Toward E-Government: Factors Affecting Utilisation of Government Websites

Hilda Mwangakala, Nerey H. Mvungi

Abstract—Development in technologies and its adoption in communications have made offering of government services and that of its agents easier and more convenient. This has been achieved through its websites. This paper looks at different schemes to assess the utilization of such offerings, the factors and parameters that influence its acceptability. A conceptual modal is developed that could be used to measure acceptability of government websites in terms of effective degree of use based on six identified parameters: trust, usefulness, easy of use, satisfaction and demographic characteristics.

Keywords—Government, Modeling, Utilization, Website.

I. INTRODUCTION

MODERNIZATION of public services through incorporation of information and communication technologies (ICT) is picking pace in developing economies worldwide. The governments, public sector organizations and private entities have realized potentials and are utilizing ICT to optimize efficiency and productivity, hence triggering heavy investments in electronic services. By using ICT in delivering services has the potential of reducing corruption due to ease of traceability, growth in business and industry, greater convenience, citizen empowerment through access to information, revenue growth, cost reductions, and more efficient and effective government management support systems. However, the success of these efforts depends, largely; on how well the targeted users for such services, the citizens, make use of them.

There is a need to establish the extent of perceived demand for online services. It may not be correct for governments to assume that everyone is eager to consume whatever is put online while a large proportion of the population does not visit or have access to the Internet. Furthermore, the governments in developing economies are faced with choices of prioritization services offerings. This paper examines citizens usage and perception of government websites and its effects on their willingness to use the websites.

II. GOVERNMENT WEBSITE USAGE STATUS

The study conducted by the authors on usage of government website revealed that the global average for government website usage by citizens is about 30%, which is very low. The country with the highest government websites usage rate is Canada, where over 51% of its citizen visits their website. However, even for the Canadians the majority are not interacting or transacting with the government through it but just obtain information. However, in other developed countries government website usage is comparatively very small as shown in an example in table1 [1].

Although all the countries in table 1 are technically advanced with very good ICT infrastructure, the usage rate of government websites is still very low. Therefore, it can be argued that the usage of government websites by its citizens is not determined only by the level of Technology and Infrastructure in place, but rather the perceptions citizens have toward their government and technology which can be influenced by beliefs and other social factors.

Tanzania has a population of more than 40 million people with profile summarized in table 2. The table shows that 1% of population is Internet users while the literacy rate is 77%. The 23% illiterate population cannot use government websites. However, about 75% of the population lives in the rural areas perceived as areas of high risk to investors hence suffer from neglect and isolation. Therefore, these areas have a very limited Internet connection and shall continue to be so unless governments subside is availed to reduce the digital divide. The Universal Access Fund in developing economies may be used to reduce the divide. To have an e-government system that is effectively used, these barriers should be

<table>
<thead>
<tr>
<th>S/N</th>
<th>Country</th>
<th>Government Website Usage in % of population</th>
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<tbody>
<tr>
<td>1</td>
<td>Canada</td>
<td>51</td>
</tr>
<tr>
<td>2</td>
<td>USA</td>
<td>37</td>
</tr>
<tr>
<td>3</td>
<td>France</td>
<td>19</td>
</tr>
<tr>
<td>4</td>
<td>Germany</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>Italy</td>
<td>30</td>
</tr>
<tr>
<td>6</td>
<td>Japan</td>
<td>18</td>
</tr>
<tr>
<td>7</td>
<td>Global average</td>
<td>30</td>
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<tr>
<th>S/N</th>
<th>Summary for Tanzanian Society</th>
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<tr>
<td></td>
<td>Internet usage</td>
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<td>1</td>
<td>77</td>
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addressed to facilitate improvement in access rates.

This paper looks at the viability of e-government as a service providing tool by examining the current use of government websites by citizens by studying attributes that influence readiness and attitude toward utilisation of e-government.

III. THE INTERNET AND ITS IMPACT

Before the Internet emerged in the late 1980s, the governments in developed countries were actively using information technology (IT) to improve operating efficiency and to enhance internal communication [2-4]. However, the focus of e-government in that era was primarily for internal and managerial functions.

The arrival of the Internet and the World Wide Web marked a watershed in IT usage by shifting the focus of governance to its external relationship with its citizens [5]. Technology played an important role in fostering the change. From starting of newsgroup and commercial email technology in the mid-1980s, to the development of the World Wide Web and Web browser technology in the early 1990s [6]. Since then the Internet has gradually matured into a cost-effective and user-friendly platform for officials to communicate directly with citizens and to deliver massive quantities of information to the public and for creation of social networks.

Because of technological advancement and economic changes, policy makers have had further incentive to shift the focus of IT usage from internal managerial needs to external linkages with the public. The National Performance Review report [7] suggested that e-government “will allow citizens broader and timelier access to information and services through efficient, customer-responsive processes thereby creating a fundamental revision in the relationship between the central government and everyone served by it.” These remarks clearly reflected the new way of thinking about public service delivery.

IV. KEY CHARACTERISTICS OF CITIZEN-CENTERED GOVERNMENT WEBSITES

The key characteristics of Citizen centered Websites focuses on assessing the availability of websites to a wide audience, ease of use, usefulness, feedback opportunities, trust and privacy concerns.

A. Accessibility

Accessibility is the first important factor of a citizen centered government website. The web is widely perceived as being convenient, low cost and easily and variably accessible services and information medium. However, this is not exactly the case. There are still a large number of citizens, albeit frequent internet users, that may not be able to afford the required hardware equipment and software applications or to subscribe to fast, high-bandwidth internet connections. Data confirms that only 30 per cent of EU households had a broadband connection in 2006 [8]. Table III shows that internet penetration gap is very wide between regions, Africa having very low and the lowest internet penetration rate. In fact, download delays have been identified as the most critical factor for the development of e-commerce [9].

Accessibility of government websites is regarded as an obligation while for commercial ones it provides a competitive advantage [11]. E-government websites aims to facilitate usage by all for all circumstances, such as age, origin, disability and social status to avoid exclusion.

It can thus be concluded that individuals’ demographic characteristics is one of the variables that can affect citizens’ accessibility of government websites.

B. Navigation

The evaluations of the items of the second factor navigation are extensively referred to in the literature [12, 13] as they directly connect to a website’s functionality and ease of use. Factors such as web interface and search functionality have been identified as key measurements that define web success [9]. Also, an inefficient and user-non-friendly navigation, is likely to confuse, frustrate or misdirect the user who finally leave the site [10,14]. Well designed websites enable users to find their search in at most three clicks. In e-commerce, customers must find a product to buy otherwise they are likely go for another online supplier. However, in e-government the citizens do not have that luxury; whenever service is not accessible online, citizens will have to use the phone or physically go to the public authority offices. Internal search engine is one of the useful navigational features of websites. Hence, the search engines are popular and import. For example, Google receives over 250 million search requests per day indicating the extent that people extensively use search engines. Correspondingly, internal search engines emerged as a useful navigational aid for sites that contain large amounts of information [10] as they provide an easy and quick way for locating information.

Another useful navigational feature is a site map or an alphabetical index [10,14]; these provide a quick overview of the pages contained within the entire website. However, full functionality of site maps and indices is achieved when their contents have simultaneously active links to the appropriate web pages [15].

Hence, based on the above theoretical foundation, the perceived ease of use variables is an important parameter to assess how navigability of websites influences citizens’ usage of government websites.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Country</th>
<th>Internet Penetration Rate [%]</th>
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<tbody>
<tr>
<td>1</td>
<td>Africa</td>
<td>5.6</td>
</tr>
<tr>
<td>2</td>
<td>Asia</td>
<td>17.4</td>
</tr>
<tr>
<td>3</td>
<td>Europe</td>
<td>48.9</td>
</tr>
<tr>
<td>4</td>
<td>Middle East</td>
<td>23.3</td>
</tr>
<tr>
<td>5</td>
<td>North America</td>
<td>74.4</td>
</tr>
<tr>
<td>6</td>
<td>Latin America /Caribbean</td>
<td>29.9</td>
</tr>
<tr>
<td>7</td>
<td>Oceanic/Australia</td>
<td>60.4</td>
</tr>
</tbody>
</table>
C. Privacy

Personalized services and full online transactions have raised public awareness of third factor privacy and associates security issues. In fact, it has been identified that “citizens place security and a desire for greater accountability above convenience or the expansion of services and information” [16]. Therefore, citizens expect government agencies to demonstrate attention to these issues because of their limited knowledge of e-government management processes and confidence in government. Surveys made indicated that 85 per cent of users of online government services believed that their local authority’s IT systems had probably suffered a security breach, and, in such circumstances, 86 per cent of users would hold the local authority itself responsible, rather than the hackers [17]. It has been proposed to use more secure, encrypted connections for the transmission of personal information and transaction data to address privacy issues. Furthermore, explicit issuing of a security statement that explains the way in which citizen data is protected and how it will be used can build confidence.

Therefore, citizens’ usage and willingness to continue using government websites can be measured by determining the impact of trust.

D. Public Outreach

Typically, a website user should be able to perform all actions online without the need for further contact through telephone or post. However, for public authority websites it is important to provide contact options with key personnel to help citizens overcome problems, such as limited technological competencies. Public outreach has been used as a criterion for the evaluation of e-government websites in the Caribbean and of academic sites. Additionally, time response to citizen’s requests has been measured as a heuristic for the evaluation of Brazilian e-government websites [18].

The impact of this factor was measured using Satisfaction and Perceived usefulness variables to assess how it influences the willingness to use government websites.

The Authors therefore used these four variables discussed above to develop a model to monitor impediments to usage of government websites.

V. ADOPTION OF TECHNOLOGICAL ACCEPTANCE MODEL

Technological Acceptance Model (TAM) has proved to be a useful tool to predict future system usage, specifically during the user acceptance testing phase of an Information System (IS) project during implementation. It is used to monitor users to establish whether a system meets all their requirements and supports the business process designed for. TAM has wide support and is the most widely accepted theoretical model amongst IS researchers [30].

Agarwal & Prasad [30] identified certain management actions to facilitate technology acceptance. One such finding pointed to a profile of individual as being more receptive to information technology innovations. Thus, a targeted recruitment and selection strategy for individuals using new technologies could promote more successful technology acceptance. Montazemi et al [19] found that the ease of use perceptions of information centre product specialists and end users are similar, but that of perceived usefulness of software packages were different. Hence, end users in sophisticated environments should be empowered to develop their own user groups and suggest their software packages for purchase. TAM has mostly been assessed in the adoption of office applications. Taylor & Todd [19] used their computing resource centre to collect data from nearly 800 student users to compare the strengths and weaknesses of TAM, TPB, and a decomposed version of TPB. Their study demonstrated that TAM fared better in usage prediction, while the decomposed TPB offered a more comprehensive understanding of behavioral intention and system usage. They further established that inexperienced users placed a different emphasis on the behavioral intention and actual system usage constructs. Mathieson [20] also compared TAM and TPB by testing both models in the same context, using subjects sampled from the same population. Additional studies using college students in an introductory management course considered TAM to be better suited to measure general levels of satisfaction across a diverse population, whereas TPB provided more insight into why an individual or group may be dissatisfied.

TAM was also tested on perceived usefulness and perceived ease of use and consumer trust by introducing the world of online commerce. It was demonstrated the importance of the perceived usefulness and ease of use in building trust in a relationship, and consumer trust of the Website in an environment lacking the usual human interaction.

Adams et al. [21] evaluated the psychometric properties of the ease of use and usefulness constructs by examining the usage behavioral of users of voice and electronic mail systems and the constructs using office applications. Despite observed robustness, absolute measures for these constructs may not be possible across varying technological and organizational contexts.

There was study of organizational adoption of voice-mail systems that attempted to tackle the conceptual and methodological issues pertaining to the measurement of system usage with TAM. The study compared subjective and objective measures of obtaining system usage data from subjects and found little correlation between the subjective self-reported results received from their subjects and the objective usage results captured by computer logging. Hence, much of previous TAM research relied too heavily on subjective usage measures’, thus creating a false impression of the strength of the relationships between TAM constructs. Although most IS researchers used self-reported usage as a surrogate for actual usage in their investigations, when, in fact, an effective surrogate must be a valid measure correlating strongly with other methods of measuring usage convergent validity.

There is a challenge to researchers of the IS research
community by those in telemedicine to re-examine existing technology acceptance theories and models in the context of system usage by highly specialized professionals. It was perceived that fostering a positive attitude towards the technology’s usefulness is far more crucial than ease of use when dealing with such specialists. Their concern was more its usefulness to improve their effectiveness and efficiency in terms of patient care and service delivery unlike others that the complexity, or ease of use had effect on actual usage. This implies that studies involving end users and business managers, may not be equally valid in a professional setting and the perceived ease of use construct was not as important as perceived usefulness. A possible implication arising from this observation may be that management has to focus on selling the utility of new technology, rather than relying on peer group persuasion by those with limited experiences with the technology.

VI. CONCEPTUAL MODEL

Based on the above theories and TAM theory in particular, the researchers developed the government website usage model which measure the influence of Perceived usefulness and perceived ease of use together with other variables (Trust in technology, trust in government, satisfaction and demographic characteristics) on the citizens’ willingness to use government websites.

It’s perceived that the ultimate objective of putting government online ought to be the frequent and recurring use of online services by citizens not only for obtaining information but also for interacting and transacting with the government. Many governments tend to measure citizens usage of government websites basing on how many people visited the website. For example, the government of Canada measured the usage in terms of people who visited the website at least once [22].

It is important for citizen usage of website measurements to go beyond a onetime surfing of the website for information seeking purposes. Governments must measure and monitor the citizens’ satisfaction and intention to continue using the existing services to increase the frequency of usage and services offerings. The Research model being developed for use added a new dimension of satisfaction which is the determining factors for users’ willingness and continued use intention. Some of the variables used in this model were culled from the studies on Internet adoption and e-Government adoption. This model was premised on the belief that government website usage is largely shaped by the extent to which the government can provide a rich, engaging, and hassle-free experience that is reliable and can provide higher levels of satisfaction. The model has six variables that are presented next.

A. Dependent Variable: Government Website Usage

The usage of e-government Websites can be divided into two stage; “initial usage” and “continued usage.” It is observed that in most cases after “initial usage” of e-government Websites, many users revert to traditional ways to acquire information and services, such as telephone inquiry and personal visits. Therefore, engaging and retaining citizens in using government Websites for “continued usage” is a challenge being faced by most government agencies providing online public services. Hence, this study, focused on the factors influencing citizens’ willingness and intention to continue using the government Websites and their perceptions toward government websites by assessing how frequent the services are used and the number of users. One usage per year is not a meaningful usage by governments or citizens. The scope of usage which is whether the government website is used for acquiring information, interacting with, or transacting with government is another very important dimension in the model.

The other dimensions include preference of the government website over other websites and preference of the online medium over other mediums of transactions with government. Issues: is the government website used when initiating searches when looking for information about government services, do citizens prefer to interact with the government through its website, or by telephone or through in-person visit? These dimensions make up the Government website usage willingness. In research model the researcher included the citizens’ satisfaction as a determining factor for citizens’ intention to continue using government websites.

B. Independent Variables

1) User Trust

Belief that a government Website will act responsibly when a citizen visits or transacts with it is central to government Website success. The concept of trust includes defined by a set of expectations that tasks will be accomplished reliably. In the context of technology, trust in technology implies believing that the technology can be used to get the desired task accomplished satisfactorily. Hence, there are two dimensions of citizen’s trusting beliefs toward government Website; trust in government and trust in technology.

2) Trust in Technology

Trust in the other party online is necessary, but not sufficient, for Website users to form the belief that tasks will be completed successfully in the online environment. There are also concerns about the reliability of the Internet infrastructure. Trust in technology is the extent to which the Website users trust the competence and security of the Internet. This has to be measured. There should be confidence in providing private information through the Internet, so as to use it to successful complete an online transaction. The citizen have to believe that the technology applied by the government Website is secure enough, without of leakage of ID and password, computer viruses, or hack. Hence, Trust in technology, significantly influences the citizens’ willingness to use government Website.

3) Trust in Government

Commercial Websites are much more than their technological interface. The quality of relationship among the