Information Quality of E-Government Websites as perceived by University Students in Pakistan

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Abstract

E-government websites are essential and effective modes of communication between governments and citizens and provide access to E-government services. Thus, information quality of these websites is vital and worth assessing in order to ensure their effectiveness. This study assessed the information quality indicators of e-government websites in Pakistan as perceived by political science undergraduate students through a quantitative survey. This sample of students was selected because they are more likely to have used e-government websites to access information and/or receive services compared to other social science students. All the participants were 18 or more years old and computer literate. Data was collected through Kandari, Jones, Nah, and Bishu (2011) questionnaire adopted with minor changes. It had nine information quality indicators such as accessibility, authority, consistency, understandability, reliability, objectivity, navigation and efficiency; consisted of 21 statements. Respondents preferred to the point information on the websites along with proper and credible ownership for proprietary information. They also opined that information on e- government websites add value to their knowledge. Findings revealed that 'accessibility', 'authority', and 'consistent and concise' were the top three indicators rated more than 4 on a 5-point Likert Scale. Overall, findings indicate a reasonably high information quality for Pakistani E-government websites as perceived by students. Findings will have implications relevant to user-centered design of E-government websites with respect to information quality.

Keywords: Information Quality- Indicators, E-government, Websites, Political Science-Students, Punjab University- Pakistan

Introduction

E-government websites provide access to information; vital to a functioning democracy, good governance, and a wide variety of services to citizens at national, state, or local levels. E-government can potentially be used to provide government services and disseminate information to citizens 24/7 (West, 2005) unless citizens fail to use the services due to their lack of awareness or information literacy required to successfully utilize online services. Governments can play their part in ensuring that

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e-government websites have gone through rigorous testing or evaluation. Because the users' satisfaction level may increase when the broader population first evaluated a service before actually rolling out that service (Verdegem & Verleye, 2009).

Websites or portals have various purposes depending on the type of organization/institution that creates and maintains them, type of information and services they provide, and characteristics and needs of potential users. For example, the main purpose of business websites or e-commerce sites is to promote and sell products; websites by academic or educational institutions deliver information services as well as services related to their core functions (research, teaching, and learning) to their students, faculty, and staff. Likewise, E-government websites/portals provide ingress to a wide range of services to citizens.

Any discussion of E-government websites/portals cannot be had without a discussion about the role information and communication technologies (ICTs) played in their proliferation because, ICTs had greater impact on every facet of life across the globe.

In the government sector, at the core of the E-government revolution is the adoption, by governments, of ICTs and their applications to effectively deliver services to citizens by saving time, energy, and cost. For the purposes of the current study, we adopted the broader definition of E-government — which is the usage of ICTs as well as their applications to offer information and public services to the citizens (Curtin, 2007).

E-government websites are often designed to meet and support users' information needs but not adequate at facilitating or serve as platforms for citizen engagement, receptiveness and discussion (Karkin & Janssen, 2014). In general, "system quality" and "information quality" affect users' satisfaction in an organizational setting (DeLone & McLean, 2003).

"System quality and information quality singularly and jointly affect both use and user satisfaction. Additionally, the amount of use can affect the degree of user satisfaction—positively or negatively—as well as the reverse being true. Use and user satisfaction are direct antecedents of individual impact; and lastly this impact on individual performance should eventually have some organizational impact" (pp. 83–87).

Due to their significance in disseminating government information to citizens and facilitating interactions, Information quality assessment of E-government websites is paramount to ensure delivery of information relevant to users' needs. The emphasis of this study is assessing the information quality of E-government websites in Pakistan by university students.

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Literature established that information quality is highly concern of citizens when they use e-government services to full fill their information needs (Ahmad et al., 2013; Rehman et al., 2012; Rehman & Esichaikul, 2011). It also noted that there is lack of research in the perspective of developing country about e-government websites/portals. This may be a challenge to ensure the information quality of the websites.

As a broad construct, information quality has several dimensions or indicators. Accessibility, timeliness, accuracy, relevance, believability, completeness, objectivity, consistency, appropriateness, and representation, readability, validity, organization and appearance are important information quality indicators for websites (Parker et al., 2006; Peng, 2002; Ballou & Pazer, 1985). Wang and Strong (1996) argue that high quality data should be good, contextually suitable for the need, obviously represented, as well as available to the information users. Eventually, the actual value of information is measured by the level of its effect on the customer (Miller, 1996).

As important information quality is to designing and implementing user-cantered e-government websites, there is no common standard for e-government website evaluation. The general public's perspective is also limited in the extant e-government website evaluation literature. E-government websites are often designed to meet and support users' information needs but not adequate at facilitating or serve as platforms for citizen engagement, receptiveness and discussion (Karkin & Janssen, 2014).

In sum, information quality is a significant construct in assessing the utility of e-government websites. Continuous and closer examination of e-government website using various dimensions of information quality would assist designers and policy makers in their efforts to enhance their use by citizens. It has been shown that service quality as well as information quality has an effect on users' intension to use e-government web sites and services available through these portals (Qutaishat, 2013). In addition, high quality e-government websites can also play vital roles in creating citizens' trust to public e-services (Tan et al., 2008).

There is ample literature on e-government and websites of e-government that offer a number of perspectives (Sandoval-Almazan & Gil-Garcia, 2012). A subset of the extant literature establishes that many factors affect the quality of e-government websites such as design, content, service and user friendliness. Of these, information quality is among the most amplified indicator that has a direct effect on the satisfaction of information users (Jiang & Ji, 2014). Users' satisfaction level may

increase when a broader population evaluate a service first before actually rolling out that service (Verdegem & Verleye, 2009).

DeLone and McLean (2003), Jiang and Ji (2014) found that quality, functionality, reliability, security and privacy features of e-government websites affect users' adoption and continued intent to use e-services. Others showed that e-government system is valuable, easy to handle, and has good quality of information as perceived by Jordanian citizens and that gender and education differences affect the use of e-government (Almahamid et al., 2010). However, Klischewski and Scholl (2006) found significant relationship among information quality, integration, information sharing, and interoperation in e-government. Reliability, efficiency, citizen support, and trust have also been shown to have a significant effect on service quality of e-government (Lin, Fofanah, & Liang, 2011).

Factors such as information quality, trust, awareness, service quality, transaction security, ease of use, lack of appropriate support and assistance, website design were generally cited as the key issues that affect citizens' intent to use e-government services. Consistently, information quality is highly concern of citizens when they use e-government services to meet their information needs (Ahmad et al., 2013; Rehman et al., 2012; Rehman & Esichaikul, 2011).

Pakistan is facing many e-government challenges both at National and provincial levels such as absence of financial, regulatory, institutional, and monitory, policy for implementation of e-Government It also lacks government information infrastructure; has inadequate telecommunication infrastructure; has low human capital index and limited internet access/availability by/to citizens (Khan et al., 2010).

Whereas the trajectory of E-government development in Pakistan is encouraging, it is still in very early stages. Consequently, lack of awareness, technology issues, ease of use, social influence, usefulness, data privacy, as well as trust are the key factors that affect the implementation of e-government in Pakistan (Ahmad et al., 2012). Butt et al. (2018) concluded that Punjab-Pakistan web portals are at the first (publishing) and second (interacting) stages of development, with respect to services. They argue that more significant work is needed to develop e-government websites at the third (transacting) and fourth (transforming) stages as well as meet accessibility, compatibility, and privacy standards.

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Research Objectives

Therefore, objectives of the study are:

➢ To explore the perception of university students' about the preferred information quality indicators of Pakistani e-government websites in terms of accessibility, authority, consistency, understandability, reliability, objectivity, navigation and efficiency.

Furthermore, the study seeks to answer the following research question:

➢ What is university students' perception about the information quality of Pakistani e-government websites?

Research Design

Quantitative research design based on survey method was used to meet the objective of the study. There is plenty of literature available that shows effective utilization of survey research method in previous studies to explore and/or assess information quality of e-Government websites (Abanumy, Al-Badi, & Mayhew, 2005; Alshehri & Drew, 2012; Jiang & Ji, 2014; Qutaishat, 2013; Tan, et al., 2008). To explore the perception of university students' about the preferred information quality indicators of Pakistani e-government websites, a questionnaire developed by Kandari et.al (2011) was adopted after minor changes to fit the local context. Prior to distributing the questionnaire, the primary author held an orientation session, which lasted between 15 and 20 minutes, with students in the relevant classrooms, or potential participants of the survey. The main purpose of the orientation was to make them aware of the purpose, goals, and significance of the study as well as describe the national e-government portal (www.e-gov.pk). Eventually, the survey instrument was distributed to a sample of 185 Political Science undergraduate students. In total, 155 respondents completed the questionnaire and 152 usable responses were used for data analysis with 82% response rate.

Findings

Respondents were under-graduate students from the Department of Political Science. This sample of students was selected because they are more likely to have used e-government websites to access information and/or receive services compared to other social science students. All the participants were 18 or more years old and computer literate. Their average age is 21 years. Majority of the respondents, 80 (71.4%), age ranged 20-22 years.

Figure:1 Internet browsing behaviour of participants n=112
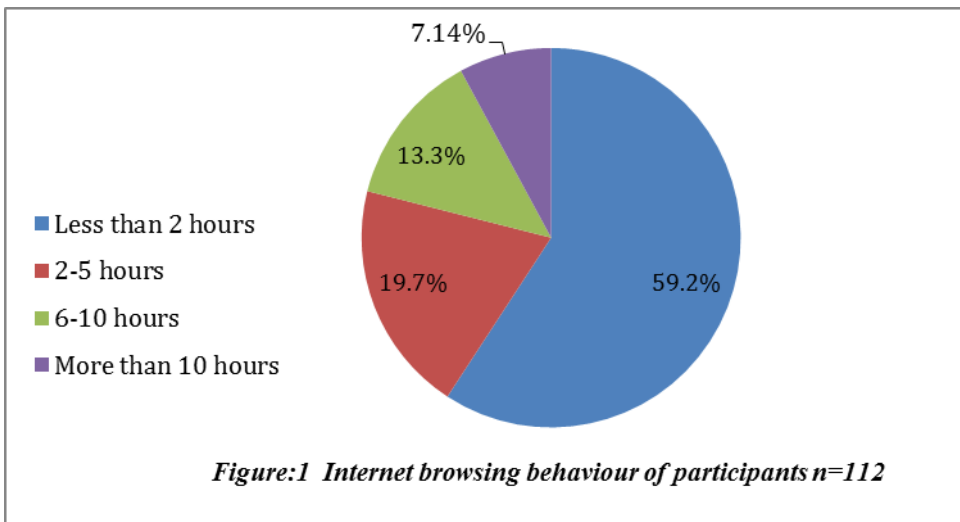
Internet browsing patterns of the respondent reveal that a significant number of respondents 67(59.8%) used internet less than 2 hours per day followed by 22(19.7%) used internet 2 -5 hours per day. Data shows that 15(13.3) %) used Internet 6-10 hours' per day. (Figure.1)

However, it is interesting to note that 8 (7.14 %) respondents spend more than 10 hours per day on internet browsing. They may use internet to spend their leisure time on social media websites or they may have Mobil data connection to use internet. Hence, it is appropriate to consider this sample of graduate students, who are political science and international relations students who browse the Internet daily, for a study of access to and the information quality of E-Government Websites.

Descriptive statistics

Table 1 provides the summary statistics of the mean ratings (on a 5-point Liker scale) of statements or items used to measure information quality indicators of Pakistani e-government Websites. The main e-Government Web portal for Pakistan, http://www.e-gov.pk provides links to all e-Government websites. It is our assumption that users or citizens would visit the Web portal first to eventually land on one or more of a number of e-Government Websites. In terms of how participants of our study rate the portal and/or other e-Government Websites, Table 1 shows a summary of the mean rating statements or items used to measure nine information quality indicators.

Among the statements used to measure one of the information quality indicators, "Consistent and concise", the statement that "The information on the websites is to the point" received the highest mean level of agreement (4.34) with a standard deviation of 0.68 (See Table 1). The relatively low standard deviation value or coefficient of variation for this item (15.6%) could be an indication that there is strong agreement among respondents about the consistency and conciseness information quality of the e-government websites. We took this as perception of respondents that e-Government websites provide information that is to the point and without inaccuracies.

The second highly rated statement was "proprietary information establishes proper and credible ownership" with a 4.33 mean rating and a standard deviation of 0.57. The high rating of this statement, one of the measures of the 'authority' information quality indicator That, the e-Government Websites, provide access to information that is to the point, citizens think they are also authoritative which could impact their view of the reliability of the information and services provided via the Websites . The statement "The information on the websites add value to your knowledge" is the third highly rated item with a mean rating of 4.30 and a standard deviation of 0.57. As a measure of the Value-added information quality indicator, the high rating of the statement speaks to the fact that citizens believe the information received via the websites is significant and goes beyond a mere dissemination of information.

The statement "Irrespective of browser and hardware types, the information on the websites is easy to view in different physical settings" has mean score 4.26 with standard deviation 0.72. It belongs to accessibility information quality indicator. It indicates that citizens are satisfied with the websites in different physical settings. They think that information is easily viewable irrespective to the browsers or hardware types during encounter with e-government websites.

Table 1

Descriptive Statistics of Information Quality Indicators Statements

Item/Scale	Indicators	Mean	SD
The information on the websites is to the point	Consistent & concise	4.34	0.68
Proprietary information establishes proper and credible ownership	Authority	4.33	0.57
The information on the websites add value to your knowledge	Value-added	4.30	0.57
Irrespective of browser and hardware types, the information on the websites is easy to view in different physical settings	Accessibility	4.26	0.72
Personal and confidential information provided by customer is not sold to third party	Reliability	4.26	0.66
It is easy to retrieve information from the websites	Accessibility	4.24	0.73
The information on the websites help in saving time while trying to complete scenarios and other tasks	Efficiency	4.22	0.66
The browser title clearly indicates the homepage of the websites	Navigation	4.21	0.64
The information on the websites is impartial	Objectivity	4.21	0.64
The information on the websites is clear and unambiguous	Understandability	4.21	0.77
The information on the websites is based on facts	Objectivity	4.18	0.69
The websites use easy to understand language for better comprehension and understanding	Understandability	4.18	0.71
The websites provide beneficial information which helps the task at hand and also adds to your pool of knowledge	Value-added	4.17	0.75
The websites clearly provide the source of information	Authority	4.16	0.78
Information provided is backed by facts	Reliability	4.16	0.95
The information on the websites offer you an advantage of letting to know more than you already do	Value-added	4.16	0.86
Information flow and site navigation on the websites are not confusing	Navigation	4.14	0.74
The websites clearly demarcate individual/group opinion and factual information	Objectivity	4.14	0.62
The information uses consistent language, symbols, units and format across all web pages	Consistent & concise	4.13	0.83
The information on the websites improve your work efficiency	Reliability	4.10	0.84
Information on websites do not get corrupt over a period of time	Efficiency	4.10	0.81

Scale: 1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly agree

"Personal and confidential information provided by customer is not sold to third party" also rating 4.26 mean score with 0.66 standard deviation. Citizens trust on the government and think that their personal information is saved.

"It is easy to retrieve information from the websites" statement 'belongs to 'accessibility' information quality indicator, has mean score 4.24 with standard deviation 0.73. It states that people felt that retrieval of information is easy when using e-government websites. "The information on the websites help in saving time while trying to complete scenarios and other tasks" item has mean score 4.22 and standard deviation 0.66 indicates that e-government websites' information save times of the citizens in completing a task. This above statement belongs to efficiency information quality indicator.

"The browser title clearly indicates the homepage of the websites" statement belongs to the navigation information quality indicator. It score mean 4.21 and standard deviation 0.64 as well as "The information on the websites is impartial" and "The information on the websites is clear and unambiguous" statements have mean score 4.21 with SD 0.64 and 0.77 and belongs to objectivity and understandability information quality indicators respectively. These statements show that citizens are satisfy to the homepage of the e-government websites. These websites provide fair, clear and unmistakable information to the citizens. E-government websites language is easy to understandable for the citizens as this statement show "The websites use easy to understand language for better comprehension and understanding" mean score 4.18 with SD 0.71.

Other statement belongs to value-added, Authority, Reliability, Navigation, Objectivity, Consistent and concise, Efficiency with mean score 4.17, 4.16, 4.13 and 4.10 respectively. These statements show that e-government websites provide useful information. Information on the websites is based on facts as well as clearly provided the source of information. Citizens feel that the information provided by the government websites improves theirs' work efficiency.

Table 2 shows the cumulative mean score of 9 Information Quality Indicators (IQI). The findings of the study reveal that accessibility IQI rated high with mean score 4.25 and standard deviation 0.01. 'Authority' and 'Consistent and Concise' are second and third high rated IQI with mean score 4.24 and 4.23 respectively. These findings divulge that accessibility is the most useful IQI for the citizen

followed by 'Authority' and 'Consistent and concise'. These three indicators are valuable for citizens when they use e-government websites.

Table 2

Cumulative mean of Information Quality Indicators

Indicators	Mean	No. of Statements	Standard Deviation
Accessibility	4.25	02	0.01
Authority	4.24	02	0.12
Consistent and concise	4.23	02	0.14
Value-added	4.21	03	0.07
Understandability	4.19	02	0.02
Reliability	4.17	03	0.08
Objectivity	4.17	03	0.03
Navigation	4.17	02	0.04
Efficiency	4.16	02	0.08

Scale: 1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly agree

Citizens are satisfy by the value-added and understandability IQI of e-government websites. Reliability, Objectivity and Navigation IQI show 4.17 mean score. Hence, these findings direct that citizens are satisfied with these indicators. Efficiency IQI show 4.16 mean score with SD 0.08. These findings are overall supportive for the IQ of e-government websites.

Discussion

The results of this study indicated positive citizens' attitude towards the e-government websites' information quality. Findings show that 'accessibility' IQI highly rated by respondents of our survey. Other researchers also found that their respondents considered 'accessibility' as an important indicator of information quality (Mohammadi & Abrizah, 2015; Alshehri, et al., 2012; Michnik & Lo, 2009; Parker et al., 2006; Abanumy et al., 2005; Choudrie et al., 2004; Ma & Zaphiris, 2003). The second most rated indicator is authority IQI. Previous studies supported our findings such as (Mohammadi & Abrizah, 2015; Hassan & Abuelurb, 2011; Kandari et al., 2011; Rieh, 2002; Stvilia et al., 2007) measured "authority" IQI as an imperative by their respondents.

Our findings with respect to ratings, by Pakistani citizens, of other indicators of information quality of e-Government Websites mirror those of others such as value added and 'Understandability' (4.21 and 4.19 respectively) supported by the previous studies (Jiang &Ji, 2014; Ahmad, Markkula and Oivo, 2012; Kandari et al., 2011; Almahamid et al., 2010; Stvilia et al., 2007; Wang and Strong, 1996).

Other information quality indicators also considered important such as reliability, objectivity and navigation having mean score 4.17. These results also supported by the previous literature (Mohammadi & Abrizah, 2015; Jiang & Ji, 2014; Papadomichelaki & Mentzas, 2012; Kandari et al., 2011; Hassan & Abuelurb, 2011; Parkeret al., 2006; Peng, 2002; Katerattanakul & Siau, 1999; Zeist and Hendricks, 1996). Our findings also rate 'efficiency' IQI (4.16. mean) important as perceived by the citizen. Our finding further extends previous results with respect to information quality indicators (Papadomichelaki & Mentzas, 2011; 2012; Liu et al., 2000).

The above findings indicate that Pakistani e-Government Portal and/or Websites users feel that information provided through the Websites is consistent and concise. At the same time, they believe that they are receiving information by credible ownership and the information they access by the e-government add value to their knowledge or task.

Conclusion and Recommendations

The important contribution of this study in the existing literature was on the information quality related to the e-government websites of Pakistan by assessing IQ indicators. This study also identifies IQ indicators do students consider important when using e-government websites in Pakistani perspective. Previous studies discussed IQ indicators in terms of information consumers with non-e-government websites, especially in Pakistani perspective. However, literature lacked empirical studies that assess IQ indicators of e-government websites in Pakistani citizens' perspective. Therefore, the current study attempts to fill that gap and produce findings that could assist in making informed policy decisions. According to Qutaishat, (2013) information quality is an important construct that would enhance the use of e-government websites.

Findings of this empirical study show that the accessibility, authority and concise and consistent are considered valuable by the citizens. Overall, the findings of the study reveal that citizens are positive about the different IQ indicators of E-Gov. websites. Tan et al. (2008) indicated that IQ is an important construct for citizens using e-government websites. This study also shows that e-government websites of Pakistan

are good in services delivery and users satisfaction. Users' satisfaction level increased when a service evaluate by the overall population before actual offering that service (Verdegem & Verleye, 2009).

This study has implications for the website designers and policy makers of e-Government Websites to consider information quality dimension to design and maintain the Websites. Information quality is an important construct; it should be addressed by government agencies responsible for the design, management, and delivery or dissemination of government information. By considering findings of the study, authors proposed some recommendations, end users' needs and their social, economic, and work contexts should be consider during the development phase of e-Government Website.

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