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User Experience of e-Government: the Nigeria Immigration Service

Abstract:

Purpose - This article identifies key considerations influencing the adoption and use of e-government services by providing insights into users' views of their experience of an e-government service in a developing country, the website of the Nigeria Immigration Service (NIS).

Design/methodology/approach - An online questionnaire-based survey was conducted to capture perceptions of the user experience with the NIS website. Descriptive statistics for each of the factors that contribute to the user experience are reported and discussed, with reference to open comments and previous literature. These factors are security and support, trust, ease of use, website quality, content and information, perceived benefits, convenience, and perceived barriers.

Findings - There is strong evidence of concern in relation to the security of financial transactions, the use of personal data, and trustworthiness, which is aggravated by inadequate user support. There is a lack of consensus regarding ease of use, website quality, and content and information. In terms of barriers and benefits, there was a general agreement that the website offered greater convenience than alternative channels, but some concerns were identified regarding the reliability of technology, and, for users in Nigeria, the reliability of the electricity supply.

Originality/value - This article adds to the very sparse literature on e-government in Nigeria, as well as extending consideration of the public value approach to e-government in developing countries.

Keywords e-government, Nigeria, citizen satisfaction, security and support, user experience, adoption, public value

Research paper

Introduction

Governments worldwide have introduced e-government services in order to reduce costs and make their operations more efficient, provide prompt service, improve service quality, remove barriers to government services, tackle social exclusion, and, provide local access points (Praeg and Spath 2010; Asogwa, 2013; Rana and Dwivedi, 2015; Abu-Shanab, 2017). Typical applications include information provision, downloading of forms, interaction, service delivery, and e-democracy (Al Ajeeli and Al-Bastaki, 2011; Siddiquee, 2016; Oni *et al.*, 2016, Sampson *et al.*, 2018).

For developing countries, the implementation of e-government promises a range of potential social, economic, and political benefits, and can make a significant contribution to the development of information technology infrastructures, and raising citizen skills in the implementation and use of information and communication technologies (Dwivedi, 2009; Lee and Lei, 2007; Yonazi *et al.*; 2010, Amagoh, 2015). However, there is evidence that developing countries struggle to achieve successful implementation and adoption of e-government (Reddick, 2010; Hassan *et al.*, 2011; Al-Refaie and Ramadna, 2017). For example, Heeks (2006) and Gunawong and Gao (2017) suggest that successful implementation and development of e-government is often hampered by lack of resources and finance, Reddick (2010) suggests that the problem lies with not achieving aims and objectives, and Lee and Lei (2007) point to the lack of adequate strategies. More poignantly, Mundy and Musa (2010) and Ciborra (2005) argue that the implementation of e-government services is not well-suited to developing countries, such as Nigeria, as political, social and cultural changes to re-shape the trust that citizens are prepared to place in their government are necessary. Finally, deficiencies in basic technological infrastructure, coupled with a lack of user experience may affect the success of the implementation of e-government systems in developing countries (Dimitrova and Chen, 2006; Rokhman, 2011; Waller and Genius, 2015; Carter *et al.*, 2016). Ultimately, the success of e-government can be judged by the extent of user adoption and user satisfaction (Al Athmay *et al.*, 2016), together with e-government's contribution to public value (Scott *et al.*, 2016).

This article reports on a study of the user experience of the Nigeria Immigration Service (NIS) website. This service has been chosen as the basis for this study because Nigeria is a large and important African developing country, and as Olasina (2012) suggests '*there are limited academic writings on this subject with reference to Nigeria*' and, in particular '*there is no literature on empirical findings on citizens' views, satisfaction and requirements for better*

e-government services'. In addition, the NIS e-service has been lauded as a relatively successful e-government service (Yusuf, 2006; Abdulkareem, 2015).

The aim of this study is, then, to provide insights into users' perceptions of their experience of the e-government service delivered through the NIS website. More specifically, the objectives are to:

1. Offer insights into the users' perceptions of the problems associated with each of the aspects of the user experience.
2. Identify those aspects of the user experience that could be improved
3. Make recommendations for service quality improvements, and for further research.

The next section of the paper distils previous research on the evaluation of e-government services and the citizen/user experience. The methodology section explains the design of the data collection instrument, and the processes associated with the online survey and data analysis. The findings and discussion section reports, and discusses, the profile of users, and descriptive statistics in respect of aspects of the user e-government experience, together with text responses to the open question. Finally, the conclusions and recommendations section summarizes the contribution of the research and makes recommendations for further research.

Literature Review

The need to encourage citizen adoption of e-government technologies has led to an increasing interest in the evaluation of e-government services, often in terms of citizen or customer satisfaction and notions of e-government service quality and impact. Halaris *et al.* (2007) classify the approaches to measuring the quality of e-government into three categories concerned, respectively, with: the quality of traditional public service (e.g. balanced scorecard and six sigma); the quality of e-government services (e.g. the American Customer Satisfaction Index (ACSI)); and the quality of e-services (e.g. E-S-QUAL, E-Qual, E-service quality). Halaris *et al.* (2007) suggest the following criteria as often being used in the studies that they reviewed: service reliability, personalisation, information/content, navigation/accessibility, security, and system performance. Similarly, the features that researchers have identified as contributing to e-service quality are: site features, security, communication, reliability, customer support, responsiveness, information, accessibility, delivery and personalisation (Rowley, 2006). Others have used the Technology Adoption Model (TAM) and/or the Diffusion of Innovation model (DOI) as the basis for their study. For example, Carter and Belanger (2005) used both TAM and DOI, and found that perceived

ease of use, compatibility, and trustworthiness were important in e-government adoption. Together, these approaches to research on the user experience of, and response to e-government have generated a wide range of different variables for consideration for inclusion in this research.

Other research has explored the benefits and barriers to the use e-government services. Gilbert *et al.* (2004) argue that it is important to consider both the positive and the negative factors that influence adoption. For example, there is evidence that users believe they benefit from savings in cost (Liao and Cheung, 2002; Ashaye and Irani, 2014) and time (Liao and Cheung, 2001, 2002; Meuter *et al.*, 2000; Ashaye and Irani, 2014). On the other hand, according to Idowu *et al.* (2009), major barriers to successful e-government include access to technology, citizen's reluctance to trust e-government services, based on and their concerns regarding privacy, information quality and financial security (Dibbell, 2012; Gilbert *et al.*, 2004; Parker, 2011; Amagoh, 2016).

Despite the potential importance of e-government to Nigeria, only a few studies have considered the user experience of e-government in Nigeria. Yusuf (2006) and Amagoh (2015) conducted studies of the extent of implementation in Nigeria and found it to be low. Mundy and Musa (2010) compared the functionality of Nigerian e-government websites with UK e-government websites, and found them to be lacking in security and privacy policies, and relative to UK websites, low in usability, and in the extent of their information content. Kazeem (2011) is the only article that reports in detail on the user experience of e-government in Nigeria; their findings raise some serious concerns regarding personal privacy, possibility of fraud and crime, insecure cookies, and unauthorized access to personal information.

Methodology

Context

Nigeria's e-government system aims to enhance internal efficiency, public services and democratic processes in the legislation and administration section of the public sector (Aneke, 2009). The early implementation of e-government in Nigeria was managed by the Nigerian Port Authority, and was subsequently taken over by the Nigerian Immigration Service. (Sampson *et al.*, 2018; Adeyemo, 2011; Adeniran, 2008). According to Okwuke (2013), the Nigerian government's aim is to promote its e-government services as a catalyst for national development. This study is based on the e-services offered by the Nigeria Immigration

Service (NIS). The Nigerian Immigration Service (NIS) controls and monitors entry and exit activities in Nigeria. It has developed e-services to support information distribution among citizens, form processing, and financial transactions, including online payment for new passports, passport renewal, visa applications, and the processing of various other entry permits (Kanat and Ozkan, 2009).

The NIS e-services are of particular interest because they are accessed by both citizens and non-citizens, and by residents of Nigeria and Nigerian national elsewhere in the world. In addition, the web site both offers information, and supports transactions. If the user wishes to move in and out of Nigeria, they are forced to adopt the system, meaning that insights from the evaluation of this service relate to both willing and reluctant users. Importantly, whilst there is evidence that Nigeria is facing significant challenges in the implementation of e-government (Akunyili, 2010; Omeire and Omeire, 2014), the NIS is acknowledged to be one of the few successful e-government implementations in Nigeria (Yusuf, 2006; Abdulkareem, 2015).

Research approach

This study adopted a quantitative, survey-based research design, in order to develop a profile of website users' attitudes towards the NIS e-government service. A quantitative approach is regarded as useful for profiling a situation (Oppenheim, 2000). In addition, an online questionnaire-based survey was particularly appropriate for this study, since potential respondents were scattered across the globe. In addition, given the potential diversity of the population a reasonably large sample was judged to be necessary (Creswell and Creswell, 2017).

Measurement

In order to identify the key variables to be included in the questionnaire and their associated items, a database of items used by a wide range of previous studies, including those in the technology adoption, diffusion of innovation, customer satisfaction and service quality traditions was collated. Table 1 summarizes the sources of the items (questions) used in this research and Appendix 1 lists the items. from the previous researches. These items were framed as statements with accompanying 5-point Likert scales (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree). Complementing these closed questions, an open question invited respondents to provide additional comments on the

NIS website and its e-services. Finally, closed questions were developed to collect demographic data including gender, age, education, income, employment sector, abode (country of permanent residence), and localization (rural or urban dwellers). Questions were also included on previous experience with information technologies and with e-government services.

Construct	Number of Items	Adapted from
Barriers	11	Zhang and Prybutok (2005)
Benefits	11	Parasuraman <i>et al.</i> , (2005)
Ease of use	10	Davis <i>et al.</i> , (1989)
Content and information	10	Aladwani and Palvia (2002)
Trustworthiness	11	Parent <i>et al.</i> , (2007)
User satisfaction	9	Zhang and Prybutok (2005)
Website quality	10	Yoo and Donthu (2001); Parasuraman <i>et al.</i> (2005); Zhang and Prybutok (2005)

Table 1: Variables included in the questionnaire

The online survey was designed in such a way that respondents could not proceed to other pages of the questionnaire without completing all of the questions on the current page; this helped to minimize any potential problems with missing data. In addition, the questionnaire screened out participants who had never used the NIS e-services. The questionnaire was piloted to remove any inconsistencies and to confirm its wording, structure and design. Piloting also offered insights into the responses to the questionnaire and its comprehensibility (Oppenheim, 2000).

Data Collection and analysis

The online survey was available for nine weeks. Respondents were directed to the survey by e-mail; an initial and two reminder e-mails were sent to each identified respondent. Respondents were identified and contacted via snowball sampling. 351 completed questionnaires were returned.

Data was loaded into SPSS 19.0 for analysis. First, data was cleaned to remove any incomplete or inaccurate responses. Appendix 1 shows the variables, and items that remained after Exploratory Factor Analysis. Descriptive statistics were then generated, both to profile the sample in terms of demographic data, and to generate descriptive statistics for the Likert

scale items. Finally, the data from the responses to the open question were entered into nVivo version10 and analysed.

Participants

All respondents confirmed that they had used the NIS website. In terms of gender, the sample was split (Male 50.1% v Female 49.9%). Of the respondents not living in Nigeria, the largest groups were those living in United Kingdom (22.5%), United States (9.1%) and Canada (4.3%). All respondents were in the age range of 18 to 65 years and there was a fairly even distribution between age categories. Education levels varied, but the sample was relatively well educated, with 67% having a Bachelor’s degree or above, 17% having a Higher Diploma and 9% having a Diploma. In terms of employment status, the distribution was: public sector (16.5%), private sector (32.8%), self-employed (23.9%), unemployed (6.3%), retiree (0.9%) and students (19.6%). Respondents classified themselves in terms of income as: low-income earners (44.2%), medium income earners (33.3%) and high-income earners (22.5%).

Demographic Profile of Respondents			
Location (Country)		%	
Nigeria		50.4	
Other (UK, US, Canada etc.)		49.6	
Location (Urban/Rural)			
Urban		84.6	
Rural		15.4	
Education Status			
Well educated (PhD and Masters)		25.7	
Moderately Educated (Bachelors and HNDs)		57.5	
Fairly Educated (Diploma, Technical, Secondary and Primary School)		16.5	
Not Formally educated		0.3	
Income Level			
Low		44.2	
Medium		33.3	
High		22.5	
Gender		%	
Male		50.1	
Female		49.9	
Age		%	
Young (18 -30years)		28.1	
Middle (31 to 50 years)		52.4	
Older (51yrs and above)		19.5	
Employment Status			
Government Employee		16.5	
Private Sector Employee		32.8	
Self Employed		23.9	
Unemployed		6.3	
Retiree		0.9	
Student		19.6	

Table 2: Demographic profile of respondents

Findings and Discussion

Introduction

Appendix 1 contains the descriptive statistics for responses to the Likert style questions relating to the user experience with the NIS e-government service. This data is presented after Exploratory Factor Analysis using PCA was conducted to confirm the original variables and their associated items. It is not our purpose in this article to report the details of the EFA, because the focus is on the descriptive statistics, but we have included the Cronbach alpha values for each of the factors in the table in Appendix 1 in order to show that the items loaded onto each factor are suitable measures. We have chosen to present this version rather than a pre-EFA version, because the EFA analysis surfaced two important new variables. First, a number of items on security and support loaded onto one factor, rather than being scattered across variables, as they were in the questionnaire design. Secondly, items relating to convenience, originally part of the measure for perceived benefits, clustered as a separate group. On this basis, the factors that emerged from the EFA were security and support, trust, ease of use, website quality, content and information, perceived benefits, convenience, and perceived barriers. Responses in each of these areas are reported in turn below. The insights from the descriptive statistics are further elucidated by comments drawn from the responses to the open question.

Security and Support

Respondents indicated a high level of negativity towards being required to use the NIS website, and much of their concerns stemmed from issues associated with security and support. In the first instance, 86.6% indicated that they had reason not to want to use the website. Users are concerned about their financial details being stolen, and their personal information being used by others; 90.9% either agreed or strongly agreed with the statement *'I worry about my financial details being stolen'*, whilst 92.3% either agreed or strongly agreed with the statement *'I worry about my personal information being used by others'*. They are also generally concerned about engaging in transactions, with 92.8% either agreeing or strongly agreeing with the statement *'I worry about safe transactions online'*. This quantitative analysis is supported by responses to the open question:

'the service payment system is too high risk considering you have to put in a personal document detailing your information which can make it easy for fraud activity to happen'.

'I fear continuing with the financial transaction but have no other choice but to do it and live in fear of not knowing what is going to happen next'

'I fear data being used by others and not for the purpose it was obtained for by the immigration service'

These concerns were not allayed by respondents' view that the NIS website policy was not clearly stated and accessible. One respondent commented:

'no clear policy on data protection and security of financial transactions is stated on the Nigeria Immigration Service website'

Given that items on security and support loaded onto the same factor it would seem that perceptions that the level of technical support available is low, and specifically that it is lower than for other e-government websites that the respondents have used, fuels concerns about the 'safeness' of the website. 87.2% either strongly disagreed or disagreed with the statement that *'Technical support available at the NIS website is as good as other e-government websites used'*. Most users either agreed or strongly agreed that *'There is a lack of technical support while using the NIS website'* (87.2%) or *'It is difficult to seek technical support from the NIS website team'* (87.4%). This analysis is consistent with data from the open question:

'struggle sometimes to get things done and there is nobody around to guide me on what to do'

'the technical support to the website needs to be improved to give users more support in difficult situations most especially during financial transactions'

Concern with security of e-government services, particularly in the arenas of privacy and the use of personal data and financial transactions, has been mentioned by various authors (Dibbell, 2012; Parker, 2011; Gilbert *et al.*, 2004;). This study provides further evidence for Colesca (2009)'s suggestion that security and privacy issues hinder the user experience concerning e-government websites. In addition, security and privacy would appear to be of particular concern in the context of Nigerian e-government services (Kazeem, 2011; Mundy and Musa, 2010); this is quite possibly associated with concerns about the trustworthiness of government (Mutimukwe *et al.*, 2017; Ciborra, 2005;).

In respect of security and support, previous studies have also that indicated that technical support provided by e-government websites can have a significant effect on the user experience of e-government e-services (Kotamraju and Van der Geest, 2011). More

specifically, the provision of technical support may affect the perception of service credibility (Bertot et al., 2008) and may therefore have links to trust and perceptions of security.

Trust

Findings on trust serve to further emphasise issues raised in response to questions on security and support, suggesting that whilst trust is a separate factor it is tightly coupled with notions of security. For example, in response to the question: *'The NIS website is safe to conduct financial transactions'* 75.4% either strongly disagreed or disagreed, and in response to the question *'The NIS website provides adequate measure to protect my financial details (credit or debit card)'*, 80.6% either strongly disagreed or disagreed. On the other hand, whilst responses to questions on the protection and disclosure of personal information were also, generally negative, they were less so, perhaps suggesting a lower level of concern regarding the risk associated with their personal data than the risk associated with financial data.

Responses to other questions were ambivalent, with overall means around 3 and significant percentages of the responses in the neither agree nor disagree category. For example, the question *'The information that I give on the NIS website is only used for the reason for which it is submitted'* had 50.8% responses as neither agree nor disagree, and *'My information is only accessed by the authorised person'* had 48.6% neither agree nor disagree. The question with the highest level of non-commitment was *'The NIS website has a good reputation'* with 73.7% neither agree nor disagree. Whilst such ambivalence may be better than negativity, it does not suggest any positive trust or confidence in the service. Examples of comments include:

'assurance needs to be given to the user that their data will not be used for any other thing than what they have submitted it for at the government website'

'the user needs to be happy that their information will be protected'

Ease of Use

Responses to the statements on ease of use, with one exception, are much less polarised than responses on security and support, and trust, indicating generally weaker feelings. The exception is the response to the question: *'I find that completing transactions on the NIS website is easy for me'*, where 75.7% either strongly disagreed or disagreed. This contrasts with the responses to *'I find that obtaining information from the NIS website for my needs is easy'*, where there was a little less negativity with only 2.8% strongly disagreeing and 55.3%

disagreeing. It appears, then that conducting transactions is regarded as more problematic than finding information. This concern is supported by the following comment: *'the NIS needs to simplify their payment process while strengthening their website security policy.* However, a minority of the respondents commented that they *'found the entire process easy and uncomplicated'*.

The two statements regarding whether using the e-service is easy, and whether the website is user friendly, surprisingly, attracted rather different patterns of responses. The responses to the statement *'I find that using e-services at the website of the NIS is easy'* were split with the largest groups of respondents either agreeing (40.7%) or disagreeing (40.5%), whereas, for the question *'I find that the NIS website is user friendly,* 15.7% agreed, and 59.8% disagreed. These suggest that there is some satisfaction with the functionality or utility of the website, but a relatively high level of negativity when invited to think of it as 'friendly'. The pattern clustering across the three middle categories also characterises the responses to most of the other questions in this section, In all instances, other than those already discussed, the disagree group is larger than the agree group, leading to a group of statements with means below 3, suggesting a pervading dissatisfaction with aspects of the website, such as navigation, layout, and easy of finding things quickly. However, it is important to observe that for several of these questions, and most notably the one on navigation, there are sizeable numbers of respondents who are positive about aspects of the website.

Furthermore, some respondents commented that *'they struggle sometimes to get things done...'* and mentioned the group of people who are particularly exposed: *'...it is difficult for non-frequent users of the Internet...'* as they have to find way to do it on their own when: *'...there is nobody around to guide me on what to do.'*

Website quality

Responses on website quality were also negative. All statements apart from the negative one *'I always have problems using the NIS website'* have means below 3. For this statement 48.7% agree and 27.9% are neutral. For the other statements, the pattern is similar to that for ease of use, with most responses lying in the middle three categories, and the largest group being in the disagree category, but with sizeable groups also in the neutral, and agree categories. This means that respondents generally do not agree that using the website is a

pleasant experience, the website adequately needs their needs, or that they feel adequately informed, or empowered. It was suggested that *'the design is poor'*, *'the website needs to be more user friendly'* and it *'looked unprofessional'*. There were several negative comments regarding navigation:

'difficult to navigate and conduct a transaction'

'hard to follow and you will have to juggle around until you find what you are looking for which is waste of time and money especially when using a cybercafé to browse the internet.'

Nevertheless, there was an acknowledgment that this was *'one of the best websites amongst Nigerian websites'* and that it *'speeded up both application and visa processes'*

Given the limited prior studies on the user experience of Nigerian websites, it is difficult to know whether the generally ambivalent comments about ease of use and website quality in this study are unique. However, Yusuf (2006) suggests that the implementation of e-government in Nigeria could be more user-centric, and, in their limited study based on the content analysis of some Nigerian websites, Mundy and Musa (2010) concluded that these sites had low usability. Overall, however, this study provides evidence that the design of the NIS website could be improved, although it has to be acknowledged that the relative complexity of e-government websites and the relative inexperience of some users might make this more challenging.

Content and Information

In contrast to the negative or ambivalent responses above, the majority of the respondents were positive when asked about the issues of content and information provided by the NIS on their website. The responses revealed that 61.9% of the respondents agreed or strongly agreed that *'There is adequate information on the NIS website for me to process any transaction'* and 68.9% agreed or strongly agreed that *'The content of the website is useful for my purpose'*. Only 45% either agreed or strongly agreed that the content was reliable, although there was also a large neutral group (41%). Means for accuracy and format were low at 2.8 and 2.69, respectively. Some responses to the open question cited limitations:

'inadequate information to complete passport application successfully'

'government should provide accurate information.'

But others were more positive:

'the information provided was adequate for what I needed'

'it provided the process of e-passport application and the addresses of consulates'

Delone and McLean (1992) highlighted the importance of content and information to the user of e-government services and this has been re-iterated by others who comment on the desirable features of web site content (e.g. Bertot *et al.*, 2008; Yoon *et al.*, 2008).

Perceived Benefits

The responses on the perceived benefits of using the NIS e-services were mixed. For example, for *'I do not consider the NIS website of any benefit to me'* over 80% strongly disagree or disagree, which implies that the majority considered NIS e-services to be beneficial to them, and 60.9% either agreed or strongly agreed that using the NIS website improved the effectiveness of their visa/passport application. However, the responses to some of the other questions were split, with, for instance 37.5% disagreeing and 31.1% agreeing that *'Making use of the NIS website reduces my travelling expenses'*, and 29.6% disagreeing and 39.6% agreeing that *'Making use of the NIS website reduces my queuing time'*. Respondents commented that it was *'better than the face to face procedure used in the past'*. Others suggested mobile channels would be even more beneficial: *'...internet on the mobile is cheaper...'* and provides greater *'...convenience of access...'*

Convenience

Responses on convenience were the most positive. Respondents commented positively on the ability to be able to use the NIS website how, where and when they want, with 90% of the respondents agreeing or strongly agreeing to *'I am able to use NIS e-services at a time that suits me'* and *'I am able to use NIS e-services from anywhere in the world'* and with over 80% agreeing or strongly agreeing to the question *'I am able to accomplish tasks more quickly using the NIS website compare to face-to-face service'*. Respondents commented:

'gives you some opportunity to do things at your own time'

However, some respondents had some negative comments to make about convenience, especially if they did not have easy access to the Internet:

'have to travel to another city in order to use the cybercafé at a time and place that is not convenient for me'

'have to wait for the opening of the cybercafé at a time that is not suitable for me'

'the government needs to provide facilities to make it possible to access e-services in libraries or special centres'

Overall, users of the NIS do perceive the availability of the service to offer convenience, particularly in the light of the anytime, anywhere nature of the service. Others have commented on the importance of convenience and the ability to use the e-government services how, when and where they want it (Meuter *et al.*, 2000; Zhu *et al.*, 2002). According to Kim *et al.*, (2006), convenience has a significant effect on customer satisfaction with the e-government experience and should not be ignored.

Perceived Barriers

The means for most of the questions relating to barriers are between 3 and 4 (between agree and disagree), however, opinions on most questions are also divided. For instance, 31.6% disagree, and 32.8% agree that *'It is costly to have Internet access in order to use government services'*. For other questions the divide is even more evident, with 32.8% disagreeing and 42.5% strongly agreeing that *'An intermittent electricity supply makes it difficult for me to use NIS e-services'*. In addition, 60.7% either agree or strongly agree that *'Lack of access to a computer results in extra cost in using NIS e-services'*. Comments in response to the open question focussed on the common impediments to the effective use of the NIS e-services. Some mentioned the intermittent *'...electricity supply...'* while some commented on the spiralling increase in the cost of *'...access to the internet...'* and others suggested that with the high rate of unemployment that *'...when you have no job or on a low wage...'* it is difficult to make use of the NIS e-service. Some respondents commented further on electricity supplies:

'electricity needs to be improved, because even if you have the computer and access to the internet, if there is no electricity supply, it is useless'

'the cost of powering / fuelling a generator for electricity is too much for low income people and students'

Other respondents commented on the cost of travelling from one location to another to use the NIS e-service:

'there is a need to help people living in rural areas by establishing an Internet centre rather than expecting them to travel a very long distance to a city where they can find the Internet'

'It's costing more to travel, wasting precious time and there may be no electricity even when you reach the city where you want to use the Internet at a cybercafé'

Finally, some respondents proposed that:

'the government needs to upgrade the infrastructure for both electricity and telephone to pave the way for cheap affordable internet access.'

Taking the data on barriers and benefits together, it is evident that NIS e-services work better for some users than others, depending on Internet access and the reliability of electricity supplies. This is not surprising, since many authors have suggested that these are major issues for e-government in developing countries (Dimitrova and Chen, 2006; Schaupp and Carter, 2005; Asogwa, 2013). Amagoh (2016) found that obsolete ICT infrastructure, intermittent electricity supply, lack of privacy and protection of users data, and poor internet access were hindering the adoption and use of e-government services in Nigeria. Of particular interest is that the sample in this study is relatively well educated and prosperous, and yet many of them still face such difficulties.

Reflections on Findings

Content and information, convenience, and benefits: According to Hazlett and Hill (2003), the government's success when using the internet to deliver its messages strongly depends on the content displayed on its website and such information being made available for users' convenience, anytime and anywhere. Furthermore, Carter and Bélanger (2005), suggest that the benefits received from the use of an e-government portal can result in the user loyalty and satisfaction. Ramon *et al.* (2007) note that the content available on such websites saves users' time and allows them to navigate and extract relevant information easily. Halaris *et. al.* (2007) points to the convenience of having access to good and accurate information on government websites as it enables users to make accurate decisions and reap the benefits of using such websites.

Website quality, security and support, and trust: The quality of a website increases users' trust and engenders positive views of its security and, also reduces their reliance on technical support (Aladwani and Palvia, 2002; Hariguna et al., 2017) and well as promoting user-friendliness and the protection of personal information (Aladwani, 2013). Website quality contributes strongly to formulating individual perceptions and hence leads to a decreased reliance on support when using the site (Elling et al., 2012). Inadequate security and support may affect users' willingness to make frequent visits to a government's website (Al-rawahna, *et al.*, 2018) as citizens' perceptions of website quality may affect their trust in an e-government service (Alenezi et al., 2017).

Barriers, and ease of use: Gilbert *et al.* (2004) state that a barrier in technological terms is a risk that makes users wary of becoming engaged with an activity. Barriers restrict citizens' feelings of control when using a website and affect their satisfaction with the use of e-government websites (Alenezi *et al.*, 2017). In other words, ease of use is a vital factor affecting the adoption and satisfaction of e-government services (Wangpipatwong, *et al.*, 2008). When using government services on electronic platforms is free of effort or difficulty, the barriers to using such services are reduced (Beldad *et al.*, 2012). If users can complete and perform a transaction effectively on the NIS portal with relative ease, they will be more willing to use the online service.

Conclusion and recommendations

Conclusion

Some of the findings from this study, especially those relating to security and support and trust may appear to be very negative. Indeed, there is wider evidence that hints that the citizens of some developing countries have every reason to be skeptical about the actions of their governments. Add to this the challenges associated with achieving reliable information systems implementations in some developing countries, and the relative novelty of information technology for some citizens, it is not surprising that citizens might have concerns about the security of the personal and financial data that they are required to load into such systems. Accordingly, progressing effective e-government is likely to require a three-pronged approach, including systems and technology development, strengthening of governance, equity and transparency of political, economic and social aspects of government, and developing citizen information technology literacies and competencies. In other words, the solution does not lie with systems alone. Further, this study confirms that Nigeria is one of those developing countries in which the potential benefits of e-government services are not always realized in practice, because citizens do not have access to reliable electricity supplies and internet connectivity. In particular, mobile technologies, which involve the development of mobile-enabled e-government services, may contribute to navigating some of the more intractable infrastructure problems.

However, some of the challenges facing the NIS e-services, and possibly other e-government services in Nigeria derive from the design of the websites and their associated systems. Whilst the users in this study reported most negatively on security and privacy, and on barriers such

as intermittent electricity supplies and internet access, they were also relatively negative regarding ease-of-use, web site quality, and content and information on the website. Maybe this is partly because the users in this study are not willing adopters of the NIS e-services; they are conscripts. In addition, they are relatively well educated, and by virtue of their use of the NIS service are likely to be relatively well travelled, and many will have experience of commercial websites and e-government websites in other countries. Accordingly, they may have high expectations of websites and e-services. Nevertheless, there is a sense that there is scope for improvement in the website design.

The most positive message from this study is that users perceive that e-government services can be convenient and effective – the challenge is for governments to deliver on these potential benefits.

Recommendations for practice

First, we offer a range of recommendations for practitioners, and especially those responsible for designing and delivering the NIS e-services:

1. Develop perceptions of security through appropriate security and privacy policy statements, and through offering adequate and easily accessible online or telephone-based support.
2. Conduct further development of the user interface for the website, based on further consultation with users as to the way in which they use the website. This consultation should include both expert and novice computer users.
3. In future redesigns of the website, pay particular attention to navigation, and to the inclusion of useful and targeted content and information.
4. Explore the options for and benefits of mobile technologies for e-government delivery.
5. Explore the potential role of social media in e-government, as this could be a new means of engaging users with e-government services.
6. Seek ways to improve on citizen perception of the trustworthiness of the service, as this is likely to improve more adoption of e-government services and citizen confidence.
7. Invest in basic infrastructures such as electricity and internet access; these are essential to successful implementation of e-government and other digital services.

Recommendations for research

Further research into the user experience of e-government services in developing countries should be conducted to generate more detailed insights into the problem and challenges associated with the delivery of specific types of e-government services in different countries. It would be particularly worthwhile to further explore the potential of mobile technologies. There is also scope for studies into other e-government services in Nigeria, and for comparative studies between Nigeria and other developed and developing countries. In addition, qualitative studies would generate greater insights into the way in which e-government services can support citizen's interactions with, and confidence in their governments.

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Appendix 1 – Findings

Variables	Items	Mean	SD	1	2	3	4	5
Security and Support (CA: 0.91)	I worry about my financial details being stolen	4.29	0.760	0.90	2.50	5.70	48.70	42.20
	I have no negative reason not to use NIS website	1.88	0.907	35.90	50.70	4.80	6.80	1.80
	I worry about safe transactions online	4.32	0.740	0.90	2.60	3.70	49.80	43.00
	I worry about my personal information being used by others	4.31	0.751	0.90	3.10	2.80	50.40	42.80
	The NIS website well designed compared to other e-government websites that I have used	1.70	0.892	51.30	35.30	6.80	5.70	0.90
	There is lack of technical support while using NIS website	4.30	0.920	1.70	5.10	6.00	35.30	51.90
	Technical support available at the NIS website is as good as other e-government websites used	1.68	0.867	51.90	35.30	6.80	5.40	0.60
	The NIS website security policy is clearly stated and accessible to the users of the website to read	1.70	0.922	53.00	31.80	8.00	6.30	0.90
	It is difficult to seek technical support from NIS website team	4.34	0.869	1.40	3.40	7.80	35.00	52.40
Trust (CA:0.90)	The NIS website is safe to conduct financial transactions	2.08	0.975	29.80	45.60	12.30	11.40	0.90
	The NIS website provides adequate measures to protects my financial details (credit or debit card)	1.88	0.896	38.70	41.90	12.50	6.30	0.60
	I am happy to provide my personal information at the NIS website	2.41	1.054	17.90	46.70	13.40	20.20	1.80
	The NIS website protect my disclosed personal information	2.38	0.909	16.50	40.50	31.80	10.30	0.90
	The information that I give on the NIS website is only used for the reason for which it is submitted	2.72	0.781	5.40	31.30	50.80	11.40	1.10
	My information is only accessed by the authorised person	2.68	0.790	6.30	32.80	48.60	11.40	0.90
	The NIS website has a good reputation	3.04	0.544	0.30	11.10	73.70	14.00	0.90
	I feel confident that I can rely on transactions conducted through the NIS website	3.05	0.896	2.60	27.90	34.20	33.00	2.30
	I feel confident that the NIS will meet their obligations for transactions conducted through their website	3.12	0.880	2.00	23.90	37.70	33.00	3.40
Ease of Use (CA: 0.91)	I find that using e-services at the website of the NIS is easy	3.01	0.952	0.90	40.50	16.50	40.70	1.40
	I find that navigating around the NIS website is easy	2.71	0.953	2.30	56.10	10.50	30.20	0.90
	I find that the NIS website is user friendly	2.50	0.835	3.90	59.80	19.70	15.70	0.90
	The NIS website layout makes it easy for me to find things at first sight	2.33	0.767	3.40	73.80	10.30	11.40	1.10
	I feel comfortable using the NIS website	2.98	0.944	1.40	39.60	20.50	36.80	1.70

	I find that obtaining information from the NIS website for my needs is easy	2.67	0.923	2.80	55.30	15.10	25.90	0.90
	I find that completing transactions on the NIS website is easy for me	2.23	0.980	19.00	56.70	8.30	14.00	2.00
Website Quality (CA: 0.76)	I always have problems using the NIS website	3.28	0.833	0.60	21.70	27.90	48.70	1.10
	It is a pleasant experience using the NIS website	2.45	0.809	4.00	62.40	18.50	14.50	0.60
	The NIS website adequately meet my needs of interaction with the government agency	2.64	0.927	5.10	51.30	19.10	23.60	0.90
	I feel adequately informed when using the NIS website	2.46	0.827	5.10	59.80	19.10	15.70	0.30
	I feel empowered when using the NIS website	2.66	0.952	7.10	45.90	22.50	23.40	1.10
Content and Information (CA: 0.90)	There is adequate information on the NIS website for me to process any transaction	3.41	0.933	1.10	23.40	13.60	57.30	4.60
	The content of the NIS website is useful for my purpose	3.61	0.739	0.30	10.80	20.00	65.20	3.70
	The information on the NIS website is up to date	3.15	0.733	0.30	17.90	50.10	30.00	1.70
	The NIS website provides detailed information on the services available	3.40	0.894	1.10	21.90	15.70	58.70	2.60
	I do not consider the information on the NIS website as accurate	2.80	0.863	4.00	36.50	36.10	22.50	0.90
	The information on the NIS website are reliable	3.33	0.743	0.30	13.70	41.00	43.00	2.00
	The NIS website provides information in an appropriate format	2.69	0.829	1.40	48.70	30.50	18.00	1.40
	There is sufficient information on the NIS website for me to make a transaction decision	3.15	1.005	1.70	35.60	11.50	48.10	3.10
	The information on the NIS website meets the needs of both citizen and non-citizen	2.93	0.957	4.60	33.00	29.60	30.20	2.60
Perceived Benefits (CA: 0.89)	Making use of the NIS website reduces my travelling expenses	2.79	1.253	15.10	37.50	8.30	31.10	8.00
	Making use of the NIS website reduces my queuing time	3.07	1.173	9.40	29.60	13.70	39.60	7.70
	I do not consider NIS website of any benefit to me	2.07	0.763	19.10	61.50	13.70	5.10	0.60
	Making use of the NIS website improves the effectiveness of my visa / passport application	3.41	1.038	4.10	20.80	14.20	52.10	8.80
	Making use of the NIS website simplifies my visa / passport application processing time	3.22	1.041	4.30	27.40	16.20	46.70	5.40
Convenience (CA: 0.86)	I am able to use NIS e-services at a time that suits me	4.22	0.756	0.30	4.80	3.70	55.00	36.20
	I am able to use NIS e-services from anywhere in the world	4.32	0.676	0.00	2.60	4.30	52.10	41.00
	I am able to accomplish tasks more quickly using NIS website compare to	4.00	0.778	0.30	5.40	12.30	58.10	23.90

	face-to-face service							
	Making use of the NIS website reduces the time associated with my initial enquiry	2.15	1.062	29.60	43.30	12.00	12.50	2.60
Perceived Barriers (CA:0.93)	It is costly to have internet access in order to use government e-services	3.21	1.316	9.10	31.60	7.40	32.80	19.10
	An intermittent electricity supply makes it difficult for me to use NIS e-services	3.38	1.548	10.70	32.80	6.30	7.70	42.50
	Lack of access to a computer results in extra cost in using NIS e-services	3.55	1.357	6.80	25.70	6.80	27.40	33.30
	Using NIS website to apply for passport or visa may cost me more	2.96	1.172	9.10	36.80	9.10	38.70	6.30