

INVESTIGATING PERSONAL AND COMMUNITY FACTORS IN E-GOVERNMENT: A CITIZEN'S PERSPECTIVE

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Abstract

This paper investigates the importance of personal factors and community factors in e-government based on the e-consultation aspect of government-to-citizen (G2C) interaction. The personal factors studied were ease of use, usefulness, reliability and security, and the community factors studied were privacy, transparency, participation and accountability. While previous empirical studies have focused mainly on personal factors of e-government web sites, this study also investigates community factors. The data analysis suggested that both personal and community factors are important factors in e-government web sites usage. Working from a socio-technical system design perspective, this paper proposes an e-government framework that reflects a G2C interaction by introducing community factors as a new e-government web site dimension, in addition to the well known personal factors that influence web site usage in general.

Keywords: Citizens Participation, Community Factors, E-Government, Socio-Technical System Design.

1 INTRODUCTION

In general, government cannot exist without the co-existence of two groups: the elected governors and the citizens who are governed. The interaction between these two groups defines the nature of government, and in our modern technological society, the e-government web site is at the heart of this relationship. For example, if a nation practices democracy, the governed help to shape the nature and direction of the government, and so the e-government web site should reflect this. Today, the interactions between the governors and the governed can increase significantly by utilising information and communication technology (ICT), including Web 2.0 and social media applications (Baumgarten & Chui, 2009; de Kool, & van Wamelen, 2008).

The importance of governments adopting and utilising the ICT is reflected by the fact that 91% of United Nations members have e-government web sites (UN 2003). In term of expenditure, International Data Corporation (IDC) (2008) estimates that e-government spending in the Asia-Pacific region alone will exceed US\$31 billion by end of 2010. However, e-government has yet to reach its potential (Al-Adawi et al., 2005). Proponents suggest the positive impacts of introducing government services online, to increase online interactions between government agencies and citizens (Andersen et al., 2010; Bertot et al., 2008; Moon & Welch, 2005), yet some claim that e-government progress has reached plateau, being unable to generate interest among citizens to participate in giving policy feedback (Baumgarten & Chui, 2009; Rocheleau, 2007). Hence this paper proposes the relevance of socio-technical design, which defines community factors relevant to the design of web technology (Whitworth, 2009).

While many empirical studies have focused on the personal factors like ease of use, usefulness, security and reliability (Davis et. al., 1989; Soufi & Maguire, 2007; Venkatesh et al, 2003; Whitworth et al., 2008), we suggest that research should go beyond these and start to give more focus on how factors at the community or collective level impact those who use e-government (Andersen et al., 2010). Current e-government empirical studies have been done independently, without a general framework, focusing example on e-services (Stafford & Turan, 2011; Wang et al., 2005) or e-participation aspects (Macintosh et al., 2005; Mambrey, 2008). Conversely empirical studies from so called demand side, of what citizens want, are rare, but have looked at the factors that influence citizens to use e-government (Belanche et al., 2010; Gauld et al., 2010).

This study investigates both personal and community factors in e-government from the socio-technical system design perspective. Socio-technical system design refers to adding social requirements to human-computer interaction (HCI), software and hardware requirements (Whitworth, 2009), in order to optimise the social operation of technical systems (Mumford, 2006). This study focused on the e-consultation aspects of government-to-citizen (G2C) interaction.

The structure of this paper is organised as follows: Section 2 discusses the proposed e-government framework, which includes the personal and community factors that influence citizens to use e-government, Section 3 explains the method used, Section 4 discusses the findings of the study and Section 5 concludes with impending future work.

2 LITERATURE REVIEW

E-government, electronic government, digital government and online government are here considered all synonyms. To date, researchers and governments alike have yet to reach a consensus on how best to define e-government with a single universal definition. This study adopts the definition of e-government from Baum et al., (2000) which defines e-government as *“the transformation of public sector internal and external relationships through net-enabled operations, information technology and communications, to optimise government service delivery, constituency participation and*

governance”. As this implies the use of technology in the service of community governance, community factors are expected to be relevant evaluation criteria.

2.1 E-government framework

From the literature on the e-government domain, most researchers categorise e-government interaction into four types: government to government (G2G), government to citizen (G2C), government to business (G2B) and government to employee (G2E) (Chadwick & May, 2003; Evans & Yen, 2005; Siau & Long, 2005). This study narrows that scope to focus only on G2C interaction based on the socio-technical perspective (Bostrom & Heinen, 1977; Whitworth et al., 2008). It adopts Chadwick and May’s (2003) G2C model, which divides that interaction in e-services, e-consultation and e-representation as shown in **Figure 1**.

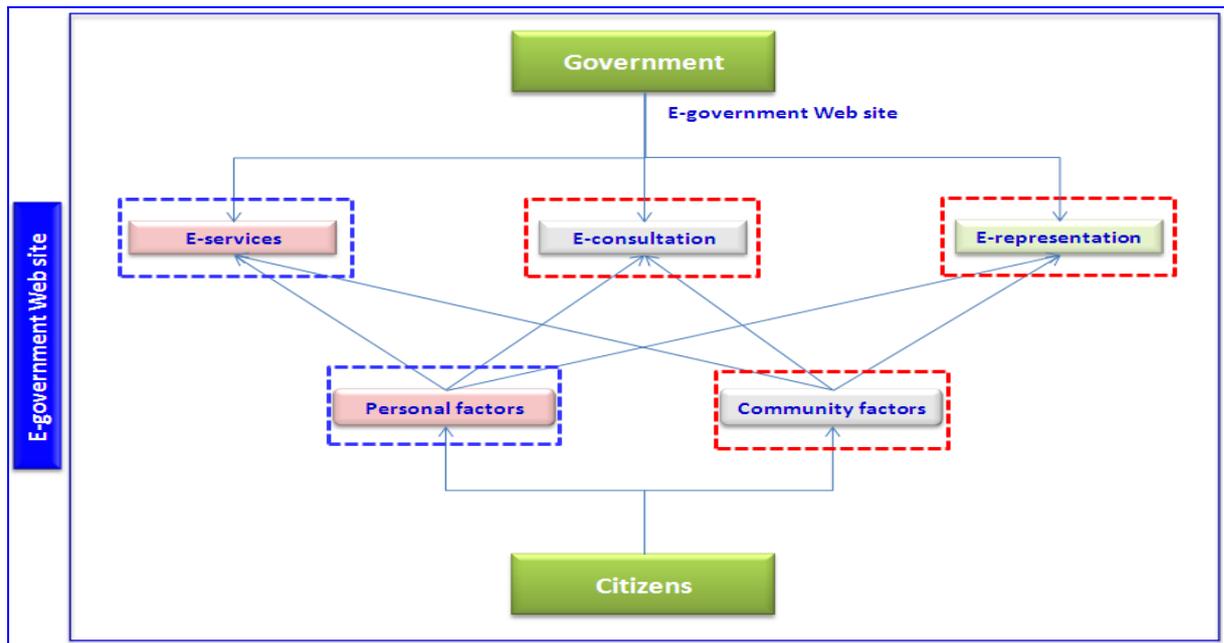


Figure 1. E-government framework – adapted from Chadwick & May (2003).

The definition of each type of e-government interaction is shown in **Table 1**.

E-government type	Definition
E-services	A one-way relationship in which government delivers services to citizens.
E-consultation	A two-way relationship in which citizens provide feedback on issues defined and initiated by government. The government retains the responsibility for final decisions.
E-representation	A many-to-many relationship in which citizens interact directly with their representatives and each other, as when citizens cast a vote.

Table 1. E-government interaction category - adapted from Chadwick and May (2003) and Jackson and Lilleker (2009).

Online interaction in an e-government framework is no longer considered as an optional but is necessary to reflect the diversity of alternatives that citizens can utilise whichever appropriate and convenient to them when dealing with government agencies (Irvin & Stansbury, 2004). Notwithstanding the diversity of alternatives offered by a government, it is rendered a failure if citizens do not accept or utilise them. Only if citizen interaction rights like privacy are recognized at

the early stage of designing and developing an e-government web site will citizens later accept and use it (Saebo et al., 2009).

2.2 Personal and Community Factors

E-government factors identified in literature are in this study grouped into personal and community categories. Each category will comprise of four factors. The personal factors are ease of use, usefulness, reliability and security. Traditionally, these factors have been much studied either as separate or combined factors in the e-government domain. The community category factors now also being considered are relatively new to the e-government domain, but are growing in research importance as relevant to a citizens' intention to use an e-government web site. The community factors considered here are privacy, transparency, participation and accountability. Definition and source of each factor for both categories are shown in **Table 2**.

Factor	Definition	Source
Personal factors		
Ease of use	<i>The degree of importance the web site is easy to use and understand</i>	Baker, 2009; Bederson et al., 2003; Davis et al., 1989; Soufi & Maguire, 2007; Venkatesh et al., 2003; West, 2004; Whitworth et al, 2008
Usefulness	<i>The degree of importance the web site provides outcomes or services that citizens want.</i>	Davis et al., 1989; Palmer, 2002; van der Heijden, 2003; Venkatesh et al., 2003; Whitworth et al, 2008
Reliability	<i>The degree of importance the web site is available and accessible to citizens without interruption or breakdown.</i>	Randell et al., 1978; Whitworth et al., 2008
Security	<i>The degree of importance the web site is protected against unauthorised entry, misuse or takeover.</i>	Ebrahim & Irani, 2005; Evans & Yen, 2006; Gil-García & Pardo, 2005; Kaliontzoglou et al., 2005; Zhao & Zhao 2010
Community factors		
Privacy	<i>The degree of importance the web site does not reveal citizens personal details to others without consent.</i>	Awad & Krishnan, 2006; Buchanan et al., 2007; Belanger & Hiller, 2006; Cullen, 2009; DiMaggio et al.,2001; Dwyer et al., 2007; McCarthy & Yates, 2010
Transparency	<i>The degree of importance the web site reveals government policies, data, laws, regulations, and finances.</i>	Bertot et al., 2010; Bonson et al., 2012; la Porte et al., 2002; Piotrowski & Van Ryzin, 2007
Participation	<i>The degree of importance the web site allows citizens to contribute to governance by vote, comment or opinion.</i>	Abelson et al., 2003; Balkin, 2004; Sæbø at al., 2009; Sæbø et al., 2008
Accountability	<i>The degree of importance the web site makes public officials answerable by declaring performance goals and actual results.</i>	Bovens, 2007; Cunningham & Harris, 2001; Wong & Welch, 2004

Table 2. Definition of personal factors and community factors important in e-government.

Drawing from the number of countries that have invested in e-government, the budget allocated to make the government presence available online and the interest researchers have in e-government, our main research question is whether both personal and community factors are important in influencing citizens to use e-government, and if so, are they equally important?

3 METHOD

The research method used was a quantitative approach, based on online web site feature simulation and an online survey of users' responses. We used purposive sampling, giving mostly respondents from Malaysia who live in New Zealand. To implement this study, we designed and developed an e-government web site questionnaire research instrument, which can be seen at the link www.e-governmentsurvey.net/E-Consultation/Default1.aspx. It involved a Part A survey, and a Part B of demographic questions.

In Part A, the survey covers both personal factors and community factors under investigation where each factor is represented by a set of five items. A total of 40 items were designed for the survey in Part A. A seven (7) point Likert scale was used, where 1 represents extremely unimportant and 7 represents extremely important. Some personal factor items were adapted from previous research but the community factors were mostly self-developed.

Each item also presented an image from actual e-government web sites around the world to illustrate the question, as compared to a simple plain text-oriented survey. This was used to engage the user, albeit it was used with caution, in that it could make the link to the questions much apparent, unambiguous to the respondents (Couper, 2008). The images were taken from the best practices' features of top e-government web sites (United Nations, 2003; United Nations, 2005; United Nations, 2008; United Nations, 2010; West, 2005; West, 2006; West, 2007). Subjects varied in their online transaction experiences, so an actual image of e-government was added into each item in the survey to guide and help respondents in answering Part A (Figure 2). Further assessments from experts were also sought prior to survey being used, to increase the content validity of the items.

The screenshot shows a survey interface for a 'Personal Factor: Ease of Use'. The title is 'The degree of importance the web site is easy to use and understand by citizens.' Below this is an instruction: 'Each statement below relates to personal factors of an e-government web site. Please indicate your importance for each statement by clicking on the button.' The main content area features a banner image for the Australian Government with the text 'Government made simpler. Dealing with the Australian Government online just got easier, with a single account to sign on to multiple agencies. See what life is now.' and a 'Register Now!' button. Below the banner is the question: 'The e-government web site only needs one logon for an interest group to consult with government agencies. How important is this feature?' To the left of the question is a blue box with the ID 'CS1'. Below the question is a seven-point Likert scale with radio buttons and labels: 'Extremely unimportant', 'Very unimportant', 'Slightly unimportant', 'Neutral', 'Slightly important', 'Very important', and 'Extremely important'.

Figure 2. Actual screen shot of Part A –Personal factor: Ease of Use.

In Part B, a set of 10 demographic questions included subject gender, age, employment, education and online experience.

Face-to-face and email were used to attract subjects to participate in the study. For email, a soft reminder was also sent after one to two weeks of not getting any responses from the initial email. Additionally, the study link was also uploaded in a web site of an organisation with the intention of increasing the number of potential respondents. All respondents participated in the study on voluntary basis. As a prerequisite requirement, potential respondents were asked whether they have done any online transaction e.g. making payment, applying form, making inquiry, posting comment, casting vote, etc. Potential respondents were allowed to participate if they fulfilled the prerequisite requirement. The study is the first part of a larger on-going one.

4 ANALYSIS ON FINDINGS

A descriptive and correlational analysis was done for each set of five items representing each of the eight factors under study in order to determine the factors' construct validity. We used Statistical Package for Social Sciences (SPSS) version 17 software to analyse the findings. The analysis involved firstly a descriptive analysis of the importance of both personal and community factors, and secondly a correlational analysis to establish the construct validity and reliability of the factor items.

4.1 Descriptive Analysis

A total of 45 respondents began the study but only 23 completed it. Male respondents were 56%. The age range was from 25 to 65 years, with more than 85% under 45 years old. In addition, 87% respondents had 11 years and above of Internet experience (see **Table 3**), so most were experienced Internet users. Almost 90% respondents had used government online services before but less than 20% respondents had done consultation online with a government agency. However, almost 83% respondents intend to vote online for their representatives if the service is made available. On average, it took almost 30 minutes for respondents to complete the study.

Demographic	Percent
Internet experience	87% (11 years and more)
Used government online services	87% (yes, both Federal and Local government agencies)
Done consultation online	17% (yes)
Intention to do voting online	83% (yes)

Table 3. Respondents Internet experience's frequency.

The Cronbach's Alpha coefficient for the survey in Part A was 0.943, which is higher than the minimum acceptable value of 0.7 suggesting a high internal consistency. 94% of the items had mean values of more than 5 in the 7-point Likert scale (see **Appendix A**), suggesting that all eight factors were important in influencing them to use an e-government web site. **Table 4** shows the importance results. All factors had a mean of more than 5, with Reliability the highest mean of 5.92, followed by Privacy (5.89). Participation had the lowest mean of 5.24. Privacy, a community factor, had the second highest mean rating, as a factor affecting e-government use. Within the community factors, Accountability and Transparency had almost the same ratings, which were higher than the Ease of Use (5.32) personal factor. This suggests that the new community factors are at least as important as the well established personal factors in influencing citizens to use an e-government web site.

Personal factors	Mean	Std. Deviation	Community factors	Mean	Std. Deviation
Ease of Use	5.82	1.02	Privacy	5.89	1.13
Usefulness	5.32	1.01	Transparency	5.52	1.21
Reliability	5.92	1.09	Participation	5.24	1.14
Security	5.66	1.10	Accountability	5.55	1.13

Table 4. Factor's Mean and Standard Deviation (N=23).

4.2 Correlational Analysis

A correlation analysis to determine the construct validity of the factors found that all items had high correlations with their factor (see **Appendix B**), with values ranging from 0.6 to 0.9, except for item 3 in Usefulness (0.522) and item 5 in Security (0.453). The overall item-variable correlation values for all factors increased by dropping one item for each factor (see the adjusted Item-variable correlation in **Appendix B**). An inter-item correlation analysis was also performed, and the results indicated all

items were positively correlated within each factor. See **Table 5** for the Privacy results, and **Appendix C** for the other factors. In other words, each factor item was different and the issue of item duplication didn't arise.

No.	Privacy1	Privacy2	Privacy3	Privacy4	Privacy5
Privacy1	1.000	.791	.678	.752	.610
Privacy2	.791	1.000	.464	.787	.629
Privacy3	.678	.464	1.000	.531	.358
Privacy4	.752	.787	.531	1.000	.804
Privacy5	.610	.629	.358	.804	1.000

Table 5: *Inter-Item correlation for factor Privacy.*

5 CONCLUSION AND FUTURE WORK

The descriptive and correlational analyses suggest that both personal factors and community factors are important in influencing citizens to use e-government. For the personal factors, reliability and ease of use were more important than security and usefulness. For the community factors, privacy was most important, then transparency, accountability, and participation had the lowest rating. Privacy was considered more important than personal factors except for reliability. It follows that community factors have the potential of influencing citizens to use e-government. This opens up the possibility of citizens having a bigger and more influential voice as a group, rather than as individuals. Both item-factor correlations and inter-item correlations supported the construct validity of all eight factors, and the Cronbach's Alpha coefficients indicated high internal consistency within each factor.

The contribution of this study is to support the relevance of community factors like privacy, transparency, participation and accountability as a new dimension of e-government design. It also suggests an e-government framework for G2C interaction involving three types of interactions: e-services, e-consultation and e-representation. In practical terms, e-government system designers will have to consider social requirements as well as traditional HCI demands to gain acceptance from citizens as users.

This study contributes towards enriching the study of e-government field by addressing the under-represented e-consultation aspect. It is also an empirical study, and according to Hassan, Shehab, and Peppard (2011), quantitative e-government studies were only 20% of the research.

Future work will involve conducting data collection for all three interaction aspects: e-services, e-consultation and e-representation. In addition to an online survey, this study will ask subjects to browse rate three different e-government web sites on these factors using the Analytic Hierarchical Process (AHP) method, which involves a pair-wise comparison of all eight factors.

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Appendix A: Factor's mean and standard deviation

Personal Factors	Mean	Std. Deviation	N
EaseofUse1	5.65	1.369	23
EaseofUse2	6.00	.798	23
EaseofUse3	5.70	1.105	23
EaseofUse4	5.87	1.014	23
EaseofUse5	5.87	.815	23
Usefulness1	5.61	1.305	23
Usefulness2	5.35	1.229	23
Usefulness3	5.57	1.121	23
Usefulness4	5.30	1.185	23
Usefulness5	4.78	1.204	23
Reliability1	6.17	.937	23
Reliability2	5.96	1.224	23
Reliability3	5.65	1.229	23
Reliability4	5.70	1.185	23
Reliability5	6.13	.869	23
Security1	5.96	1.224	23
Security2	5.30	1.490	23
Security3	5.35	1.526	23
Security4	5.52	1.563	23
Security5	6.17	.984	23

Community Factors	Mean	Std. Deviation	N
Privacy1	5.65	1.668	23
Privacy2	6.26	1.176	23
Privacy3	6.43	.992	23
Privacy4	5.61	1.777	23
Privacy5	5.48	1.410	23
Transparency1	5.48	1.123	23
Transparency2	5.65	1.112	23
Transparency3	5.39	1.033	23
Transparency4	5.83	1.029	23
Transparency5	5.26	1.322	23
Participation1	5.04	1.397	23
Participation2	5.52	.898	23
Participation3	4.70	1.146	23
Participation4	5.48	.947	23
Participation5	5.48	1.123	23
Accountability1	5.65	1.369	23
Accountability2	5.09	1.041	23
Accountability3	5.52	.994	23
Accountability4	5.74	1.054	23
Accountability5	5.74	1.214	23

Appendix B: Factor's item-variable correlation

Ease of Use

No.	Item	Item-variable Correlation	Adjusted Item-variable correlation
1	The e-government web site only needs one logon for an interest group to consult with government agencies.	0.926	0.911
2	The e-government web site provides categories to navigate consultations.	0.856	0.892
3	The e-government web site provides demonstrations on how to use it e.g. how to register, post or view comments.	0.747	Item dropped
4	The e-government web site makes public consultation easy to follow.	0.904	0.930
5	The e-government web site has a Frequently Asked Questions (FAQ) section to explain how to do consultation online.	0.777	0.829

Usefulness

No.	Item	Item-variable Correlation	Adjusted Item-variable correlation
1	The e-government web site provides almost all services relating to public consultation.	0.663	0.642
2	The e-government web site provides email notification on the availability of public issues for consultation.	0.718	0.752
3	The e-government web site sends reminders to all interest groups of consultation e.g. closing date to submit feedback.	0.522	Item dropped
4	The e-government web site enables an interest group to search for e-consultation list of best practices.	0.840	0.891
5	The e-government web site provides a recommendation link for an interest group to invite another group to give comment.	0.794	0.832

Reliability

No.	Item	Item-variable Correlation	Adjusted Item-variable correlation
1	The e-government web site is working to provide services 24 hours 7 days a week.	0.799	0.766
2	The e-government web site provides links to related sites when a transaction error occurs.	0.749	Item dropped
3	The e-government web site provides contact number when the host server is down.	0.850	0.842
4	The e-government web site allows interest group to try again once it recovers from a transaction error.	0.815	0.888
5	The e-government web site confirms a transaction has been made.	0.773	0.817

Appendix B: Factor's item-variable correlation

Security

No.	Item	Item-variable Correlation	Adjusted Item-variable correlation
1	The e-government web site requires an interest group to enter username and password to logon.	0.720	0.727
2	The e-government web site logs off automatically if left idle, e.g. after 30 minutes.	0.807	0.831
3	The e-government web site adds CAPTCHA feature to avoid machine logon.	0.855	0.872
4	The e-government web site is accredited by an established third party.	0.856	0.862
5	The e-government web site uses security method like encryption when dealing with an interest group data.	0.453	Item dropped

Privacy

No.	Item	Item-variable Correlation	Adjusted Item-variable correlation
1	The e-government web site requires interest groups to accept a privacy statement before doing a transaction e.g. posting a comment.	0.883	0.901
2	The e-government web site does not reveal an interest group's details to the public without its consent.	0.823	0.822
3	The e-government web site does not give an interest group's details to a third party for other purpose e.g. market survey or sales.	0.823	0.846
4	The e-government web site has a link to a privacy policy on its main page.	0.904	0.923
5	The e-government web site does not reveal an interest group's comment to the public.	0.761	Item dropped

Transparency

No.	Item	Item-variable Correlation	Adjusted Item-variable correlation
1	The e-government web site discloses relevant information to citizens about consultation issues.	0.805	0.817
2	The e-government web site lets citizens download results of previous consultations.	0.818	0.843
3	The e-government web site reveals the number of signatures of an e-petition signed by citizens.	0.868	0.884
4	The e-government web site shows closing dates for interest groups to submit their comments on consultation issues.	0.792	0.833
5	The e-government web site lets an interest group to view others' comments on consultation issues.	0.768	Item dropped

Appendix B: Factor's item-variable correlation

Participation

No.	Item	Item-variable Correlation	Adjusted Item-variable correlation
1	The e-government web site allows citizens to contribute in a public consultation e.g. commenting on another group's inquiry.	0.743	Item dropped
2	The e-government web site allows citizens to support or reject an e-petition.	0.746	0.789
3	The e-government web site provides links to online dialogue channels for citizens to post comments, documents, photos or videos.	0.849	0.851
4	The e-government web site allows citizens to give comments before, during and after a public consultation.	0.874	0.889
5	The e-government web site allows an interest group to rate some bright ideas from community relating to public consultation issues.	0.765	0.832

Accountability

No.	Item	Item-variable Correlation	Adjusted Item-variable correlation
1	The e-government web site gives reply to an interest group's comment within the agency's service pledge time.	0.714	0.762
2	The e-government web site encourages citizens to give feedback on public issues e.g. displaying more photos relating to public consultation issues.	0.628	Item dropped
3	The e-government web site publishes the progress at every stage of a public consultation processes.	0.825	0.827
4	The e-government web site publishes previous public consultations and its results for future reference.	0.741	0.754
5	The e-government web site publishes the expected benefits of supporting a policy or project in a public consultation e.g. building an expressway for public transport.	0.862	0.866

Appendix C: Factor's inter-item correlation

	EaseofUse1	EaseofUse2	EaseofUse3	EaseofUse4	EaseofUse5
EaseofUse1	1.000	.791	.678	.752	.610
EaseofUse2	.791	1.000	.464	.787	.629
EaseofUse3	.678	.464	1.000	.531	.358
EaseofUse4	.752	.787	.531	1.000	.804
EaseofUse5	.610	.629	.358	.804	1.000
	Usefulness1	Usefulness2	Usefulness3	Usefulness4	Usefulness5
Usefulness1	1.000	.089	.344	.522	.348
Usefulness2	.089	1.000	.181	.642	.637
Usefulness3	.344	.181	1.000	.173	.196
Usefulness4	.522	.642	.173	1.000	.622
Usefulness5	.348	.637	.196	.622	1.000
	Reliability1	Reliability2	Reliability3	Reliability4	Reliability5
Reliability1	1.000	.602	.450	.664	.529
Reliability2	.602	1.000	.594	.335	.390
Reliability3	.450	.594	1.000	.642	.640
Reliability4	.664	.335	.642	1.000	.614
Reliability5	.529	.390	.640	.614	1.000
	Security1	Security2	Security3	Security4	Security5
Security1	1.000	.481	.398	.606	.233
Security2	.481	1.000	.731	.514	.179
Security3	.398	.731	1.000	.702	.230
Security4	.606	.514	.702	1.000	.293
Security5	.233	.179	.230	.293	1.000
	Privacy1	Privacy2	Privacy3	Privacy4	Privacy5
Privacy1	1.000	.791	.678	.752	.610
Privacy2	.791	1.000	.464	.787	.629
Privacy3	.678	.464	1.000	.531	.358
Privacy4	.752	.787	.531	1.000	.804
Privacy5	.610	.629	.358	.804	1.000
	Transparency1	Transparency2	Transparency3	Transparency4	Transparency5
Transparency1	1.000	.612	.615	.508	.525
Transparency2	.612	1.000	.638	.580	.497
Transparency3	.615	.638	1.000	.751	.554
Transparency4	.508	.580	.751	1.000	.436
Transparency5	.525	.497	.554	.436	1.000
	Participation1	Participation2	Participation3	Participation4	Participation5
Participation1	1.000	.380	.548	.533	.334
Participation2	.380	1.000	.515	.709	.508
Participation3	.548	.515	1.000	.685	.613
Participation4	.533	.709	.685	1.000	.630
Participation5	.334	.508	.613	.630	1.000
	Accountability1	Accountability2	Accountability3	Accountability4	Accountability5
Accountability1	1.000	.214	.540	.249	.545
Accountability2	.214	1.000	.437	.353	.450
Accountability3	.540	.437	1.000	.613	.570
Accountability4	.249	.353	.613	1.000	.655
Accountability5	.545	.450	.570	.655	1.000