics of a system that influence users' trusting beliefs in the system operator (McKnight & Chervany, 2001). *Interpersonal trust* describes the willingness of a party to depend on another party on a personal level even if negative consequences are possible (Mayer et al., 1995). Finally, *dispositional trust* refers to the general trusting attitude of a truster - an inborn characteristic that is independent of any party or context (Mayer et al., 1995). Previous studies have concentrated on investigating trust in the context of e-commerce, in which the direct contact with physical products and salespeople is missing and information asymmetry concerning product quality prevails (Belanger et al., 2002). A yet under-researched IS context regarding the importance of different trust dimensions are OCs, which can be defined as "*groups of people with common interests and needs who come together online. Most are drawn by the opportunity to share a sense of community with like-minded strangers, regardless of where they live*" (Hagel III & Armstrong, 1997). As OCs strongly build on IT factors to influence trust towards other members and the community platform (operator), interpersonal and system trust serve as the two prevailing trust concepts from an IS research perspective. Previous studies on trust in OCs mainly stem from two separate streams of research. While the first stream investigates trust as antecedent of participation (Chiu et al., 2006; Ridings et al., 2002b), the second examines trust from a community perspective by analyzing how the design of single IT factors on community platforms contribute to trust-building (Leimeister et al., 2005; Shneiderman, 2000). However, what is still missing in the existing body of research is an integrated view on the relationships between (a comprehensive set of) IT factors, trust factors and participation.

3 THE TECHNOLOGY-TRUST-PARTICIPATION MODEL

Our conceptual model, which we call the Technology-Trust-Participation (TTP) Model, is based on an integrative view on how IT factors, trust variables, and participation are related to each other (see Figure 1).

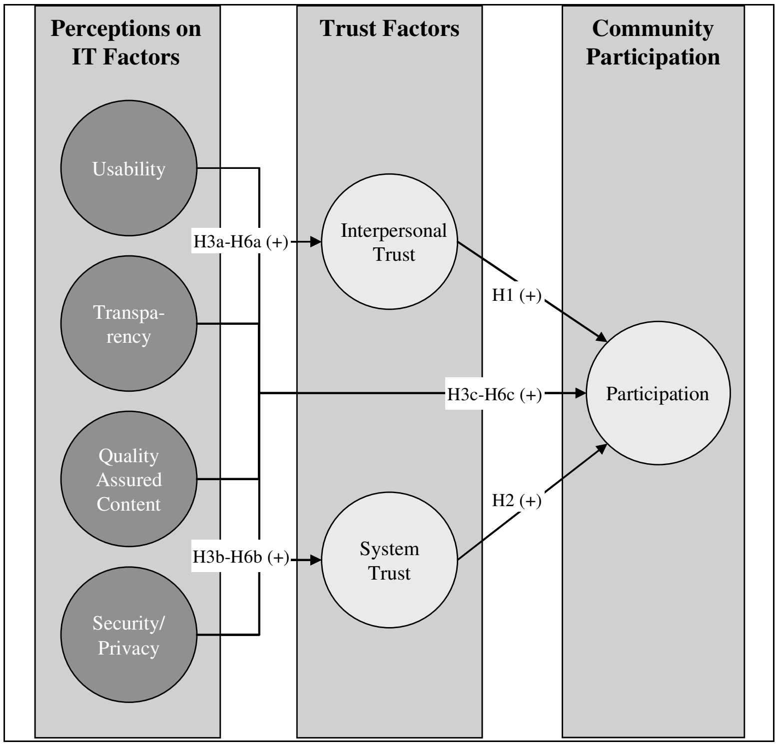

Figure 1. Research model on Technology-Trust-Participation

More specifically, the research model examines how community members' perceptions on the provision of different IT factors (namely usability, transparency, quality-assured content (QAC), and security/privacy) are related to trust-building in OCs and how trust-building translates into users' participation. Furthermore, it hypothesizes on direct links between IT factors and participation.

3.1 Trust Factors and Participation

Various trust factors have been examined in IS research with respect to their impact on community success – a concept usually represented by the level of participation (i.e., the number of participants or the number of messages posted) (Pavlou, 2002). Due to the social nature of community exchanges, trust in other members has been identified as an important factors influencing participation in OCs, because it enables individuals to engage more openly in knowledge exchanges in the collective (Ridings et al., 2002b). Numerous authors have stressed the importance of trust among members. Chiu et al. found that knowledge-sharing in OCs is facilitated by a strong sense of trust between their members (Chiu et al., 2006). Ridings et al. found that trust in other members had significant downstream effects on members' desire to exchange information and thus to contribute to the OC's success (Ridings et al., 2002b). Based on empirical evidence, we propose the following hypothesis:

H1: Community members' interpersonal trust is positively related to their participation.

Studies have reported significant relationships between trusting beliefs in the vendor of a commercial website and the intention to use or purchase offered products (Lim et al., 2006b). Trusting beliefs of an individual in a vendor refers to the perception of the trustworthiness of the vendor who possesses characteristics through which the individual can infer that he/she benefits from the vendor (McKnight et al., 2002). A trustee who possesses these traits is very desirable as an exchange partner, because he/she will behave ethically and consistently in the exchange (Mayer et al., 1995). Transferred to the OC context, if the community system and its operator are perceived as trustworthy, members are encouraged to participate (Leimeister et al., 2005). We therefore hypothesize:

H2: Community members' trust in the community system is positively related to their participation.

3.2 Relationships between IT Factors and Trust and between IT Factors and Participation

Various studies have examined the effects of IT factors on trust variables in e-environments. Shneiderman (2000), for example, gives guidelines to design trust in websites (Shneiderman, 2000). Leimeister et al. describe how to implement trust-building functionalities in an OC for patients (Leimeister et al., 2005). Reviewing the existing literature, four main clusters of trust-building IT factors emerge from the discussions – *usability*, *transparency*, *quality-assured content*, and *privacy/security* – which are deemed as the most relevant factors in this context (Belanger et al., 2002; Leimeister et al., 2005; Preece et al., 2004).

Usability can be defined as "*the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction*" (Karat, 1997). Research studies have reported that poor usability is highly correlated with site failures (Everard & Galletta, 2005). Information design is particularly crucial in OCs, as it supports an OC's role as a medium for social interaction (Preece et al., 2004). Research has shown that social cues, such as personal lists of friends and communication widgets (e.g., posts, wall-to-wall, etc.) increase interpersonal trust because they facilitate to become acquainted with other members so that the lack of "human touch" can be compensated (Lim et al., 2006a). In addition, accessibility of information build trust in a website because it reflects consistency and reduce users' perceived risk of wasting time and frustration (Wang & Emurian, 2005). Navigational elements also help users to become confident with the website and increase its overall trustworthiness. An empirical study about the reasons for lurking in OCs has shown that usability is a problem for many users, especially for the inexperienced ones. Providing clear directions for use is therefore required to improve active participation (Preece et al., 2004). Based on the empirical evidence, we propose the following hypotheses:

H3a: *Usability-related IT features are positively associated with interpersonal trust.*

H3b: *Usability-related IT features are positively associated with system trust.*

H3c: *Usability-related IT features are positively associated with participation.*

Transparency in e-environments can be understood as the selective exchange of sensitive information between two entities involved in the exchange relationship in order to reduce ex-ante risk and uncertainty (Pavlou, 2002). Due to the anonymous nature of the Internet, information about a website's operator and users are thus relevant for the trust-building process and for active participation (Leimeister et al., 2005). Information about the true identity of the community operator is reported to enhance transparency and to increase the trust of members in the community system (Ridings et al., 2002b). It is also proposed that making information about community goals and terms of use explicit and easily accessible enhance trust not only in the community system but also in other members (Grazioli & Jarvenpaa, 2000). Furthermore, the trustworthiness of the information provided in a community is of critical importance. The results of an online survey indicate that separation of advertising and editorial information increase trust in the displayed content (Leimeister et al., 2005). It is also shown that reacting fast and in a courteous and professional manner to user questions is an effective way to increase user trust (Shneiderman, 2000). For the reasons given above, transparency is suggested to efficiently increase trust and active participation. Based on empirical research, we derive the following hypotheses:

H4a: *Transparency-related IT features are positively associated with interpersonal trust.*

H4b: *Transparency-related IT features are positively associated with system trust.*

H4c: *Transparency-related IT features are positively associated with participation.*

QAC captures indicators of the perceived quality of a website and the information contained therein. Since there is no direct contact with a salesperson, the quality of product descriptions is essential for online stores (Everard & Galletta, 2005). In OCs, the quality of displayed information is also an important factor convincing the users that the content is accurate and unbiased. Results studies confirm that feedback mechanisms induce trust and promote participation and positive feedback from other members increases trustworthiness and credibility (Leimeister et al., 2005). By taking action against unacceptable behavior, opportunistic behavior can be reduced and interpersonal trust-building can be supported (Pavlou, 2002). To induce trustworthiness in community members, roles of membership are proposed, which distinguish between novices at the lowest level up to leaders at the highest level. These levels of membership shed light on the expected quality of user comments and recommendations (Kim, 2000). To support users' trust in the content of a website, its operators have to signal that they care about the content's quality To guarantee the correctness of content, comments should be proofread by community staff (Ridings et al., 2002b). By contrast, teasers and misleading bargain offers induce mistrust, which may decrease participation (Wang & Emurian, 2005). The perceived quality of a website and the presented information thus lead to community participation (Leimeister et al., 2005) Therefore, we derive the following hypotheses:

H5a: QAC-related IT features are positively associated with interpersonal trust.

H5b: QAC-related IT features are positively associated with system trust.

H5c: QAC-related IT features are positively associated with participation.

Information privacy refers to "*the claim of individuals or institutions to determine for themselves when, how, and to what extent information about them is communicated to others*" (Westin, 1967). While a security threat is defined as a "*circumstance, condition, or event with the potential to cause economic hardship to data in the form of destruction, disclosure, modification of data, and/or fraud, waste, and abuse*" (Kalakota & Whinston, 1996), security measures offer protection against them. In the context of OCs, security is associated with the authentication on websites and protection against data theft. Participating in OCs usually entails the disclosure of personal data which can be collected and potentially misused. It has been found that trusting beliefs in online companies were significantly affected by users' security and privacy concerns. Trusting beliefs had a significant impact on the intention to provide personal data (Malhotra et al., 2004). Security mechanisms, such as encryption and authorization protocols, increase security and trust in OCs, as well as privacy mechanisms such as privacy seals from trusted third parties and IT features to configure user anonymity. These IT features allow each member to decide what kind of personal data is revealed to others and therefore help to increase community members' willingness to divulge personal data (Leimeister et al., 2005). It has been found that security and privacy mechanisms are important determinants of community success and user participation (Leimeister et al., 2005). Therefore, we formulate the following hypotheses:

H6a: Security/privacy -related IT features are positively associated with interpersonal trust.

H6b: Security/privacy -related IT features are positively associated with system trust.

H6c: Security/privacy -related IT features are positively associated with participation.

4 EMPIRICAL METHODS

4.1 Survey administration

To investigate the research questions and corresponding hypotheses of our research model, we conducted an online-survey with OC users. The online-survey underwent a pretest and a pilot phase. Content and face validity of the questionnaire was ensured by asking 40 community members to provide feedback on usability and language ambiguity after filling in the survey. During the collection phase, which lasted from May to June 2008, hyperlinks to the online survey were posted in a random selection of a total of 80 (US and German) general-interest OCs (e.g., www.facebook.com; www.studiVZ.de) provided by Nielsen Online (NetView). At the beginning of the data collection session, an introduction to the study's context was presented. After 45 responses to the survey had been discarded because of missing data and incomplete information, our final data set contained 364 respondents. Non-response bias was assessed by verifying that (1) respondents' demographics were similar to those of typical Internet and community users and (2) by ensuring that early and late respondents were not significantly different (Armstrong & Overton, 1977). We compared the sample based on its demographics (i.e. age, gender, education and membership duration). All t-tests between the means of the early and late respondents showed no significant differences, and the demographics (see Table 1 in Appendix A) were similar to the demographics reported by other community and Internet studies (Ridings et al., 2002b).

4.2 Measurement Development

All measurement items for the study's principal constructs (both for the survey and content analysis) were adopted from existing measures and adapted for this study. Table 1 presents the constructs used in the online survey along with the sources from which they were drawn.

Constructs (Abbr.) (measurement model)		**Survey Item (Scale from 1=low agreement to 7=high agreement except for Particip)**
Self-reported Particip. (reflective) (Ridings et al., 2002a)	Particip1	Level of average knowledge sharing (i.e., providing or seeking) per month from 1=less than once per month to 7=more than 30 times per month
	Particip2	I am participating actively (i.e., providing or seeking) in the online community
Interpersonal Trust (reflective) (Chiu et al., 2006)	InterTrust1	Community members will not take advantage of others even when the opportunity arises
	InterTrust2	Members in the community will always keep the promises they make to one another
	InterTrust3	Members in the community behave in a consistent manner
	InterTrust4	Members in the community are truthful in dealing with one another
System Trust (reflective) (McKnight et al., 2002); (McKnight & Chervany, 2001)	SysTrust1	I believe that the community would act in my best interest
	SysTrust2	The community is truthful in its dealings with me
	SysTrust3	The community would keep its commitments
	SysTrust4	The community is sincere and genuine
Usability (formative) (Everard & Galletta, 2005; Leimeister et al., 2005; Preece et al., 2004)	Usability1	The community website is simple to navigate
	Usability2	The community website provides synchronous and asynchronous communication technologies to interact with other community members
	Usability3	The community website provides support functions such as FAQ or Help
	Usability4	The implementation of personal friends lists foster social networks
	Usability5	The layout of the community website looks professional (e.g. clear design)
	Usability6 (R)	The accessibility of the pages on the community website was impaired by missing information and broken links
Transparency (formative) (Leimeister et al., 2005)	Transpar1	Information about the community operator (name, address) are clearly visible on the website
	Transpar2	Information about the terms of use is easy to find
	Transpar3	Product advertisements are clearly separated from factual content on the community website
	Transpar4	Goal and purpose of the community are clearly defined
	Transpar5	The operator reacts fast and in a courteous and professional manner to member questions
Quality Assured Content (formative) (Kim et al., 2008; Leimeister et al., 2005; Pavlou, 2002)	QualContent1	The community allows users to rate and assess the interactions and transactions with other users via rating and reputation mechanisms
	QualContent2	The quality of the content published within the community is assured by a third party
	QualContent3	The community provides reliable information (e.g. no free or teaser offers are present)
	QualContent4	A reliable feedback mechanism is provided by the community to report unacceptable behavior of community members
	QualContent5	A clear user role concept indicates what users are allowed to do.
Security & Privacy (formative) (adapted from (Belanger et al., 2002)	SecPriv1	The community lets the community members decide on what information will be disclosed to other members
	SecPriv2	Personal data that is transmitted with utmost care (via security features like SSL etc.)
	SecPriv3	Third party privacy seals indicate that the community is trustworthy
	SecPriv4	The community provides prominent links to the privacy policy statement
	SecPriv5	The community lets the community members in control of their data through changeability of data and termination of membership

Table 1. Measurement of variables in online-survey

5 STATISTICAL ANALYSES AND RESULTS

The dataset was analyzed using partial least squares (PLS)-based structural equation models (Chin, 1998; Lohmöller, 1989). In contrast to parameter-oriented and covariance-based structural equation modeling, the component-based PLS method is rather prediction-oriented (Chin, 1998), p. 352) and has become the preferred option when formative constructs come into play (Gefen, 2000). It seeks to predict variations in the dependent variables of the model which is our aim for this study's trust and performance variables. PLS is best suited for testing complex relationships by avoiding inadmissible solutions and factor indeterminacy. Finally, we chose PLS to accommodate the presence of a large number of (reflective and formative) variables and relationships.

5.1 Assessing the Measurement Models

The reflective measurement models were validated using standard procedures from the current literature (Chin, 1998; Straub, 1989). Items of scales in a related domain were pooled and factor-analyzed to assess their convergent and discriminant validity. While convergent validity was determined both at the individual indicator level and at the specified construct level, discriminant validity was assessed by analyzing the average variance extracted and inter-construct correlations. All standardized factor loadings are significant (at least at the $p<0.05$ level), thus suggesting convergent validity (Bagozzi et al., 1991). To evaluate construct reliability, we calculated composite reliability and Cronbach's alpha for each construct. All constructs have a composite reliability significantly above the cutoff value of 0.707, and Cronbach's alpha values greater than 0.7 (Hair et al., 1998). All reflective constructs also met the threshold value for the average variance extracted (AVE>0.50). With respect to the discriminant validity of latent variables, the square roots of AVEs exceeded the inter-construct correlations among the independent constructs.

Validating formative measures, we first carefully reviewed the content and face validity of the formative indicators used to measure the IT factors in both research sub-models by including 3 senior IS academics and 5 community operators in the item selection and evaluation process. In addition, we ensured that the final set of formative indicators was well-supported by past empirical studies. To ensure that multicollinearity is not present in formative constructs, one can use the variance inflation factor (VIF) statistic. If the VIF statistic for formative measures is greater than 3.3 (Diamantopoulos & Siguaw, 2006), the researcher should adjust the formative construct. While VIF-values ranging from 1.212 to 2.683 indicated that there is no problem with multicollinearity in the survey sample, eight weights of formative indicators were not significant. Since dropping those items would mean skipping a significant part of the nomological domain of the constructs and harming content validity (Bollen & Lennox, 1991), we retained all of the insignificant indicators. The relationships among formative indicators and the latent construct to be measured should also be interpreted as hypotheses that need to be evaluated in addition to the structural paths (Petter et al., 2007). Overall, constructs in our measurement model satisfied various reliability and validity criteria, and could be used to test the structural models and the associated hypotheses proposed earlier (see Tables 3 and 4 of the Appendix).

5.2 Evaluating the Structural Model

Figure 2 illustrates the path coefficients and the R^2 values of the structural model based on the survey sample. The results indicate that the IT factors explain 32 percent of the variance in interpersonal trust among community members and 43 percent in system trust. 45 percent of the variance in self-reported participation is explained by the IT factors and trust variables investigated in this study.

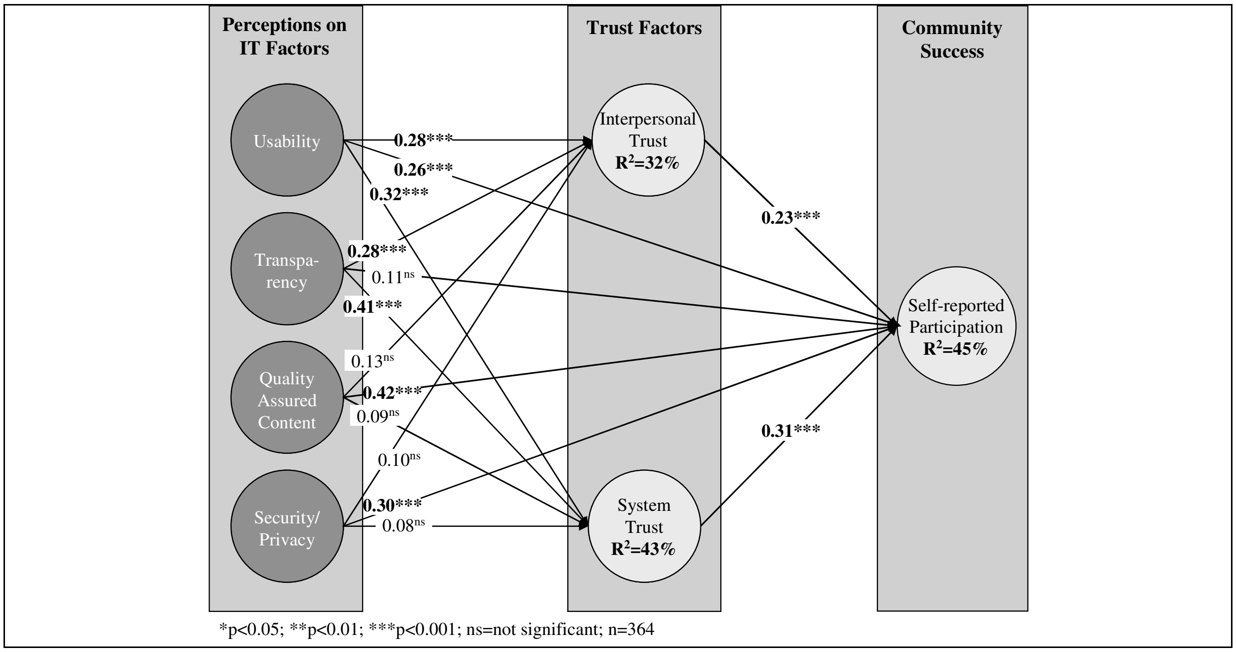

Figure 2. Structural model results for the Trust-Technology-Participation Model

Both interpersonal (*$\beta=0.23$; $p<0.001$*) and system trust (*$\beta=0.31$; $p<0.001$*) were significantly related to the level of participation, thus providing support for H1 and H2. In addition, we used the Meng et al. (1992) Z-test[1] for comparing the significance of the differences between path coefficients of technology, trust and participation variables (Meng et al., 1992). Based on the path coefficients and the Z-test, the relationship between system trust and participation was observed to be stronger (*$p<0.01$*) than the relationship between interpersonal trust and participation. Furthermore, while the relationship between transparency-related IT features and interpersonal trust was not stronger (*$p<0.05$*) than the relationship between usability-related IT features and interpersonal trust, we found that that transparency-related IT features had a stronger effect on system trust than usability-related IT features (*$p<0.01$*). Analyzing IT factors' impact on the trust factors, we found that usability- and transparency-related features had a positive effect on both interpersonal (*$\beta_{usa}=0.28$, $\beta_{trans}=0.28$; both $p<0.001$*) and system trust (*$\beta_{usa}=0.32$, $\beta_{trans}=0.42$; both $p<0.001$*), providing support for H3a, H3b and H4a, H4b respectively. Significant relationships could not be found between QAC- and security/privacy-related features and the two trust factors, thus rejecting H5a/H5b and H6a/H6b.

Examining which IT features were specifically the driving forces behind usability and transparency's influence on trust factors, we found that navigational cues (*$t=1.96$; $p<0.05$*), easy-to-use communication mechanisms (*$t=4.38$; $p<0.001$*), the provision of personal friends lists (*$t=2.32$; $p<0.01$*) and easy access to most important community content (*$t=3.29$; $p<0.001$*) were significant usability-related IT features. Surprisingly, the professionality of the OC's layout and the provision of support functions such as FAQs were not significant drivers behind the IT factor usability. For transparency-related features, we found that easy-to-find information about the terms of use (*$t=3.91$; $p<0.001$*), a clear separation of ad from factual/community content (*$t=2.34$; $p<0.01$*), and a clear definition of the goal, purpose and target groups of the OC (*$t=1.84$; $p<0.05$*) were significant

[1] This particular test allows one to determine if one variable (e.g., a) correlates with the criterion variable (stronger or weaker) as compared to another variable (e.g., b). Using correlation coefficients from our online-survey study, the following formula was used to calculate the Z-statistic: $Z=(Z_{y,a}-Z_{y,b})\sqrt{\frac{N-3}{2(1-r_{ab})h'}}$, where $Z_{y,a}$ and $Z_{y,b}$ are Fisher's Z-transformations, N is the sample size, h is $(1-fr^{*2})/(1-r^{*2})$, f is $(1-r_{a,b})/2(1-r^{*2})$, and r^{*2} is $(r^2_{y,a}+r^2_{y,b})/2$ (Meng et al. 1992)

usability-related IT features. Although we did not find a significant relationship between the overall IT factors QAC and security/privacy and trust factors, single IT features forming these two factors showed positive effects. For QAC-related features, the provision of IT-enabled rating mechanisms (*t=1.95; p<0.05*) and reliable feedback mechanisms to report unacceptable behaviors of other community members (such as low-quality content) (*t=3.17; p<0.001*), and the establishment of moderators and experts as trusted third parties to oversee the quality of the OC's content (*t=2.21; p<0.01*) showed significant effects on the IT factor QAC. Security/privacy-related features that enable users to configure how much personal data is disclosed to whom (*t=2.25; p<0.01*), that display third-party privacy seals (*t=1.90; p<0.05*) and how personal data is transmitted (*t=1.95; p<0.05*) were also significant drivers behind the IT factor 'security/privacy'. Unexpectedly, IT features such as prominent links to the privacy statement of an OC or the blocking of free and teaser offers were not significant drivers behind their respective QAC and security/privacy factors.

6 DISCUSSION

6.1 Major Findings and Contributions

This research study contributes to a heightened understanding of the connection between IT factors, trust variables and participation in OCs by clarifying their interrelationships from a community user perspective. Based on our empirical findings, we can derive several important implications.

First, while many researchers have extensively examined the importance and impact of IT-mechanisms in e-commerce, only few have investigated the influence of a comprehensive set of IT factors and features on trust- and participation-building in online-communities. Our findings suggest that IT factors are indeed helpful in explaining the influence on trust variables and participation. However, there were not only similarities, but also interesting differences in the way IT factors influenced trust- and participation-building. More specifically, usability- and transparency-related IT factors were the dominant mechanisms to have an effect on both interpersonal and system trust, while QAC- and security/privacy-related IT factors had no effect on both trust variables. Regarding IT factors' impact on participation, we found that all IT factors were significantly associated with participation except for transparency. These results validate, complement and extend existing research literature. For instance, we could validate that the majority of usability-related IT features such as perceived flaws in the site quality (e.g., missing links or incomplete information) of a website or poor navigational cues lead to diminished trust perceptions of users (Everard & Galletta, 2005). However, the study's findings also suggest that the mere provision of a professional website design or of supporting functions (e.g., Help or FAQs) does not affect trust-building, but has rather a direct effect on community participation. In line with previous empirical studies such as Leimeister et al. (2005), we also found that most of the transparency-related IT features (i.e., information about terms of use, goal, and purpose of the community as well as a clear separation of ads and content) examined in this study have a significant impact on trust-building, but not on participation. Conversely, we found that the provision of IT-enabled customer service features and the disclosure of the community operator's identity had direct effects on community participation, but not on trust. The overall effect of the IT factor 'transparency' on participation implies that providing transparency via IT features helps users to gain trust in other members and the community operator, but is not a sufficient means to encourage users to engage in community activities more often. Consistent with previous findings on data security/privacy (Belanger et al., 2002; Malhotra et al., 2004), we found that IT features on anonymity configuration and the deployment and signaling of basic security standards (e.g., https, SSL, etc.) were crucial IT features in the sense that they both affected trust- and participation-building. However, we also found that IT features that enable the configuration of personal data and provide access to privacy statements were not trust-building, but rather positively affecting participation. Finally, it could also be confirmed that QAC-related IT features such as rating and reputation mechanisms, IT-enabled content quality checks through experts (Leimeister et al., 2005) and IT features that mediated the reporting of unacceptable user behavior in OCs (Pavlou, 2002) were observed to significantly influence trust variables. Overall, the IT factor 'QAC' as a whole did not have a significant effect on trust-building which suggests that the perceived quality of the content itself is not sufficient to provide for enhanced trust, but nonetheless helps increasing participation.

Second, in respect of the trust literature in general and the main trust variables examined in this study in particular, another key finding is that interpersonal trust and system trust are significant predictors of user participation. More specifically, the trust factors examined in this study are significant mediators in the relationship between the effects of IT factors on community participation. System trust turned out to be stronger in affecting participation compared to interpersonal trust which was mainly due to the evidence that transparency-related IT features were stronger in affecting system trust than usability-related IT features, while transparency- and usability-related IT features had an equally high effect on interpersonal trust. The results suggest that in OCs, there are often well-established trust relationships among members, since they know each other from real life (Chiu et al., 2006). As a possible consequence, IT features can not affect interpersonal trust inasmuch as the trust towards the community operator who is most often not known in real life.

Third, we have also interesting implications for investments into and the deployment of IT features on OCs. Based on our findings, community operators have several options to increase participation and user trust by deploying IT features. First and foremost, community operators should look at their portfolio of usability-related IT features deployed on their website and think about improving specific ones, since they largely affect both trust factors and participation. In terms of trust-building, they should also consider transparency-related IT features, as they collectively and significantly affected trust variables in our study. Finally, select QAC- and security/privacy-related IT features can be used in addition to usability-related IT features to increase community participation. In this regard, community operators can view our results as reference points for how to allocate IT investments.

6.2 Limitations and Future Research

This study has a number of limitations that create interesting opportunities for future research. First, even if general-interest OCs cover a considerable share of the overall online community market, the generalizability of the study's findings must be tested in special interest community segments (e.g., gaming, health, etc.). Further research should therefore concentrate on examining the moderating effects of different types of online environments in the relationship between IT factors, trust and participation. Second, in order to give more in-depth recommendations on how community operators should improve in their deployment of IT factors, it would be necessary to evaluate the current degree of implementation of IT features on community websites. Future research thus could assess a representative sample of OCs using content analysis and examine how community operators have actually realized individual IT features on their websites. Third, as we used self-reported participation as proxy for community participation, common method bias was assessed (Podsakoff et al., 2003): A correlational marker technique (Richardson et al., 2009) was used, in which the highest variable from the factor analysis was entered as an additional independent variable. This variable did not create a significant change in the variance explained in the dependent variables. This test suggests lack of common method bias. Nonetheless, future studies should integrate complementary measurements such as indicators of website traffic (e.g., page views or viewtime) to examine whether IT factors impact actual community participation.

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Appendix

Study	Age (in years)	Gender	Education	OC membership in months (*STD*)
General-interest Online Communities (n=364)	<18: 9% 19-30: 58% 31-40: 15% 41-50: 9% >50: 9%	62% Women	None: 7% College: 8% College or higher education: 50% Academic studies: 20% Professional education: 15%	27.2 (*53.5*)

Table 2. Socio-demographic data

Constructs	# of Indicators	Factor Loadings*	Composite Reliability	Average variance extracted	Cronbach's Alpha
Particip	2	0.741 – 0.823	0.892	0.815	0.826
InterTrust	4	0.723 – 0.921	0.886	0.739	0.832
SysTrust	4	0.857 – 0.913	0.923	0.848	0.879
* All factor loadings are significant at least at the p<0.05 level					

Table 3. Factor loadings and quality criteria for latent variables

Formative Constructs	Items	Weight	t-Value
Usability	Usability1	0.194	1.960*
	Usability2	0.473	4.380***
	Usability3	0.050	0.253^{ns}
	Usability4	0.333	2.321**
	Usability5	0.101	0.506^{ns}
	Usability6 (Reverse)	0.444	3.290***
Transparency	Transpar1	0.068	0.521^{ns}
	Transpar2	0.524	3.913***
	Transpar3	0.367	2.328**
	Transpar4	0.149	1.825*
	Transpar5	0.070	0.658^{ns}
Quality Assured Content	QualContent1	0.204	1.954*
	QualContent2	0.411	2.205**
	QualContent3	0.127	0.760^{ns}
	QualContent4	0.572	3.174***
	QualContent5	0.141	1.216^{ns}
Security & Privacy	SecPriv1	0.362	2.249**
	SecPriv2	0.279	1.954*
	SecPriv3	0.263	1.895*
	SecPriv4	0.001	0.012^{ns}
	SecPriv5	0.169	0.444^{ns}
*p<0.05; **p<0.01; ***p<0.001; n.s.=not significant			

Table 4. Measurement model assessment of formative IT factors