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A usability assessment of e-government websites in Sub-Saharan Africa

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ABSTRACT

E-government holds enormous potential for improving the administrative efficiency of public institutions, encouraging democratic governance, and building trust between citizens/private sector and governments. However, most e-government initiatives to date have failed to attain their full potential, because they are increasingly plagued by usability issues. Consequently, there have been increasing calls for evaluating the usability of e-government websites, as they are widely considered to be the primary platform for government interaction with citizens. This study, therefore, seeks to contribute to extant knowledge by evaluating the usability of e-government websites from Sub-Saharan Africa (SSA). This is particularly important as little is known about the usability of e-government websites in the region, and worst still, it is the least advanced region in terms of e-government development. This study evaluated a total of 279 e-government websites from 31 SSA countries. The findings showed that most e-government websites in SSA were characterised by poor usability. The average usability score for the websites was 36.2%, with the most usable website having a score of only 64.8%. The study also showed that the usability of e-government websites was positively associated with the E-Government Development Index (EGDI) and the E-Participation Index (EPI).

1. Introduction

Evidence from the private sector over the years has increasingly demonstrated the significant power of information and communication technologies (ICTs), especially in transforming how businesses interact with and deliver value to customers, as can be seen from the massive success of electronic businesses activities (Huang & Benyoucef, 2014). It is, therefore, not surprising that government at all levels (i.e. federal/state, regional and local) are trying to replicate such success stories for their institutions by tapping into the power of ICTs, particularly the internet and web technologies, to deliver better quality services to citizens and increase their organizational effectiveness. This espousal of ICTs by governments is what is generally termed as electronic government or simply e-government. One of the key factors that motivate the use of e-government solutions among different government institutions is the strong aspiration to foster higher levels of citizen satisfaction and trust in governments (Bannister & Connolly, 2011; Kumar, Sachan & Mukherjee, 2017; Porumbescu, 2016). As such, governments are increasingly depending on public-facing internet technologies, such as websites' to improve government information and service delivery to citizens (Karkin & Janssen, 2014; Porumbescu, 2016). Hui, Xiaolin and Jianying (2014) noted that e-government websites have become so popular such that almost every country around the globe has implemented at least one e-government website. However, citizen acceptance and utilisation of these e-government websites are still a challenge for many governments, as many e-government websites fail to meet user expectations (Huang & Benyoucef, 2014; Venkatesh, Hoehle & Aljafari, 2017). Consequently, researchers and practitioners have increasingly called upon governments to carefully consider improving the usability of their e-government websites as a means to address this challenge. This is necessary as usability has been widely shown to affect citizen's adoption and use of e-government websites (AlFawwaz, 2012; Huang & Benyoucef, 2014; Venkatesh et al., 2017; Youngblood & Mackiewicz, 2012). Websites that are poorly designed from a usability perspective might reduce their use, as poor usability negatively affects day-to-day website interaction (Baker, 2009; Clemmensen & Katre, 2012).

As mentioned, it has been widely argued that usability plays a central role in the success of e-government systems (Ansari, Baqar, Hassan & Saeed, 2016; Venkatesh, Hoehle & Aljafari, 2014). It has been one of the main factors accounting for the failure of many e-government projects (Asiimwe & Lim, 2010). Consequently, e-government website usability has been a key research area over the past decade (AlFawwaz, 2012; Asiimwe & Lim, 2010; Baker, 2009; Clemmensen & Katre, 2012; Donker-Kuijer, Jong & Lentz, 2010; Huang & Benyoucef, 2014; Kirui & Kemei, 2014; Venkatesh et al., 2014; Youngblood & Mackiewicz, 2012). According to Huang and Benyoucef (2014), even though e-government has seen enormous growth, it will only attain its full potential if existing

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and emerging usability barriers are identified and addressed. As such, developing world regions like Sub-Saharan Africa (SSA) could significantly benefit from developing usable e-government websites as a means to improve the growth of e-government in the region, given that it lags behind all other regions with respect to e-government development (UNDESA, 2016).

However, while e-government usability plays a vital role in the success of e-government initiatives, there is still limited knowledge on the usability of e-government websites in SSA (Kirui & Kemei, 2014). This is a critical concern as researchers (Asiimwe & Lim, 2010; Kituyi & Anjoga, 2013; Kirui & Kemei, 2014) have pointed out the need for specific developing world-based studies on examining e-government usability. The challenges in developing countries differ from those highlighted in existing literature from the developed world. Furthermore, albeit the literature widely postulates that e-government efforts will stifle if e-government websites are not optimally designed to have good usability (Baker, 2009; Clemmensen & Katre, 2012), there is little empirical evidence on whether countries that are more advanced in e-government development are better off with regards to developing usable e-government websites, given that e-government websites are seen as the fundamental platform for interaction between governments and citizens (Karkin & Janssen, 2014). Consequently, the main purpose of this study is to evaluate the usability of e-government websites in SSA countries, and compare the usability outcomes against the overall e-government development in these countries.

2. Literature review

2.1. E-government development in SSA

SSA is the geographical area on the African continent that lies south of the Sahara desert and consist of 49 countries. These 49 countries include all African countries that are located either partially or fully to the south of the Saharan desert. In other words, SSA can be seen as all African countries, excluding the five North African Arab nations (i.e. Algeria, Egypt, Libya, Morocco, and Tunisia). SSA is historically known as “Black Africa”, a name devised as a means to delineate it from the northern parts of Africa primarily occupied by Arabs (Tyler & Gopal, 2010). World Bank (2016) data estimates the population of SSA at the end of 2015 to be over 1.001 billion people. The most populated country in SSA is Nigeria, with an estimated population of 183 million, while the least populated is Seychelles, with an estimated population of 93 thousand (World Bank, 2016).

The growing importance of e-government in SSA can be seen in the increasing number of SSA governments rolling out roadmaps for e-government implementation. Some of the SSA countries that have rolled out national agendas for e-government include Botswana, Kenya, Mauritius, Mozambique, Namibia, Senegal, Seychelles, and South Africa. Even though some African countries have not rolled out complete e-government roadmaps, almost all countries have implemented at least one e-government website portal (Rorissa & Demissie, 2010; UNDESA, 2016). Existing classifications (Affisco & Soliman, 2006) of e-government development usually rank the state of e-government into four key categories, namely: (1) publishing (web presence), (2) interacting, (3) transacting, and (4) transforming (integration).

While evidence on the state of e–government in Africa is limited, some studies (Dombeu, 2009; Ngulube, 2007; Rorissa & Demissie, 2010; Schuppan, 2009), however, have attempted to document the levels of e-government on the continent. A common finding from all these studies is the fact that most of the e-government websites in SSA were at the lower end of e-government development (web presence or interacting). Moreover, the general posture of e-government development as a whole in SSA is comparatively lower than the rest of the world, as shown by the United Nations E-government Development Surveys (UNDESA, 2016). However, in the world of technology, constant change is inevitable and there is a high possibility that e-government websites in SSA have significantly evolved since the last of these studies was done. Likewise, the UN E-government Development Surveys have also shown progress in e-government development in SSA between 2010 and 2016, albeit lower than other regions (UNDESA, 2016).

2.2. E-government website usability

Usability has been widely defined in the field of human-computer interaction (HCI) following the ISO 9241-11 standards in which usability refers to “the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use” (ISO/IEC, 1998). This definition covers a wide range of products and has been customised in some instances to suit a specific context. In accordance with the ISO definition, Venkatesh et al. (2014, p. 670) defines e-government usability as “the extent to which a website can be used by citizens to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified e-government service context.” The context is based on how the system is used and the circumstances surrounding its use. In a specific context, a given usability dimension might be more or less important (Harvey, Stanton, Pickering, McDonald & Zheng, 2011).

Extant usability literature in the context of e-government websites has mostly focused on two well-formulated sets of heuristics, namely Nielsen’s usability heuristics (Nielsen & Molich, 1990; Nielsen, 1994) and the six-dimensional framework (Baker, 2009). The Nielsen heuristics initially developed by Nielsen and Molich (1990), and further refined by Nielsen (1994), have been widely published and used for usability evaluation. These heuristics consist of 10 items that were primarily developed for the usability evaluation of user interfaces. These items include the visibility of system status, match between system and the real world, user control and freedom, consistency and standards, error prevention, recognition rather than recall, flexibility and efficiency of use, aesthetic and minimalist design, help users recognise, diagnose, and recover from errors, and help and documentation (Nielsen, 1994).

Since its creation over two decades ago, these heuristics have been shown to be applicable to a wide range of ICT systems (Donker-Kuijer et al., 2010; Huang & Brooks, 2011). Nonetheless, researchers over the years have increasingly found the need to modify or extend the original Nielsen heuristics in order to increase their applicability in different contexts, including e-government websites (Ansari et al., 2016; Delopoulos, 2015; Garcia, Maciel & Pinto, 2005; Huang & Brooks, 2011).

Unlike the Nielsen heuristics, the six-dimensional framework was developed specifically for heuristic evaluation of e-government websites (Baker, 2009). The development of this framework was based on the aggregation of numerous usability variables over the years (Baker, 2004; Baker, 2007, 2009; Roach and Cayer, 2007; Stowers, 2002). This framework (Fig. 1) was first introduced by Stowers (2002) and later modified by Baker in 2004, 2007 and 2009.

The dimensions included in the framework are online services, user-help and feedback, legitimacy, navigation, accessibility, and information architecture (Baker, 2009). Even though not all e-government website usability studies have directly followed this six-dimensional framework approach as provided in Fig. 1, the different usability heuristics that such studies adopted (e.g. Al-Khalifa, 2010; Asiimwe & Lim, 2010; Al-Soud & Nakata, 2011; Asiimwe & Lim, 2010; Byun & Finnie, 2011; Eidaroos, Probets & Dearnley, 2009; Harfoushi, AlFawwaz, Obiedat, Faris, & Al-Sayyed, 2012; King & Youngblood, 2016; Kinsell & DaCosta, 2014; Kituyi & Anjoga, 2013; Maheshwari, Kumar, Kumar, & Sharan, 2007; Venkatesh et al., 2014) were often subsets of these six dimensions, as can be seen in Table 1.

The comprehensiveness of the six-dimensional framework and its specific focus on e-government website usability makes it a suitable heuristics evaluation framework for evaluating the usability of e-government websites in SSA. Additionally, Web Content Accessibility