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Result-oriented e-government evaluation: Citizen's perspective

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Abstract

E-government evaluation is ubiquitously perceived as a government website evaluation. Related literature shows that such studies are usually carried out with an intention to benchmark the government bodies and to rate one agency over the other; however this paper presents a result-oriented approach to evaluate the government websites from citizens' perspective. The whole task of e-government evaluation is carried out in three phases. The first phase discusses the design of a scale for e-government evaluation. The second phase accentuates on developing the test cases for each indicator (of the devised scale) to collect the citizen's feedback. The third phase refers to test run the approach in the selected government bodies. Since the approach is result-oriented, the reports on the basis of generated results are delivered to the stakeholders to initiate learning process. The study showed that the evaluation conducted in all three government bodies succeeded to trigger certain level of learning in the government body.

Keywords

Website evaluation; E-government; Test cases; Learning; Results utilization

Introduction

The exponential trend of adopting latest technologies has changed the people style of thinking and the approach towards availing services. Governments are endeavoring to bridge the gap between citizens and them by provision of access to publications and data, participation in decision-making processes, and through interactive services. An efficient and responsive website is an instance of this effort. Despite of these efforts, researchers found that expectations are still to be met (eUser, 2005; AGIMO, 2006; Eurostat, 2007; Kumar et al., 2007). The existing gap is due to various issues and main of them are computer illiteracy, people aptitude to prefer older means, lack of interest and trust (Wangpipatwong et al., 2005; AGIMO, 2006; Accenture, 2007; Kunstelj et al., 2007). Government, on the supply side exhibit its role in form of delivering services by communicating with citizens, businesses, local agencies and employees through web channel (Layne and Lee, 2001; Jeong, 2007).

Citizens are the main and primary stakeholders and they all are not same (Bertot & Jaeger, 2006; Bicking et al., 2006) in terms of skills, interest and their physical limitations (handicapped, low vision, color or total blindness). To create citizens interest, trust and aptitude towards using websites, government needs to add value in service delivery mechanism (Kunstelj & Vintar, 2004; Dugdale et al., 2005; eUser, 2005; Berner Fachhochschule & Unisys, 2005) which could satisfy them. So a website usage is reliant on different factors that make any user a habitual visitor of that site. Many scholars have devised tools and strategies for websites evaluation from citizen's perspective. A government body's website holds a significant value in providing service delivery to citizens and serves as an interface between both stakeholders (in e-governance). The website evaluation therefore is a significant intervention to improve public services in e-governance. In Government to Citizens (G2C) relationship, there could be two possible options to carry out website evaluation i.e. one is evaluation based on available tools and the other is based on citizen's perspective. The paper presents an approach for government websites evaluation by dispensing a list of indicators that is constructed by an assessment of the available alternatives.

E-government evaluation is usually perceived as government websites evaluation (Butt, 2014) therefore both terms could be used alternatively. The whole task of designing a result-oriented approach to conduct a citizen's centric e-government evaluation is accomplished in three milestones. The first milestone is to construct a

scale of indicators for measuring citizen's satisfaction across government websites. The second milestone is linked with the construction of test cases for the identified indicators (during first milestone). The third (and the last) milestone is to test run the strategy in three government bodies. In the available literature about the website evaluation, significant work accentuates on the development of scales, however there is lack of sufficient work pertaining the scale application for government websites evaluation. In other words there is a wide breach in the available literature related to the development of a measurement scale for government websites. Besides that, most of the e-government evaluation based studies are intended to benchmark the government bodies rather than initiating any learning process (Butt, 2014).

The paper adds value to the literature by presenting a result-oriented approach i.e. research is not intended to merely test and benchmark the government bodies rather it is expected to generate utility out of the test results. As a part of it, the research attempts to trigger the learning process in the government body after test running.

Alternatives Assessment: Website Indicators

The government website has emerged as an inevitable tool with the shift of office automation from analogue apparatus. Availability of the government services over the internet is unquestionable since they are economical, brisk, and readily approachable in the remote areas (Warkentin et al., 2010). Researchers have investigated and are still coming up with the solutions to converge maximum citizens on the government website for service delivery.

The excessive use of government websites is directly proportional to the citizen's satisfaction and the trust in government (Welch et al., 2005; Warkentin et al., 2010). According to Parasuraman et al. (1985) user or customer satisfaction addresses the gap between his expectation and his perception of what he is receiving. Service quality measurement has always been of utmost significance for researchers and as a part of it scales are devised to gauge this qualitative entity. One thing is vital while talking about the online services satisfaction, that the nature of the website be taken account i.e. whether it's an e-commerce website, social networking, informative or public service delivery websites. For different website types, the performance indicators differ too. Table 1 presents the work of some researchers regarding website indicators for measuring user satisfaction.

Table 1. Website performance indicators

Research work	Website Measuring Indicators
Zeithaml et al. (2000)	Access, efficiency, flexibility, ease of navigation, reliability, personalization, responsiveness, security/privacy, trust/assurance, site aesthetics, and price knowledge.
Wolfenbarger & Gilly (2002)	Website design, privacy/security, reliability, and customer service
Madu (2002)	Performance, reliability, storage capacity, serviceability, security & system integrity, trust, aesthetics, responsiveness, service, differentiation & customization, features, structure, Web store policies, reputation, assurance and empathy
Santos(2003)	Reliability. Communication, , Efficiency, Support, Security and Incentive
Yang et al. (2004)	Reliability, attentiveness, ease of use, security, access and credibility
Yang & Fang (2004)	Reliability, assurance, responsiveness and access
Jun et al. (2004)	Reliability, assurance, responsiveness and empathy
Dina et al. (2004)	Ease of use, web site design, customization, responsiveness and assurance
Alexander and Tate (2003-2006)	Authority, accuracy, objectivity, currency, and coverage
Lee & Lin (2005)	Website design, reliability, responsiveness, trust and personalization
Rowley (2006)	Security, communication, information, delivery, accessibility, reliability, customer support, responsiveness and personalization.
Behkamal et al. (2009)	Functionality (suitability, accuracy, interoperability, security, traceability); reliability(maturity, fault tolerance, recoverability, availability); usability (understandability, learnability, operability, attractiveness, customizability, navigability); efficiency (time behavior, resource utilization); maintainability (analyzability, changeability, stability, testability); and portability (adaptability, install ability, co-existence, replace ability)

Apart from the examples of work shown in table 1, many researchers have devised tools and instruments based on different dimensions for quality measurement of e-services. Some of these tools are listed below

Table 2. Tools for website evaluation

Instrument/scale	Research	Dimensions
SERVQUAL	Parasuraman , Zeithaml, and Berry (1988)	Tangibles, Reliability, Responsiveness, Assurance, Empathy
E-SERVQUAL	Zeithaml et al. (2002)	Efficiency, reliability, fulfillment, privacy, responsiveness, compensation, and contact.
D&M model	DeLone and McLean (2003)	system quality, information quality, service quality, system use, user satisfaction, and net benefits
E-SEQUAL	Dawson et al. (2003)	service quality, value and usability
E-SQUAL	Parasuraman et al. (2005)	Efficiency, Fulfillment, System availability and privacy. These four dimensions are divided into 22 items scale.
E-RecS-QUAL	Parasuraman et al. (2005)	11 items in three dimensions: responsiveness, compensation, and contact.
e-GovQual	Papadomichelaki and Mentzas, (2009)	25 attributes are classified into 4 dimensions: reliability, efficiency, user support and trust.
COBRAS	Osman et al. (2011)	Cost, Opportunity, Benefit, Risk, Analysis for Satisfaction.

Tools and scales mentioned in table 1 and table 2 are designed specifically for either measuring e-retailing, e-shopping or e-services delivery websites. Both tables show that the major derived indicators are fabricated on the information quality, usability or secure transaction entities. Among all the available alternatives, a comprehensive or meticulous scale for evaluating e-government websites seems not to be present. Since e-governance is not merely the name of e-services or e-commerce rather it includes e-democracy (e-participation) and e-management as well (Dawes, 2002; Cook et al, 2002; Sakowicz, 2008; Yigitcanlar & Baum, 2008). Whereas e-management and e-democracy are the two dimensions which have been not addressed in the way they should be (as a part of website performance indicators mentioned in tables 1 and 2).

According to parliamentary office of science and technology, E-democracy can't be explained in one definition, however in broader terms e-democracy is the use of Information and Communication Technologies (ICT) to increase and enhance the citizens' engagement in government decision making processes facilitating direct-democracy on broader level (Korac-Kakabadse & Korac-Kakabadse, 1999). This implies that citizens should be given privilege to give feedback and participate in decision making process. Different scholars have emphasized on the significance of

e-democracy (Barber, 1984; Held, 1996; Tsagarousianou et al., 1998; Coleman & Götze, 2001) and have put forwards different models for its implementation. Van Dijk (2000) has described the ICT contribution for citizen's participation to make them active and updated, he emphasized that the technology should be effective enough to generate genuine response. Coleman and Götze (2001) identified the effective ways may be online polling and surveys to gauge public opinion. Fishkin (1995) argued about the Americans, who do have the opportunity to poll and provide their feedback on certain issues and policies, and they are concerned about it. According to Browning (2002), as compared to the past era, today citizens are in position to ask and demand for the information, while going online. Most of the researchers and practitioners concede that the role of citizen's participation in the democratic scenario cannot be denied at any stage of e-governance.

In this section, various scales and scholars work were presented and it is observed that there lack a significant scale which is explicitly designed for government websites evaluation. In the upcoming section a scale for government websites evaluation would be formulated on the basis of the e-governance dimensions and available indicators (from various scales).

Scale designing (for e-government evaluation)

The quick look on the literature shows that most of the available scales and indicators are developed for general website evaluation or e-services evaluation (e-services is only one dimension of e-governance) and there is a significant deficiency in the literature for e-government evaluation scale. In this section, a scale would be designed for e-government evaluation on the basis of the available work and the e-governance dimensions.

The customer satisfaction indicators are highly dependent on the type of site they are visiting. For e-retailing or e-commerce websites citizen's satisfaction key indicators may be reliability and secure transaction. For government websites parameters get changed a bit, as e-government websites are aimed to service people to optimize G2C relationship. E-governance usually delivers in four dimensions (Sakowicz , 2003) i.e. e-services, e-management, e-commerce, and e-democracy and they are externally linked to a government website.

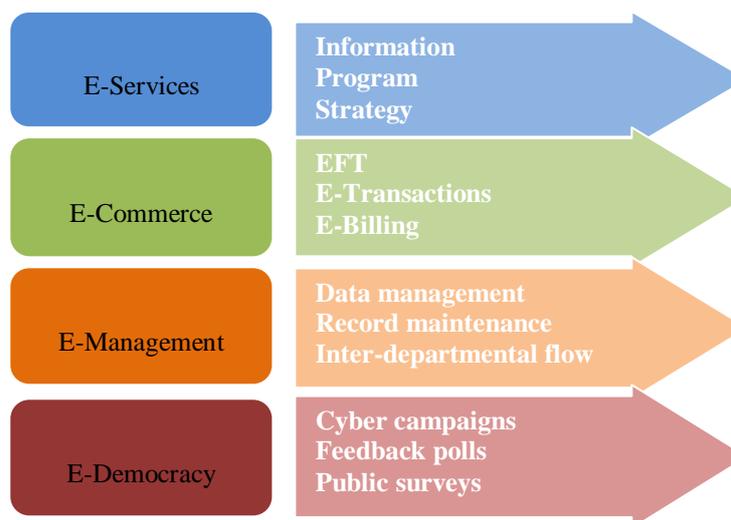


Figure 1: E-Governance dimensions

The four dimensions complete the picture of e-governance and when any government shifts to e-government, these all dimensions must be addressed via web interface to provide uninterrupted service delivery to the citizens. If the e-governance dimensions and the available indicators are mapped and a relationship is developed, a scale “CURRIP” is possible to construct for e-government evaluation. Table 3 shows the key indicators extracted from the researchers work and their relation with their relevant e-governance dimension.

Table 3. Parameters adapted for research

(E-Governance) FACETS	Key Indicators (derived)	Research (Indicators adopted from)	Comments
E-Services	Information (Peculiarity)	DeLone & McLean (2003) Melitski et al (2005) Rowley (2006) Liu et al (2010)	Information entity is same as that of content mentioned by different scholars. While some researchers have expanded the information attributes as key indicators.
	Usability	Zeithaml et al. (2000) Dawson et al., (2003) DeLone &McLean (2003) Yang et al. (2004) Behkamal et al (2009)	In most of the studies usability as a key indicator is used while others have either used alternate word or any single instance of usability e.g. ease of use is mentioned.
E-Management	Confidentiality	Zeithaml et al. (2000) Lee & Lin (2005) Parasuraman et al. (2005) Rowley (2006)	Personalization, privacy all these attributes are disguised as confidentiality in the adapted scale. Management of record should be in the way that creates in user a feeling of personalization.
E-Commerce	Reliability	Zeithaml et al. (2000) Wolfenbarger & Gilly (2002) Madu (2002) Behkamal et al. (2009) Papadomichelaki and Mentzas(2009)	Reliability and trust are main key indicators that matter a lot while performing e-transactions.
E-Democracy	Participatory	Zeithaml et al, (2002) Parasuraman et al. (2005)	Participatory is the key element of good governance, which is been ignored in many scales, in some researches it been addressed as only contact. But participation is more of a just contact in e-government.
	Responsiveness	Parasuraman et al.,(1988) Zeithaml et al, (2002) Yang & Fang (2004) Parasuraman et al. (2005) Rowley (2006)	Responsiveness indicator is included in most of the scales, implies whatever query or command citizen has put forward, is it responded timely? However none of them has discussed responsive application in terms of website responsiveness on various gadgets.

From table 3, it is observed that the two key indicators that come under e-democracy dimension of e-governance (participatory and responsive) though have been used in the available literature but with very limited scope and description. In this research, these both key indicators are added with the same name but with broad scope by inclusion of e-

governance dimension. Participatory is usually discussed in terms of providing contact opportunity to the end user in the available literature. On the other hand in e- governance, the participation usually refers to provide citizens an opportunity to feedback and poll across services quality and decision making process. Same way, the responsiveness is perceived as the user's query to be addressed timely and effectively, however its extended scope includes that website adjusts its self on wide range of devices (e.g. laptops, tablets, desktop computers etc) with minimum scrolling, panning and resizing. The "CURRIP" scale key indicators mentioned in table 3 could be expanded further into secondary indicators. The expanded indicators would provide basis for designing an approach to collect citizen's perspective. Table 4 shows the expansion of the key indicators from CURRIP scale into several secondary indicators.

Table 4. CURRIP scale & expanded indicators

E-Governance delivery dimensions		Citizens satisfaction Indicators	
<i>Dimension</i>	<i>Instances</i>	<i>Key Indicator</i>	<i>Indicators</i>
E-Services	Information Program Strategy	Information (Peculiarity)	Availability Accuracy Authenticity Up2date
		Usability	Adequacy Timeliness Easy to use Comprehensiveness Navigability Outlook(Attractive) Readability
E-Management	Data management Record maintenance	Confidentiality	Authenticity & Integrity Record maintenance of every citizen. Privilege to view record.
E-Commerce	EFT E-Transactions E-Billing	Reliability	Secure transaction Reliable transaction
		Participatory	Feedback opportunity Polling
E-Democracy	Cyber campaigns Feedback polls Public surveys	Responsive	Effective query handling Extended accessibility (multi-device support)

Table 4 shows that how e-governance dimensions, their possible instances, and their relevance with the derived key indicators could provide a list of indicators. This section presented a CURRIP scale with 20 indicators that could be exploited for e-government evaluation (website). Identification of the indicators or the designing of the scale for government website evaluation further require some suitable method for revealing citizens perspective. In the next upcoming section, strategy to notify citizen's perspective would be presented.

Test Cases Development

In order to evaluate and calculate the public feedback on various issues, previous research shows that “questionnaire” has always being the choice of practitioners as large number of participants could be accommodated as compared to other data collection methods (Van Velsen et al., 2008). Most of the scholars emphasize on the big sample size that could truly represent the whole population (Dicks, 2002) and therefore could lead to some reasonable analysis (Cawsey et al., 2000) however small sized sample make generalization crucial (Weibelzahl et al., 2002). People usually hesitate to respond by questionnaire as few researchers reported less response rate (Henderson et al., 1998; Gregor et al., 2003). Moreover when we have to analyze various parameters which sound overlapping each other with minor differences, the response could be ambiguous as the sample may find it hard to differentiate e.g. adequacy and accuracy, easy to use and navigability etc. There could be the possibility of biased responses as well e.g. if someone is satisfied with his/her intention to hit website for any task, that attitude would probably be reflected on the response scale as well or this could occur in other way round in case of being prejudiced. Van Velson et al. (2007) found the questionnaire method as “not the best choice” to use it for evaluating usability parameter. He has supported his argument by quoting examples from questions and measurement scale (construction and designing) section of previous researches and found that they (questions and scale) should be articulated and uncomplicated for user ease.

For this research “test cases” would be designed for each parameter and the test would be carried out with a multivariate heterogeneous group of people i.e. group would be diverse encompassing the possible combination of people that could affect the result. The possible population attributes are shown in table 5.

Table 5. Population characteristics

Variable	Grouping
Gender	Male
	Female
Internet operational expertise (IOE)	Below average
	Average
	Above average
Age (years)	25-45
	45-65
	>65

Each test would be conducted across 18 people and heterogeneity among that group is accomplished by following crossing over and 2 persons would be selected for each set, one male and one female.

Table 6. Test case group characteristics

IOE Age	Below average (1)	Average (2)	Above Average (3)
20-40 (C1) Persons 6	C1* 1 (2)	C1* 2 (2)	C1* 3 (2)
40-60 (C2) Persons 6	C2* 1 (2)	C2*2 (2)	C2*3 (2)
>60 (C3) Persons 6	C3* 1 (2)	C3*2 (2)	C3* 3 (2)

(IOE: Internet Operational Expertise)

Once the targeted test group is formulated, next step is how to conduct a test. Test could be conducted from 2 persons at one time of same class. The intention of testing environment is supposed to be user friendly to get genuine and natural response and results. Had that test been conducted across all groups at one time, this would have imparted some artificiality among low operational skilled group as they considered it to be a competition. Test would be conducted in English however a Dutch interpreter would also be sitting beside to interpret in case of any problem. Along with the test case copy (shown in the following section), the test executer would notify following aspects as well (As these aspects will overall be helpful for analysis phase)

1. Test Sample category
2. Internet Browser
3. Internet bandwidth
4. Task allocated
5. Number of steps (task accomplished in)
6. Overall remarks
7. Sample response about test

A “test case” is a course of action with set of conditions and variables under which a tester determines whether the test satisfies the requirements. Test case designing is a complex art comprises of various components depending upon the environment and situations they are to be emulated and tested.

In this research, each test case comprises of set-up instructions (pre-test and post-test), test procedure, expected results and remarks. Test cases are designed for all 20 secondary indicators listed out in table 4. Some of the indicators are very similar

to each other in their pre-conditions and testing procedure therefore such indicators are grouped together. Test cases are attached in the appendix section.

Test Cases are carried out sequentially i.e. whenever a user opens any website the first issue is the website timeliness and loading speed and rest of the attributes come later. Table 5 shows the indicators and their associated test cases.

Table 5. Indicators their assigned names and associated questions

E-Governance Delivery Dimensions	Citizens satisfaction <i>Key Indicator</i>	Indicators	Validity (GB)	Test cases
E-Services	Information (Peculiarity)	Availability(1a)	√	Test case 2
		Accuracy	√	Test case 3
		Authenticity(2a)	√	Test case 6
		Up2date	√	Test case 3
		Adequacy	√	Test case 5
		Timeliness	√	Test case 1
	Usability	Loading speed	√	Test case 1
		Easy to use	√	Test case 4
		Comprehensiveness	√	Test case 5
		Navigability	√	Test case 4
		Attractiveness	√	Test case 4
		Readability	√	Test case 5
		E-Management	Confidentiality	Authenticity & Integrity (2b)
Privilege to view record (1b).	√			Test case 2
Efficient record maintenance.				Test case 7
E-Commerce	Reliability	Secure transaction	X	
		Reliable transaction	X	
E-Democracy	Participatory	Feedback opportunity	√	Test case 8
		Polling	√	Test case 9
	Responsive	Effective Query handling	√	Test case 10
		Extended accessibility (multi-device support)	√	Test case 10

Test Case#1: Loading Speed & Timeliness

Whenever a person approach the government website, with any intention, the first step that he/ she hits is the website URL address. After hitting URL the latency involved while uploading the website is inversely proportional to the user's contentment level. There are various rationales depending on different factors that cause the latency in website speed. Generally speaking it depends upon the length of the content, number of the links (e.g. CSS, JavaScript, images etc.), bandwidth used to access the site, server type on which the site is hosted (e.g. Dedicated, semi-dedicated, shared), location from where the user is accessing website etc. moreover the website should be accessible irrespective of the time it is approached.

Test Case#2: Content Availability & Adequacy

Every user who comes on the government's website definitely has some objective for that access, the selected Dutch government websites are tested using online tool (site worth traffic), and result shows that all the selected websites encounters above 10,000 daily page views. Moreover the website utility is vital in an aspect as a huge number of people who live outside the Nederland are linked to GB through web portal so whoever approaches the website to seek any information, the availability and then the sufficiency of content is a concern that he/she countenances.

Test Case#3: Accuracy & Recency

Once user found his or her relevant stuff on the website the very next requisite of the user is the correctness of the content, which should be up-to-dated and the recent one. Old information or the inappropriateness of the information may lead to mistrust among users and could further affect the usage of the website.

Test Case#4: Easy to use, Layout & Navigability

Despite of the exponential trend of acquiring computer, internet knowledge there are still group of people who are reluctant while using internet based applications. There may be various reasons for those limitations. However website layout should be designed in a way to be easy in maneuver to make user a regular visitor of the website rather reaffirming his/her reluctance of using internet applications. Links of website should be aligned and rightly destined, the visitor may not feel like lost in the website and could traverse his/her path.

Test Case#5: Comprehensiveness & Readability

Comprehensiveness refers to "understandability of the content" implies that the language used is up to the average user level and well phrased. As complex sentences leaves ambiguity in the user's mind and the intention for opting website remains unfulfilled. The colors and style of font used should be simple and readable as low color contrast ratio or intricate font style hamper reading and understanding process.

Test Case#6: Authenticity & Integrity

Authenticity refers to the information access in such a way that no one could maliciously or accidentally alter it. Controls are required while creating, modifying and updating information. 'Authenticity' indicator is dually deployed, i.e. at one side it is used to check any inconsistency in the information and on the other side it is employed to check the security and trustworthiness of the users account management.

Test Case#7: Efficient Maintenance

User is validated and permissible to access his/her record by using a unique Id that is allocated to him/her by the respective government agency. Every agency ensures the record of the user be maintained efficiently hereby acquiring several strategies, usually public bodies have huge well organized and normalized information systems for proficient data manipulation. Information system upon the verification of user's ID and password assent him/her to access his/her information. Citizens expect that whatever data they are providing to government would be dealt with utmost care and diligence and would be processed according to the valid laws and rules.

Test Case#8: Participatory (Feedback Means)

Participation is accounted as one major attribute of good governance by UNDP. The website of public bodies serves as a portal of communication between them and citizens. Its importance becomes more evident in case where subscribers are living outside the country or in case of bad weather or other reason when people get stuck to houses. Use of website, to interact, for expatriate is economical as well convenient (rather than calling in again and again and waiting for the operator response to transfer call to the appropriate service facilitator). There may be different ways that a user can put up his complaint or query e.g. feedback form (complaint form), email address.

Test Case#9: Polling

Polling is referred as a way to get the population opinion on a certain issue, government policy or quality of the service etc. Gathered response afterwards is aggregated to illustrate the inclination and could be exploited to improve the area (the poll is held for). Polling is an element of democracy and universally democracy is defined as "government of the people by the people and for the people". The importance of people involvement at any stage of governance cannot be shunned out, even though in ICT assisted governance the interfaces and means of communication are changed. There may be different ways that may be used to get citizens feedback e.g. polling, survey form etc. the test case is designed to check whether there is any mechanism to get citizens take on various service issues.

Test Case#10: Responsiveness

Responsiveness as an indicator of e-democracy projects the proficient query handling process. There may be a feedback form or an email for the user to put forward any query specially when the website subscribers are out stationers, it could be a cost beneficial and quick way to get one's problem sorted out. This test case checks the search handling module which displays the results in accordance with the searched word entered by the user. Another very important aspect of responsiveness is the adjustment of a website on various gadgets; this test is included in the designed test case.

Once all the test cases are designed, they are ready to be tested in the selected government bodies. In the next section the results of the test running of these test cases would be presented.

Results of Test Running

Three government bodies are selected for the test running. The selection of the websites is made on the fact that these government bodies have their clients from all age groups and vary in their size of administration and scope of service delivery i.e. large sized, medium sized and the third one is a public university.

Table 6. Test cases results for GB1

TEST RUNING IN GB1		
INDICATORS/TEST CASES	CITIZENS REMARKS AND FEEDBACK	REMARKS
Loading time	Good√√ Testcase1: Post condition 1 achieved	Every time the test is conducted, the website loaded very quickly and it's calculated loading time is 1.96sec.
Timeliness	Good√√ Testcase1: Post condition 2 achieved	
Availability	Good√√ Testcase2: Post condition 1 achieved	Every sample is asked to think of a relevant issue from the selected government body prior opening the website. The respondents found the content available and sufficient.
Adequacy	Good√√ Testcase2: Post condition 2 achieved	
Accuracy , Recency & Authenticity	Good√√ Testcase3: Post condition 1 &2 achieved	22% of the respondents found it accurate and up-to-date, while 88% said that we assume the content to be accurate, up-to-date, and authentic as it's a government website.
Readability	Good√√ Testcase5: Post condition 2 achieved	The website content is readable and option provided to make it big or small. Respondents found the website content written in good language making it comprehensive and understandable.
Comprehensiveness	Good√√ Testcase5: Post condition 1 achieved	
Easy to use& Layout	Good√√ Testcase4: Post condition 1 &2 achieved	
Navigability	Could be improved (!) Testcase4: Post condition 3 in some cases was not achieved i.e. At few pages, the samples felt difficulty to navigate back	Adding Bread crumbs to every web page could solve the issue.
	85% of the samples found difficulty in finding the contact link from the pages where the menu bar is on the bottom of the footer.	85% suggested a visible and clear contact link on every page.
Authenticity & Integrity	45 % of the sample doesn't have DIGID, 25% lost their ID, 10% had	People stance that they would only go for using DIGID if it is

Privilege to view record	to find it and rest of the 20% refused to use that application.	the only way to perform a task, else they won't use it.
Efficient record maintenance		
Secure transaction	Not -Applicable	
Reliable transaction		
Feedback opportunity	Satisfactory √ Testcase8: 45 % of the sample found it difficult to locate the means to submit their query and complaints.	People don't want to share their information for simple queries, as they found it mistrust from the government side to enter their credentials to submit a query or feedback.
	Testcase8: 55% people suggested that they don't want to enter their postcode to get GB contact number.	They all suggested a central phone number for them to be accessible by everybody easily without sharing their information.
Polling	Need to be addressed (!) Testcase9: 61% of the respondents suggest that it would be good if they are allowed to poll across a certain policy on the website despite of knowing whether their opinion will affect the decision. 39% of the respondents said that they don't want to have polling place on the website as we are sure our poll won't make any change	Respondents suggest a small polling place on the website to poll in or against any policy update; this would encourage them to use the website quite often and would lead to foster trust development in government agencies.
Responsive	Good√√ Testcase10:Post condition 3 achieved	All respondents refused to send any email or to fill in the contact form so post condition 1 is not applicable here. Website is equally accessible in various electronic gadgets.
Effective searching results	Good√√ Testcase10:Post condition 2 achieved	Each respondent is asked to search for any relevant issue or item and assess the generated results. Respondents liked the way the results are listed out on the website.

The results show the mix response and feedback from the selected respondents for GB 1 test running. All the searched terms and the issues that respondents searched for were translated into a report and delivered to the web department of the government body for consideration.

Same test cases are conducted for GB2 and the results are shown in table 7.

Table 7. Test cases results for GB2

TEST RUNING IN GB2		
TEST CASES	CITIZENS REMARKS AND FEEDBACK	REMARKS
Timeliness	Good√√ Testcase1: Post condition 1 achieved	For every test conducted for each respondent, website was readily available and load in good time. The calculated load time of the website is 1.46sec.
Loading time	Good√√ Testcase1: Post condition 2 achieved	
Availability	Good√√ Testcase2: Post condition 1 achieved	Every respondent is asked to think of a relevant issue from the selected government body prior loading the website.
Adequacy	Good√√ Testcase2: Post condition 2 achieved	The respondents found their relevant content available and sufficient.
Accuracy, Recency, and authenticity	Good√√ Testcase3: Post condition 1 &2 achieved	Respondents say that they assume the government content to be accurate, up2dated and authentic.
Readability	Needs improvement (!) Testcase5: Post condition 2 is partially achieved i.e. 51% of the subjects found the default font too small to be visible.	“Kies lettergrootte AAA” missing on the website to make text size readable.
Comprehensiveness	Good√√ Testcase5: Post condition 1 achieved	Respondents found the content of the website developed in easy and understandable language.
Easy to use & Layout	Good√√ Testcase4: Post condition 1 &2 achieved	
Navigability	Good√√ Testcase4: Post condition 3 is partially achieved i.e. 11% of the subjects opted for the English website link on the home page and that is empty.	English website front page is not working
Authenticity & Integrity	Not -Applicable	
Privilege to view record		
Efficient record maintenance		
Secure transaction	Not -Applicable	
Reliable transaction		

Feedback opportunity	Satisfactory ✓ 100% of the respondents liked the ways; the contacts are categorized on the website. 51% had objection on the forms (formulier) to communicate as they prefer only an email address for sending email or a telephone number. 45% liked the formulier but not with lots of fields.	People don't want to share too much information for simple queries, as they found it mistrust from the government side to enter their credentials to submit a query or feedback.
Polling	Need to be addressed (!) 75% of the people suggest that it would be good if they are allowed to poll across a certain policy on the website despite of knowing that their opinion won't affect the decision.	They suggest a small polling place on website to poll in or against any policy update; this would encourage them to use the website quite often and would lead to foster trust development in government agencies.
Effective Query handling	Needs Improvement (!) Testcase10: 32% people searched for some terms and they did not find the desired results. 42% Percent of the total respondents found it confusing the style the search results are displayed in two headings, i.e. under ;frequently asked questions' and the 'whole website'.	Subjects recommend one single category displaying final search results.
Responsive	Good✓✓ Testcase10:Post condition 3 achieved	Website is equally accessible in various electronic gadgets.

The respondent's feedback for GB 2 website is mixed. Few indicators seem to score less while others score well. After test running for GB2, test cases are conducted for GB 3 and the results of test running are presented in table 8.

Table 8. Test cases results for GB3

TEST RUNING IN GB3		
INDICATORS/TEST CASES	CITIZENS REMARKS AND FEEDBACK	REMARKS
Loading time	Good✓✓ Testcase1: Post condition 1 achieved	Website loads quickly every time it is opened. The calculated loading time of the website is 1.2 sec.
Timeliness	Good✓✓ Testcase1: Post condition 2 achieved	
Availability	Good✓✓ Testcase2: Post condition 1 achieved	The respondents found their relevant content available on the website and sufficient.
Adequacy	Good✓✓ Testcase2: Post condition 2 achieved	

Accuracy , Recency & Authenticity	Good√√ Testcase3: Post condition 1 &2 achieved	Respondents believe that the information available on the website is accurate, up2dated and authentic.
Readability	Good√√ Testcase5: Post condition 2 achieved	The website content is readable and text option is provided to make it big or small. Respondents found the website content written in good language making it comprehensive and understandable.
Comprehensiveness	Good√√ Testcase5: Post condition 1 achieved	The website is easy to use, navigable and respondents liked the web layout.
Easy to use& Layout	Good√√ Testcase4: Post condition 1, 2 and 3 achieved	
Navigability		
Authenticity & Integrity	Not -Applicable	
Privilege to view record		
Efficient record maintenance		
Secure transaction	Not -Applicable	
Reliable transaction		
Feedback opportunity	Good√√ Testcase8: Post condition 1, 2 and 3 achieved	
Polling	Satisfactory √ Testcase9: 66% of the respondents suggest that it would be good if they are allowed to poll across a certain policy on the website	Respondents suggest a small polling place on the website to poll in or against any policy update
Responsive	Needs Improvement (!) Testcase10: Post condition 3 is not achieved.	Website does not response on various electronic gadgets.
Effective Query handling	Good√√ Testcase10:Post condition 2 achieved	Each respondent is asked to search for any relevant issue or item and assess the generated results. Respondents liked the way the results are listed out on the website.

For the GB 3 test running, as compared to the other two government body's results, most of the indicators are satisfied and post conditions achieved. Since the study is intended to be result-oriented therefore study doesn't end after conduction of test cases for the selected government bodies, its scope is extended up to measure the learning it initiated.

Table 9. Learning level achieved after test cases conduction

Test Cases results Utilization Learning Process initiated					
Learning process (4I Framework)	Level	GB 1	GB 2	GB 3	Description
Intuiting	Individual	√	√	√	The stakeholders from individual to group level (team leader, manger) were selected and reports were developed and designed in a way making it easy to interpret and addressable.
Interpreting	Group	√	√	√	
Integrating		-	-	√	
Institutionalizing	Organization	-	-	-	

The learning process in any government body is not a single step activity rather it involves various processes, levels and routes as identified by 4I Framework (Crossan et al., 1999). The three levels of organizational learning, i.e. individual, group and organization, involve four processes. The ‘individual’ level learning involves learning process ‘intuiting’, group level learning engrosses two processes ‘interpreting’ and ‘integrating’, and the ‘organization’ level learning involves ‘institutionalizing’. If the learning flows or travels from individual towards organization, the learning route is named as ‘feed forward’. On the other hand if learning happens in reverse order i.e. from organization to individual level learning, the route is called as ‘feed backward’.

Table 9 shows that group level learning is achieved for all three government bodies, the reports were delivered at individual and group level of the government body therefore the learning followed feed forward route. The test was conducted with the consensus of the stakeholders and reports were prepared and delivered on their desire.

The reports were delivered at individual and group level for learning initiation; at individual level reports were delivered to developers, ICT support assistants and at group level report delivered to ICT managers and IT director. Their response about the reports showed the level of learning achieved. Because of the various tiers of government bodies there spend lots of time in integrating the changes and some procedural latency before the changes are institutionalized which is the highest level of learning. However the study initiated the learning process in the government body, the recommended changes are if institutionalized could make the web design in line with the citizens demand.

Conclusion

The importance of the citizen's feedback regarding e-government evaluation cannot be denied since citizens are the primary stakeholders and the main beneficiaries. Though the citizens centric approaches are iteratively available in the literature but such studies are merely focused on either designing strategy or to just benchmark the government bodies. However according to several scholars the evaluation based studies must be followed by some level of results utility or effectiveness. The outcome utilization in this research is in form of initiating learning process in the tested government body.

The study introduced a comparatively new method 'test cases' to gather citizen's response. According to the various researchers, questionnaires and other quick data collection methods although provide large sample size in very less time but one may have doubts on the originality of the data provided due to several reasons. Test case method could be a better option for the e-government evaluation, in which a series of tasks are defined for each indicator and sample is asked to perform that task and his/her reaction is notified. The responses collected by test cases are more real and in line with the indicator.

The paper presented a design of a scale for e-government evaluation. The CURRIP scale presented in the paper spans all the dimensions of e-governance. On the other hand, the available scales are either for the e-commerce websites or for the e-services evaluation. Responsiveness and participation are the key indicators that previously have not been discussed under e-government evaluation. They measures the availability of the opportunity for the citizens to provide feedback and to participate, and also checks the website accessibility on various devices. These indicators belong to e-democracy dimension of the e-governance and therefore the scale is new addition to the e-government evaluation literature as it provides a broad and bigger picture of e-governance.

The test cases for few indicators could not be carried out for all three website as the respondents said that they don't want to share any personal information with the government. For such indicators any other set of procedure could be developed to gather the efficiency of the website across those indicators to complete the evaluation process. Respondents disliked when they faced an inquiry on a government website to share their personal information even for getting telephone number or address of the office. Government needs to take a forward step by letting and allowing citizens to participate in decision making process as it could help to build the trust between both stakeholders.

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Test Case #: 1	Test Case Name: Loading Speed & Timeliness
System: GB	Subsystem: GB Website
Designed by:	Design Date:
Executed by:	Execution Date:

**APPEN
DIX.
TEST
CASES**

Description: Test the loading speed and timeliness of GB Website.

Pre-Condition

The users may or may not be the clients of GB user for this specific test case as it about the accessing issues.

The number of users n=18, and test would be conducted on different internet bandwidth.

Step	Action	Anticipated Response	Remarks
1	Access and open GB website in different times.	Website loads and opens.	
2	Check post condition 1		
3	Check post condition 2		
4	Repeat step 1, 2& 3 with n user(s)		

Post Conditions

- 1 website gets available devoid of any error e.g. server down
- 2 website loads without time delay or latency...

Test Case #: 2	Test Case Name: Content availability
System: GB	Subsystem: GB Website
Designed by:	Design Date:
Executed by:	Execution Date:

Description: Test the user's corresponding content availability on the GB website

Pre-Condition

The users are the clients of GB but they don't use the website.

The number of users (n) selected for this test is 18. As GB has multiple categories to deal with, so users selected would be the representative of all the services GB delivers.

Step	Action	Anticipated Response	Remarks
1	Enter URL	Website loads...	
2	Check/ search for clients relevant information or content	Information is displayed or available on website.	
3	Check post condition 1		
4	Check post condition 2		
5	Repeat step 1, 2,3,4 for n user(s)		

Post Conditions

- 1 The user finds his/her relevant information on the website.
- 2 Information available is adequate and sufficient.

Test Case #: 3	Test Case Name: Accuracy, Recency &
Authenticity	
System: GB	Subsystem: GB Website
Designed by:	Design Date:
Executed by:	Execution Date:

Description: Test Accuracy & Recency of the content

Pre-Condition

The users are the clients of GB, the client are diverse in terms of their relation with GB e.g. one user from each service delivery area. It's preferred if they don't use the website to avoid any biased perception on pre-usage.

Number of user n=18.

Step	Action	Anticipated Response	Remarks
1	Open website	Website loaded	
2	User search for his/her relevant information	Information is displayed in the anticipated section under the link related to the user's context.	
3	Check post condition 1		
4	Check post condition 2		
5	Repeat steps 1,2,3,4 with n user(s)		

Post conditions

- 1 The available information is exactly what the user was looking for.
- 2 The available information is the most recent one i.e. devoid of any old content that is no more valid currently.

Test Case #: 4	Test Case Name: Content availability
System: GB	Subsystem: GB Website
Designed by:	Design Date:
Executed by:	Execution Date:

Description: Test the website navigability and ease while using and traversing.

Pre-Condition

The users are the clients of GB and they don't use the website (to avoid learned features).

The number of users n=18

Step	Action	Anticipated Response	Remarks
1	Enter URL	Website loads...	
2	User is asked to perform various operations on website i.e. traversing whole website, opening his/her relevant links.	Links and other operations lead to the relevant progression they are captioned for.	
3	Check post condition 1		
4	Check post condition 2		
5	Check post condition 3		
6	Repeat step 1, 2,3,4 with n user (s)		

Post-Conditions

- 1 The user did not find difficulty while performing any operation on website.
- 2 The website layout/design is facilitating the user to perform operations.
- 3 All links are functioning appropriately.

Test Case #: 5	Test Case Name: Comprehensiveness & Readability
System: GB	Subsystem: GB Website
Designed by:	Design Date:
Executed by:	Execution Date:

Description: Test the content Comprehensiveness and Readability

Pre-Condition

The users are the clients of GB and they don't use the website (to avoid biasness).

The users are heterogeneous group from normal to ones having some visual limitations, e.g. color blind or low vision.

The number of users n=18

Step	Action	Anticipated Response	Remarks
1	Enter URL	Website loads...	
2	User is asked to read and understand his/her relevant content.	The content is readable and easy to understand.	
3	Check post condition 1		
4	Check post condition 2		
5	Repeat step 1, 2,3,4 with n user (s)		

Post-Conditions

- 1 The user did not find difficulty while reading the content on website.
- 2 colors used in website did not hinder the reading process.

Test Case #: 6	Test Case Name: authenticity & Integrity
System: GB	Subsystem: GB Website
Designed by:	Design Date:
Executed by:	Execution Date:

Description: Test the authenticity and integrity for user

Pre-Condition

The users are the clients of GB and they don't use the website and do possess DIGID.
The number of users n=18

Step	Action	Anticipated Response	Remarks
1	Enter URL	Website loads...	
2	User is asked to locate his/ her relevant information on website.	Information is located at right place.	
3	Check post condition 1		
4	User is asked to open page for login to the system	Log in page loads.	
5	User is asked to enter his ID.	Users' credentials are displayed.	
6	User is asked to leave page idle for 5-10 minutes.		
7	Check post condition 2		
8	User without logging off closes the Log-in window.		
9	User is asked to reopen the ID page	Page reloads.	
10	Check post condition 3		
11	Repeat step 1 to 9 with n user (s)		

Post-Condition

- 1 Alike Information is consistent throughout the website
- 2 sessions should be expired to avoid any misuse of account by other user.
- 3 Page is opened without displaying last (un signed-off) closed account information.

Test Case #: 7	Test Case Name: Efficient maintenance
System: GB (DigID Login)	Subsystem: GB Website
Designed by:	Design Date:
Executed by:	Execution Date:
Description: Test the user's record maintenance	

Pre-Condition

The users are the clients of GB and they don't use the website and possess DIGID.
The number of users n=18

Step	Action	Anticipated Response	Remarks
1	Enter URL	Website loads...	
2	User is asked to open his account.	Account opens with details.	
3	User is asked to seek his new and old record.	Record is retrievable.	
4	Check post condition 1		
5	Check post condition 2		
6	Repeat step 1, 2,3,4 with n user (s)		

Post-Condition

- 1 Record is updated.
- 2 old records are well managed and free of errors.

Test Case #: 8	Test Case Name: Feedback
System: GB	Subsystem: GB Website
Designed by:	Design Date:
Executed by:	Execution Date:

Description: Test for means to provide feedback on the website.

Pre-Condition

The users are the clients of GB and they may or may not be the users of that website.
The number of users n=18

Step	Action	Anticipated Response	Remarks
1	Enter URL	Website loads...	
2	User is asked to locate the means to provide feedback.	Page opens.	
3	Check post condition 1		
4	Check post condition 2		
5	Repeat step 1, 2,3,4 with n user (s)		

Post-Condition

- 1 email address and feedback form is provided on the page.
- 2 enough space for user to provide feedback.

Test Case #: 9	Test Case Name: Survey & Polling
System: GB	Subsystem: GB Website
Designed by:	Design Date:
Executed by:	Execution Date:
Description: Test for polls & survey	

Pre-Condition

The users are the clients of GB and they may or may not be the users of that website.
The number of users n=18

Step	Action	Anticipated Response	Remarks
1	Enter URL	Website loads...	
2	User is asked to check whether he/she finds any means of polls and survey on the website.	User finds the links.	
3	Check post condition 1		
4	Check post condition 2		
5	Repeat step 1, 2,3,4 with n user (s)		

Post-Condition

- 1 polls and survey are relevant to organizational context.
- 2 user is made known (introductory text is added) for the purpose of the survey or polls.

Test Case #: 10	Test Case Name: Responsiveness
System: GB	Subsystem: GB Website
Designed by:	Design Date:
Executed by:	Execution Date:

Description: Test responsiveness

Pre-Condition

The users are the clients of GB and they may or may not be the users of that website.

The number of users n=18

Step	Action	Anticipated Response	Remarks
1	Enter URL	Website loads...	
2	User is asked to open the contact link.	Contact page opens.	
3	User is said to send one basic query.	Query submitted.	
4	Check post condition 1		
5	User is asked to search for some relevant terms using search text box option	Results displayed	
6	Check post condition 2		
7	The website is accessed on different gadgets.	Website readjusts.	
8	Check post condition 3		
9	Repeat step 1, 2,3,4 with n user (s)		

Post-Condition

- 1 For basic questions there is automated answers generated mechanism and user is responded immediately.
- 2 Results are satisfactory and relevant to the searched item
- 3 Website readjusts in the selected device as per the device dimensions.

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