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TRACK: ICTS AND ORGANISATIONS

E-GOVERNMENT ACCESSIBILITY RESEARCH TRENDS IN DEVELOPING COUNTRIES

Completed Research

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Abstract

E-government has increasingly been adopted globally by governments in order to enhance the provision of services to citizens and promote inclusive governance. It is perceived that E-government has the potential to significantly improve government-citizen interaction by providing equal access to government services for all citizens. Lack of equal access to E-government services has emerged as one major setback of E-government in achieving its objectives. Studies in E-government have documented how E-government can act as a tool for exclusion particularly for persons with disabilities (PWDs) an already marginalized group if accessibility barriers are not addressed. Developing countries however, have received little attention in this regard which calls for a greater concern; since 80% of the world's disabled population reside here. Few studies that have been conducted in the developing countries fail to integrate PWDs into the digital society. This calls for the need to examine how researchers conduct studies on E-government accessibility towards PWDs, the research approach they adopt and the understanding they gain of the phenomenon. This paper present findings based on systematic literature review with the purpose of identifying key research foci, methodologies and theoretical perspectives used when studying E-government accessibility for PWDs particularly in developing countries.

Keywords: E-government Accessibility, Developing Countries, Persons with Disabilities

1. Introduction

Globally there has been a paradigm shift in governance where ICTs is playing a pivotal role in reforming public sector. The use of ICTs in government has evolved in recent years with the emergence of the Internet. E-government (electronic or digital government) is the application of ICTs, mobile devices and particularly internet web-based applications by government in order to simplify and optimize government procedures while delivering fast, efficient and accessible services to citizens (G2C), businesses (G2B) and other government agencies (G2G). It is perceived that the arrival of E-government has significantly reduced cost in government processes, eliminated bureaucratic machinery, enhanced provision of services to the citizenry and made government more responsive (Tolbert and Mossberger, 2006; Guma, 2012; Mittal and Kaur, 2013). For example, it was estimated that United States and Europe alone could save up to \$110 billion and 144 billion English pounds respectively by implementing E-government (Sydmonds, 2000). This is also true for developing countries especially Africa, where E-government has significantly helped to improve quality of services to citizens, eliminate some corrupt practices and speed up internal government procedures (Basu, 2004; Kettani et al., 2008; Weerakkody et al., 2009; Hong et al., 2015). A major distinction of E-government in comparison to other electronic services is that it should be accessible to all (Kaaya 2004; Schuppan, 2009; Cumbie and Kar, 2014; Tashtoush et al., 2016). Lack of equal access has resulted in several umbrella terms of exclusions: info-exclusion, digital exclusion and social exclusion (Muddiman, 2000; Joi, 2004; Watling, 2011)

With E-government, accessing E-government portals is of great importance as the internet is the core mode of service delivery (Damodaran and Olphert, 2005; Rubaii-Barrett and Wise, 2008; Malik et al., 2016). In order for E-government to provide equal access to government services and promote inclusive governance it has to be accessible. For E-government to be accessible, E-government web-based applications should be easy to interact with regardless of device (PC, webTV, mobile devices) and be compatible with assistive technologies persons with disabilities (PWDs) may employ (West, 2005; Shi, 2007; Henry et al., 2014). This is particularly crucial for PWDs who tend to be marginalized from the population mainstream to be integrated into the digital society (Jaeger, 2006; Rubaii-Barrett and Wise, 2008; Makoza and Chigona, 2013). Through E-government, PWDs who have faced several discriminations in the past; can potentially have equal access to online opportunities thereby creating independence, feeling of belongingness, self-esteem and also self-actualization for them (Rubaii-Barrett and Wise, 2008; Cumbie and Kar, 2014). Accessing online content comes with additional cost burden for most PWDs (visual, hearing, cognitive and mobility) who require different forms of assistive technologies and devices to enhance their functional capabilities (Boussarhane and Daoudi, 2014; Henry et al., 2014). Assistive technologies and devices such as tactile interfaces for visually impaired screen readers for computers (e.g. JAWS, NVDA), braille display, speech synthesizer, tactile screens, magnification software, embosser, screen readers for mobile phones (e.g. TALKs, Mobile Speak), and character recognition scanner (Jacko & Vitense, 2001; Boussarhane & Daoudi, 2014) refer to any software or hardware that helps to increase, maintain and improve functional capabilities for PWDs (Pal et al., 2010). When E-government portals are designed without PWDs in mind, it becomes difficult for such persons to use them since these websites may not be compatible with the assistive technologies they use (West, 2005; Henry et al., 2014). Moreover, if websites are not designed to be accessible; with even advanced assistive technologies PWDs will still encounter challenges (Stewart, Narendra and Schmetzke 2005).

Several researchers on E-government accessibility have advocated for government to adopt special considerations to address the need of marginalized group particularly PWDs who stand to gain more if they can access online government services at their convenience (DRC, 2004; Pilling and Boeltzig, 2007; Tashtoush, 2016). Others have also argued the need to examine the interplay between PWDs, society and

technology in order to arrive at an appropriate solution for providing accessible E-government services (Chaudhry and Shipp, 2005; Jaeger, 2006; Agangiba and Kabanda, 2016). The most cited accessibility challenges faced by PWDs include poor designs on the part of developers (Heeks, 2005; Stewart et al., 2005); use of inappropriate technology on the part of designers (Takagi et al., 2004; Heeks, 2005; Otniel, 2015); PWDs inability to acquire needed assistive technologies (Foley et al., 2005; Dobranksy and Hargittai, 2006; Cumbie and Kar, 2014); and their lack of needed skills to operate assistive technologies (DRC, 2004). Till date however, developing countries have made little progress in the provision of inclusive E-government services particularly towards PWDs despite the fact that 80% of the world's population with disabilities reside here (UNESCO, 2014). Accessibility becomes more crucial as governments advance in the provision of online services. Failure to resolve accessibility issues will create another disability "digital disablement" in addition to their physical disablement (Chaudhry and Shipp, 2005). The purpose of this study is to examine how knowledge about of E-government accessibility is arrived at – specifically, how researchers go about investigating the phenomenon. This paper therefore pays particular attention to E-government accessibility in developing countries, and seeks to (1) identify and categorize the different research foci; (2) to analyze the methodologies used to conduct such researches; (3) to determine fundamental theoretical perspectives used to study the topic; and (4) to suggest opportunities for future research. Addressing the outlined objectives will enable researcher identify the research gaps in terms of foci in E-government accessibility and the most appropriate methodology and theoretical lens to adopt in bid to holistically resolve E-government accessibility issues for PWDs particularly in developing countries.

The rest of the paper is structured as follows: related studies on E-government in developing countries is presented in section 2. Section 3 covers epistemological and ontological approaches used in IS researches. Section 4 outlines the research methodology used in this study. The next (section 5) discusses the findings of literature synthesis. Finally, section 6 presents conclusions, recommendations and future research.

2. Related work on E-government in Developing Countries

Over the past years, several research studies have been conducted on E-government in developing countries. E-government is seen not as an option but a necessary tool for improved governance especially in developing countries where corruption perceptions in government are high (Gupta and Jana, 2003; Bal, Biricik and Sari, 2015). It is perceived that E-government in developing countries has the potential of improving quality of government services to citizens as well as government-citizen interactions (Basu, 2004; Ndou, 2004; Bal et al., 2015). Mistry and Jalal, (2012) found that E-government has greater impact in developing countries than developed countries as it has transformed most governments by reducing corruption and enhancing provision of efficient services. As a results developing countries have made and continue to make tremendous investments into E-government to harness these benefits (Bhatnagar and Singh, 2010). Most cited benefits of E-governments include; provision of fast and efficient service to citizens at a reduced cost (Agangiba and Agangiba, 2013; Mittal and Kaur, 2013), promote transparent and effective governance (Tolbert and Mossberger, 2006; Bal et al., 2015), improve resource management and accountability (Fang, 2002; Stanforth, 2006); empower citizens and make governance inclusive (Rubaii-Barrett and Wise, 2008; Gyaase and Gyamfi, 2012). For developing countries particularly Africa to gain maximum benefit from E-government, its implementation needs to be context oriented (Heeks, 2005; Schuppan, 2009; Mutula 2013), citizen-centered (Bertot, Jaeger and McClure, 2008) and socially inclusive; (Makoza and Chigona, 2013). There is also the need for existence of strong institutions and legal frameworks (Heeks, 2002; Basu, 2004; Rorissa and Demissie, 2010). This is because E-government in developing countries still faces numerous challenges such as limited ICT infrastructure, lack of human capacity, low literacy rate and accessibility among others (Rorissa and Demissie, 2010; Mittal and Kaur,

2013). According to Heeks (2005, p.63), most E-government projects fail due to gap in “design and reality”. Low adoption by citizens is another setback because most E-government initiatives are transferred from the developed world and do not necessarily meet the needs of citizens (Heeks, 2003a; Schuppan, 2009). Existing initiatives also face issues of sustainability due to inadequate funds and high bureaucracy in public sectors (Kumar and Best, 2006; Stanforth, 2006).

Accessibility challenge is another hindrance which makes E-government services difficult to reach all citizen (Basu, 2004; Cumbie and Kar, 2014). For example, accessibility issues have resulted in digital divide and disparity in E-government service provision between urban and rural cities (Hoque and Sorwar, 2015). For E-government web applications to be accessible, it should provide equal access to all users, be easy to use and compatible with assistive technologies PWDs may employ (Abanumy, et al., 2005; Bertot and Jaeger, 2006). A focus on accessibility for PWDs is of paramount importance as accentuated by Tim Berners-Lee W3C Director and inventor of the World Wide Web in his quote; “The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect” (Berners-Lee, 1997). Accessible E-government services have the potential of creating independence and also self-actualization for PWDs and promote their social inclusion (Rubaii-Barrett and Wise, 2008; Bonacin et al., 2010; Makoza and Chigona, 2013). Till date however, most E-government accessibility studies have focused mostly on developed countries; with developing countries particularly Africa receiving the least attention (Rodríguez Bolívar et al., 2014; Rorissa and Demissie, 2010). Few studies conducted in developing countries have demonstrated how E-government fails to integrate PWDs into the digital society (Abanumy et al, 2005; Shi, 2007; Baguma et al, 2007; Freire et al, 2008; Kuzma et al, 2009; Abu-Doush et al, 2013; Boussarhane and Daoudi, 2014). Since E-government services are mostly monopoly (Leist and Smith, 2014), the cost of excluding PWDs becomes higher as governments advance in providing more sophisticated services online (Jaeger, 2006; Rubaii-Barrett and Wise, 2008; Cumbie and Kar, 2014).

As a result of these challenges, most E-government projects remain unsuccessful (Heeks, 2003a), yet governments continue to invest in E-government; this calls for the need to examine how researchers go about investigating the E-government accessibility phenomenon in developing countries. This is because the manner in which researchers acquire knowledge influences understanding of their world (Beckwith et al., 2008; Tan et al., 2009; Dixit and Stump, 2011). The approach adopted by a researcher to acquire knowledge about a phenomenon; embeds in itself set of assumptions about the nature of phenomenon to be investigated, the methods he/she uses to understand the phenomenon and the kind of knowledge formed (Morgan and Smircich, 1980). If E-government accessibility remains a challenge in developing countries, it is in the best interest of researchers to interrogate how they acquire this knowledge.

3. Epistemological and Ontological Approaches in IS

In social science and IS studies, researchers tend to implicitly or explicitly use a specific intellectual stance to gain understanding of a phenomenon. Chua, (1986) articulates three beliefs that describe the way of perceiving and researching the world; (1) belief about the object or phenomenon of study, (2) belief about conception of knowledge (3) belief about relationship and the real world. Every researcher adopts a paradigm to conduct research, which embeds in itself an ontological and epistemological perspective (Orlikowski and Baroudi, 1989). By ontological stance researchers make claims of what exist or they perceive to exist (Creswell, 2003). What exist or reality could be objective or subjective depending on interpretation; which can be external object or in the mind (Cua and Garret, 2008). Epistemology refers to how a researcher acquires, creates or communicates knowledge about a particular problem or phenomenon and how to obtain an understanding that is valid (Hirschheim, 1985). Ontological and epistemological assumptions of a researcher relate to the methodology and methods he or she chooses and reflect on his or her research findings (Scotland, 2012). According to Cua and Garret, (2008) epistemology and ontology

overlap as a consequence of methodology. Three main ontological approaches are defined in IS: quantitative, qualitative and mixed method. Each ontological paradigm has an underlying research epistemology. In IS researches three common epistemological paradigms are adhered to: positivistic (or conventional), constructivist (or interpretive) and critical paradigm (Chua, 1986; Orlikowski and Baroudi, 1991; Kanellis and Papadopoulos, 2009; Myers and Klein, 2011). These paradigms tend to have considerable impact on how validity, reliability and rigor of the research is understood (Becker and Niehaves, 2007).

Quantitative researchers argue that existing truth or knowledge is objective and can be measured (Creswell, 2003). They contend a researcher is independent of the objects subject to his observation. Positivism is a common epistemological paradigm associated with quantitative researchers. Positivists argue that knowledge can be expressed in terms of facts that are positively validated by measurement (Hirschheim et al., 1995). This paradigm is premised on stable or fixed relationships between objects, which is investigated using structured instrumentation in an attempt to test theory or hypothesis; drawing inferences from a large population in order to produce a generalizable result (Popper, 1972; Orlikowski and Baroudi, 1991). Positivists adopt deterministic explanations to phenomenon, postulate data is value free and rejects role of humans as active makers of their social world (Orlikowski and Baroudi, 1991; Guba and Lincoln, 1994).

Qualitative on the other hand argue knowledge is socially constructed within a context so that data cannot be 'value-free data' (Walsham, 1995 p.376). Qualitative research seeks to understand the phenomenon of interest from the participants' perspective through in-depth interaction in their given social and cultural context (Morgan and Smircich, 1980; Kaplan and Maxwell, 1994). Interpretivism and critical are two such paradigms that follow qualitative methodology (Myers, 1997). Interpretivism posits objects exist to the extent, which you perceive them; in effect, our perceptions shape the reality (Orlikowski and Baroudi, 1991; Kelliher, 2005). The objective of an interpretivist is to produce understanding of a phenomenon within a particular culture and context; examining phenomenon in the natural setting through the meanings participants assign to them (Walsham, 1995; Kaplan and Maxwell, 2005). Reality is not independent of the researcher, but rather as "an emergent social process-as an extension of human consciousness and subjective experience" (Burrell and Morgan 1979, p. 253). Critical on the other hand does not seek only to develop explanations or understanding of phenomenon but extend to critique the phenomenon under investigation and help transform social conditions (Ngwenyama and Lee, 1997; Myers and Klein, 2011). It seeks to emancipate and opposes every form of power and discrimination; however, it is constrained by systems of political, economic and cultural authorities (Orlikowski and Baroudi, 1991). Critical opposes the separation of value and inquiry; critical research focuses on emancipation of humans (Ngwenyama, 1991).

Research sometimes may require both objective and subjective view of reality. At this point, subjectivity and objectivity becomes inseparable; for example, to study and understand a phenomenon like poverty, objectively one can measure through income levels but the stigma and shame attached to poverty can only be understood through the perceptions of individuals in that state which is socially constructed. It becomes clear therefore that sometimes a research cannot be purely quantitative or qualitative but a mixed approach. Mixed approach produces triangulation, through the use of multiple data sources (Markus, 1994). All diversities in terms of problems addressed, theoretical foundations, means of data collection and interpretation are useful in increasing rigor and output in IS researches (Benbasat and Weber, 1996). Table 1 below summaries the three epistemological paradigms discussed. The next section discusses the methodology used in this study, in bid to identify research foci, methodological approaches and theoretical perspectives used by researchers in investigating E-government accessibility phenomenon particularly in developing countries.

Table 1: Summary of epistemological paradigms

Positivism	Interpretivism	Critical
Underlying ontological assumption is mainly quantitative	Underlying ontological assumption is mainly qualitative	Underlying ontological assumption is mainly qualitative
Reality is objective and projected as a definite structure	Reality is subjective and socially constructed i.e a projection of human imagination	Reality historically constructed with internal influence such as politics, economics e.t.c
Aims to study a system, processes and change	Aim to understand, explore and discover reality	Aims at finding alternative social condition to enhance human life
It involves empirical analysis of relationships in the external world	It concerned with understanding the processes through which human form specific relationships	It concerned with critiquing social conditions and how to improve them
Measuring outcomes on causal relationships	Understanding causal relationships	Reasoning and critiquing
Data is value-free	Data is value-laden with human judgement	Data has explicit value on improvement of human conditions
Aims to generalize research findings	Aims to understand in-depth research problem	Aims to emancipate and improve human conditions

4. Methodology

4.1 Approach

The purpose of this study was to examine how knowledge about of E-government accessibility is arrived at – specifically, how researchers go about investigating the phenomenon. An analysis of literature following systematic literature review guidelines were conducted (Okoli & Schabram, 2010). A systematic review follows a systematic methodology and explains explicit procedures used in conducting review which makes it easier for other researchers to reproduce following same approach on the same topic (Fink, 2013). According to Okoli and Schabram, (2010) systematic literature review procedures include identification, evaluation and synthesis of existing scholarly articles. These guidelines were adopted because they are specifically designed for IS research to ensure rigor and reproducibility and in addition it places emphasis on how researchers go about conducting research as part of review procedure; which is a core aspect of this study.

4.2 Data collection

Data was collected from top ranked IS journals on developing countries according to (Heeks, 2010): Information Technology for Development, Information Technologies and International Development, Electronic Journal of IS in Developing Countries, African Journal of Information and Communication and African Journal of Information Systems. The study also included two popular disability journals: Disability Studies Quarterly and Journal of Disability Policy Studies. The Government Information Quarterly and the Electronic Journal of e-Government; which are top journals that address governance issues were also searched. Studies and Searches included only publications in English from the year 2000 – 2015. This period was chosen because issues of accessibility for PWDs with regards to online services gained much attention after the formulation of Web Content Accessibility Guidelines in 1999 (W3C, 1999). In addition, Google Scholar was used to assist with a broader search of literature which possibly was omitted using the databases. Search key terms used were specific to the main goal of the study: E-

government accessibility for PWDs in developing countries. As such, the key terms used include E-government accessibility, E-government and disabilities, E-government in developing countries. Quotes were used to restrict search to likely relevant articles; example E-government accessibility was searched “E-government accessibility”. The initial search resulted in 356 papers from the eight journals. A complement search from Google Scholar resulted in additional 22 articles bringing the total articles to 378. Each of these journal articles became the data corpus for the study.

4.3 Analysis

The analysis commenced by reading each of the articles to understand the article’s goal and relevance to this study. Whilst doing this analysis, it was observed that some articles were repeating and therefore were discarded. For example, the article “Engaging Citizens with Disabilities in eDemocracy” repeated three times during search for E-government accessibility, E-government and disabilities, E-government in developing countries in the journal of Disability Studies Quarterly. This exercise reduced the total articles in the data corpus to 316. At the next stage of analysis, 25 articles were excluded because they were administratively focused (i.e editorials). Editorials are special issues by editors of journals where they briefly discuss articles that are published for a particular theme issue. For example, African Journal of information and Communications alone had 12 editorials each focusing on a particular theme of issue. After this stage, 291 remained for further analysis.

Table 1: Summary of literature synthesis

Data source	Initial Search	After Removing Repeating Articles	After Removing Journal Editorials	Articles on E-government Accessibility	Final search (Focus on Disability)
Journal on Disability Policy Studies	14	9	9	4	4
Disability Studies Quarterly	18	15	13	4	4
Information Technologies and International Development	58	45	37	6	0
Journal of IT for Development	46	37	37	8	2
Electronic Journal of e-Government	40	40	40	34	5
Electronic Journal of IS in Developing Countries	40	29	28	3	1
African Journal on Information and Communication	93	72	60	0	0
African Journal of IS	41	41	39	3	0
Government Information Quarterly	6	6	6	6	4
Google Scholar	22	22	22	22	8
Total	378	316	291	90	28

Each of the remaining articles in the data corpus were synthesized in the following manner to assess relevance to the study. The article’s title, abstract, keywords, introduction and conclusion were read; and articles whose focus was only on E-government accessibility were included for the next phase of analysis. This exercise once again substantially narrowed down the number of articles to 90 (see Column 5). The next phase of analysis focused on determining whether the articles were specific to PWDs and online government services. That is, only articles that focused on PWDs were included - those that were on E-government accessibility but whose unit of analysis was not PWDs were excluded. For example, Hoque and Sorwar (2015) examined the disparity between urban and rural towns in terms of accessing E-government services in India. Thus although the study addresses E-government and accessibility, the focus was not on the disabled, but rather on the digital divide. On this basis, a total of 62 papers were removed, making the data corpus to have 28 articles. The remaining articles were categorized into research foci, methodologies and theoretical perspectives as shown in Table 2 and 3.

Table 2: Summary of research foci and theoretical perspectives

Research Focus	Theoretical Perspective	Articles
Evaluate accessibility of E-government websites for PWDs	Technological determinism	19
Examine perception of E-government implementers on accessibility guidelines		3
Investigate the impact of policies on accessibility	Policy analysis	3
Investigate barriers to information access by PWDs	Social exclusion	2
Investigate how assistive technologies impacts accessibility		1

Table 3: Summary of research methodologies

Methodology		Articles
Ontology	Quantitative: Website analysis, Questionnaires/ Survey	22
	Qualitative: Observation, interviews	3
	Mixed Approach: Interviews, Survey, Website analysis	3
Epistemology	Positivist	22
	Interpretive	4
	Critical	2

5. Findings and Discussion

5.1 E-government Accessibility Research Foci, Methodologies and Theoretical Perspectives

This study revealed that most of E-government accessibility researches focused on a common theme-evaluation of how accessible E-government websites are for PWDs. The assessment of data corpus indicates 19 articles examined the design of E-government websites to ascertain the ease with which PWDs can navigate through and access information. For example, Bousarhane and Daoudi, (2014) evaluated the accessibility of three Moroccan E-government websites using automatic tool AccessiWeb. The study concluded that the websites do not meet the minimum criteria recommended by Web Content Accessibility Guidelines (WCAG) for PWDs due to poor design and inappropriate use of technology. The other remaining 18 articles reported similar findings.

The next theme that gained attention focused on the impact of policies on accessibility for PWDs. These researchers argued for the need to establish and monitor policies that ensure equal access to government information particularly for PWDs. Kuzma et al, (2009) for example, carried out a study to examine if the enforcement of disability laws has impact on accessibility of E-government for PWDs in twelve countries. Their study revealed that countries that have strong disability legislation are likely to have more accessible E-government than those that do not. The study found that, the countries (Liberia, South Africa, Kenya and Namibia) in Africa provided the least accessibility because of weak legal mandate for PWDs. Three other studies examined the barriers PWDs face in accessing online government information. These studies argued that accessible E-government would help integrate PWDs into the informational society and promote their social inclusion. For instance, in a comparative study between India and the US, Chaudhry and Shipp, (2005) showed that developing countries need more commitment to address social-cultural issues in quest to improve accessibility. They argued that technology alone in itself is insufficient to address accessibility and called for holistic assessment to better understand the interplay between society, technology and PWDs in order to enhance accessibility. Another research focus identified in the review process was the role stakeholders' perceptions play in addressing E-government accessibility. These studies contended that stakeholders' perception on accessibility had influence on the way they develop E-government. A typical example, Freire et al, (2008) conducted a survey of 613 participants on accessibility in Brazil. The participants were mainly drawn from industry, academia and government. Analysis of survey results indicated that accessibility awareness was very low even though accessibility law in Brazil was enacted several years. This lack of awareness on accessibility by stakeholders according to Freire et al, (2008) accounted partly for accessibility challenges that PWDs faced. The study also revealed that participants in academia ranked top for stakeholders with the least awareness on accessibility. Finally, one study explored how assistive technologies can enhance access of online services for PWDs. Abanumy et al, (2005) in their study of E-government accessibility in Saudi Arabia and Oman demonstrated that assistive technologies play an essential role in enhancing accessibility for PWDs. They advocated for web developers to test their designs with various assistive technologies PWDs employ in order to detect possible design barriers.

Further findings in the context of literature review showed that most researchers used quantitative methods such as survey, website analysis and questionnaires and mostly aligned themselves with a positivist stance. These researchers aimed to measure the level of E-government accessibility for PWDs, as such ontologically the researcher plays a passive role and does not intervene in the process (Kanellis and Papadopoulos, 2009). When E-government accessibility studies are conducted in such a manner, focus is always placed on the supply side at the neglect of the demand side where PWDs can be involved (Reddick, 2004; Makoza and Chigona, 2013). Researchers used website analysis to identify design

barriers that PWDs may encounter in accessing online government services (Shi, 2007; Baowaly and Bhuiyan, 2012; Bousarhane and Daoudi, 2014). Surveys questionnaires were used mainly by researchers to elicit accessibility perception of E-government stakeholders (Freire et al, 2008; Abu-Doush et al, 2013). Three studies included in the review process employed qualitative methods to understand and interpret accessibility phenomenon. Studies that used qualitative methods followed an interpretive or critical paradigm. Using these paradigms, researchers investigated accessibility challenges from the perspective of PWDs as well as E-government implementers (Stienstra and Troschuk, 2005). By adopting interpretive or critical approach, they aimed to gain in-depth understanding of E-government accessibility phenomenon and to emancipate for improved accessibility conditions for PWDs. In this way researchers acknowledged that the perception shapes the reality; and the perception one holds for an object in a given context is the same with the majority participants within that context (Orlikowski and Baroudi, 1991; Kanellis and Papadopoulos 2009). Three studies conceded both ontological stances by employing a mixed approach to understand accessibility phenomenon. For example, Abu-Doush et al, (2013) employed observation and interviews on 20 visually impaired to understand the challenges they face when accessing E-government services in Jordan. In addition, they conducted a survey with web developers to know their perception on accessibility. The interview results showed that PWDs had serious challenges accessing E-government website while the survey revealed weak understanding on accessibility on the part on web developers.

From theoretical perspective, it was observed that E-government accessibility studies towards PWDs in developing countries have been conducted mostly using technological determinism which is grounded on conformance to web accessibility guidelines. Researchers by the use of this lens presume that when E-government portals are designed to be accessible PWDs can effectively use them. Most studies that adopted this lens used website analysis as a method (Shi, 2007; Kuzma et al, 2009; Bousarhane and Daoudi, 2014; Serra et al., 2015; Tashtoush et al., 2016). Three researchers through the lens of policy analysis critically reviewed disability policies to understand how the government legally makes provision for equal access for PWDs. For example, Jaeger, (2008) carried out a user-centered evaluation to discover areas of accessibility flaw according to Section 508 of the Rehabilitation Act. By critically analysing Section 508 which is used by many as a guideline for developing and evaluating accessibility of website against E-government websites, one can ascertain conformance with law which is require to improve E-government accessibility. Researchers who took to policy analysis postulate that establishment of law alone is insufficient to address accessibility; there is the need to monitor its implementation. Accessible web in the era of E-government remains crucial for PWDs to be integrated into the digital society (Goodwin et al, 2011), as a result three researchers adopted the social exclusion lens to argue equal access to government information for PWDs (Chaudhry and Shipp, 2005; Cumbie and Kar, 2014). According to Chaudhry and Shipp, (2005) several levels of influence act as barriers for PWDs; example access to assistive technologies, poor web designs and weak legal framework. These barriers they argued individually or collectively affect accessibility for PWDs and exclude from having equal access to information. After research foci, methodologies and theoretical perspectives are identified we proceed to discuss these findings in the next section.

5.2 Discussions on Findings

The literature analysis revealed that most E-government accessibility researches focus on testing the E-government websites with automatic tools to measure their level of accessibility for PWDs. This means that none of the E-government stakeholders are involved. Also the challenges that PWDs face is not taken into consideration since they are not involved. The use of quantitative methods was so high among researchers which calls for concerns. Accessibility is subjective (Bradbard and Peters, 2010; Yesilada et

al., 2015) as such the use of qualitative and mixed approaches will help gain in-depth and better understanding of the perceptions of E-government implementers and the challenges PWDs face in accessing E-government services.

The use of technological determinism as a theoretical lens in E-government accessibility by most researchers is problematic particularly for developing countries where the needed technology is not readily available (Musa, 2006). Although testing with automatic tools is fast and convenient; it is not efficient for detecting all accessibility barriers that PWDs face since more than 40% of the accessibility guidelines require human intervention (Jaeger, 2006; Shi, 2007, Bradbard and Peters, 2010). As a result, researchers (Bradbard and Peters, 2010; Ellcessor, 2010; DRC, 2004; Jaeger and Xie, 2008, Kuzma, 2010; Henry et al., 2014; Paterno and Schiavone, 2015) have recommended for the involvement of PWDs in accessibility evaluations. The high rate of technological determinism as a lens in studying E-government accessibility confirms the techno-centric nature of E-government researchers. For E-government to make the needed impact it has to be more citizen-centric; focusing on the needs of the citizens and not just technology (West, 2005; Akman et al., 2005; Bertot et al, 2008). To holistically address E-government accessibility for PWDs E-government has to be viewed as a complex system that embeds in itself social, political, technological and administrative aspects (Grönlund, 2005; Alshawi and Alalwany 2009). Acknowledging the political influence on disabilities and E-government policies, some researchers tend to address E-government accessibility for PWDs through policy analysis perspective. Despite the fact that some existing studies showed that government policies and laws has some impact on accessibility (Abanmy et al., 2005; Kuzma et al., 2009); legislations alone do not guarantee accessible E-government (Jaeger, 2004; Burns and Gordon, 2009; Kuzma, 2010). For example, even if web policies are well implemented and monitored to ensure accessible E-government portals; PWDs will still encounter challenges without the acquisition of needed assistive technologies and devices they require and the necessary training thereof. To this end some researchers have argued the need for governments to support PWDs in the acquisition of assistive technologies (DRC, 2004; Paternò and Schiavone, 2015) in order to promote their social inclusion. E-government failure to integrate PWDs will exclude them from participating in the digital society. When accessibility acts as barrier for PWDs to fully benefit from E-government service they become socially excluded in the end (Foley et al., 2005; Makoza and Chigona, 2013; Bousarhane and Daoudi, 2014). As a results, some researchers addressed E-government accessibility from the standpoint of social exclusion (Chaudhry and Shipp; Cumbie and Kar, 2014). They argued, if E-government is developed in a manner that is not accessible to PWDs then it can only be considered an active form of exclusion on the part of government. The use of social exclusion lens also calls for extra caution due to its multidimensional nature.

This study has shown that E-government is complex in nature and as such accessibility for PWDs cannot be simplified to technological issues only. Based on the identified trends in E-government accessibility, authors recommend for future researchers to adopt ontological and epistemological approaches that help better to understand E-government accessibility phenomenon rather than measure simply the level of accessibility. We advocate for the use of appropriate methods to knowledge acquisition and an encompassing theoretical lens to unravel E-government accessibility issues from multiple stakeholder perspective: example government, developers, PWDs etc. as revealed in this study.

6. Conclusion

The aim of this study was to examine how researchers conduct studies on E-government accessibility for PWDs, the research approach they adopt and the understanding they gain of the phenomenon particularly in developing countries. Following systematic literature review key research foci, methodologies and theoretical perspectives used when studying E-government accessibility for PWDs particularly in developing countries are identified. The study revealed that (1) most researchers focused on evaluation of E-government websites for PWDs; (2) the use of quantitative methods following positivistic stance by

researchers in the conduct of E-government accessibility studies was dominant; and (3) the use of technological determinism as a theoretical lens was high among researchers in the conduct of E-government accessibility studies. Based on this identified trend in E-government accessibility research, we advocate for researchers to explore the usefulness of qualitative and mixed approaches in E-government accessibility studies to help better understand accessibility issues and how to improve it. Investigating E-government accessibility issues from participants' perspective where PWDs can be involved will enable researchers arrive at a more holistic solution that befit the context of developing countries. We recommend for researchers to adopt theoretical lens that can help better understand the intertwined relationship between the society, PWDs and technology in addressing E-government accessibility.

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