

EXPERIENCES OF PERSONS WITH DISABILITIES IN ACCESSING E-GOVERNMENT SERVICES IN GHANA

Research paper

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Abstract

One of the objectives of E-government is to foster citizen participation in government-related activities and services. For this to happen, accessibility of these E-government services is crucial for all citizens, more specifically for persons with disabilities (PWD). While several studies have evaluated the accessibility of E-government services to PWD, most fall short on providing empirical and context-specific experiences from the perspective of PWD. The purpose of the study is to examine the experiences of the visually impaired in accessing E-government services in Ghana so as to inform political leadership and societal decisions towards improving inclusivity and accessibility of E-government services for PWD. Based on the interviews carried out with 18 visually impaired, seven overarching themes were identified, categorised into the three dimensions of socio-political, technological and contextual respectively. Given that few studies have examined accessibility from the perspective of PWD in developing countries and particularly in Africa, these findings offer unique insight of the amalgamated factors that lead to the exclusion of PWD from E-government services in these contexts.

Keywords: E-government, Accessibility, Person with Disabilities, Ghana.

1 Introduction

E-government use in most countries is now seen as a norm, specifically in developed economies. Designed with a citizen-centred approach in mind, E-government aims to provide a single point of access for all government web-based services and in so doing it: (1) promotes democracy through inclusive participation for all, (2) increases economies of scale in providing government services to citizens and (3) enhances government accountability and transparency (Ahn and Bretschneider, 2011). Developing countries have encountered challenges in efforts aimed at implementing E-government, more so in the provision of accessible E-government services for persons with disabilities (PWD) (Adepoju and Shehu, 2016). Studies have shown that majority of online government services particularly in Africa are not accessible to PWD (Goodwin *et al.*, 2011; Yaokumah, Brown and Amponsah, 2015; Mtebe and Kondoro, 2017; Verkijika and De Wet, 2017). Investigating PWD inclusion in the participation of E-government services is therefore important for researchers because: (1) governments offer many critical services with no alternate providers, and (2) PWD stand to gain more if they can access online government services at their convenience (Pilling and Boeltzig, 2007).

While there have been studies examining how to facilitate the integration of PWD into the digital society; few of these are in developing countries – and this could be the underlying reason as to why most government web-based services in these regions for the most parts are not accessible (Goodwin *et al.*, 2011; Patra, Dash and Mishra, 2014; Verkijika and De Wet, 2017). Further, for those that have examined this phenomenon in developing countries, few have presented empirical evidence from the perspective of PWD to elicit contextual challenges they face with regards to use of E-government services. There remains limited understanding as to how or what are the amalgamated factors that lead to PWD being excluded from E-government. This lack of understanding can be observed in the lack of accessible E-government initiatives across developing countries where 80% of the world population living with disabilities reside (UNESCO, 2014). In Africa alone, it is estimated that 10 percent of the population live with disabilities (WHO, 2011). These figures are likely to rise due to demographic trends, chronic health conditions and ageing populations (UNESCO, 2014). Given the fact that most governments are now embracing E-government, it is important to assess whether these E-government services are accessible to PWD in developing countries, and what the accessibility challenges are.

This study is situated in the Ghanaian context in West Africa. Ghana adopted E-government through the ICT4AD (ICT for Accelerated Development Program) in 2003, and the E-government strategy in 2005. In 2008, the government introduced the GeGov project to support some government business processes through the provision of a modern E-government system. These efforts have received significant financial support from international agencies such as the World Bank and the United Nations Development Program (UNDP), (Osei-Kojo, 2017). Despite these initiatives, Ghana is still ranked relatively low (0.4182) in E-government provision by the UN (Agboh, 2017; Wihlborg, Hedström and Larsson, 2017). Studies in Ghana regarding PWD and accessibility of E-government services are few, with the exception of a study by Yaokumah *et al.* (2015), which evaluated 19 E-government portals and websites in Ghana and showed that they were all inaccessible to PWD. The study by Yaokumah *et al.* (2015) is a step towards better understanding accessibility of government portals and websites in Ghana, but it does not shed light on the PWD perspective, nor does it consider the contextual challenges and opportunities that PWD encounter while accessing E-government services. With this background, the purpose of this study is to understand the contextual concerns of PWD in Ghana as a means to improve inclusivity and accessibility of E-government services for PWD. Disability groups affected by web accessibility include those with: visual, hearing, cognitive and impairments (Shi, 2007). This study focuses on the visually impaired because studies (Venter and Lotriet, 2005; Shi, 2007; Abu-doush *et al.*, 2013; Boussarhan and Daoudi, 2014) have long shown that the visually impaired are the most challenged with regards to accessing electronic services among the different disability groups. The study was guided by the research question: What are the experiences of the visually impaired regarding access to E-government services in Ghana?

The rest of the paper is organised as follows: Section 2 summarises previous studies on E-government accessibility for PWD. Section 3 discusses the methodology adopted for sampling, the data collection

and analysis. Findings and discussions are covered in Section 4, and finally, Section 5 presents conclusions, research implications and future work.

2 Related Works

E-government comes with several benefits for both developed and developing countries. Like any other IS system, success of an E-government system depends on a number of factors including: (1) how well it is aligned with the norms, values and beliefs in its wider context, (2) how compatible it is with established practices, (3) how socially accepted it is, (4) whether it is endorsed by regulation, and (5) whether it possesses a high degree of legitimacy. All these are essential for resource mobilization and successful development (Markard, Wirth and Truffer, 2016). For the countries that have adopted E-government, the failure rate remains high due to among other reasons, challenges in the design of Information Systems (IS) which is fraught with uncertainty largely because of their constitutive nature (Purao and Wu, 2013). Due to these challenges, researchers are concerned that instead of contributing towards the realisation of the perceived benefits, specifically inclusiveness and accessibility to all, such systems could potentially have the unintended consequence of excluding citizens, specifically those who are already disadvantaged and falling outside the norms, giving rise to new barriers for them (Wihlborg, Hedström and Larsson, 2017). In addressing this concern, three major themes consistently appear in literature as aspects requiring further attention for the adoption and implementation of E-government that is cognisant of PWD concerns. These themes are E-government as a technical system, E-government as a socio-political system, and contextual needs of PWD in accessing E-government. Each will be discussed in turn.

2.1 E-Government as a technical system

Contact between citizens and E-government systems is usually through websites. These “websites can be considered key elements of successful E-government strategies... as they are seen as comprehensive points of access to a great variety of electronic public services... and can change the way citizens, businesses, and other stakeholders interact with government” (Gil-Garcia, 2006, p. 2). Lewthwaite (2014) posits that the values which promote universal, statistical and automated approaches to web accessibility do not consider geographical, social, technological or cultural diversity - ‘these values can be limiting, and potentially counter-productive, for example, for the majority of disabled people in the “Global South” where different contexts constitute different disabilities and different experiences of web access’ (Lewthwaite, 2014, p.1375). With this understanding, several studies have sought to examine whether E-government systems are designed and implemented to address PWD concerns – lest they fail to provide inclusivity and accessibility for all, given contextual challenges and opportunities. Such studies examine areas of improvement of E-government systems by evaluating the accessibility of E-government portals and websites for PWD through the use of automatic tools.

Adam and Kreps (2009) note that as long as disability activists are not included in the standards-making agenda of the web accessibility movement, achieving web accessibility for all will remain a challenge. Following this observation, and the importance of involving PWD in the accessibility debate (Youngblood and MacKiewicz, 2012; Henry, Abou-zahra and Brewer, 2014), Reichling and Cherfi (2013) proposed a method for websites development which takes into account accessibility expectations of end-users. Kascak et al. (2014) propose a means of bridging discrepancies between the existing design guidelines and universal design principles to improve the design of mobile health applications for the elderly of whom many have multiple diseases and consequent disabilities.

2.2 E-Government as a socio-political system

Although E-government systems are seen as technologies used to engage citizens and support public sector operations and services, they are ‘explicitly political in nature, and reflect values from the very

political context in which they are borne ... such as the values for what kinds of end-users the technologies will be designed' (Volda *et al.*, 2014). These values tend to be articulated in policies, 'legislation, executive orders, judicial rulings, guidelines and regulations, rulemaking, agency memos, signing statements, agency circulars, and other types of official statements'. These latter artefacts become 'sets of directives intended to shape decisions and actions of individuals, organizations, and government agencies' (McClure and Jaeger, 2008, p. 257). IT artefacts in E-government are inscribed with these policies and directives, as E-government systems are based on legal acts and other regulations (Goldkuhl, 2016). Abascal *et al.* (2016, p. 179) claim that 'the universal accessibility concept is usually formulated in terms that ignore the socioeconomic and socio-political contexts'. It then becomes important for researchers to understand how well E-government policies and other directives address the socioeconomic and socio-political contextual concerns of PWD.

2.3 Contextual needs of PWD for accessing E-Government

Previous studies have documented preconditions to improve the accessibility of E-government services for PWD. Most are based on contextual needs of PWD such as literacy and numeracy skills (Abascal *et al.*, 2016), which 'can significantly affect an individual's access to and understanding of websites and can, in turn, limit ability to complete tasks such as forms and surveys online' (Grantham, Grantham and Powers, 2012, p. 21). To address this challenge, researchers such as Summers *et al.* (2014, p. 13), are now examining and building artefacts that are cognizant of the fact that there are citizens, and PWD in particular 'who struggle with both word recognition and understanding what the words put together actually mean'.

As for those PWD that have literacy and numeracy skills, the majority, according to Chadwick *et al.* (2013) are not accessing the Internet to the same degree as others and not all of them that have access to a computer and Internet access to use it. They identify financial and economic barriers, societal attitudes and exclusion, policy and governmental support, educational and training barriers, and individual impairment-associated challenges in accessing the Internet as key barriers to Internet access for PWD. With regards to education and training barriers, many researchers call for the enhancement of digital literacy (the ability to use the Internet to meet information needs) and skills for inclusion purposes of PWD. Not only do PWD need digital literacy, but they also need to possess the knowledge and skills required to use assistive technologies designed to compensate for disabilities. These latter devices are aimed at enhancing functional capacities and enabling PWD to be independent in performing day to day activities (Hurst and Tobias, 2011; Boussarhan and Daoudi, 2014).

PWD face the challenge of affordability related to the cost of having access to E-government systems or Internet services in general. In developing countries, the high cost of assistive technologies (Bengisu, 2010; Borg and Östergren, 2015), low bandwidth, older technology (Henry, Abou-zahra and Brewer, 2014) and the cost of accessing the Internet act as deterrents to the use of the web. Jayakar *et al.* (2015) examined ten case studies of policies and programs promoting ICT and broadband access for PWD in the leading economies of the Asia-Pacific region to identify success factors behind programs that succeed on the basis of effectiveness and cost efficiency. The authors show that: (1) goal clarity, (2) responsiveness to the needs of disabled persons, (3) customisation of products and services considering the heterogeneity of user populations, and (4) government's role in coordination and legitimization of the efforts of other stakeholders, were key to effectiveness and cost efficiency.

3 Methodology

A qualitative enquiry was deemed appropriate for the study because we seek to understand the E-government phenomenon as it is situated in the Ghanaian context, from the perspective of the visually impaired. The main themes from the literature were used as a guide during the data collection process to learn the meaning that the visually impaired hold about E-government services. Purposeful sampling and snowballing techniques were used to contact persons with visual impairment who were literate and were likely to use E-government services. A total of eighteen participants living with visual impairments participated in the study. Participants categorised their degree of impairment.

Demographic information on participants that emerged from the data is indicated Table 1. Data collection took place between September to October 2016 and February to March 2017. Data was collected through in-depth, semi-structured interviews which were based on the three main themes found in literature, i.e. (i) *policies and associative directives as enablers or barriers to successful utilisation of E-government services*; (ii) *web accessibility challenges*; and (iii) *contextual challenges of successful utilisation of E-government services*. Interviews were audio recorded. All interviews were in English except a few portions where vernacular was used. Participant verification was used (i) to ensure that the researcher's transcriptions represented the exact opinions expressed by participants, and (ii) as part of an audit trail to ensure trustworthiness.

Interviewee	Gender	Age	Duration of impairment	Occupation	Educational Level	Degree of impairment
PWD1	Female	22	10	Student	Tertiary	Blindness
PWD2	Male	35	25	Assistive technology Instructor	Tertiary	Low vision
PWD3	Male	31	16	Educationist	Tertiary	Blindness
PWD4	Male	52	32	ICT Director	Tertiary	Blindness
PWD5	Male	25	From birth	Teaching Assistant	Tertiary	Blindness
PWD6	Female	49	From birth	State Attorney	Tertiary	Blindness
PWD7	Male	25	14	Teaching Assistant	Tertiary	Low vision
PWD8	Male	24	13	Student	Tertiary	Blindness
PWD9	Male	38	25	ICT Director	Tertiary	Blindness
PWD10	Male	22	16	Student	Tertiary	Blindness
PWD11	Male	22	15	Student	Tertiary	Blindness
PWD12	Male	20	From birth	Student	Tertiary	Blindness
PWD13	Female	29	27	Customer-Care Personnel	Tertiary	Blindness
PWD14	Male	50	From birth	Lecturer	Tertiary	Low vision
PWD15	Male	52	From birth	Musician	Secondary	Low vision
PWD16	Male	37	30	Journalist	Tertiary	Low vision
PWD17	Male	40	10	Teacher	Tertiary	Blindness
PWD18	Male	33	26	Unemployed	Tertiary	Blindness

Table 1. Profile of interviewed participants for this study

Interviews were transcribed verbatim using otranscribe (<http://otranscribe.com/>) and analysed using inductive thematic analysis procedures described by Braun and Clarke (2006). The analysis process was iterative with each stage building on previous stages. Data was repeatedly read to identify interesting features that related to E-government accessibility for PWD. Transcripts were read, while interesting features were coded. Codes were formatted into tables in Microsoft Excel. Using the initial codes, similar codes or codes that had common features were grouped to form sub-themes. For example, initial codes 'Lack of access results in dependency', 'Inaccessibility reduces confidentiality', 'Inaccessibility results in low self-independence', and 'Lack of access decreases privacy' were logically grouped under the sub-theme 'Lack of independence and privacy'. Examples of coding from extracts of sub-theme development are illustrated in Figure 2. Sub-themes which described the same incidents were grouped to form an overarching theme.

Extract from PWD ₁	Sub-theme	Codes and relationships
So, if I can't register my company I will still have to ermm depend on someone to give me some-thing to eat. If I can't access information on the Ghana website, I don't know what is going on... information is very important to everybody and to persons with disability because, by being disabled, we are being handicapped in accessing information	Lack of independence and privacy	<ul style="list-style-type: none"> • Lack of access results in dependency • Lack of access reduces independence • Lack of access decreases privacy • Inaccessibility leads to dependency • Lack of access reduces independence • Inaccessibility leads to dependency • Inaccessibility reduces confidentiality • Inaccessibility results in low self-independence

Figure 2. A sample of coding and sub-theme development.

4 Findings

The analysis of the 18 interview transcripts resulted in 40 sub-themes which were logically organised into 7 themes as shown in Figure 3. Each of the themes will be discussed in turn.

Theme	Description
E-government challenges, benefits and access options	The benefits and the challenges related to E-government and need for multi-channel access to E-government services
Assistive technologies acquisition, training and usage	Issues relating to assistive technologies such as how to acquire them, train in them and efficiently use them
Institutions and legal frameworks	E-government stakeholders' knowledge on legislations and the efficiency with which institutions enforce these laws
Consequences of E-government inaccessibility	Challenges PWD face and are likely to encounter if accessibility issues relating to E-government are not addressed
Societal attitudes and perceptions	The societal awareness on the needs of PWDs and the perception society holds on PWD and accessibility
Lack of support from industry	There is inadequate support from industries partners such as ICT companies, ISPs and banks to make the digital society inclusive
PWD lack of E-readiness	Factors that affect PWD preparedness to take advantage of E-government such as late adoption of ICTs, low income levels among others

Figure 3. Themes with their descriptions.

4.1 E-government challenges, benefits and access options

This theme encompasses the challenges reported by the visually impaired regarding E-government services, the benefits derived from these services and the need for multi-channel access to E-government services. Evident from the study show that thirteen participants (PWD_{1, 2, 3, 5, 7, 9, 10, 11, 12, 14, 16, 17 and 18}) had used E-government either for purposes of information or services. Participants perceived that E-government has greater benefit for PWD because they had difficulties accessing the physical government offices due to mobility issues. They indicated that E-government portals act as virtual gateways that enable them to interact with agencies on a 24/7 basis (PWD₁₂). A major challenge regarding E-government indicated by participants was that most platforms were not accessible, thereby making it difficult for them to access information and services. For example, PWD₁₇ explained the challenges when accessing E-payslip - a government to employee (G2E) E-government initiative:

I'm a teacher so I have been accessing E-Payslip online. So, when I want to go there I also type in the address and it opens; but there's one challenge I've been having with that place right now. They [the site] give you a particular code and that code, the screen reader is not able to identify it or is not able to read the code so, it means when you get there sometimes you have to get a sighted person to come and look at that one for you which doesn't give you the independent that you want to get. Because maybe you are in the comfort of your room you

want to do everything alone you know matters of payslip, but here you have to call somebody to assist you there.

As a result of some of the challenges, respondents called on the government to have variable options in accessing E-government services. For instance, regarding the E-payslip there was a proposal that their payslips could be emailed *so that we use our laptops and phones to access it, it will be more efficient than everyday logging onto the platform...since it is not friendly...or accessible for now* (PWD₃).

4.2 Assistive technologies acquisition, training and usage

This theme was the most salient among participants. All interviewees indicated that they required assistive technologies to enable them to access E-services. The most cited challenges regarding assistive technologies include high cost, limited capabilities, lack of training, and lack of subvention from government. It was observed that most interviewees depended on technologies to efficiently perform their duties, as PWD₂ stated *'technologies make things possible for us'*. Screen readers were the commonly used assistive technologies. Concerning the high cost PWD₉ explained that:

Assistive technology generally is not affordable, it is just in recent times you are looking at open source ... screen readers screen magnifiers...Even with the open source they are not robust enough to deal with you know the various things one would want to do using various E-platforms. So, the very robust ones you must buy and you must buy at an expensive cost so we say for ... the most robust screen reader one can find on the market today which is the ... J-A-W-S Job Access With Speech...erhh program is ... single user license is gonna cost you about a \$1,095

The high cost of assistive technologies was attributed to the lack of local production because *'there are very few assistive technology devices that you can find on the Ghanaian market for persons with visual impairment in particular or persons with disabilities in general. So, mostly you would have to import what you require'* PWD₉. The cost of assistive technologies forced many participants to adopt illegal means of using them. Many interviewees admitted they were using screen readers illegally which they popularly referred to as *'cracked'*. This restricted access and limited the capacities of the screen readers as PWD₁₀ narrates:

Because you realise that if you are not having the brand new, the bought one, you are limited in terms of the things the screen reader can do for you. Because it has some features which you can only get if and only if you buy the brand-new package apart from that, you will be limited in terms of the things you can use them for. You get it. The software I use is not the bought one I use just the 40 minutes one it's every 40 minutes...you restart it.

The high cost of acquiring ICT and assistive training made it difficult for them to acquire the necessary ICT skills. This was more of a problem for the visually impaired who became late blind and required new training on ICT (PWD_{6, 11, 13, 17}). Also, many of the visually impaired were not employed which worsened their plight in that regard because *affordability is an issue for the majority* (PWD₉). The high cost of training was alluded to be due to a few experts who could train the visually impaired on assistive technologies and the limited number of training facilities. Again, such facilities were only located in the capital city which made it difficult for those located outside the capital to have easy access. PWD₉, an ICT director and trainer on assistive technologies indicated that the inadequate training centres forced them to offer consultancy via phone for free, which should not be the case. He explains:

...there are very limited training facilities. So, what we end up doing especially as training in assistive technology, what I'm doing a lot of pro bono [working without fee] work. We are supposed to be earning money from it [training]. But because of the challenge in accessing you know ... training PWD in their various localities is difficult, so they have to call you from where they are and you have to give free training.

Participants felt the lack of subvention from the government made their plight worse. They perceived their situation would improve if the government offered the needed support as PWD₁₂ stated:

So, if the government can make that deliberate effort to buy some of these things, and also going forward, if the government can also negotiate with international partners or donors and also bring in more investment I think that would also help so from there maybe if we can access ermm some of these, since it's coming from abroad, if we the government can bring on board these people to help us, probably we might even get it cheaper.

The analysis of this theme shows that while access to ICT was perceived as a challenge, the cost of acquiring assistive technology and the training thereof was more of a barrier due to unemployment, limited expertise and lack of training facilities. One proposition to address this challenge was through government intervention in the form of subsidies for the purchase of assistive technologies.

4.3 Institutions and legal frameworks

Many participants advocated for state institutions to be firm in implementing laws that protect the rights of PWD. Interviewees raised several issues relating to institutions and legal frameworks which include: amendments to the existing disability Act, and lack of enforcement. They perceived that the existence of strong institutions and effective implementation and monitoring of legislation would go a long way to ensure equal access for all citizens in the digital society. Although the Persons with Disability Act (PDA) was promulgated in 2006 to promote the interests and protect the rights of PWD, most respondents argued it was ineffective, and there was a need to amend the PDA to cater for the needs of PWD in the technological age. For instance, they stated PDA was passed at a time E-services were not common hence the Act *does not say anything about E-services because I know the Act was passed or enacted about ten years ago, E-services was not the talk of the town in Ghana at the time* (PWD₉). According to PWD₁₁ amending the Act was necessary because it is not in line with the *United Nations Convention on Persons with Disability and there are a lot of things in there that have not been incorporated into it*. Apart from the fact that it was perceived to be incomprehensive, its implementation was perceived to be ineffective (PWD₇), and *very useless, just a blanket to signify that there is intention or there are efforts being made towards addressing the needs of the disabled but it's not really clear* (PWD₁₀). Similar sentiments were echoed by other participants, that the existence of the PDA so far had no real impact but was *just a law that government can use to say we are aware of PWD and their rights while practically nothing is being done* (PWD₁₆).

According to the respondents, the lack of enforcement of legislation was partly because of institutional inability to conduct effective monitoring and supervision which is *'a common problem we have in Ghana, our institutions are weak'* (PWD₇). The lack of policy on accessibility in the digital era shows that government was not committed to addressing the needs of PWD. They contended an effective accessibility policy was crucial to guiding developers, and until *Ghana has that, developers will not be guided, be they in the public or private sector...you see Ghana as we speak does not have an accessibility policy for... producing electronic information* (PWD₉). This lack of commitment and political will by the government (PWD₁₆) impedes progress in addressing accessibility issues. The lack of commitment was alluded to state agencies responsible for PWD being under-resourced to handle the many challenges confronting PWD, and that government was slow to act regarding issues of disabilities. For instance, the government had passed an Inclusive Education policy since 2012, but not much effort had been put into enacting it. According to PWD₁₆, the effective implementation of the Inclusive Education policy is the surest way to create long-lasting awareness which can significantly improve the situation of PWD, as he illustrated:

I think that the biggest awareness that may last for me may start from our schools... we are all advocating inclusive education...So, they don't even get close but if somebody is schooling with a visually impaired person from say class 1 up to JHS [Junior Secondary School], the person will definitely be ... acquainted with the person, the person will know the need of the person'.

This theme calls for the government to commit to the address of policy instruments directed at PWD concerns and provide the necessary resources for implementation to allow utilisation of E-services, which in turn will increase interaction and participation with PWD.

4.4 Consequences of E-government inaccessibility

Participants reported several consequences they faced and the possible challenges they envisaged if accessibility issues were not resolved. Accessibility barriers prevent PWD from harnessing the full benefit of E-government. A majority expressed fear that prolonged inaccessibility to government information and services could further exacerbate PWD exclusion. Lack of access to vital government information could lead to low productivity and a possibility of losing ones' job, as PWD₁₆ declared:

As a journalist, if I am unable to go on the net to search information, what will be my use here? If I need information concerning a certain story, I'm doing, and I can't go online, to look for that then they will think that look ... I cannot do something on my own, I always have to rely on somebody... employers wouldn't want somebody who will just come and sit down and ask other employers to assist him or her, they would want somebody whom when given a task, will be able to execute that task to its fullest and if I don't have the information how do I execute those tasks?

Many interviewees contended that government offers crucial services, as such they risk being excluded if they were unable to have access. For example, PWD₃ and PWD₁₂ confirm that government was the highest employer of PWD and that recent government job vacancies were advertised online. They both indicated that these job opportunities would elude them if they were unable to access government portals. This ultimately deprives PWD the opportunity to contribute meaningfully to nation building as PWD₁₀ explained:

If I can't access information, I will be obsolete; I will be outdated, ok? If you don't have much information about the government procedures and processes how can you contribute your quota towards government? You can't know but and Aristotle also said that the price wise men pay for not contributing towards nation building is to be governed by fools so if I don't have information, then I obviously will be governed by a fool.

A fair number of interviewees reported a lack of independence and privacy as one of the consequences of inaccessibility. They explained that though they had adequate education to be self-reliant, lack of access made them depend on others for assistance. Such trends they indicated drastically reduced their privacy and handling of confidential information (PWD₁₃). Also, the increased cost and risk (PWD₄, PWD₉) associated with enquiry of services via telephone and travel were among the consequences of E-government inaccessibility, especially in cases of accessing emergency services such as E-medical services. According to the findings here, the visually impaired were concerned that they could become less productive, unemployable, and face higher costs when accessing services.

4.5 Societal attitudes and perceptions

The study identified lack of societal support and perceptions as a factor that impedes accessibility. Most participants felt that society lacked awareness of their needs. They perceived that most people in society did not have knowledge of disabilities, which made society not to factor their needs. According to PWD₂, it is not that *people don't want to do it ... they are not aware about it*. Awareness of PWD needs and concerns was therefore seen to be important. PWD₁₆ was of the view that education on disability should be prioritised to get society well informed on the potential of PWD:

So yes, awareness is the biggest challenge, I usually don't want to sound like erh it's a blame on people... Sometimes the people simply do not know. And if you do not know, how are you going to do something about? I think that if we are able to raise the awareness that, persons with disabilities are able to do things equally when the things are made accessible, I'm sure that people will begin thinking about it

According to PWD₄, awareness education should target all members of society because even the government still associated the blind with braille and provided braille copies of policies and constitutions which they could easily obtain on an accessible portal. He illustrates:

More awareness, that is the word more awareness of the new situation. ... because it would have been so much easier for everybody, the blind and for government itself, to just make those things more accessible and then you don't need to waste so much money brailleing all that thing we can just go on the net, read ourselves. if we need it to be brailled then we are brailleing 1 or 2 copies for our own situations but you don't need to braille for... you see and what most people do not understand, is that not every blind person reads braille. That is something people don't understand; not every blind person reads braille.

According to this theme, education and continuous awareness campaigns on needs of PWD are important in the Ghanaian society to best create an environment in which PWD are perceived as members of society that can contribute positively to its development.

4.6 Lack of support from industry

Some respondents were of the view that industry (private-owned companies, telecommunication companies, and Internet Service Providers (ISPs)) had a significant role in addressing accessibility needs of PWD by considering PWD in their designs, providing funds and creating more awareness on disabilities. For example, PWD₉ stated there was a need for banks to make their services more accessible; while PWD₁₇ critiqued the ISP services. According to PWD₁₇, most people access the Internet on the computers via modems linked to specific ISPs, *'however, the setup that you have to go to before you can connect to the net is not accessible to the screen reader'* (PWD₁₇). Although industrial support was regarded as important, there was a view that the government needs to regulate and show full commitment to this course. For instance, PWD₁₂ felt the government needs to guide investors in areas that require the most support in a bid to improve accessibility for PWD. He explains:

Aside government... involve private investors maybe donor... partners or international donors. They need a little encouragement from government to come to render the support. Some of these agencies are out here ready to support but they don't really know the targeted areas to you know bring up their supports sometimes too umm I.. yes so, I think yes so, this donor partner would come should come in to also support and maybe private investors even within Ghana can also support, the companies, corporate bodies and all that.

These views were echoed by PWD₁₀ who indicated that industries were specific as to whom or which initiative they supported, and most of the time, their support excludes PWD:

the various companies have what we call the corporate social responsibilities and all that they are able to even to sponsor people to go from Ghana to Brazil to go and watch football so... [belches] excuse me; they should be able to also put their hands-on-deck in supporting us.

According to this theme, the combined efforts of government and the industry are important to arrive at the provision of accessible services for PWD.

4.7 PWD lack of E-readiness

Several factors, which are PWD-driven, were perceived to create barriers towards accessing E-government services. One of them relates to PWD's perception that they (PWD) did not play a leading and an active role in advocating for PWD issues, as PWD₅ explained:

I think we [PWD]ourselves have to let our challenges be heard and we have to find a way of... increasing and making our voice heard in a more appreciable way than as it is now then civil societies, erhh those interested in disability issues should ... they should be up and doing. Some wait for the issues to come before they talk about it. But any civil societies can help and

we those suffering from the problem can also contribute our quota so that together with government, all of us can bring some kind of formidable solution to all of these things.

Some participants were of the view that the majority of PWD were not ready for electronic services because of most of them lacked the needed ICT education and skills to use E-services efficiently. They indicated ICT skills were a necessity to enable them to utilise E-services efficiently because if *'they [PWD] don't have that skill, then whether the website is accessible or not, it doesn't make any difference to them'* (PWD₄). They lamented the adoption of ICT in schools is usually late which tended to affect more disabled persons since they required more training because of various limitations. PWD₁₀ stated:

We should start from the basic level...you should start, but we live in a world where technologies are not allowed to be used in our various basic and secondary cycle institutions so you ... can't really get that unless there is a policy to prevent that from occurring. Else in, Ghana is the only country... I so far know that technologies are not used in schools except the university.

The findings in this theme show that PWD need to be at the forefront, advocating for their needs and creating awareness. There is also a need to institutionalise ICT education in the education sector that targets PWD needs.

5 Discussion

The findings of the study show that the visually impaired are faced with the following challenges when attempting to use E-government services: (1) lack of E-readiness, (2) limited or no access to assistive technologies and the necessary training, (3) institutional and legal frameworks that fail to protect PWD rights, (4) government's lack of commitment to addressing PWD concerns, (5) societal indifference to PWD concerns, (6) unintended consequences of E-government, and (7) the lack of industrial support. While the previous section provided empirical findings, the following subsections will discuss these themes in the context of the three main themes identified in literature so as to identify the pertinent contextual concerns facing PWD and in particular the visually impaired in Ghana.

5.1 Technological perspective

The first objective of the study was to understand from the perspective of the visually impaired, the web accessibility challenges in Ghana. The findings show that the cost associated with access of ICTs to use E-government services was a challenge. However, this was underplayed by the cost associated with access to and use of assistive technologies. Ghana like most developing countries, has low availability of assistive technologies, potentially because of a lack of a regulative instrument such as a policy or implementation due to inadequate funds (Borg and Östergren, 2015; Gould *et al.*, 2015). In contrast, in most developed countries, assistive technology policies have been implemented to regulate their sale and ensure their availability and affordability. Access to ICT and assistive technologies and the cost associated with this access, training and use were main factors that affected the visually impaired. Similar findings are reported in literature that the accessibility and overall adoption of E-government services require high ICT or digital literacy (Basu, 2004; Almarabeh and AbuAli, 2010).

Another reported challenge was that most E-government platforms were not accessible due to the poor structure of the web portals and websites, making it difficult for them to access information and services. These findings corroborate those of Yaokumah *et al.*, (2015), that the majority of E-government portals and sites do not comply with principles of the Web Content Accessibility Guidelines (WCAG). As an alternative, respondents proposed the need for government to provide other means for accessing these services for PWD such as via email. Other participants pointed to the unintended consequences of using assistive technologies illegally due to the government's lack of providing assistive technology policies that regulated the sales to ensure their availability and affordability. Another major unintended consequence was the disempowerment of PWD due to the lack of participation in the digital revolu-

tion, thereby creating new forms of exclusion. *Therefore, from perspective of the visually impaired in Ghana, the web accessibility challenges include: (i) the high costs associated with access of ICTs for accessing E-government services; (ii) high costs associated with acquisition of assistive technologies and training; and (iii) inaccessible E-government platforms due to the poor structure of the portals and websites.*

5.2 Socio-Political perspective

Another objective of the study was to understand from the visually impaired perspective, the role of policies and associative directives perceived to act as enablers or barriers to successful utilisation of E-government services in Ghana. The findings show that two main policies exist in Ghana, the Persons with Disability Act and the Inclusive Education Policy. Despite the existence of these policies, PWD were not adequately protected by these directives and called for the amendment of the existing disability Act, which they perceive as not effective and not being enforced by those in political leadership. This is perceived as a barrier for PWD because past studies have suggested that the enactment of accessibility policy and its strict enforcement is necessary to address E-government accessibility challenges (Goodwin *et al.*, 2011; Bertot, Jaeger and Hansen, 2012). While the Inclusive Education policy exists (Ametepee and Anastasiou, 2015), its implementation is weak, with limited resources, which show that government lacked the political will to enforce and implement policies needed to tackle accessibility issues.

The lack of a comprehensive, inclusive policy to address issues of, among others, digital literacy for PWD, was instrumental in the causation of the next barrier of lack of experts to impart knowledge to PWD using assistive technologies. Also, the continuous lack of support from the industry in the form of funding (for example, for providing assistive technologies), design and creating more awareness on disabilities was seen as a barrier. Awareness was identified as key to breaking the negative perceptions around PWD. The Ghanaian society still holds strong misconceptions about disabilities which made them render little support to PWD. For instance, *'some people even wouldn't get close to you for the fear that they might also be affected with visual impairment'*. This posture does not offer a conducive atmosphere for PWD to voice out their accessibility needs. Others felt reluctant to complain about their accessibility because *'people even think that disability issues are being emphasised too much'* and as such were not enthused about issues regarding PWD. These perceptions could be contributing factors as to why most were of the view that they were not vocal enough in addressing their challenges, within their immediate networks and at political strata. In addition, these perceptions could lead to stigmatisation, deprivation and further exclusion of PWD (Mitra, Posarac and Vick, 2011; Koca-Atabey, 2013). Participants in this study are of the view that as long as there is no political will to address PWD concerns, the industry sector and society at large will also be absent in addressing these challenges. *Therefore, from perspective of the visually impaired in Ghana, (1) the lack of a comprehensive policy that addresses PWD concerns in all spheres of, for example, education, assistive technology subsidy, awareness campaigns, and (2) the lack of industrial and societal support were key barriers to successful utilisation of E-government services in Ghana.*

5.3 Contextual perspective

The final objective sought to identify contextual challenges that PWD face in successful utilisation of E-government services in Ghana. One of the main barriers was PWD readiness for E-government services. All respondents were highly educated and hence could use E-government services. However, they stated that the late adoption of ICTs influenced their ability to use them efficiently. The general assertion was that ICT usage was allowed in Ghanaian schools only at the tertiary levels which made it difficult for them to master its use. Subsequently, they felt they lagged behind because *'Ghana is the only country... I so far know that technologies are not used in schools except the university'*. The implication was that there were *'individuals who can on their own access the information, and those who for instance, educated but could not manipulate the computer and access it on their own'*. These findings echo Chadwick *et al.* (2013) who indicate that the majority of PWD that have literacy and numer-

acy skills, are not accessing the Internet to the same degree as others and not all of them that have access to a computer and Internet access actually use it.

Another reported challenge was the perception that PWD need to become vocal and instrumental in achieving accessible services from government. While this perception did not feature prominently amongst all respondents, there was a concern that PWD were not part of the driving force of seeing the change towards accessible E-government services. This corroborates the view of Adam and Kreps (2009) that as long as disability activists are not included in the standards-making agenda of the web accessibility movement, achieving web accessibility for all will remain a challenge. Additional findings show that high unemployment was mostly featured among PWD and this was seen as a key contributing factor to poverty. Previous studies (Loeb *et al.*, 2008; Mitra, Posarac and Vick, 2013) exploring poverty among PWD reported similar findings in most developing countries. Finally, most participants were of the view that the Ghanaian society lacked awareness of and knowledge on the ranges of disabilities and for some, disability in general, which made incorporating PWD in societal activities and functions such as education difficult. It, therefore, follows that *contextual challenges faced by the visually impaired in Ghana in successful utilisation of E-government service include (i) digital literacy as a result of having ICT literacy being introduced in post-secondary education, (ii), lack of disability activists to lobby for PWD concerns and create awareness at all levels of society; (iii) Unemployment which affected access of ICT services, assistive technology acquisition and training; (iv) lack of societal awareness of disability, resulting in negative perceptions of PWD. These factors, in turn, affect PWD E-readiness for using E-government services.*

6 Conclusion, Implications and Future work

The purpose of this study was to empirically identify the concerns of PWD, in particular, the visually impaired in a developing context of Ghana which can then be used by political leadership as instruments to improve inclusivity and accessibility of E-government services for PWD. Following a qualitative enquiry approach, the findings show that E-government services for PWD in these contexts are affected by the interplay of socio-political, technological and PWD E-readiness factors. Technological factors impeding the usage of E-government service included the high costs associated with access of ICTs; (ii) high costs associated with the acquisition of assistive technologies and the training; (iii) and inaccessible E-government platforms due to the poor structure of the portals and websites. Socio-political factors include: (i) the lack of a comprehensive policy that addresses PWD concerns, and (ii) the lack of industrial and societal support, as key barriers to successful utilisation of E-government services in Ghana. Finally, E-readiness of PWD for successful utilisation of E-government service was affected by (i) digital literacy (ii), lack of disability activists to lobby for PWD concerns and create awareness at all levels of society; (iii) unemployment; and (iv) lack of societal awareness of disability, resulting in negative perceptions of PWD.

Given that few studies have examined accessibility from the perspective of PWD in developing countries, and in Africa in particular, these findings offer unique insight of the amalgamated factors that lead to the exclusion process of PWD from E-government service in these contexts. Findings have implications for E-government developers and state agencies rendering E-government services. To this end, further studies can investigate accessibility perceptions from the standpoint of other stakeholders and the values embedded in perceptions of E-government service to understand 'their superordinate goals, irrespective of what may be written in the project document for political ends' (Rose and Persson, 2012). This is critical for developing countries given that E-government initiatives here and in Africa, in particular, are derived from Western nations through donor agents and influential institutions like the World Bank and the International Monetary Fund (IMF) (Fröhlich and Peters, 2017).

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References

- Abascal, J. et al. (2016) 'Rethinking universal accessibility: a broader approach considering the digital gap', *Universal Access in the Information Society*, Springer Berlin Heidelberg, 15(2), pp. 179–182..
- Abu-doush, I. et al. (2013) 'Towards a more accessible e-government in Jordan : an evaluation study of visually impaired users and Web developers', *Behaviour & Information Technology*, 32(3), pp. 273–293.
- Adam, A. and Kreps, D. (2009) 'Disability and Discourses of Web Accessibility', *Information, Communication & Society*, 12(7), pp. 1041–1058.
- Adepoju, S. A. and Shehu, I. S. (2016) 'Accessibility Evaluation and Performance Analysis of e-Government Websites in Nigeria', *Journal of Advances in Information Technology*, 7(1), pp. 49–53.
- Agboh, D. (2017) An Assessment of Ghana's global E-government UN ranking. Available at: <http://www.aabri.com/AC2017Manuscripts/AC17046.pdf>.
- Ahn, M. J. and Bretschneider, S. (2011) 'Politics of e-government: e-government and the political control of bureaucracy', *Public Administration Review*, 71(3), pp. 414–424.
- Almarabeh, T. and AbuAli, A. (2010) 'A General Framework for E-Government : Definition Maturity Challenges , Opportunities , and Success', *European Journal of Scientific Research*, 39(1), pp. 29–42.
- Ametepee, L. K. and Anastasiou, D. (2015) 'Special and inclusive education in Ghana: Status and progress, challenges and implications', *International Journal of Educational Development*. Elsevier Ltd, 41, pp. 143–152.
- Basu, S. (2004) 'E-government and developing countries: an overview', *International Review of Law, Computers & Technology*, 18(1), pp. 109–132.
- Bengisu, M. (2010) 'Assistive technologies for visually impaired individuals in Turkey.', *Assistive technology : the official journal of RESNA*, 22(3), pp. 163–71.
- Bertot, J. C., Jaeger, P. T. and Hansen, D. (2012) 'The impact of polices on government social media usage : Issues , challenges , and recommendations', *Government Information Quarterly*. Elsevier Inc., 29(1), pp. 30–40.
- Borg, J. and Östergren, P. O. (2015) 'Users' perspectives on the provision of assistive technologies in Bangladesh: awareness, providers, costs and barriers', *Disability and Rehabilitation: Assistive Technology*, 10(4), pp. 301–308.
- Boussarhan, I. and Daoudi, N. (2014) 'The Accessibility of Moroccan Public Websites : Evaluation of Three E-Government Websites', *Electronic Journal of e-Government*, 12(1), pp. 67–81.
- Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology. Qualitative Research in Psychology', *Qualitative Research in Psychology*, 3(2), pp. 77–101.
- Fröhlich, K. and Peters, A. (2017) 'E-Government Social Exclusion and Satisfaction Among Namibian Citizens: A Case of a Namibian Government Ministry', in *In Proceedings of SAICSIT '17*, Thaba Nchu, South Africa, pp. 1–6.
- Gil-Garcia, J. R. (2006) 'Enacting state websites: A mixed method study exploring e-government success in multi-organizational settings', in *Proceedings of the Annual Hawaii International Conference on System Sciences*, pp. 1–10.
- Goldkuhl, G. (2016) 'E-government design research: Towards the policy-ingrained IT artifact', *Government Information Quarterly*, 33(3), pp. 444–452.

- Goodwin, M. et al. (2011) 'Global web accessibility analysis of national government portals and ministry web sites', *Journal of Information Technology & Politics*, 8(1), pp. 41–67.
- Gould, M. et al. (2015) 'Convention on the rights of persons with disabilities, assistive technology and information and communication technology requirements: where do we stand on implementation?', *Disability and Rehabilitation. Assistive technology*, 10(4), pp. 295–300.
- Grantham, J., Grantham, E. and Powers, D. (2012) 'Website accessibility: an Australian view', in *In Proceedings of the 13th Australasian User Interface Conference*, p. 126 (pp. 21-28).
- Henry, S. L., Abou-zahra, S. and Brewer, J. (2014) 'The Role of Accessibility in a Universal Web', *Proceedings of the 11th Web for All Conference*. ACM.
- Hurst, A. and Tobias, J. (2011) Empowering individuals with do-it-yourself assistive technology, *Proceedings of the 13th international ACM SIGACCESS conference on Computers and accessibility ASSETS 11*.
- Kascak, L. R., Rébola, C. B. and Sanford, J. A. (2014) 'Integrating Universal Design (UD) principles and mobile design guidelines to improve design of mobile health applications for older adults', in *In Healthcare Informatics (ICHI), 2014 IEEE International Conference*, pp. 343–348.
- Koca-Atabey, M. (2013) 'A personal validation of the social nature of disability : different environments , different experiences', *Disability & Society*, 28(7), pp. 1027–1031.
- Kuzma, J., Yen, D. and Oestreicher, K. (2009) 'Global e-government Web Accessibility : An Empirical Examination of EU , Asian and African Sites', pp. 1–6.
- Lewthwaite, S. (2014) 'Web accessibility standards and disability: Developing critical perspectives on accessibility', *Disability and Rehabilitation*, 36(16), pp. 1375–1383.
- Loeb, M. et al. (2008) 'Poverty and disability in Eastern and Western Cape Provinces, South Africa', *Disability & Society*, 23(4), pp. 311–321.
- Markard, J., Wirth, S. and Truffer, B. (2016) 'Institutional dynamics and technology legitimacy—A framework and a case study on biogas technology', *Research Policy*, 45(1), pp. 330–344.
- McClure, C. R. and Jaeger, P. T. (2008) 'Government information policy research: Importance, approaches, and realities', *Library & Information Science Research*, 30(4), pp. 257–264.
- Mitra, S., Posarac, A. and Vick, B. (2011) Disability and poverty in developing countries : a snapshot from the world health survey. Available at: http://documents.worldbank.org/curated/en/2011/04/14382786/disability-poverty-developing-countries-snapshot-world-health-survey%5Cnhttp://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2011/06/16/000386194_20110616042613/Rendered/PDF/6256.
- Mitra, S., Posarac, A. and Vick, B. (2013) 'Disability and poverty in developing countries: a multidimensional study', *World Development*, 41, pp. 1–18.
- Mtebe, J. S. and Kondoro, A. W. (2017) 'Accessibility and Usability of Government Websites in Tanzania', *The African Journal of Information Systems*, 9(4), pp. 261–279.
- Osei-Kojo, A. (2017) 'E-government and public service quality in Ghana', *Journal of Public Affairs*, 17(3), pp. 1–8. doi: 10.1002/pa.1620.
- Patra, M. R., Dash, A. R. and Mishra, P. K. (2014) 'Accessibility Analysis of Government Web Portals of Asian Countries', in *Proceedings of the 8th International Conference on Theory and Practice of Electronic Governance*, pp. 383–386.
- Pilling, D. and Boeltzig, H. (2007) 'Moving Toward E-Government – Effective Strategies for Increasing Access and Use of the Internet Among Non- Internet Users in the U . S . and U . K . ', in *Proceedings of the 8th annual international conference on Digital government research: bridging disciplines & domains*, pp. 35–46.
- Purao, S. and Wu, A. (2013) 'Towards values-inspired design: the case of citizen-centric services', in *The 34th International Conference on Information Systems*, pp. 1–8.
- Reichling, M. and Cherfi, S. S. S. (2013) 'Integrating accessibility as a quality property in web developments', in *In Research Challenges in Information Science (RCIS), 2013 IEEE Seventh International Conference*, pp. 1–12.

- Rose, J. and Persson, J. S. (2012) 'E-government value priorities of Danish local authority managers. IT Management in Local Government', in Rose, J., Persson, J. S., Krømmersgaard, P. and Nielsens, P. . (ed.) IT Management in Local Government. Aalborg: Software Innovation, pp. 27–56.
- Shi, Y. (2007) 'The accessibility of Chinese local government Web sites : An exploratory study', *Government Information Quarterly*, 24(2), pp. 377–403.
- Summers, K. et al. (2014) 'Making Voting Accessible: Designing Digital Ballot Marking for People with Low Literacy and Mild Cognitive Disabilities', *USENIX Journal of Election Technology and Systems*, 2(2), pp. 11–33.
- UNESCO (2014) *Disability Data and Statistics, Monitoring and Evaluation: The Way Forward- a Disability-Inclusive Agenda Towards 2015 and Beyond*.
- Venter, S. and Lotriet, H. (2005) 'Accessibility of South African Web sites to visually disabled users', *SA Journal of Information Management*, 72(2), pp. 1–14.
- Verkijika, S. F. and De Wet, L. (2017) 'Determining the Accessibility of e-Government Websites in Sub-Saharan Africa Against WCAG 2.0 Standard', *International Journal of Electronic Government Research (IJEGR)*, 13(1), pp. 52–68.
- Voida, A. et al. (2014) 'Shared values/conflicting logics: working around e-government systems', in *Proceedings of the 32nd annual ACM conference on Human factors in computing systems*, pp. 3583–3592.
- WHO (2011) *Understanding Disability*. Available at: http://www.who.int/disabilities/world_report/2011/chapter1.pdf (Accessed: 15 November 2015).
- Wihlborg, E., Hedström, K. and Larsson, H. (2017) 'E-government for all – Norm-critical perspectives and public values in digitalization', in *Proceedings of the 50th Hawaii International Conference on System Sciences*.
- Yaokumah, W., Brown, S. and Amponsah, R. (2015) 'Accessibility, Quality and Performance of Government Portals and Ministry Web Sites: A View Using Diagnostic Tools', in *2015 Annual Global Online Conference on Information and Computer Technology (GOCICT)*, pp. 46–50. doi: 10.1109/GOCICT.2015.18.
- Youngblood, N. E. and MacKiewicz, J. (2012) 'A usability analysis of municipal government website home pages in Alabama', *Government Information Quarterly*, 29(4), pp. 582–588.