



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

**Accessibility of E-government Services for Persons with Disabilities in
Developing Countries- The Case of Ghana**

By

MILLICENT AKOTAM AGANGIBA (AGNMIL001)

A Dissertation Submitted in Fulfilment of the Requirements for the Degree of
Doctor of Philosophy in Information Systems

DEPARTMENT OF INFORMATION SYSTEMS

UNIVERSITY OF CAPE TOWN

Date: 21-7-2020

Supervised by:

Associate Professor Salah Kabanda

Professor Irwin Brown

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

DECLARATION

I, Millicent Akotam Agangiba, hereby declare that the work on which this dissertation is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

Signature:

Signed by candidate

Date: 21-7-2020

Millicent Akotam Agangiba

PREFACE

Parts of this thesis have already appeared in publications. These include:

Conference:

- Agangiba, M., Kabanda, S., & Brown, I. (2018, June 26-28). Experiences of Persons with Disabilities in Accessing E-Government Services in Ghana. In *Proceedings of the 26th European Conference on Information Systems (ECIS)*, Portsmouth, United Kingdom, Research Papers. 69.
- Agangiba, M., & Kabanda, S. (2018, March 21-23). Web developers' perspective on the accessibility of E-government Services for Persons with Disabilities in Ghana. In *Proceedings of the 2nd International Women in Science Without Borders*, Johannesburg, South Africa.
- Agangiba, M. A., Nketiah, E. B., & Agangiba, W. A. (2017, September 20-22). Web accessibility for the visually impaired: A case of higher education institutions' websites in Ghana. In *Proceedings of the 16th International Conference on Web-Based Learning*. Springer, Cham, Cape Town, South Africa, pp. 147-153.
- Davids, N., Kabanda, S., & Agangiba, M. (2017, June 12-13). Accessibility of African E-government services for persons with disabilities. In *Proceedings of 17th European Conference on Digital Government (ECDG)*, Lisbon, Portugal, pp. 54.
- Agangiba, M., & Kabanda, S. (2016, September 4-6). E-Government Accessibility Research Trends in Developing Countries. In *Proceedings of the 10th Mediterranean Conference on Information Systems, (MCIS)*, Paphos, Cyprus, pp. 8.
- Agangiba, M., & Kabanda, S. (2016, May 18-20). Towards a Conceptual Framework for E-Government Accessibility for Persons with Disabilities in

Developing Countries. In *Proceedings of the 9th International Conference on Information Resources Management*, Cape Town, South Africa, (*CONF-IRM*), pp. 7.

Journal:

- Agangiba, M., & Kabanda, S. (2017). Research foci, methodologies, and theories used in addressing e-government accessibility for persons with disabilities in developing countries. *Interdisciplinary Journal of Information, Knowledge, and Management*, 12, 245-268.

In a poster session at:

- European Conference on Digital Government, 2017 (Best Poster Award)
- L'Oréal-UNESCO Sub-Saharan Africa Forum, 2016
- Schlumberger Foundation, Faculty of the Future Conference, 2016

This acceptance by the academic community has provided guidance and motivation to the production of this thesis. Portions of the published works have been synthesised into this thesis.

ABSTRACT

Several benefits have been attributed to E-government, including the potential to promote independence and belongingness for persons with disabilities (PWD) by enhancing participatory and inclusive governance. Hitherto, government services that required several and long journeys followed by long queues waiting for service at government offices can now be accessed online irrespective of the geographical location via E-government services. As a result, developing countries like Ghana continue to commit resources to the implementation of E-government to harness the associated benefits. Accessibility has been acknowledged, by both practitioners and those in academia, as a key consideration to prevent disparities among citizens which may put PWD at risk of exclusion. However, providing solutions to accessibility challenges for PWD has consistently proven difficult in most E-government implementation projects in developing countries. Therefore, this study investigates the accessibility of E-government services for PWD in Ghana with the aim of identifying how key E-government stakeholders perceive accessibility and the contextual drivers that lead to the exclusion of PWD in the development of E-government services. Also, this study seeks to understand if and how these stakeholders and contextual drivers reinforce the exclusionary process. The study employed an interpretive, inductive approach, with sensitising concepts from E-government accessibility literature, and the social exclusion framework. Multiple data collection methods were used, namely; observations as a preliminary step to obtaining a better understanding of how the visually impaired use ICTs; interviews as the primary data collection technique from 37 participants; and document analysis. The study involved 3 groups of participants: the visually impaired, E-government web developers and government officers. Data analysis was carried out in two phases- firstly thematic analysis was used to report on perceptions of government officers and developers on accessibility and the experiences of PWD. Contextual drivers impeding accessibility and affecting accessibility experience of PWD were also derived from the thematic analysis. Secondly, E-government and disability policy documents mentioned in interview discussions were analysed using content analysis. The findings of the content analysis were used to validate, clarify and to conduct post-interview checking.

The findings show that government officers and developers play a key role in the development of E-government services. Whilst Government officers and developers were identified as powerful agents whose practices determined the accessibility of services that were developed; PWD were side-lined and not involved in the E-government development project. Also, perceptions of government officers and developers on accessibility vary from those of PWD. While government officers and developers believe that with little assistance from third parties PWD can access E-government services, PWD perceive accessibility should offer them the independence to retrieve government information and engage in electronic transactions of their choice. Evidently, accessibility perceptions of E-government implementers differ from that of PWD.

Further, the findings show that exclusion of PWD from E-government services is as a result of the intertwining of several contextual drivers, including political, socio-cultural, technological and personal. Political, socio-cultural and technological drivers influence the perceptions and practices of government officers and developers and determine their responses to the accessibility needs of PWD. Personal drivers limit the capabilities of PWD to access E-government services and impact on their accessibility experiences. Contextual drivers independently facilitate the exclusion of PWD; however, their interactions with government officers and developers shape their perceptions and constitute crucial exclusionary forces. These exclusionary forces when fed into the development of E-government services reinforce the exclusion of PWD. Given that personal drivers limit the capabilities of PWD, their inabilities to act as change agents reinforce their exclusion. Moreover, power differentials among stakeholders play a vital role in the exclusionary process. The study contributes to better understanding of influences on the E-government development process, how services become inaccessible and the accessibility challenges PWD face. Practically, the study has several implications on the development and implementation of E-government services in developing countries like Ghana. For example, the findings are useful to inform the political leadership on policies and structures to put in place to enhance the accessibility of E-government services for PWD.

DEDICATION

To my family:

To William- my husband, soulmate and best friend. Thank you so much for your endless support, patience and understanding.

To my children Gabriel, Benedict and Milcah- your smiles energise me and make each day remarkable for me. I love you all.

To my late father:

It is unfortunate that you left in the middle of this journey. I miss you every day. Your words of wisdom continue to inspire me to work hard, be persistent and have self-confidence.

ACKNOWLEDGEMENTS

There would not be enough space to mention the endless list of those who in diverse ways, contributed to the success of my PhD studies. My profound gratitude goes to all who sacrificed time, money and shared thoughts to help accomplish this dream. My utmost appreciation goes to the Almighty God, for His guidance and provision throughout my years of studies.

I am grateful to my supervisors, Associate Professor Salah Kabanda and Professor Irwin Brown for painstakingly supervising this thesis. They have been supportive throughout the research journey. Special thanks to Associate Professor Kabanda for her invaluable support and mentorship right from the onset of this research. I am eternally appreciative for the patience, kind-heartedness, constructive suggestions and several lunches in her house that helped to shape my thoughts and gave meaning to the ideas articulated in this thesis.

To my lovely husband, William Akotam Agangiba and my kids Gabriel, Benedict and Milcah who endured my long absence from home and sometimes sacrificed family resources to enable me to complete my studies, I say God bless you, and I love you forever. My heartfelt gratitude to my parents, Nana Ohene Kontoh of blessed memory and Cecilia Kontoh for their prayers and for inspiring me all the time to strive for more academic honours. To my wonderful siblings (Joyce, Prince, Ishmael and Samuel), I say thank you for your tremendous support; I could not have asked for a better family!

Notable appreciation to the directors of the institutions I liaised with during my research. Special thanks go to Dr Obeng Asamoah of the Ghana Blind Union, Mrs Doris Ampaw Ameyaw of Registrar's General Department, Mrs Linda Tamakole of the Ministry of Local Government and the staff of the National Information Technology Agency who responded to my call and provided me with the needed information for the completion of this thesis.

To my colleagues (Computer Science and Engineering Department) and staff of the University of Mines and Technology, I say thank you for your support. A special mention must be made of Associate Professor Grace Ofori-Sarpong (a.k.a Home Supervisor), Dr Cynthia Boye, Dr Richard Amorin, Associate Professor Bernard Kumi-Boateng, Associate Dr Naa Dedei Tagoe,

Dr Yakubu, Professor Anthony Simons and Professor Richard Amankwah for their inspirations throughout this PhD journey.

To my amazing friends whose support chats, jokes, outings and fun made my journey an interesting one; I say thank you and God bless you all. Special thanks go to Dr Gordon Amoako, Dr & Mrs Appiah Mensah, Edina Farai Nyemba, Siti Kabanda, Dr Elizabeth Wamicha, Mampi Lubasi, Pitso Tsibolane, Meke Kapepo, Ralitsa Debrah, Tejumade Ogundipe, Jonas Agyepong, Gifty Gyimah, Ada Allotey, Esenam Tagboto, Emmanuel Nketiah and all the amazing friends I made in UCT along this journey that space would not permit to mention here, I say God bless you and I appreciate your support.

Finally, I owe debts of gratitude to my funders who supported my research: Schlumberger Faculty for the Future Fellowship, L'Oréal-UNESCO For Women in Science Fellowship for Sub-Saharan Africa and the University of Cape Town.

TABLE OF CONTENTS

DECLARATION	I
PREFACE	II
ABSTRACT	IV
DEDICATION	VI
ACKNOWLEDGEMENTS	VII
LIST OF FIGURES	XV
LIST OF TABLES	XVI
LIST OF ABBREVIATIONS	XVII
CHAPTER 1 : INTRODUCTION TO STUDY	1
1.1 Introduction	1
1.2 Background of the study	1
1.3 Problem statement	3
1.4 The context of the research study	5
1.5 E-government in Ghana	8
1.6 Research goal and research questions	10
1.7 Approach to the research	11
1.8 Significance of research	11
1.9 Scope of research	14
1.10 Organisation of the thesis	14
CHAPTER 2 : LITERATURE REVIEW	16
2.1 Introduction	16
2.2 E-government	16
2.2.1 Technological Deterministic Perspective	17
2.2.2 Socio-Technical Perspective	18
2.2.3 Socio-Political Perspective	19
2.3 Classification of E-government	20
2.3.1 Government - to - Citizen E-government (G2C)	20
2.3.2 Government - to - Business E-government (G2B)	22
2.3.3 Government - to - Employee E-government (G2E)	23

2.3.4	Government - to - Government E-government (G2G)	24
2.4	Maturity of E-government	26
2.5	Benefits of E-government in Developing Countries	30
2.5.1	Quality of Service Delivery	31
2.5.2	Cost Reduction	32
2.5.3	Transparency, Accountability and Trust	32
2.5.4	Corruption Reduction	33
2.5.5	Inclusive Governance	34
2.6	Challenges of E-government in Developing Countries	35
2.6.1	Lack of Infrastructure	35
2.6.2	Lack of Legal Framework	36
2.6.3	Security, Privacy and Trust	37
2.6.4	Lack of Human Capacity	38
2.6.5	Design- Reality Gap	39
2.6.6	Corruption and Inadequate Funds	40
2.6.7	Digital Divide	40
2.6.8	Accessibility	41
2.7	Assistive Technologies	42
2.8	E-government Accessibility	44
2.9	Evaluation Tools	46
2.10	Chapter Summary	48
CHAPTER 3 : THEORETICAL BASIS		49
3.1	Introduction	49
3.2	Disability	49
3.3	Accessibility Models	51
3.3.1	Web Accessibility Integration Model	51
3.3.2	Summary of other accessibility models	52
3.4	Towards a conceptual framework for E-government accessibility	53
3.4.1	Sensitising concepts	54
3.4.2	Social exclusion framework	56
3.4.3	Sensitising framework	61
3.5	Theoretical foundations for data interpretation	64
3.5.1	Capability approach	64
3.5.2	Structuration theory	65
3.5.3	Organizational influence theory	66

3.6	Chapter Summary	67
CHAPTER 4 : RESEARCH METHODOLOGY		68
4.1	Introduction	68
4.2	Research purpose	68
4.3	Research reasoning process	69
4.4	Ontological and epistemological approach	69
4.5	Research strategy	72
4.6	Research methods	73
4.6.1	Data collection	73
4.6.2	The Sampling Process	75
4.6.3	Data Analysis	78
4.6.3.1	Familiarising oneself with the data	80
4.6.3.2	Generating initial codes	83
4.6.3.3	Searching for Themes	85
4.6.3.4	Reviewing Themes	89
4.6.3.5	Defining and naming themes and producing the report	93
4.6.4	Content analysis of policies	94
4.6.4.1	Analysis process	95
4.6.4.2	Linking content analysis to themes	101
4.7	Ethical Considerations	102
4.8	A reflection on the Methodology Used	103
4.9	Chapter Summary	104
CHAPTER 5 : PRESENTATION OF FINDINGS		105
5.1	Introduction	105
5.2	Findings	105
5.2.1	Institutions, policies and enforcement	105
5.2.1.1	Enforcing accessibility	106
5.2.1.2	Persons with Disability Act (PDA)	108
5.2.1.3	Institutions enforcing laws	109
5.2.1.4	Inclusive education	110
5.2.1.5	Related findings from content analysis	112
5.2.2	Assistive Technologies acquisition and usage	112
5.2.2.1	Assistive Technologies required for access	113

5.2.2.2	Availability and affordability of Assistive Technologies	114
5.2.2.3	Training in Assistive Technologies	116
5.2.2.4	Government needed interventions on Assistive Technologies	117
5.2.2.5	Limited capabilities of Assistive Technologies	118
5.2.2.6	Local production of Assistive Technologies	119
5.2.2.7	Assistive Technologies' policy implementation	120
5.2.2.8	Stakeholders' knowledge in Assistive Technologies	121
5.2.2.9	Related findings from content analysis	122
5.2.3	Accessibility requirements	123
5.2.3.1	Accessibility needs and benefits	124
5.2.3.2	Accessibility awareness	127
5.2.3.3	Education on disabilities and accessibility	129
5.2.3.4	Related findings from content analysis	130
5.2.4	Developing E-government	131
5.2.4.1	Design considerations	132
5.2.4.2	Determinants of final design	133
5.2.4.3	Developers' perceptions	134
5.2.4.4	E-government contracts	135
5.2.4.5	Development guidelines	137
5.2.4.6	Market force drivers	138
5.2.4.7	Related findings from content analysis	139
5.2.5	Effects of inaccessibility	139
5.2.5.1	Lack of independence and privacy	140
5.2.5.2	Cost burden	141
5.2.5.3	Living deprived life	142
5.2.5.4	Low productivity	143
5.2.5.5	Risk and emotional effect	144
5.2.5.6	Related findings from content analysis	145
5.2.6	E-government challenges and benefits	146
5.2.6.1	E-government challenges	147
5.2.6.2	E-government benefits	149
5.2.6.3	E-government maturity	150
5.2.6.4	Related findings from content analysis	151
5.2.7	Making society inclusive	152

5.2.7.1	Societal and family support	153
5.2.7.2	Governmental support	154
5.2.7.3	Related findings from content analysis	155
5.2.8	PWD lack E-readiness	156
5.2.8.1	Literacy	157
5.2.8.2	Access to ICTs and internet	158
5.2.8.3	Education on E-government systems	159
5.2.8.4	Late ICT adoption and use	160
5.2.8.5	Awareness of their rights	161
5.2.8.6	Related findings from content analysis	162
5.2.9	PWD role in accessibility	163
5.2.9.1	PWD lack power to enforce accessibility	164
5.2.9.2	Voicing out complaints	165
5.2.9.3	PWD need to play an active role	166
5.2.9.4	Related findings from content analysis	167
5.2.10	Societal perceptions and beliefs	168
5.2.10.1	Social-cultural beliefs	168
5.2.10.2	Contextual conditions	170
5.2.10.3	Related findings from content analysis	171
5.3	Summary of findings	172
5.3.1	Relationships among themes	172
5.3.2	Chapter Summary	175
CHAPTER 6 : DISCUSSION OF RESEARCH FINDINGS		177
6.1	Introduction	177
6.2	Discussion of empirical findings	177
6.2.1	Technological drivers	178
6.2.2	Socio-cultural drivers	180
6.2.3	Political drivers	181
6.2.4	Personal drivers	183
6.2.5	Development of E-government services	186
6.3	Chapter Summary	190
CHAPTER 7 : THEORETICAL ELABORATION		191
7.1	Introduction	191

7.2	Theoretical elaborations	191
7.2.1	Agents of exclusion	192
7.2.2	Drivers of exclusion	196
7.2.3	Exclusionary process	202
7.3	Chapter Summary	204
CHAPTER 8 : CONCLUSION AND RECOMMENDATION		206
8.1	Introduction	206
8.2	Overview of the study	206
8.3	Contributions of the study	207
8.3.1	Contribution to theory	207
8.3.2	Contribution to Practice	209
8.4	Limitations of the study	211
8.5	Suggestions for future studies	213
8.6	Research conclusions	214
9.	REFERENCES	215
10.	ATTACHMENTS	249
10.1	Sample of Consent Form	249
10.2	Research Instrument	250
10.3	Consent of Stakeholders	253
10.4	Profile of Respondents	255
10.5	Sample of Transcript Verified by Respondent	257
10.6	Policy Documents Analysed	258
10.7	Research Code Book	259

LIST OF FIGURES

Figure 1.1: Map of Ghana	6
Figure 1.2: Flowchart of the research approach	13
Figure 3.1: Web Accessibility Integration Model (Source: Lazar et al., (2004))	52
Figure 3.2: Particularisation of social exclusion theory to the study	62
Figure 4.1: NVivo output Word Cloud	81
Figure 4.2: NVivo output Word frequency query (Summary) from transcripts	82
Figure 4.3: NVivo output word tree (access to services)	82
Figure 4.4: A screenshot of coding at an early stage	85
Figure 4.5: Categorising nodes to form subtheme (Inclusive education).	86
Figure 4.6: Comparison diagram between “Accessibility awareness” and “Accessibility needs and benefits”	87
Figure 4.7: Coding similarity between ‘Institutions, policies and enforcement and Enforcing accessibility’	89
Figure 4.8: Summary of word count for ‘Service(s)’ from all policy documents	98
Figure 4.9: Sample of references to the keyword ‘Access/Accessibility/Accessible	98
Figure 5.1: Frequency analysis of Institutions, policies and enforcement	106
Figure 5.2: Frequency analysis of Assistive technologies acquisition and usage	113
Figure 5.3: Frequency analysis of Accessibility requirements	124
Figure 5.4: Frequency analysis of Developing E-government	131
Figure 5.5: Frequency analysis of Effects of inaccessibility	140
Figure 5.6: Frequency analysis of E-government challenges and benefits.	146
Figure 5.7: Frequency analysis of Making society inclusive	153
Figure 5.8: Frequency analysis of PWD lack E-readiness	157
Figure 5.9: Frequency analysis of PWD role in accessibility	164
Figure 5.10: Frequency analysis of Societal perceptions and beliefs	168
Figure 5.11: A screenshot of relationships among themes in NVivo	174
Figure 6.1: E-government accessibility framework from empirical observations	189

LIST OF TABLES

Table 2-1: Summary of E-government type and benefits in some developing countries.....	25
Table 2-2: Summary of some proposed E-government models	28
Table 2-3: E-government type in stages with examples of services.....	30
Table 2-4: Accessibility Guidelines	47
Table 3-1: Summary of disability models.....	50
Table 3-2: Sensitising concepts from literature	63
Table 4-1: Phases of thematic analysis (Braun & Clarke, 2006: 87)	79
Table 4-2: Searching for themes.....	90
Table 4-3: Reviewing of themes.....	92
Table 4-4: Themes emerging from the analysis	94
Table 4-5: Summary of keywords with their description.....	96
Table 4-6: Policy documents selected for content analysis	99
Table 4-7: Keywords used in content analysis with their frequencies	100
Table 4-8: Summary of keywords with their corresponding themes	102
Table 5-1: Themes with their corresponding relationships	173
Table 6-1: Grouping of themes.....	178
Table 7-1: Research questions and their relationship to theoretical propositions	204
Table 8-1: Practical approach to improving the accessibility of E-government services	209

LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
AT	Assistive Technologies
CSSPS	Computerized School Selection and Placement System
DACF	District Assembly Common Fund
DPA	Data Protection Act
DRC	Disability Rights Commission
E-GIF	E-Government Interoperability Framework
ETA	Electronic Transactions Act
G2B	Government to Business E-government
G2C	Government to Citizens E-government
G2E	Government to Employee E-government
G2G	Government to Government E-government
GCNet	Ghana Community Network
GDP	Gross Domestic Product
GGEA	Ghana Government Enterprise Architecture
GICTeD	Ghana Information Communication and Technological Directorate
GNCA	Ghana National Communications Authority
GSS	Ghana Statistical Service
ICT	Information and Communication Technology
ICT4AD	ICT for Accelerated Development
IEP	Inclusive Education Policy
IS	Information Systems

IWS	Internet World Stats
JAWS	Job Access with Speech
LEAP	Livelihood Empowerment against Poverty
NCA	National Communications Authority
NCPD	National Council on Persons with Disabilities
NITA	National Information Technology Agency
NITA	National Information Technology Agency
OECD	Organisation for Economic Co-operation and Development
PKI	Public Key Infrastructure
PWD	Persons with Disabilities
UN-ASP	United Nations and American Society for Public Administration
UNCRPD	United Nations Convention on the Rights of Persons with Disabilities
UNDESA	United Nations Department of Economic and Social Affairs
WAIM	Web Accessibility Integration Model
WCAG	Web Content Accessibility Guidelines

CHAPTER 1 : INTRODUCTION TO STUDY

1.1 Introduction

Electronic government commonly called E-government is an important tool to transform the public sector and to bring government services to the door-step of the citizenry (Ahn & Bretschneider, 2011). Governments offer critical services; hence, access is crucial, especially for marginalised groups like persons with disabilities (PWD). Several studies (Foley, 2004; Jaeger, 2006; Pilling & Boeltzig, 2007; Watling, 2011) have long shown that the accessibility of online government services is of great benefit to PWD; providing them with more convenience and reducing discrimination. However, the implementation of accessible E-government services for PWD has been a challenge for many developing countries, particularly those in Africa (Adepoju, Shehu & Bake, 2016; Verkijika & De Wet, 2017; Nakatumba-Nabende et al., 2019). This study focuses on E-government as a means through which citizens can interact and conduct transactions with the government electronically. This study is based in Ghana, a developing country in West Africa.

The rest of the chapter is organised as follows: Section 1.2 presents the background to the study. The problem statement is outlined in Section 1.3, while Section 1.4 provides the context of the study. Section 1.5 discusses E-government and its implementation in the Ghanaian context. The research objectives and questions are presented in Section 1.6. Section 1.7 describes the research approach. Section 1.8 outlines the significance of the research, while Section 1.9 sets out the scope of the research. Finally, the structure of the thesis is discussed in Section 1.10.

1.2 Background of the study

Governments worldwide have adopted the use of ICT to engender efficiency in their internal operations and to improve the quality of services to citizens. The use of ICT by governments commonly termed E-government is no longer considered an option but a necessary tool to improve efficiency, promote transparency and enhance interactions with citizens. E-

government aims to provide a one-stop-shop for all its stakeholders at all times, irrespective of geographic location (Alshehri & Drew, 2010; Tashtoush, Darabseh & Al-sarhan, 2016). So far, studies (Bhatnagar, 2002; Schuppan, 2009; Mistry & Jalal, 2012) have shown that E-government has made a significant impact in developing countries and helped to transform the public sector by increasing service delivery efficiency and reducing corruption. E-government is also perceived to promote equal participation among the citizenry especially for the marginalised in society such as rural folks and the disabled (Makoza, 2013; Boussarhan & Daoudi, 2014; Cumbie & Kar, 2014). However, regardless of these benefits, E-government can also act as a tool for exclusion, especially for PWD who tend to be sidelined from the mainstream population. Accessibility is one such challenge that creates disparity among citizens (Rorissa & Demissie, 2010; Cumbie & Kar, 2014). This study focuses on accessibility geared towards PWD. In the context of this study, therefore, accessibility implies that PWD can use E-government services without any barriers (Arrue, Vigo & Abascal, 2008a; Henry, Abou-Zahra & Brewer, 2014).

E-government services provide convenience to PWD in several ways. For example, a visually impaired person who requires services from the government would need a guide to assist in travelling to the respective government ministry or agency. However, with E-government, services that would otherwise have required citizens to travel, sometimes, long distances to government offices could now be accessed via web-based applications from any convenient place. This has helped to save time and reduce the cost of accessing government services. E-government also offers anonymity by cutting down on face-to-face interactions, which sometimes result in discrimination against PWD (Jaeger, 2006; Rubaii-Barrett & Wise, 2008).

For this reason, several researchers (Abanumy, Al-badi & Mayhew, 2005; Jaeger, 2006; Rubaii-Barrett & Wise, 2008; Abu-doush et al., 2013; Boussarhan & Daoudi, 2014; Tashtoush, Darabseh & Al-sarhan, 2016; Ismailova, 2017; Nakatumba-Nabende et al., 2019) have argued for the need to make E-government services accessible because of their potential to create independence and ensure equal participation for PWD in digital society. To this end, investigating the accessibility of E-government services for PWD in the context of developing countries is of paramount importance given that PWD tend to be sidelined from the

mainstream population. Furthermore, of the estimated one billion people living with disabilities globally, 80 per cent reside in developing countries (World Bank, 2020); yet accessibility to E-government services remains a great challenge (Goodwin et al., 2011; Adepoju, Shehu & Bake, 2016; Verkijika & De Wet, 2017; Nakatumba-Nabende et al., 2019). Therefore, a large number of people risk continued exclusion if the accessibility of E-government services is not addressed.

1.3 Problem statement

Many governments in developing countries have implemented E-government and are advancing in the provision of E-services to citizens. Like many ICT projects, E-government implementation in developing countries has recorded many failures (Heeks, 2003; Gichoya, 2005); however, it still holds the promise of benefit (Kettani et al., 2008; Gyaase & Gyamfi, 2012; Choi et al., 2016). Designed with a citizen-centred approach in mind, most governments in developing countries have implemented E-government to facilitate the delivery of quality services, improve government-citizen interactions and to promote participatory governance. For these objectives of E-government to be achieved, services ought to be accessible to all citizens. Accessibility is important because governments provide critical services to citizens with no alternate providers (Leist & Smith, 2014). Accessibility, particularly for PWD, an already marginalised group, is crucial as it has the potential to create a feeling of belonging, self-actualisation, and integration into digital society (Makoza & Chigona, 2013; Cumbie & Kar, 2014). Despite these benefits, E-government services geared towards PWD globally have been minimal with the African continent recording the least (Adepoju, Shehu & Bake, 2016).

Consequently, most studies conducted on E-government accessibility have focused on developed countries with developing countries receiving little attention, especially those in Africa (Rorissa & Demissie, 2010; Adepoju, Shehu & Bake, 2016). The few studies (Baguma et al., 2007; Boussarhan & Daoudi, 2014; Yaokumah, Brown & Amponsah, 2015; Agbozo & Spassov, 2018; Nakatumba-Nabende et al., 2019) that have examined the accessibility of E-government services for PWD in developing countries ignore contextual influences and do not provide experiential experiences from the perspective of PWD. This is problematic since

contextual understanding is important for governments to institute the best local practices for the development of accessible E-government services (Heeks, 2005; Kuzma, Yen & Oestreicher, 2009). Again, the experiences and needs of PWD may differ from one context to another (Koca-Atabey, 2013). For these reasons, there remains little understanding of the amalgamated factors that affect the development of accessible E-government services and those that constrain their use by PWD.

In researching E-government accessibility for PWD, many researchers tend to have a technological determinist focus in which they are mainly concerned with techno-centric matters (Agangiba & Kabanda, 2016a; Dollie & Kabanda, 2017). For instance, past studies (Abanomy, Al-badi & Mayhew, 2005; Makoza & Chigona, 2013; Boussarhan & Daoudi, 2014; Mtebe & Kondoro, 2017) investigating the accessibility of E-government services for PWD mainly evaluated E-government websites with the help of automatic tools to determine their accessibility. PWD were not involved in such studies to better understand their contextual challenges regarding access to E-government services. In this way, researchers have tended to ignore the context that shapes the E-government development process and accessibility experiences of PWD. This approach, therefore, does not holistically address accessibility challenges for PWD. To address accessibility challenges for PWD, it is important to understand the contextual factors that influence the development of E-government services that lead to the exclusion of PWD. It is, therefore, necessary for researchers to be concerned not only with technology but also with contextual discourse (Heeks, 2005; Abascal et al., 2016). Moreover, ICT and its related technologies ‘cannot be usefully studied in isolation from their social context’ (Rose & Hackney, 2003: 8). To this end, it is not surprising that earlier studies that examined the accessibility of E-government services for PWD in developing countries have not contributed to understanding the integration of PWD into a digital society. To date, many E-government services in developing countries remain inaccessible to PWD (Goodwin et al., 2011; Verkijika & De Wet, 2017; Agbozo & Spassov, 2018; Nakatumba-Nabende et al., 2019); it has, therefore, become necessary to interrogate the approach of studying this phenomenon to understand inclusivity for PWD. That is, for E-government services to be accessible to PWD, a comprehensive assessment of technological, social and political practices

and discourse is required to unfold the social phenomena and power structures that could influence actions and practices. This study intends to provide a contextual understanding of E-government stakeholders' perceptions about accessibility for PWD; to explore roles E-government stakeholders play in the development of E-government services which lead to the exclusion of PWD, and to identify contextual drivers in the exclusionary process. This study, therefore, seeks to understand the E-government accessibility phenomenon focused on PWD, which is embedded in the Ghanaian socio-cultural system.

1.4 The context of the research study

Ghana is a republic geographically located in West Africa. It is bordered to the west by Côte d'Ivoire, to the east by Togo, to the north by Burkina Faso and the south by the Gulf of Guinea and the Atlantic Ocean (see figure 1-1). Ghana is a former British colony formerly called the Gold Coast. Ghana was the first country in Sub-Saharan Africa to gain independence from colonial rule on 6 March 1957 (Fosu, 2009). Ghana has rich ethnic and cultural resources that were utilised to help promote nationalism post-independence (Mutula, 2013). The country covers a land area of 238,533 sq.km with a population of over 29 million people. It has an estimated 76.67 per cent and 90.6 per cent literacy rate for adults and youth respectively (<https://countrymeters.info/en/Ghana>). The country is classified as a lower-middle-income economy with a Gross Domestic Product (GDP) of 47 billion US Dollars, a per capita GDP of 1,632 US Dollars and an annual growth rate of 8.3 per cent at the end of 2017 (GSS, 2018). In recent times, Ghana has been ranked as the fastest-growing economy among the 54 countries on the continent (Agboh, 2017).

Politically, Ghana is seen as a frontrunner of political change in sub-Saharan Africa (Haynes, 1993). Ghana is also described as a beacon of democracy in Africa due to its political stability (Fosu, 2009; Osei-Kojo, 2017). The country, initially a one-party democracy, changed to a multiparty system after the first overthrow of the president, Dr Kwame Nkrumah in 1966. Since then, the country has practised political pluralism but not without interruptions due to coup d'états; nevertheless, it has remained relatively peaceful. Constitutional rule began in 1993 after successful elections were held in 1992 to begin the fourth republic. So far, seven successful and peaceful elections have been held in the fourth republic. Governance in Ghana

is decentralised like in many other countries to promote participatory governance and to bring government services closer to citizens in their localities (Crook, 2017). Administratively, Ghana is demarcated into national (central government), regional (16 regions) and district/municipal (254 districts) with the district offices being closest to the citizenry. However, decentralisation in Ghana especially at the district/municipal level is still poor (Crook, 2017), compelling citizens to travel long distances to the regional and national offices to obtain information and services from the government.

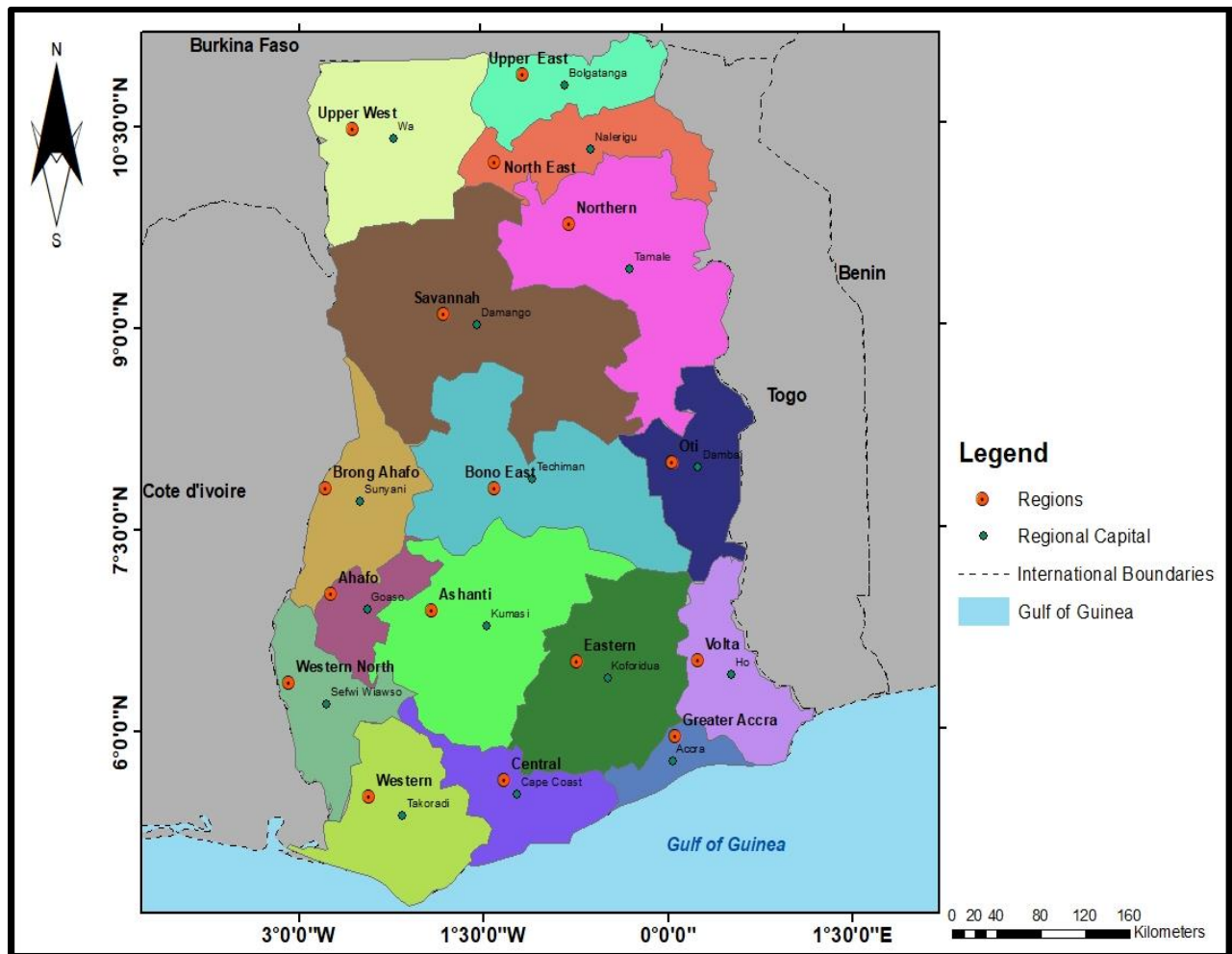


Figure 1.1: Map of Ghana

Over the past two decades, there has been an increase in the utilisation of ICTs in Ghana. With the emergence of the internet, many sectors of the Ghanaian economy have been transformed. The number of internet users countrywide is estimated at 34.3 per cent of the population (IWS,

2018). The country also enjoys a high mobile phone penetration of 137.38 per cent (NCA, 2018) with total mobile voice subscriptions of 40,089,004 as of July 2018. For this reason, the government in recent times has explored the use of modern technologies to disseminate essential information to citizens. The Government of Ghana has been described as a pioneer in Africa in the use of social media such as YouTube and Facebook, among others in disseminating information (Mutula, 2013). The central government and all 34 government ministries have established a web presence through the implementation of websites or portals to interact with citizens. By exploring various innovations and using social interventions, the government seeks to fulfil its mandate of ensuring equal opportunities for all citizens as spelt out in the constitution of Ghana. With this in mind, the government has put in place several interventions to support vulnerable groups like children, the aged, and the disabled. For example, the government has established the Livelihood Empowerment Against Poverty (LEAP) programme to support the underprivileged in society and to help alleviate poverty (Mensah et al., 2008).

In Ghana, an estimated 10 per cent of the population lives with disabilities (Picton, 2011). The common types of disabilities in Ghana include physical, visual, hearing and speech impairments with visual being the most prevalent (Mensah et al., 2008). Despite political freedom, many PWD struggle to have equal access to employment, health, education, and ICT services, among others (Mensah et al., 2008; Nkansah & Unwin, 2010). As a result, the government has made efforts to ensure that the rights of PWD are protected. For instance, it passed the Persons with Disability Act (PDA) in 2006, signed and ratified by the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) in 2012 in an effort to promote equality for PWD (Ametepee & Anastasiou, 2015). In line with steps taken by the government to promote the well-being of PWD and bridge the inequality gap, the National Council on Persons with Disability (NCPWD) was established and tasked to develop a long-term strategy to enhance the livelihood of PWD. Also, as part of the government's initiative, 3 per cent of the district assembly funds are set aside to support PWD within their localities. It was envisaged that these funds would support PWD in the acquisition of assistive technologies, training in ICTs and entrepreneurial skills. However, these interventions so far

seem inadequate as PWD continue to experience various challenges (Boateng, 2015; Asamoah, 2016).

Ghana is appropriate for this study for several reasons which include: 1) Ghana maintains quality data on PWD (Mitra, Posarac & Vick, 2011); 2) the government of Ghana is a strong advocate for PWD equality (Ametepee & Anastasiou, 2015); 3) PWD in Ghana have demonstrated strong willingness to actively participate in governance and decision making (Asamoah, 2016); and 4) Ghana is an example of a developing country, particularly within Africa, that has made significant progress in the implementation of E-government (UN-DESA, 2018).

1.5 E-government in Ghana

E-government was adopted in Ghana over a decade ago. The government of Ghana, realising the important role that ICT could play in growing its economy, empowering its citizens and being competitive, declared ICT a national priority in 2001 (Agboh, 2017). This led to the formulation of the Ghana ICT for Accelerated Development (ICT4AD) policy in 2003; a strategy aimed at building an ICT-led economy. The policy was intended to help reform fourteen key areas of the Ghanaian economy, including education, agriculture, governance among others using ICT and to make Ghana an information-rich knowledge-based society. In line with the objectives of ICT4AD, ICT adoption has penetrated most sectors of the Ghanaian economy with its use in governance gaining much prominence. In recent times, Ghana has been ranked as one of the fastest-growing ICT markets in Africa (Agboh, 2017).

E-government, as defined in the Ghanaian context, is the use of web-based Internet applications and other information technologies, by the government to enhance the access to and delivery of government information and services to citizens, businesses, and among government agencies. Like most developing countries, the quest to improve the quality of services and compete with the rest of the world (Kaisara & Pather, 2011) propelled the government of Ghana to adopt E-government in 2005. Subsequently, the government developed several policies to ensure the smooth implementation of E-government and officially launched the E-government project in Ghana. The government of Ghana further established the Ghana Information Communication and Technological Directorate (GICTeD), which later

metamorphosed into the National Information Technology Agency (NITA) to ensure the effective implementation and regulation of E-government projects. Since the adoption of E-government, Ghana has made steady and significant progress. Many E-government projects, e.g. the Computerized School Selection and Placement System (CSSPS), and the Ghana Community Network (GCNet) have been successfully implemented with funding support from international donor partners (Osei-Kojo, 2017). It is not surprising that Ghana has been described as a pacesetter in Africa with respect to E-government (Mutula, 2008). Similarly, West (2008), in a comprehensive evaluation of E-government websites for 198 countries across the globe ranked Ghana top on the African continent. According to United Nations reports, Ghana has over the years improved in the E-government Development Index (EGDI). Ghana, which was ranked 147th out of 193 countries in 2010, is now placed 101st in 2018. On the African continent, Ghana because of the high EGDI (EGDI =0.5390) is ranked 5th while it is placed 1st in the West African sub-region (UN-DESA, 2018).

The government of Ghana has a one-stop-shop E-government web portal in place which renders services: Government-to-Citizens (G2C), Government-to-Business (G2B), and Government-to-Government (G2G) (<http://www.eservices.gov.gh>). E-government services offered in Ghana range from basic (e.g. reading government information online) to transactional (e.g. applying for a passport online) (Osei-Kojo, 2017). Despite the strides made, the country continues to face challenges related to infrastructure, human capital, and accessibility, among others. The Government of Ghana, however, continues to show readiness and commitment in ensuring that all citizens harness the benefits of E-government in full. For instance, the government has committed resources to provide Wi-Fi and internet services in remote areas in Ghana (UN-DESA, 2018).

There has been limited research in Ghana regarding E-government and its accessibility to a vulnerable group like PWD. The few studies conducted tend to investigate E-government accessibility for PWD from a technologically deterministic perspective. For example, Yaokumah et al. (2015), evaluated 19 E-government portals and websites in Ghana using diagnostic tools. The study revealed that E-government portals are not accessible to PWD in Ghana. In another instance, Agbozo and Spassov (2018) evaluated Metropolitan Assembly

websites in Ghana. The results of the evaluation highlighted several accessibility errors which would make it difficult for PWD to use E-government services. Though these studies shed light on the accessibility of E-government services for PWD, they do not provide a contextual understanding of the phenomena. Due to the contextual neglect, these studies failed to identify key E-government stakeholders who play a role in the exclusion of PWD, the contextual drivers involved in the exclusionary process and ultimately how PWD become excluded in the end.

1.6 Research goal and research questions

The involvement of PWD in E-government accessibility studies in developing countries has been minimal. In Ghana, as far as the researcher knows, no studies on E-government accessibility has involved PWD. On the contrary, several studies have argued that PWD ought to be involved in the design of services to ensure that they are accessible to them (Jaeger & Xie, 2009; Makoza & Chigona, 2013; Henry, Abou-Zahra & Brewer, 2014). Also, there is a lack of contextual understanding of influencing factors and practices by E-government stakeholders, which tend to exclude PWD from E-government services. This is because many of the studies on E-government accessibility for PWD tend to ignore the context in which E-government services are developed (Abascal et al., 2016). The aim of this study, therefore, is to provide a contextual understanding of the roles of E-government stakeholders and the underlying drivers involved in the exclusionary process of PWD from E-government services. Against this background, this study seeks to investigate the following questions:

1. Who are the stakeholders of E-government, and how do they perceive E-government accessibility for PWD?
2. What are the contextual drivers in Ghana that lead to the exclusion of PWD accessing E-government services?
3. How do contextual drivers and the role of stakeholders reinforce the exclusionary process?

1.7 Approach to the research

Drawing on the extant E-government literature, particularly on accessibility, relevant stakeholders for this study were identified. Further, important concepts relating to accessibility for PWD were identified. The concepts sensitised and guided the researcher on issues and areas to focus on designing research instruments (Blumer, 1954; Charmaz, 2003). To better understand the role of agents and the contextual drivers involved in the exclusionary process disadvantaging PWD from accessing E-government services, the social exclusion theory was used as the sensitising lens. The E-government concepts were then particularised in the social exclusion theory to develop a sensitising framework for this study. Data collection and analysis followed. Data collection used multiple methods; observation, interviews and document analysis. A total of 37 respondents from various localities within Ghana participated in the study. Content analysis techniques were employed to analyse E-government and disability-related policy documents (Neundorf, 2002; Krippendorff, 2004) while thematic analysis was used for the interview data (Braun & Clarke, 2006, 2012). The approach adopted in this study, as displayed in figure 1-2 is aligned with interpretivism. Finally, the findings of the study are presented.

1.8 Significance of research

E-government promises several benefits including fostering the delivery of quality and efficient services to citizens and promoting participatory governance. Even though E-government is no panacea to the challenges facing developing countries, its effective implementation could potentially help to alleviate some of them. Developing accessible services is critical to enhancing its adoption and usage. Investigating E-government accessibility to a marginalised group such as PWD is crucial. This, however, requires understanding the contextual challenges PWD face in accessing E-government services and the entire development process.

This study is significant for four reasons: (1) it would provide E-government implementers and policymakers insights into challenges PWD face accessing E-government services in Ghana; (2) it would highlight the amalgamated factors that influence the development of E-

government services leading to the exclusion of PWD; (3) it would bring to light the considerations E-government developers ought to make to ensure that the services they develop are accessible to PWD; and (4) it would promote awareness with regards to E-government accessibility for PWD which over the years has been found as a major hindrance to improving accessibility for PWD (Abanumy, Al-badi & Mayhew, 2005; Freire, Russo & Fortes, 2008; Abu-doush et al., 2013).

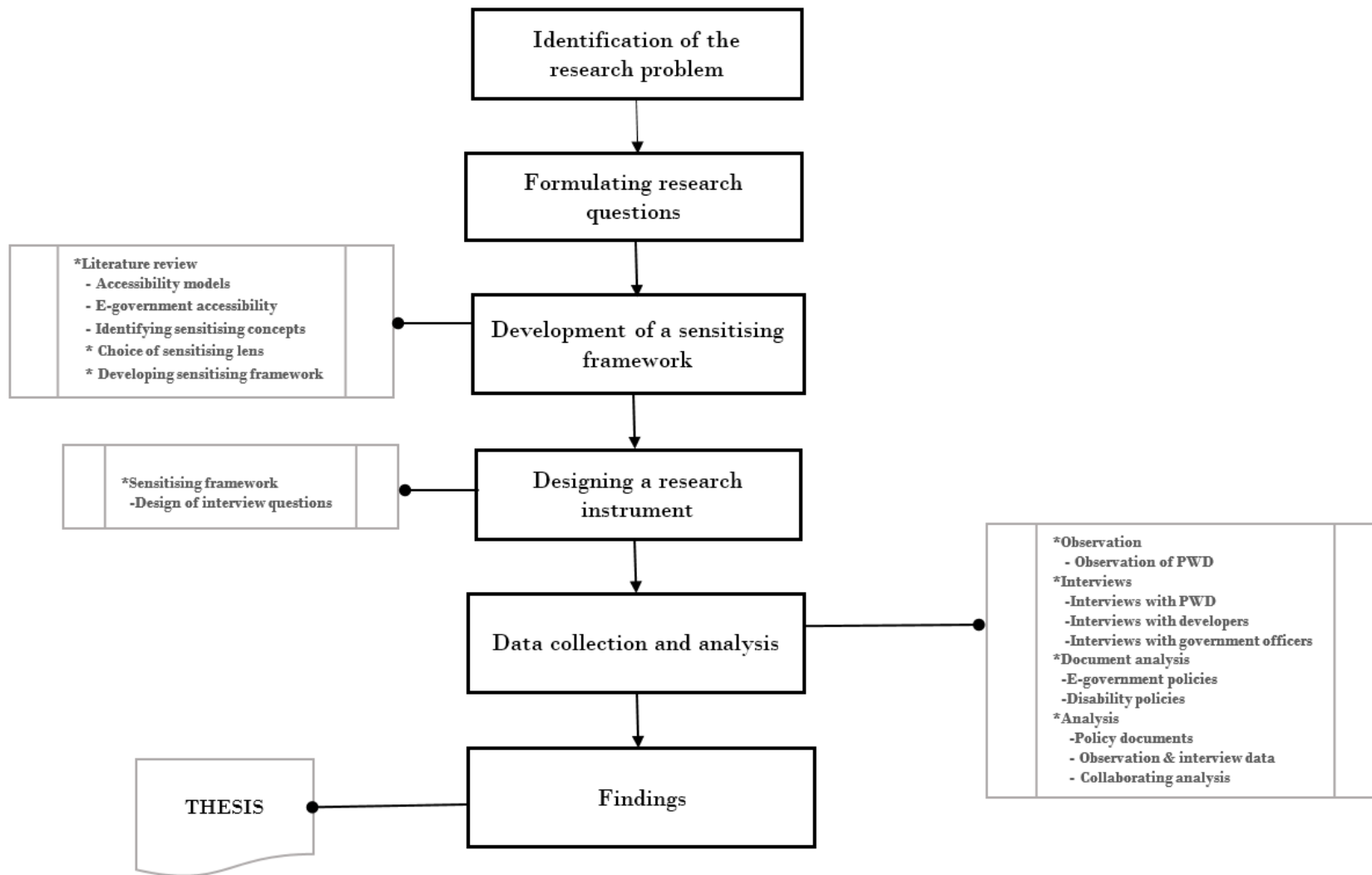


Figure 1.2: Flowchart of the research approach

1.9 Scope of research

For this study, E-government concentrates on the delivery of electronic services to citizens (Gyaase & Gyamfi, 2012; Tashtoush, Darabseh & Al-sarhan, 2016). To enhance citizen participation, E-government needs to be accessible. E-government accessibility can be focused on different groups within society. For example, West (2008) conducted an E-government accessibility study that looked at accessibility disparity for literate and illiterate people. In another instance, an E-government accessibility study by Hoque and Sorwar (2015) focused on accessibility inequality between people living in urban and rural areas. This research is limited to the accessibility of E-government services to PWD. A focus on a vulnerable group like PWD is important to ensure that their special needs are taken into consideration so that they are well integrated into digital society (Jaeger, 2008; Henry, Abou-Zahra & Brewer, 2014). Also, several studies (Abanumy, Al-badi & Mayhew, 2005; Jaeger, 2008; Henry, Abou-Zahra & Brewer, 2014) have shown that when services are designed to be accessible to PWD, it offers universal accessibility in the long run and provides greater benefit to all. Further, this research focuses on the visually impaired. Even though diverse forms of disabilities such as hearing, mobility, speech and cognitive impairment (Carter & Markel, 2001; Jacko & Vitense, 2001) are considered as being important and need to be addressed, this research focuses on the visually impaired because previous studies (Takagi et al., 2004; Baguma et al., 2007; Jaeger & Xie, 2009; Abu-Doush et al., 2013; Boussarhan & Daoudi, 2014) have shown that they are the most challenged group among the disabled population with regards to the accessibility of electronic services.

1.10 Organisation of the thesis

The thesis is organised into eight chapters as follows: Chapter 1 details the research background, the problem statement, research objectives and the approach taken to achieve the objectives, scope and significance of the research. Chapter 2 presents a literature review of this study. It begins with a review on E-government perspectives followed by categorisation of E-government. The benefits and challenges of E-government for developing countries are covered. The chapter ends with discussions on E-government accessibility. Chapter 3 provides the theoretical basis of the research. It comprises discussion on disabilities, accessibility models

and conceptualisation of a framework for the research. Chapter 4 describes the research approach emphasising methods of data collection, how data will be collected, analysed and collaborated. Further, it will provide an analysis of all data collected. The report on research findings are presented in Chapter 5 while Chapter 6 provides discussions of empirical findings in the context of literature. Chapter 7 presents the theoretical elaboration of the empirical findings. Finally, Chapter 8 concludes the research and in doing so, outlines the research's contributions to theory and practice and provides suggestions for future research studies.

CHAPTER 2 : LITERATURE REVIEW

2.1 Introduction

The purpose of this study is to investigate E-government accessibility for persons with disabilities in Ghana. This chapter examines the literature on key concepts that are of interest to the phenomenon under study, i.e. E-government in developing countries and accessibility. The chapter starts with the definition of E-government, classification of E-government, stages of E-government maturity, the benefits and the challenges of E-government, particularly in developing countries. The chapter looks at accessibility in general and the assistive technologies used by persons with disabilities in the context of developing countries. It then follows with discussions on E-government accessibility with emphasis on developing countries. This chapter concludes with a summary and a direction for the study.

2.2 E-government

Globally the use of ICT and the Internet in the activities of government continues to expand and has, in recent years, been playing a key role in the transformation of the public sector. E-government (electronic or digital government) is the term used to describe ICT-related transformations in government operations. A major objective of E-government is for governments to enhance service provision to citizens and improve internal government operations (Alshehri & Drew, 2010; Adepoju & Shehu, 2016).

E-government has been defined by different researchers in several ways based on the notion and the context of the application. Fang (2002), describes E-government as the use of ICT at various levels of government to provide efficient service to citizens as well as the business sector. It is seen as a one-stop online shop that can help governments realise their dream of providing 24/7 reliable services to their citizens (Backus, 2001). According to Basu (2004), E-government is the strategic use of ICT in governance to bridge the gap between the government and citizens, thereby improving government-citizen interactions. Given that most government objectives are focused on citizens (Rorissa & Demissie, 2010; Kaisara & Pather, 2011), it becomes crucial that E-government services meet the needs of citizens and be accessible to all.

For E-government to provide a one-stop-shop to citizens at their convenience, the use of web-based applications remains a core aspect. The provision of E-government services should be through multiple channels to allow citizens several options for access. In most developing countries, due to the high penetration of mobile devices (smartphones, tablets, etc.), E-government may be extended through M-government (Mobile government) to promote flexibility and enhance government-citizen interactions (Rossel, Finger & Misuraca, 2006; Serra et al., 2015; King & Youngblood, 2016). In Brazil, for instance, several mobile applications are used in the provision of E-government services (Serra et al., 2015). The Caixa Economica Federal mobile app enables citizens in Brazil to be connected to the federal bank and obtain services related to social benefits. In another instance, mobile money; a mobile payment system serves as one of the E-payment options to pay for E-government services in Ghana (<https://www.epay.gov.gh/>). In this study, therefore, E-government is defined as the application of ICT, electronic media, mobile devices and particularly web-based applications by the government to provide fast, accessible and efficient services to its citizens and to promote participatory and inclusive governance. Existing literature on E-government research shows that E-government can be viewed from three major perspectives: technologically deterministic, sociotechnical and socio-political.

2.2.1 Technological Deterministic Perspective

This realm views E-government as a technologically-oriented system. As such much emphasis is placed on technology and technological artefacts such as the design, network concepts, hardware and software (Bekkers & Homburg, 2005). From this perspective, researchers mainly focus on answering questions oriented to technology giving little or no consideration to the study of society and political administration within which E-government operates (Yildiz, 2007; Dawes, 2008). These researchers hold the notion that society is solely technology-driven; hence, technological progress is equal to social progress (Coursey & Norris, 2008; Wyatt, 2008; Norris & Reddick, 2013). From this viewpoint, E-government researchers tend to focus solely on the supply side of E-government (Makoza & Chigona, 2013; Madsen, Berger & Phythian, 2014). They contend that E-government is technology-driven as such the use of advanced technologies by governments will help reduce costs in its operations and enhance the provision

of services to citizens (Moon, 2002; Ebrahim & Irani, 2005; Bélanger & Carter, 2008; Verdegem & Verleye, 2009; Almarabeh & AbuAli, 2010). This assumption, however, is flawed since the services provided may not meet the actual needs of the citizens or citizens may be lacking certain pre-requisites to access these services fully. For E-government to achieve its objectives, it must be citizen-focused, meet the demands of its users and be accessible (Ochara, 2008). While this perspective of E-government is useful to understand how governments can capitalise on modern technologies to improve and optimise its operations, the opinions of citizens who are key stakeholders in E-government are sidelined. An approach to involve citizens becomes necessary; hence, the sociotechnical perspective.

2.2.2 Socio-Technical Perspective

From a sociotechnical perspective, E-government is a process that pays attention not only to technology but how citizens interact with the system. This approach is useful in identifying factors necessary for diffusion, adoption, and use of E-government (Heeks, 2003; Heeks & Santos, 2009). Several researchers advocate this approach (Jaeger & Thompson, 2003; West, 2004; Welch, 2005; Horst, Kuttschreuter & Gutteling, 2007; Bertot, Jaeger & Grimes, 2010; Lee, 2010). From a socio-technical system view, it is recognised that E-government involves citizens and technology, and the interaction between citizens and technology generates unique characteristics. E-government as socio-technical systems should be designed by taking into consideration the skills required by citizens to operate it in a given social context. Heeks (2005) argued that social context has an impact on how technology is deployed and subsequently, how E-government is implemented. The perceptions of government officers implementing E-government can also constrain the process, therefore, understanding their attitudinal perceptions can help manage E-government complexity (Yildiz, 2007; Agangiba & Kabanda, 2016b). Researchers in this realm argue that technology is a carrier and what is contained within it is defined by the people who develop it and those that use it (Heeks, 2005; Madsen, Berger & Phythian, 2014). To this end, the sociotechnical approach helps to study E-government with a reflection from both the supply and demand side. However, the assumption that an E-government system is solely a sociotechnical system can be problematic because E-

government initiatives mostly form part of a wider project channelled by political vision hence require strong political leadership and willingness (Grönlund & Horan, 2005; Bolgherini, 2007).

2.2.3 Socio-Political Perspective

The socio-political approach to E-government study is mostly focused on how information technology can facilitate procedures in the public sector (Niehaves, 2007). A typical example is the use of technology in the decentralisation of governance (Elliman, Irani & Jackson, 2007; Gyaase & Gyamfi, 2012). From this standpoint, E-government is shaped mainly by social context and political administration. Researchers in this realm contend that E-government requires political leadership and not technical expertise (Fountain, 2001; Bolgherini, 2007; Homburg, 2008). For example, a study by Fountain (2001) revealed that ICT implementation in government is shaped by political agendas as well as bureaucracies in public organisations. As a result, Fountain (2001) argued that to address the government as a producer of services and citizens as customers meant that the inherently political nature of public service delivery should not be ignored. Fountain (2001) further stated; governments do not only provide services but are also involved in policymaking, and these policies may influence how the public organisations operate. As such E-government cannot succeed with the 'pure' notion of socio-technicality since E-government is aligned with the political agenda, hence its success is determined by policies and the people who implement them (Gupta & Jana, 2003; Bolgherini, 2007; Madsen, Berger & Phythian, 2014). These policies tend to widen the gap between citizens and the public administration and also hinder certain groups in society from benefitting fully from E-government (Basu, 2004; Ochara, 2008; Madsen, Berger & Phythian, 2014). Researchers from this standpoint claim that the logic embedded in the design of E-government technologies is indirectly inscribed in E-government policies so as to serve the interests of the public organisation (Fountain, 2001; Bolgherini, 2007; Cordella & Iannacci, 2010). To this end, E-government reforms are the eventual outcomes of E-government policies. From a socio-political perspective, the government often propagates its political agenda and fulfils a political aim through E-government initiatives implemented for citizens (Grimsley & Meehan, 2007; Cordella & Iannacci, 2010).

This study argues that E-government is the interweaving of technology and context (Heeks, 2005; Cocchiglia & Vernaschi, 2006); that although E-government is technology-driven, the social context in which it operates and the attitudinal perceptions of stakeholders is crucial to its success. How citizens can interact with the technologies employed in the E-government system efficiently is crucial. Given that legislation administers E-government, the issue of politics cannot be overlooked. For this reason, this study posits that E-government is an intertwining of social context, technology and political administration (Grönlund & Horan, 2005; Jaeger, 2006; Alshawi & Alalwany, 2009; Thakur & Singh, 2013; Agangiba & Kabanda, 2016b; Choi et al., 2016).

2.3 Classification of E-government

In many countries, E-government implementation is regulated by ICT and policies which tend to influence how governments operate and provide services to their stakeholders. E-government is categorised into four different groups based on how the government interrelates with its different stakeholders. These include: from Government-to-Citizens (G2C), Government-to-Business (G2B), Government-to-Employees (G2E) and Government-to-Government (G2G) (Carter & Belanger, 2003; Ndou, 2004; Ebrahim & Irani, 2005; Cumbie & Kar, 2014; Choudrie & Alfalah, 2016).

2.3.1 Government - to - Citizen E-government (G2C)

Government - to - Citizen (G2C) E-government deals with government interactions with citizens and is a citizen-centric approach that involves government improving services delivered to citizens regarding quality, cost, transparency, and accessibility. This form of E-government is essential because the ultimate goal is to deliver effective and efficient services to citizens (Cocchiglia & Vernaschi, 2006; Jaeger & Bertot, 2010; Choudrie & Alfalah, 2016). Through G2C, government agencies can constantly communicate with citizens and receive feedback from them, thereby enabling participatory governance (Ndou, 2004; Gyaase & Gyamfi, 2012). In this manner, G2C enhances accountability, transparency and strengthens democracy overall. G2C allows citizens to access services at their convenience using web technologies (e.g. government portal), multiple channels (PC, mobile device, Web TV, etc.)

and consequently replacing pre-existing bureaucratic procedures (Ndou, 2004; Ebrahim & Irani, 2005; Serra et al., 2015). Citizens can benefit from a wide range of electronic services (E-services) to include e-Tax filing, e-Banking, e-Education, e-Procurement, e-Agriculture, and e-Health. G2C, in this way, enhances both government-citizen interaction and citizen satisfaction (Fang, 2002; Verdegem & Verleye, 2009; Malik et al., 2016; Verma & Vats, 2020). Although governments in most developed countries are far more advanced regarding electronic interactions with citizens, developing countries are still striving hard to achieve this status. Despite this fact, the literature indicates some benefits accrue through G2C in developing countries. For example, G2C services have helped to reduce distance and time for citizens to access a number of services such as obtaining birth certificates for children; which previously required much travel and waiting in queues (Kitaw, 2006; Kettani et al., 2008; Schuppan, 2009; Bhatnagar & Singh, 2010; Nasri, 2014). Again through G2C E-government, procedures for the payment of individual taxes and other revenues have become shorter, much faster and more efficient in Tanzania relieving citizens of long queues and the stress associated with them (Schuppan, 2009). G2C has also helped to improve the quality of life for underprivileged communities in Bangladesh (Hoque & Sorwar, 2015). G2C E-government has also significantly reduced the frustration citizens go through to obtain services from the government as a result of bribery and corruption (Bhatnagar, 2002; Kumar & Best, 2006; Bwalya, 2009; Schuppan, 2009; Bertot, Jaeger & Grimes, 2010; Kim, 2014). A typical case is the “whistleblowing” in Kenya, which has eliminated several corrupt practices by allowing citizens to anonymously report any acts of corruption (Schuppan, 2009). Similarly, G2C has helped curb bribery and corruption in the process of obtaining pensions for the aged in India (Kumar & Best, 2006; Verma & Vats, 2020). Also, G2C has optimised services provided by the government to citizens in several sectors such as the health and education sectors (Zheng & Walsham, 2008; Bwalya, 2009; Gyaase & Gyamfi, 2012; Chipeta, 2018). For example, the procedures involved in the selection and placement of students from basic schools to senior high schools in Ghana have become faster, more effective and more transparent through the Computerised School Selection and Placement System an E-government initiative (Gyaase & Gyamfi, 2012). Similar initiatives are reported in Kenya and Egypt (Hafkin, 2009). Although

most E-government initiatives in developing countries are targeted at citizens, some services have been developed for businesses.

2.3.2 Government - to - Business E-government (G2B)

Government - to - Business (G2B) E-government refers to interactions between the government and private businesses mostly for commercial purposes (Fang, 2002; Shambour & Lu, 2010; Agangiba & Agangiba, 2013) to simplify regulatory processes and foster the smooth operations of government and businesses. With the use of G2B, businesses can easily search and obtain information relevant to them, scrutinise and make strategic decisions that were difficult in the past (Evans & Yen, 2006; Joseph, 2009). For example, businesses can remain informed of both new and existing projects they can bid on. Non-profit businesses can also send proposals through the E-government portal to request funding support from the government. G2B includes transactions such as e-procurement, acquiring a business permit, the filing of company taxes and the development of an electronic marketplace for the government which strengthens the relationship between the government and the private sector. E-procurement has helped to reduce procurement processing time, improved document management and access to goods and services for both the government and the private sector. Even though most developing countries tend to offer more G2C services (Rorissa & Demissie, 2010), they have also made strides in providing G2B services. For instance, the use of eProcurement in India and e-Perolehan in Malaysia are both G2B initiatives that allow online tendering by businesses, enabling governments to swiftly process purchase orders and for businesses to receive payments from the government (Aman & Kasimin, 2010; Bhatnagar & Singh, 2010). In Ghana, an E-government project GCNet has helped to reduce the time for clearing goods and obtaining other services at the ports for businesses (Schuppan, 2009). Another successful G2B project is the South African Revenue Services' (SARS) e-filing system which has measurably improved transactions related to tax returns between the government and businesses (Mutula & Mostert, 2010). Similar successes of G2B are reported in Jordan (Al-jaghoub, Al-yaseen & Al-hourani, 2010) and Mauritius (Kitaw, 2006). In addition to the few success stories of G2B in developing countries, G2E E-government is also gaining traction.

2.3.3 Government - to - Employee E-government (G2E)

Government - to – Employee (G2E) E-government is concerned with the technology-mediated relationship between the government and its employees. Even though employees are also citizens, they should be treated as internal customers with separate needs which must be addressed (Ndou, 2004). G2E deals more with improving intra-governmental operations to promote efficiency. G2E aims to improve internal efficiency and adopt best practices in government operations in areas such as financial management, supply chain management, and knowledge management. G2E enables the government to undertake capacity building through e-learning processes to enhance the efficiency and performance of employees in their designated jobs; thus improving productivity (Fang, 2002; Lin, Fofanah & Liang, 2011; Rao, 2011). In this regard, G2E aids employees to offer services to citizens in matters relating to government efficiently and promptly.

On the one hand, with G2E, employees can share the workload and have access to the same data, which reduces data duplication and corruption since employees can easily be audited. On the other hand, government agencies can use the intranet to share employee information and conduct transactions with employees. Overall, G2E speeds up internal administrative processes, reduces operational costs and enhances the provision of services from the government to employees such as information on payroll, pension and compensation benefits, job training, and labour laws among others (Ndou, 2004; Rao, 2011; Sagheb-Tehrani & Ghazarian, 2016). Most developed countries have advanced in G2E; however, developing countries, particularly those in Africa, rank low in G2E implementation (Hafkin, 2009; Rorissa & Demissie, 2010). Despite this fact, literature has documented some benefits to developing countries derived through G2E.

In India, G2E has improved internal communication and services provided by the government to its employees (Ifinedo, 2006; Rao, 2011). E-Payslip is an example of a G2E initiative in Ghana by the Controller and Accountant General under the auspices of the Ministry of Finance which enables government employees to access their payslips online easily, view a summary of payslips and make decisions regarding their salaries (Dzomeku, 2014). Likewise, in Nigeria, G2E enables the government to electronically pay its employees, which has made a previously

cumbersome process easier and faster (Babalola, 2013). Overall, an integrated G2E enhances communication between the government and its employees, thereby improving employee satisfaction and retention. Collaborative G2E is necessary for effective and advanced G2G implementation.

2.3.4 Government - to - Government E-government (G2G)

Government - to – Government (G2G) E-government refers to how the government interacts with governmental agencies at the different levels (local, regional and national) and the international community at large facilitated by the use of ICTs (Ndou, 2004; Choi et al., 2016). G2G is particularly used in the decentralisation of government and to link local and regional governments to the central government (Heeks, 2006; Hafkin, 2009). In G2G E-government, the main users are government officers. G2G is meant to enable government officers to efficiently transact and perform business functions internally and with other governments, at the same time trimming down operational costs in government (Evans & Yen, 2006; Lin, Fofanah & Liang, 2011). In this regard, G2E allows government agencies to share resources, skills, and capabilities which eradicates the duplication of effort and redundant resources in the traditional setting thereby enhancing efficiency in the process (Christensen & Lægreid, 2007). G2G strengthens collaboration and cooperation among various government agencies. For example, a collaboration between the police, immigration, and passport offices can help governments address national issues such as security and crime. As such, the integration of government agencies will enable authorities to make faster and quality decisions. Some successful G2G implementations in developing countries as documented in the literature are discussed, such as WeredaNET which is a G2G E-government initiative under the Ministry of Capacity Building in Ethiopia. WeredaNET through voice over IP, messaging and video conferencing connects the Ethiopian government internationally, all regional states to the federal state, and regional states to the local states. This helps to reduce travel and administrative costs involved in document sharing and enables information to reach the lowest government institutions promptly (Kitaw, 2006; Vincent, Dombau & Rannyai, 2014). A G2G initiative by Morocco’s General Treasury (TGR) established to enable electronic workflow for public procurements allows different multi-departmental stakeholders involved in public

procurements to be connected; and this offers online tracking of procurement accounting operations (Kettani, 2014).

Similarly, through G2G all treasuries across Karnataka, India have been computerised and networked. As a result, treasuries can make payments such as salaries to staff, retirement pensions to pensioners who worked in civil service and payment to contractors (Bhatnagar & Singh, 2010). Another successful G2G is the BacenJud: a G2G project that links the Brazilian Central Bank and the Brazilian Justice Department (Joia, 2004). BacenJud has helped to improve efficiency in processing and answering requests between the two agencies. For example, a request which previously could take up to 20 days to process is completed within 24hrs using BacenJud.

Table 2-1: Summary of E-government type and benefits in some developing countries

Type of E-government	Use	Examples of Services	Examples of developing countries where implemented
G2C	Allows citizens to access information and services from government	Filing tax form, Job search, Job application Application for certificates (Birth, Death, Marriage) Renewal of driver's license Enrolment in higher education Land registration Application of building permit Immigration services Education, Health, Agriculture related services	Algeria, Angola, Ghana, Kenya, Tunisia, Egypt, Jordan, Senegal, Haiti, Nigeria, South Africa, Nepal, Rwanda, Pakistan, South Africa
G2B	Enables government to interact with the private sector (businesses)	Search for business law and regulation, Filing company tax, Registration of business, Filing social contribution for employees	Egypt, Jordan, Senegal, Nigeria, Haiti, Liberia, South Africa, Indonesia Nepal, Tunisia
G2E	Deals with interactions between government and its employees. Focuses on improving internal efficiency in government operations and reducing redundancies	Online information on salary, pay slips Conditions of service, Information on holidays, Information on compensations Sharing of workload E-training	Swaziland, Indonesia, Ghana, South Africa, Uganda, Togo, Rwanda, Tunisia
G2G	Enhances intra and inter-agency communications. Enables different government units to be integrated and sharing of resources.	Grant application, Electronic document sharing among government agencies, E-training for government workers	Mauritius, Morocco, Indonesia, Botswana, Togo, Tunisia, Swaziland, South Africa, Uganda, Ethiopia

Adopted from (Hiller & Belanger, 2001; Sagheb-Tehrani & Ghazarian, 2016)

Although these classifications are essential to understanding the possible relationships that could exist between the government and its stakeholders through E-government,

classifications depend mainly on the maturity level of E-government within a particular country.

2.4 Maturity of E-government

The high interest in E-government has necessitated the need for researchers to conduct studies into best practices to measure and monitor the progress of E-government diffusion and use (Karokola & Yngström, 2009). E-government develops in stages from inception until it reaches maturity. E-government maturity refers to growth levels in governments' online services and citizens' participation in governance (UN-ASPA, 2001; Ifinedo & Singh, 2011). The maturity models guide and help to benchmark E-government developments at every stage. The stages differ in terms of characteristics but overlap regarding descriptions. Several maturity models have been proposed in the literature and by international organisations and practitioners (Hiller & Belanger, 2001; Layne & Lee, 2001; UN-ASPA, 2001; Moon, 2002) as shown in Table 2-2.

These models range from four-stage to six-stage maturity levels but with common features and depict E-government as an evolutionary process (Irani, Al-Sebie & Elliman, 2006). The initial stage of E-government involves information publishing, which allows the government to display information for access through the website (Layne & Lee, 2001; Moon, 2002). In most developing countries, the first stage is mostly dedicated to the setting up of infrastructure (e.g. stable electricity supply, expansion of telecommunication networks and ICT, creation of wide-area networks, expansion of internet connectivity) that will support the implementation of E-government (Ndou, 2004; Sagheb-Tehrani, 2010).

The second stage is a one-way interaction where stakeholders can view information from the government. This stage is characterised by static government websites which display information to stakeholders (UN-ASPA, 2001). Stakeholders can access policy documents, download forms, video and audio applications, among others. While in the first and second stages, stakeholders access information, the next stage is more interactive.

The third stage allows for interaction and feedback from the government. Websites at this stage include data-transfer technologies with email systems incorporated (Moon, 2002). This

enables stakeholders to make enquiries and receive a response from state agencies. For example, citizens can enquire via email to find out their pension benefit from a specific government agency (Deloitte, 2001; Hiller & Belanger, 2001).

In the fourth stage, E-government is considered more transactional and involves two-way communication between the government and its stakeholders. The government offers more advanced services, through a single portal government provides services to its departments, businesses, and citizens. Government services are available 24/7 and stakeholders can complete transactions such as paying taxes, license renewals and ID card applications, among others, online (Hiller & Belanger, 2001; UN-ASPA, 2001; Sagheb-Tehrani, 2010). This stage offers a one-stop-shop government portal where stakeholders can access relevant information and do transactions with the appropriate departments and agencies.

The last stage is the highest level of maturity, where citizens have the privilege of customising the web portal according to their desired features, performing advanced services and participating in governance. E-government, at this stage, provides sophisticated online services and interactions from the government to its stakeholders and reverse (UN-ASPA, 2001; Karokola & Yngström, 2009). This stage includes, for instance, citizens' ability to engage in electronic forums and electronic voting, among others. Citizens can access information from different government departments and agencies from one central location. It is characterised by the integration of G2C, G2B, G2E, G2G, and the reverse. The last two stages are meant to enhance democracy and promote inclusive participation for and by all government stakeholders at all levels.

Most E-government maturity models have been criticised for focusing on web technologies and online advancement with the assumption that technical infrastructure, technology and user experience on E-government for citizens exist (Ndou, 2004; Cordella & Iannacci, 2010). As a result, maturity models are best suited to developed countries where the telecommunication infrastructure exists coupled with high literacy rates (Ndou, 2004). In developing countries like Ghana, the growth in information and communication structure can be attributed to the emergence of E-government (Dzidonu, 2003). As such, maturity models may over-rate or

under-rate the progress of E-government in these countries (Karakola & Yngström, 2009). Some researchers argue that the progress of E-government should be determined by the level of public sector reform or modernisation and not just technological progression (Ndou, 2004; Coursey & Norris, 2008; Norris & Reddick, 2013). In a similar light, Heeks (2006) contends assessing the maturity of E-government from this perspective is appropriate, particularly for developing countries, given that the context in which E-government is deployed and managed affects its performance. The maturity level of E-government impacts the context of the website and consequently the level of sophistication in services provided by the government and the potential benefits citizens can get (Hiller & Belanger, 2001; Goodwin et al., 2011). For example, a government at the transactional stage will provide information on payment options and allow citizens to submit forms online, which requires certain security features and connection to a database server. This makes the design of such an E-government website complicated, however, citizens will gain access to more services compared to the information stage where information is merely disseminated online.

Table 2-2: Summary of some proposed E-government models

Hiller & Belanger (2001)	Information dissemination	Allow posting of information on websites
	two-way communication between government and citizen	Allowing for download of forms, thereby making the web more interactive.
	Transaction phase	Makes it possible for citizens to make a transaction online
	Integration stage	Government systems at different levels are vertical and horizontally integrated
	Political participation	Allows citizens to participate in government decision making through forums, e-voting
Layne & Lee (2001)	Catalogue	Government has a web presence with few static websites
	Transactional services and forms	Citizens can do and complete transactions (such as pay taxes, renewing passports and so on) online.
	Vertical integration	Focus on government transformation and offers more transaction services online.
	Horizontal integration	Allows for concurrent verification and validation of government information, provides citizens with unified service and strengthens intergovernmental relations
UN-ASPA (2001)	Emerging Web Presence	Government has a minimum of web presence, and most websites remain static with few options for citizens
	Enhanced Web Presence	One-way interaction between government and citizens. Government provides much more information on the web

		and citizens have access to public policy documents and downloadable databases
	Interactive Web Presence	Citizens can contact government officials through emails, fax etc.
	Transactional Web Presence	Involves a two-way communication between government and citizens. Government services available 24/7 and citizens can complete transactions such as paying taxes, renewing of licenses and applying for ID cards online
	Networked Web Presence	Provides sophisticated online services and interactions. Citizens can access information from different government departments and agencies from one central location. It is characterised by the integration of G2C, G2B, G2G and the reverse.
Moon (2002)	One-way communication	Governments at this stage post data and information on the Websites
	Two-way communication	This stage there is an interaction between the governments and the stakeholders
	Service and financial transactions	E-government users can execute self-services that involve financial transactions
	Integration	Horizontal and vertical integration between departments which allows data sharing and systems
	Political participation	Focuses on political activities such as online voting, e-democracy

E-government stakeholders may have access to varying services, depending on the stage of E-government development. Table 3 illustrates the various E-government stakeholders and the services available based on the developmental stage of E-government.

Table 2-3: E-government type in stages with examples of services

	Stages of E-government				
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Type of Government	Information	Two-way communication	Transactional	Integration	Political Participation
Government to Citizen (G2C)	Job search	Enquiries and enrollment in higher education	Register and obtain birth certificates	24/7 one-stop shop to all citizens' services, e.g. e-health	Online voting, e-participation
Government to Business (G2B)	Search for business laws and regulations	Enquiries on social contribution for employees	Register and obtain a business license	Access to all business services, e.g. paying tax online, e-procurement	Filing comments online
Government to Employee (G2E)	Organisation restructuring information	Request for conditions of services	Electronic paychecks	A one-stop shop for jobs, upgrading, retirement benefits etc.	N/A
Government to Government (G2G)	Requirement of agencies information	Enquiries from regional and local government agencies	Electronic transfer of funds among agencies	All departments are linked which allows for sharing of information and systems	N/A

Adopted from (Hiller & Belanger, 2001)

2.5 Benefits of E-government in Developing Countries

Many studies have demonstrated that citizens, businesses and government agencies can derive significant benefits from E-government (Jaeger & Thompson, 2003; Ndou, 2004; Bhatnagar & Singh, 2010). Before recent years, governments in developing countries had a traditional arrangement where most operations and procedures were performed manually, characterised by long queues and lots of paperwork. Obtaining services from the government was such a difficult task. This is because many government officers requested gratification for the simplest task, such as procuring government forms (Ifinedo, 2006). Citizens were mostly required to travel long distances and sometimes join several queues to obtain services from government agencies (Ndou, 2004; Kettani et al., 2008; Nkwe, 2012). Also, obtaining services from the

government demanded movements to and from several departments, and this made the process stressful, laborious, costly and time-consuming. The provision of services from the government to its stakeholders was inefficient and quite a slow process. Productivity in the public sector was considered low, characterised by high bureaucracy, bribery, and corruption (Basu, 2004; Tolbert & Mossberger, 2006; Aladwani, 2016). More disturbing was the lack of transparency and accountability, which created mistrust between the government and its citizens. The need to avert this trend in the public sector became increasingly important, particularly, the need to boost productivity, reduce the cost of government operations, and deliver better services to citizens (Fang, 2002; Ndou, 2004). The advent of E-government has resulted in a paradigm shift from the conventional government set up in developing countries to offering benefits outlined below.

2.5.1 Quality of Service Delivery

E-government has created various opportunities for governments to improve their interactions with citizens, expand their business horizons with the private sector through the electronic market and ensure effective coordination between government agencies. E-government initiatives are mainly targeted at improving the overall efficiency of government performance through the provision of quality services to citizens and businesses while optimising its internal operations (Almarabeh & AbuAli, 2010; Mistry & Jalal, 2012; Thakur & Singh, 2013). In this light, the use of E-government has helped to transform public administration; speed up service provision and improve the quality of services to its stakeholders for many governments in developing countries (Basu, 2004; Kitaw, 2006; Schuppan, 2009; Agangiba & Agangiba, 2013; Mittal & Kaur, 2013). It has enhanced the overall satisfaction with the delivery of public services and the dissemination of information on government operations. Government services have become more service-oriented and proficient. E-government, through its online services via the web, promises 24/7 access to services and information from the government at a convenient time to beneficiaries. In many developing countries, as far as access to information is concerned, this promise has been largely delivered (Teicher, Hughes & Dow, 2002; Schuppan, 2009; Rorissa & Demissie, 2010; Jasmi et al., 2018). For example, most African governments have developed websites and portals where citizens can get information on government services

and operations at their convenience (Rorissa & Demissie, 2010). This has helped to save time and reduce costs significantly.

2.5.2 Cost Reduction

The traditional government setup was associated with many costs due to excessive paperwork, extensive travel, long queues and waiting times related to government services and operations thereby affecting the overall productivity of both government and citizens (Kettani et al., 2008; Bhatnagar & Singh, 2010; Kaisara & Pather, 2011). It is in this light that governments, despite their scarce resources, have greatly invested in E-government through the adoption of a wide range of technologies to increase cost- efficiency and save time (Bhatnagar & Singh, 2010). In a similar light, citizens have adopted E-government services to save time and reduce costs through the use of E-services (Thakur & Singh, 2013; Kettani, 2014). E-government, therefore, has cost reduction benefits for both government and citizens (Nkwe, 2012). For instance, automating vehicle license enquiries and renewals will free government resources which can be channelled for other local services while saving citizens the time and cost of having to make several trips to physical government offices. Governments have made gains by implementing E-government as agencies now use less space, do less paperwork and require less workforce for the same work, which previously demanded many resources. The use of E-government overall has improved resource management leading to more transparent and accountable governance (Fang, 2002; Bhatnagar & Singh, 2010; Choi et al., 2016).

2.5.3 Transparency, Accountability and Trust

Studies have shown that prior to E-government, trust in the government was declining due to several bureaucratic processes that frustrated citizens who visited government offices for services (Tolbert & Mossberger, 2006; Morgeson, VanAmburg & Mithas, 2011). It is perceived that E-government has the potential, to a large extent, to increase citizens' trust and confidence in the government by providing transparent and accountable governance (Tolbert & Mossberger, 2006; Choi et al., 2016). This is because E-government improves service delivery to citizens, and this could, in the long run, change their perceptions about the government. Research has long established that citizens who are satisfied with the use of E-government

tend to trust the government more (Welch, 2005; Tolbert & Mossberger, 2006). For example, Tolbert and Mossberger (2006: 358) postulate ‘that the use of government websites may lead to positive attitudes toward the government, which, in turn, may encourage improved trust or confidence in the government generally’.

Moreover, the capturing of electronic data enhances the monitoring and evaluation of activities at government agencies; increasing transparency and accountability. The increase in transparency and accountability is also key to strengthening democracy, which leads to better governance (Gyaase & Gyamfi, 2012; Oni, Okunoye & Mbarika, 2016). Given that E-government covers a wide range of services: education, health, agriculture, security, and political participation (e.g. e-voting), accountability is crucial to ensure agencies manage resources allocated to them properly. This is particularly useful for developing countries where corruption contributes a significant cost to governments (Bhatnagar, 2003).

2.5.4 Corruption Reduction

Research shows that perceptions of corruption in developing countries are high as compared to developed countries (Dada, 2006; Bal, Biricik & Sari, 2015; Aladwani, 2016). Combatting corruption is critical to boosting growth by ensuring that resources and investment are not diverted for unintended purposes. In many developing countries, corruption has been identified as the biggest obstacle to economic development (World Bank, 2001 cited in Elbahnasawy, 2014). According to Mistry and Jalal (2012: 150), “factors such as rigid bureaucratic traditions, low level of public sector wages, weak or ineffectual penalty systems, institutional controls, lack transparency of rule processes” contribute to corruption. E-government has been touted as an important tool to mitigate corruption. It is seen as an anti-corruption programme that can help curb corruption in the government as it enables effective tracking of government processes (Elbahnasawy, 2014; Kim, 2014). So far, it has helped to transform the public sector in many developing countries. For example, it has helped to minimise face-to-face interactions with officers who may demand a bribe or be bribed to manipulate government processes (Kitaw, 2006; Sagheb-Tehrani, 2010; Mistry & Jalal, 2012). It has also provided a means of tracking data on government transactions and decisions made by a government officer acting as a disincentive for government officers to engage in corrupt

practices such as fraud, bribery or embezzlement (Bhatnagar, 2003). Additionally, E-government has expanded access to information, thereby creating more awareness of corruption and corrupt behaviours (Elbahnasawy, 2014; Jasmi et al., 2018). The increased access is expected to promote more inclusive and participatory governance.

2.5.5 Inclusive Governance

A major objective of E-government is to improve the relationship between the government and its stakeholders (Cocchiglia & Vernaschi, 2006). It is perceived that E-government “represents an opportunity to leverage the infrastructure to develop artefacts that assist the marginalised by providing more accessible local services” (Thakur & Singh, 2013: 47). In this regard, E-government helps to promote inclusive governance where all citizens can participate in decision making; thereby broadening citizens’ participation. This inclusive participation empowers citizens and contributes to strong democratic processes (Kitaw, 2006). It also promotes equality and eliminates discrimination to a great extent due to the anonymity it offers since most services are provided via the web (Almarabeh & AbuAli, 2010; Mistry & Jalal, 2012). E-government is seen as having the potential to extend government services and bridge the access gap that exists between the government and citizens. For instance, it has helped improve the information gap between the government and rural citizens (Hoque & Sorwar, 2015). In effect, making governance more inclusive and the government responsive to the needs of citizens. As highlighted by OECD (2001), inclusiveness is a major characteristic of good governance that ensures that opinions of all, particularly the vulnerable in society are taken into account in decision-making. However, achieving a totally inclusive E-government demands that E-government projects are aligned with context; technological, social, and cultural needs of citizens (Heeks, 2003; Bonacin et al., 2010).

Despite the benefits derived so far, several challenges are hindering the progress of E-government in developing countries.

2.6 Challenges of E-government in Developing Countries

Most of the E-government challenges are attributed to inadequate ICT infrastructure and a lack of human capacity. There is also a lack of equal access, particularly between the rural and urban areas as well as other accessibility issues that demand attention to have successful E-government implementation (Bhatnagar, 2002; Ngulube, 2007). It is perceived that many E-government initiatives in developing countries are transferred directly from developed countries which according to Heeks (2005: 63) creates a gap between “design and reality” since the issue of context is ignored. Another setback is the issue of corruption and inadequate funds, which make it difficult to sustain existing E-government initiatives (Heeks, 2003; Stanforth, 2006; Aladwani, 2016). There is also a lack of legal frameworks to support effective E-government implementation. These challenges are discussed in detail in the following subsections.

2.6.1 Lack of Infrastructure

Infrastructure development is important to support modern technologies necessary for the implementation of E-government. Lack of infrastructure is considered the biggest challenge that hampers the successful implementation of E-government (Lin, Fofanah & Liang, 2011; Nkohkwo & Islam, 2013). E-government requires the necessary infrastructure set up to be deployed countrywide, however, many developing countries compared to their developed counterparts lack such infrastructure (Ndou, 2004; Gichoya, 2005; Almarabeh & AbuAli, 2010). These include a strong telecommunication backbone, internet access, ICTs, and a reliable power source (Jaeger & Thompson, 2003). According to Nkohkwo and Islam (2013), internet connectivity and stable power supply form a key aspect of the infrastructure challenge, particularly for countries on the African continent. Africa has the lowest internet penetration compared to the rest of the world (Internet World Stats, 2016) with the highest internet tariffs (Lin, Fofanah & Liang, 2011). This acts as a major setback given that the internet is the main mode of delivering E-government services (Coursey & Norris, 2008; Rorissa & Demissie, 2010; Malik et al., 2016).

The expansion of telecommunication networks and internet access is crucial to provide equal access and bridge the gap between urban and rural areas. As governments continue to accept opportunities for new technologies in the E-government sector, a wider gap is created between those with access to ICTs and those without which results in barriers to E-government participation (Mphidi, 2008; Zheng & Walsham, 2008; Almarabeh & AbuAli, 2010; Cumbie & Kar, 2014; Hoque & Sorwar, 2015). Citizens without access to ICTs cannot learn to acquire the needed skills to fully benefit from E-government. It is important, therefore, that the government puts firm laws and policies in place to facilitate access to ICT infrastructure. This is because setting up the infrastructure is mostly regulated by law and policy (e.g. telecommunication policy) which makes legislation an important aspect of successful E-government implementation (Gichoya, 2005; Thakur & Singh, 2013).

2.6.2 Lack of Legal Framework

Policies and legislation are important factors for the diffusion and adoption of E-government. In many countries and in most instances, the legislation sets the terms of reference for E-government projects (Thakur & Singh, 2013). As a result, the policies and laws in a given country are important as it can impede the desired results of E-government. However, many developing countries, especially those in Africa, have weak institutions and a legal framework which hinders the smooth implementation of E-government (Ndou, 2004; Rorissa & Demissie, 2010). This could sometimes be attributed to the lack of political will (Cordella & Iannacci, 2010; Thakur & Singh, 2013) to enforce the policies that relate to E-government implementation. Like any ICT application, E-government implementation is inherently a political process (Stanforth, 2006) as such political willingness and leadership coupled with smart policies are key to help attain its developmental goals faster and at a reduced cost (Basu, 2004). For example, the government of Ghana put in place the ICT for accelerated development (ICT4AD) policy to help expand and ensure access to ICT (Dzidonu, 2003). An agency, National Information Technology Agency (NITA) was also established to implement the policy (NITA, 2008). NITA is mandated to enforce ICT4AD policy and directed to identify and promote innovative technologies, practices, standards, and guidelines among government agencies. It revealed that the successful implementation of E-government requires a new set

of laws, policies, and legislation that can be enforced impartially to protect the user (Adesola, 2012). For instance, there is the need to purposely put in place a law to fight cybercrime which is a global threat with regards to the Internet (Huang & Bwoma, 2003; Bélanger & Carter, 2008; Babalola, 2013). Such legislation needs to be designed in a way to protect the data of users regarding security and privacy so they can trust and feel comfortable to use E-government services.

2.6.3 Security, Privacy and Trust

Many E-government users do not trust the system and feel reluctant to use it if they cannot be guaranteed the security of their personal information (Bélanger & Carter, 2008). This lack of trust in E-government systems may negatively impact on its adoption. Most E-government systems collect confidential data from users, as such, security and privacy are key aspects to address during implementation (Huang & Bwoma, 2003; Bélanger & Carter, 2008). It is perceived that security and privacy influence citizen satisfaction in the use of E-government services (Choi et al., 2016). In light of this, the government needs to address challenges related to electronic activities such as information sharing, computer crime, data security, and intellectual property rights. Security is an important technical construct that helps users procure in safety while maintaining the integrity of data. As such security features need to be considered concurrently with each upgrade and scheduled maintenance of E-government applications to ensure confidentiality, authenticity, and integrity of information (Karokola & Yngström, 2009; Choi et al., 2016). Governments need to design Public Key Infrastructure (PKI) to tackle these issues and to guarantee secure transactions (Ndou, 2004; Agangiba, Kontoh & Ansah, 2013).

Security features, however, become complicated based on the technological complexity and the sophisticated nature of services offered (Karokola & Yngström, 2009). For example, an E-government application offering online transactions requires more advanced security features to protect personal information, and ATM card information, among others, compared to one only displaying information. Since electronic communications are highly susceptible to privacy attacks, there should be legal frameworks in place to handle such issues (Basu, 2004; Bélanger & Carter, 2008). For instance, the government needs the necessary framework in place to allow

digital signatures (replacement for handwritten signatures) for transactions. To this end, Waziri and Yonah (2014), contended that to holistically address security issues, both technical and non-technical elements such as social, cultural and legal should be factored into consideration. Ensuring security is a key aspect since it is a crucial means of building citizens' trust in the E-government system. Every stage of E-government demands its specific, robust security features be designed by experts, developing countries still lack such skilled staff (UN-ASPA, 2001; Heeks, 2005) which poses a challenge to E-government deployment and upgrade.

2.6.4 Lack of Human Capacity

In most developing countries, the lack of human resources is a big challenge for E-government because many government staff are not well equipped owing to inadequate training for the public sector (UN-ASPA, 2001; Bwalya, 2009). According to Chen et al. (2006), a major distinction in E-government success between developed and developing countries is the latter's deficiency in human resource capacity. Many government employees and officers in developing countries lack the skills, expertise, and training in the area of installation, design and deployment of ICT infrastructure and the development and promotion of E-government strategies (Moon, 2002; Ndou, 2004; Chen et al., 2006; Dada, 2006).

According to Ebrahim and Irani (2005: 604), although some governments have IT staff, "most of their training may not equip them to program industry-strength web-enabled applications". In light of this, Rorissa and Demissie (2010), emphasised the need for developing countries, especially those in Africa, to invest in human capital necessary to maintain ICT infrastructure. The human resources (ICT managers, web designers/ developers, procurement officers, and others) required may, however, differ from country to country depending on E-government goals to be pursued (Basu, 2004). Governments should prioritise E-government goals and recruit qualified staff in line with them as well as implement mechanisms to ensure regular training to keep staff abreast of modern technologies. The deficiency in capabilities also emanates from high illiteracy rates, low ICT education, and limited access to the internet experienced by developing countries. In general, the lack of in-house expertise forces the government to outsource technical skills internationally which sometimes results in a design

that does not befit the context and with an additional financial burden (Heeks, 2005; Chen et al., 2006).

2.6.5 Design- Reality Gap

According to Heeks (2005), there is sometimes a mismatch between what the citizens require and what the government offers, creating a “design-reality gap”. This gap, which exists between local reality and system design, is seen as a major contributor to E-government’s failure (Heeks, 2005; Dada, 2006; Choi et al., 2016). When E-government services are not designed to be citizen-centric, the tendency that they will receive patronage and meet user satisfaction is low (Bertot, Jaeger & McClure, 2008; Verdegem & Verleye, 2009; Janssen, Van Der Voort & van Veenstra, 2015). There is the need, therefore, to consider the context in which E-government is being deployed to develop more citizen-centric services.

From this perspective, Fountain (2001) differentiated two types of technologies “objective and enacted”. She further explained that objective technology is an already-invented technology implemented by an E-government decision-maker while enacted is one that is designed and deployed specifically to the context. Based on this assertion, Heeks, (2005), contends that most E-government initiatives fail in developing countries because technologies deployed are enacted; directly transferred from the developed world and not necessarily befitting the context. This happens because most E-government designers in developing countries are external to the context of deployment, which results in a “design-imposing application” (Heeks, 2005: 65). Given the substantial differences between developed and developing countries, it is crucial for developing countries to adopt context-oriented strategies to succeed in E-government implementation (Chen et al., 2006; Ochara, 2008; Schuppan, 2009; Priandi, Fernandez & Sandeep, 2019). For E-government to succeed, contextual conditions such as social, political, legal and the human capital prevailing at the time of implementation play a significant role. Also, when E-government is deployed incrementally, the risk of failure becomes lower (Dada, 2006) since implementers can plan and allocate funds to a specific task at a time. Misappropriation of funds due to poor management, bribery, and corruption is a major setback to the success of E-government.

2.6.6 Corruption and Inadequate Funds

Most E-government projects in developing countries fail due to inadequate funds since donor partners fund many of them (Stanforth, 2006; Schuppan, 2009; Nkwe, 2012; Nkohkwo & Islam, 2013). As a result, good financial management is crucial to make the best use of resources allocated for E-government projects. The project needs to be well planned and executed in small bits since larger projects are likely to fail if funds run out or are cut by donors. Literature shows that many large projects fail in developing countries (Heeks, 2002; Dada, 2006) when the allocated funds are inadequate or mismanaged through corruption. While E-government is touted as a tool for fighting corruption (Bhatnagar, 2002; Bertot, Jaeger & Grimes, 2010; Kim, 2014; Serra et al., 2015), sometimes E-government projects fail due to mismanagement as a result of corrupt practices (Heeks, 1999; Cocchiglia & Vernaschi, 2006; Kim, 2014; Aladwani, 2016; Choi et al., 2016). In developing countries where the perception of corruption is high (Dada, 2006; Bal, Biricik & Sari, 2015; Aladwani, 2016), it becomes an important factor to consider. Corruption in the form of bribery, kickbacks, over-pricing, and embezzlement, among others, abuses the resource earmarked for E-government projects and diverts them from attaining their full potential. In this manner, corrupt acts have an adverse effect on E-government, both directly and indirectly. In developing countries, it is typical to find that public officers are motivated either socially or politically (Aladwani, 2016). For instance, an individual may be awarded an E-government project based on the person's affiliation to a senior public officer rather than expertise and competence. As a result, if the E-government initiative is not efficiently executed, it becomes difficult to probe. The preferential treatment is given to such persons instead of qualified and skilled staff affects the general performance of E-government. Given the large sum of resources budgeted for E-government projects, they must be maximised for the benefit of all by providing equal access to all citizens.

2.6.7 Digital Divide

A clear distinction between E-government and other electronic services is that the latter has a targeted audience while the former should be accessible to all citizens (Kaaya, 2004; Schuppan, 2009). This is because services offered by governments mostly have no alternatives (Kaaya, 2004; Schuppan, 2009; Cumbie & Kar, 2014; Leist & Smith, 2014; Tashtoush, Darabseh & Al-

sarhan, 2016), as such, equal access for all citizens is crucial. The lack of equal access for citizens in digital society has long been a critical issue resulting in several umbrella terms: digital exclusion, info-exclusion and social exclusion (Muddiman, 2000; Joi, 2004; Ochara, 2008; Watling, 2011). The term “digital divide” been popularised by researchers (Fang, 2002; Joi, 2004; Kaaya, 2004; Dobransky & Hargittai, 2006; Mphidi, 2008; Kaisara & Pather, 2011; Hoque & Sorwar, 2015; Choudrie & Alfalah, 2016) to describe the gap created between those who have access to ICTs and those that do not. Individuals with no access cannot learn to obtain the pre-requisite skills needed to operate ICTs and access information in a digital society. Lack of ICT infrastructure, low literacy rates, limited internet, low ICT literacy and lack of awareness have been identified by researchers as key contributory factors to the digital divide among citizens (Chen et al., 2006; Almarabeh & AbuAli, 2010; Rorissa & Demissie, 2010). Physical access to ICT is not enough since E-government demands that citizens be able to read and write to utilise it effectively. Developing countries, however, have high illiteracy rates, which pose a threat to successful E-government adoption (Basu, 2004; Ndou, 2004; Almarabeh & AbuAli, 2010). This is true, particularly for citizens in the rural and deprived communities who have limited access to ICTs and awareness of E-government benefits compared to their counterparts in the cities. The expansion of ICT is necessary to ensure equality in access to information and promote knowledge growth. As Okiy (2003: 1) accentuated “rural development is a basis for economic development and information is an important ingredient in the development process”. This view is also shared by Hoque and Sorwar (2015) who argue that inequitable access between the urban and rural areas has severe implications for productivity and fiscal growth of a country. For this reason, accessibility remains a key issue addressed by researchers to date.

2.6.8 Accessibility

Accessibility is a term used to refer to the ease with which individuals can get physical facilities (e.g. buildings, computers) and services (e.g. E-commerce, E-government services). Many studies relating to accessibility that have been conducted describe it as a crucial factor that needs to be addressed since it has a great impact on usability (Murawski & Church, 2009; Yesilada et al., 2015). Accessibility issues exist in several sectors such as transport, health,

library, education, and E-government, among others (Muddiman, 2000; Kelly, Phipps & Howell, 2005; Jaeger, 2008; Hill, 2013). For example, accessibility issues have resulted in disparity in E-government service provision between urban and rural areas (Hoque & Sorwar, 2015). Accessibility also has several foci and can be expressed in several terms: age, gender, race, language, income, education, and disability. For example, Yesilada et al. (2015) argued that income levels of different countries result in accessibility disparity between developed and developing countries. Differences in educational levels and language may lead to accessibility issues among the literate and the illiterate (West, 2008). Accessibility problems between the rich and the poor may also result due to differences in financial levels. Vulnerable groups such as women, children, and persons with disabilities (PWD), depending on the context, may encounter various accessibility problems. Although accessibility issues have diverse foci, many researchers (Jaeger, 2008; Bradbard & Peters, 2010; Henry, Abou-Zahra & Brewer, 2014) have emphasised the need to keep the scope focused on PWD, an already marginalised group. This is to ensure that the special needs of PWD are taken into consideration.

Accessibility to E-government services in this study primarily refers to the design of E-government services in a manner that is easy for PWD to use without barriers (Arrue, Vigo & Abascal, 2008b; Boussarhan & Daoudi, 2014). Studies have shown that the design of services that are accessible to PWD, in the long run, offers universal access and greater benefit to all (Abanumy, Al-badi & Mayhew, 2005; Jaeger, 2008; Henry, Abou-Zahra & Brewer, 2014). Some PWD require the use of diverse assistive technologies to have access to electronic services.

2.7 Assistive Technologies

Assistive technologies (AT) refer to any products (equipment, devices, software or hardware) that help to increase, enhance, compensate or neutralise impairments and maintain functional capabilities for PWD in everyday life (Scherer, 2005; Boussarhan & Daoudi, 2014; Visagie et al., 2017). In the context of this study, AT implies all devices and technologies that enable PWD to interact with ICTs such as the computer and other electronic devices. A major role of AT “is to enhance the capabilities of persons and to equalise the playing field for persons with disabilities” (Leung et al., 1999: 41). AT and devices such as speech recognition, braille display,

screen readers (e.g. JAWS, Mobile Speak, TALKs), magnification software (e.g. ZoomText), head pointers, tracker balls, adaptive keyboards, and character recognition scanners enable PWD to effectively interact with computers and other electronic devices (Lazar & Jaeger, 2011; Boussarhan & Daoudi, 2014). Several existing studies have shown that these technologies are not disruptive but rather enhance functional capacities and improve quality of life for PWD by enabling them to perform their daily activities independently (Scherer, 2005; Hurst & Tobias, 2011; Boussarhan & Daoudi, 2014). Many PWD depend on others to perform several tasks which sometimes can be frustrating, the use of assistive technologies helps to boost their confidence, self-esteem, and promote independence (Scherer, 2005; Filgueiras et al., 2007). AT provide PWD with opportunities to perform activities which they would otherwise have difficulties doing due to impairment, thereby improving their quality of life (Hasselbring & Baugh, 2005; Katsioloudis & Jones, 2013). PWD, however, require appropriate technologies to meet their particular needs (Pilling & Boeltzig, 2007; Boussarhan & Daoudi, 2014). To this end, customised or modified assistive technology solutions are sometimes preferred to off-shelf solutions (Hurst & Tobias, 2011). Given the significant role assistive technologies play in the lives of PWD, it is important that they are readily available and affordable.

In the context of developing countries, limited studies have been conducted on assistive technologies to ensure their safe, efficient and effective use (Borg, Lindstrom & Larsson, 2009; Eide & Øderud, 2009). The few studies conducted show that assistive technologies are scarce in most developing countries and the available ones sell at very high prices making these difficult for PWD to acquire (Eide & Øderud, 2009; Borg, 2011; Gould et al., 2015; Visagie et al., 2017). This is despite the fact that governments in most developing countries have ratified the United Nations Convention on Rights of Persons with Disabilities (UNCRPD) binding them to implement policies that promote inclusive AT and ICT for PWD (Borg, Lindstrom & Larsson, 2009; Gould et al., 2015). Though such policies exist in many developing countries, their implementation is a challenge. Gould et al. (2015) explained that this difficulty is a result of the countries' low economic income to support such policies. Another challenge related to AT use in developing countries is inadequate training and skills. Like all other technologies,

ATs demand prerequisite training, and skills to use them effectively. However, knowledge of the development of AT personnel is scarce in developing countries (Borg, Lindstrom & Larsson, 2009; Eide & Øderud, 2009). This has been attributed to the lack of policies and legislation by governments to promote research, development, and training in these technologies (Borg, 2011). The knowledge and skill of developers and providers of assistive technologies are perceived to be crucial in helping PWD select appropriate technologies and obtain the necessary training (Scherer, 2005; Borg, Lindstrom & Larsson, 2009). Consequently, most PWD in developing countries tend to lack relevant skills to effectively operate such technologies (Bengisu, 2010; Borg, Larsson & Östergren, 2011). Due to the significance of assistive technologies for PWD, it is expected of governments to ensure their availability and affordability realising that a considerable portion of the population may lack access to E-government services without these technologies.

2.8 E-government Accessibility

The ‘explicit intent of E-government effort is to provide information and services electronically to its stakeholders’ (Ochara, 2008: 25). An accessible web is, therefore, crucial in the delivery of E-government services as E-government portals are the main channels for the provision of services (Rubaii-Barrett & Wise, 2008; Malik et al., 2016).

The quality of E-government service invariably depends on the accessibility of the web (Goodwin et al., 2011; Wahid et al., 2015; Albalushi et al., 2016). For many researchers, accessibility serves as the basis for evaluating E-government services (Albalushi et al., 2016). According to Albalushi et al., (2016), web accessibility and performance are two crucial factors for any successful electronic services, therefore, to ensure equal access and promote inclusiveness for E-government services they should be accessible to all. Accessible E-government implies that citizens, regardless of disability, can interact and with ease use E-government services without barriers (Berners-Lee, 1997; Shi, 2007; West, 2008; Henry, Abou-Zahra & Brewer, 2014), in which case web-based applications should be compatible with assistive technologies PWD use. This is particularly crucial because PWD by default interact with two systems: first assistive technologies and then the system in use (Filgueiras et al., 2007). Accordingly, when web applications are designed in an accessible manner, it tends to

lessen the burden on PWD using them. The information age and the growing digital society presents a great opportunity for PWD who have faced several discriminations in previous eras to be integrated into a networked society. Access to E-government services has the potential to provide independence and boost self-confidence for PWD who have been marginalised from the mainstream population for decades now (Jaeger, 2008; Rubaii-Barrett & Wise, 2008; Cumbie & Kar, 2014).

Similar to any other electronic services, most PWD (specifically those with visual, hearing, cognitive, and mobility impairment) require various forms of assistive technologies to access E-government services (Boussarhan & Daoudi, 2014). This presents PWD with an extra cost burden compared to their abled peers - acquiring assistive technologies. The effective and efficient use of these technologies also demands that the appropriate assistive technology is chosen and PWD are given the necessary support and training in the technologies (Disability Rights Commission, 2004; Pilling & Boeltzig, 2007). Accessibility remains critical because with the most advanced assistive technologies PWD will still face challenges if E-government portals and other web applications offering E-government services are not designed to be accessible (Stewart, Narendra & Schmetzke, 2005; West, 2008; Lazar & Jaeger, 2011). It infers that addressing the issue of E-government accessibility demands an understanding of the intertwined relationship between PWD, technology, and the social context (Chaudhry & Shipp, 2005; Jaeger, 2008).

Accessibility problems faced by PWD have mainly been attributed to poor design by web developers (Heeks, 2005; Stewart, Narendra & Schmetzke, 2005; Boussarhan & Daoudi, 2014); lack of accessibility awareness from society (Abanumy, Al-badi & Mayhew, 2005; Boussarhan & Daoudi, 2014); inappropriate selection of assistive technologies; and lack of user experience for PWD (Disability Rights Commission, 2004; Dobransky & Hargittai, 2006; Cumbie & Kar, 2014). Many governments globally are advancing in the provision of online services to citizens and PWD risk being excluded from digital society if accessibility issues are not resolved (Jaeger, 2006; Rubaii-Barrett & Wise, 2008; Cumbie & Kar, 2014). To date, most E-government accessibility studies conducted have focused on developed countries (Shi, 2006; Adepoju & Shehu, 2016). A few studies conducted in developing countries revealed that PWD

faced serious challenges in accessing E-government services (Freire, Russo & Fortes, 2008; Kuzma, Yen & Oestreicher, 2009; Abu-doush et al., 2013; Makoza & Chigona, 2013; Boussarhan & Daoudi, 2014; Yaokumah, Brown & Amponsah, 2015; Adepoju & Shehu, 2016). These accessibility barriers have also mostly been identified using standardised evaluation tools (automatic tools).

2.9 Evaluation Tools

The use of evaluation tools (automatic tools) is one approach adopted by E-government accessibility researchers. Evaluation tools are software for automatically testing accessibility of portals or websites based on predefined guidelines from governments, universities, institutions, and, sometimes, companies. Examples of these tools include: EvalAccess, AccessiWeb, Web Accessibility Evaluation Tool (WAVE), AChecker, CynthiaSay, Tests de Accesibilidad Web (TAW) to mention a few (Abanumy, Al-badi & Mayhew, 2005; Makoza & Chigona, 2013; Boussarhan & Daoudi, 2014). Table 2-4 illustrates some accessibility guidelines proposed by institutions and organisations. The Web Content Accessibility Guidelines (WCAG) by World Web Consortium (W3C) are the most popular among the guidelines serving as ‘de facto’ guidelines. WCAG has been used by most researchers (Abanumy, Al-badi & Mayhew, 2005; Kuzma, Yen & Oestreicher, 2009; Olalere & Lazar, 2011; Boussarhan & Daoudi, 2014). The WCAG describes the steps developers need to adhere to create accessible web applications, particularly for PWD.

WCAG consists of 14 guidelines and 65 checkpoints to guide the development of accessible websites for a wide range of disabilities (W3C, 1999). Three priorities are defined within the WCAG based on these checkpoints: Priority 1 (16 checkpoints), Priority 2 (30 checkpoints) and Priority 3 (19 checkpoints). The three priorities conform to three levels of criteria of accessibility: Level A, Level AA, and Level AAA. A website that adheres to Level A means that all problems related to Priority 1 have been fixed. For a website to attain Level AA, accessibility issues in Priorities 1 and 2 should be fixed. Website compliance with Level AAA means issues in Priorities 1, 2 and 3 must be addressed. According to W3C standards, a website must conform to Level AA criteria to provide accessibility to PWD. Since the establishment

of WCAG, several countries have established their web guidelines by modifying those of WCAG.

However, these guidelines do not measure accessibility, hence the need for evaluation tools. Several researchers (Abanumy, Al-badi & Mayhew, 2005; Shi, 2007; Kuzma, Yen & Oestreicher, 2009; Olalere & Lazar, 2011; Makoza & Chigona, 2013; Boussarhan & Daoudi, 2014; Ismailova, 2017) who tested E-government websites or portals using evaluation tools revealed serious accessibility challenges for PWD. Evaluation tools help to detect accessibility problems quickly and conveniently, their use, however, presents some challenges. These tools can only detect up to 50% of accessibility problems (Jaeger, 2006; Shi, 2007; Bradbard & Peters, 2010) and therefore require supplementary manual testing. The sole use of automatic testing to identify accessibility challenges has also been criticised because using this approach places all responsibility on PWD irrespective of context (Adam & Kreps, 2009; Bradbard & Peters, 2010). There is lack of research studies in developing countries that involve key E-government stakeholders in understanding E-government accessibility geared towards PWD (Adam & Kreps, 2009; Jaeger & Xie, 2009; Bradbard & Peters, 2010; Henry, Abou-Zahra & Brewer, 2014) and this study is aimed at addressing this gap.

Table 2-4: Accessibility Guidelines

Participants	Description	Reference
Governments	Section 21 of the UK's 1995 Disability and Discrimination Act	(the UK, 1995)
	EUROPA - Web Accessibility Policy	(Commission of the European Communities, 2001)
	Section 508 of the U.S. Rehabilitation Act Amendments of 1998	(US Section 508, 2002)
Universities	The MIT's Web Accessibility Principles	(MIT, 2002)
	Michigan State University Web Accessibility Guidelines	(Michigan State University)
	The Oregon State University Web Accessibility Guidelines	(Oregon State University)
Institutions	IEEE Recommended Practice for Internet Practices (IEEE,	(IEEE, 1999)
	UK Mencap	(UK Mencap, 2002)
	The WAI initiative by the World Wide Web Consortium (W3C)	(W3C, 1999 -WCAG 1.0; W3C, 2008-WCAG 2.0)

Adopted from (Abanumy, Al-badi & Mayhew, 2005)

2.10 Chapter Summary

E-government has become a global phenomenon and a necessary tool for improved governance; as a result, many governments have adopted it (Gyaase & Gyamfi, 2012; Adrees, Omer & Sheta, 2015). However, developing countries still lag in the provision of E-government services, particularly services geared towards PWD (Adepoju, Shehu & Bake, 2016). Accessibility has been identified as one such hindrance which tends to exclude PWD. Although the need to give special attention to PWD has been widely acknowledged, few studies have been conducted on the accessibility of E-government services for PWD in the context of developing countries. These few studies fall short of providing empirical evidence regarding the contextual roles E-government stakeholders play in the exclusion of PWD from such services. This is because the use of evaluation tools following technological determinism has dominated this research field where key E-government stakeholders are hardly involved in soliciting their understanding of accessibility within the given context.

This study emphasises the local context, where the study is being conducted. This is because context consideration is crucial to the successful development of E-government in developing countries (Heeks, 2005; Schuppan, 2009; Priandi, Fernandez & Sandeep, 2019). Additionally, the adoption of appropriate policies and technologies are necessary to enable developing countries to harness the full benefit of E-government initiatives in their contexts (Cocchiglia & Vernaschi, 2006; Choi et al., 2016; Goldkuhl, 2016). Research has long shown that E-government developers and government implementers influence how E-government services are developed (Heeks, 2005; Yildiz, 2007); however, few studies have been conducted in developing countries involving these key stakeholders (Madsen, Berger & Phythian, 2014). Moreover, in the E-government community, few researchers have used theories or developed frameworks for understanding accessibility issues geared towards PWD (Jaeger & Matteson, 2009). Studies have suggested that it is not sufficient to ‘consider who may be excluded, but also the conditions under which exclusion occurs’ (King & Youngblood, 2016: 725). Thus, this study seeks to better understand how PWD become excluded from E-government services based on an empirical case in Ghana.

CHAPTER 3 : THEORETICAL BASIS

3.1 Introduction

This study seeks to investigate the accessibility of E-government services for persons with disabilities (PWD) in Ghana. In particular, the study aims to identify how key E-government stakeholders perceive accessibility and contextual drivers that lead to the exclusion of PWD. This chapter introduces the theoretical basis used in this study by highlighting the relevance of concepts to the phenomenon under study. The chapter covers discussions on theoretical models for studying disability and accessibility for PWD. Further, a sensitising framework is developed based on sensitising concepts drawn from E-government accessibility literature. The chapter also outlines the benefits of social exclusion theory as a sensitising lens to understand the roles of E-government stakeholders and the contextual drivers involved in the development of E-government services that lead to the exclusion of PWD.

The rest of this chapter is structured as follows: Section 3.2 discusses disability as a concept; Section 3.3 covers theoretical models on accessibility; 3.4 focuses on the proposed sensitising framework; Section 3.5 discusses the theoretical foundations for data interpretation; and finally, Section 3.6 concludes the chapter.

3.2 Disability

Disability has no unified definition; it differs depending on context and the experience by individuals (Mitra, 2006; Koca-Atabey, 2013). In general, disability refers to any form of impairment such as visual, hearing, mobility speech and cognitive that results in functional limitations for an individual (Palmer, 2011; Altman, 2013). Visual impairment is classified as the most restrictive type of disability (Venter & Lotriet, 2005; Boussarhan & Daoudi, 2014). Causal factors of disability have been identified to include: ageing conditions, chronic ailments, low birth weight, poor nutritional status, low immunisation, poverty among others (Elwan, 1999; UNESCO, 2014). In many countries, PWD are marginalised and highly associated with poverty; hence, they battle with stigma (Mitra, Posarac & Vick, 2011; Samman & Rodriguez-Takeuchi, 2013).

Disability is acknowledged as a crucial issue that demands attention in many countries. However, not many efforts have been dedicated to resolving issues relating to disabilities particularly in developing countries even though disabilities statistics remain high (Borg, Larsson & Östergren, 2011; Mitra, Posarac & Vick, 2013). A typical example, Africa, which is the second largest continent in the world, has 10 per cent of its population disabled (Rorissa & Demissie, 2010; WHO, 2011). Over the years, many governments in developing countries have made efforts in bridging the gap between the disabled and the mainstream population (Loeb et al., 2008). It is perceived that equal access for PWD in the information era has the potential to empower them and help improve their quality of life (Rubaii-Barrett & Wise, 2008; Boussarhan & Daoudi, 2014). With the dawn of ICT and digitalisation of government, much is expected from governments to ensure equal access and to promote participatory digital society. Studies (Dobrinsky & Hargittai, 2006; Fontes et al., 2014) show that disability models guide strategies and the measures used to handle disability issues. The prominent models include: medical, social and biopsychosocial as summarised in Table 3-1.

Table 3-1: Summary of disability models

Medical	Social	Biopsychosocial
Disability is an individual problem.	Disability is a social problem.	Disability is both an individual and a social problem.
The responsibility associated with disability is placed on individuals with impairment.	The responsibility associated with disability is solely placed on society and ignores or impairment.	The responsibility associated with disability shared by individuals with impairment and society.
PWD are viewed as devalued entities in society.	PWD are valuable people in society.	PWD will make a more useful contribution when society creates an enabling environment that improves impairment.
In integrating PWD into society, the power of control lies with medical/ technological experts.	PWD have full control of their lives in society.	Integrating PWD into society is a collaborative effort between technological experts, society, and PWD.
Solutions for PWD solely lies with on medical /technological experts.	Solutions for PWD depend on the structuring of the social and political settings	Solutions for PWD depend on technology with the right social and political settings.

Adopted from (Oliver, 1990; Dobrinsky & Hargittai, 2006; Fontes et al., 2014)

Despite the existence of these models, PWD still face several challenges accessing information and services in the digital era and ‘have remained isolated from the decision-making processes that affect their lives’ (Fontes et al., 2014). For this reason, researchers have proposed various accessibility models to help improve access to services for PWD in the information age.

3.3 Accessibility Models

Accessibility remains a key feature of any service delivery as such studies on it is continually increasing (da Silva & Alturas, 2015; Adepoju & Shehu, 2016). In the information society era, accessibility that is focused on PWD is necessary because they stand to benefit more if they can access electronic services at their convenience (Pilling & Boeltzig, 2007; Dobransky & Hargittai, 2016). In light of this, several accessibility models have been proposed by researchers to serve as a reference for enhancing access, particularly to electronic services for PWD. The use of models helps to identify gaps (Bloch & Richins, 1983) that need to be narrowed to improve accessibility.

3.3.1 Web Accessibility Integration Model

The Web Accessibility Integration Model (WAIM) describes the different ways flaws enter web design during development (Lazar, Dudley-sponaugle & Greenidge, 2004). Lazar et al. (2004), used this model to assess the perception of webmasters on accessibility. The model divides accessibility into three components: societal foundations, stakeholders’ perceptions and web development. They argued that how a society valued accessibility is reflected in the education curriculum and the training provided for web developers. Additionally, existing laws on accessibility influence the way developers prioritise accessibility. According to the model, societal foundations tend to influence the decision of stakeholders involved in the development of a specific website. The model suggests that if stakeholders are passionate about accessibility, websites developed are likely to be accessible. According to WAIM, stakeholders are influenced by the societal perceptions, which include: training, education, policy and the existing statistics on inaccessibility. These perceptions, in the end, affect the overall web development.

The model postulates that during web development, both initial and subsequent design is influenced by the guidelines and tools selected by the web developer. The tendency that the web developer uses guidelines depends on its availability, clarity, and how efficiently the developer can execute them. It aligns with a technological deterministic approach to addressing accessibility. WAIM focuses on web developers and how they can design websites to conform to accessibility guidelines and legislation. The model has been adopted in the E-government domain by Baguma et al.,(2007) to understand accessibility perceptions of webmasters working in the government sector in Uganda and to evaluate their knowledge of accessibility guidelines. Figure 3-2 illustrates the Web Accessibility Integration Model

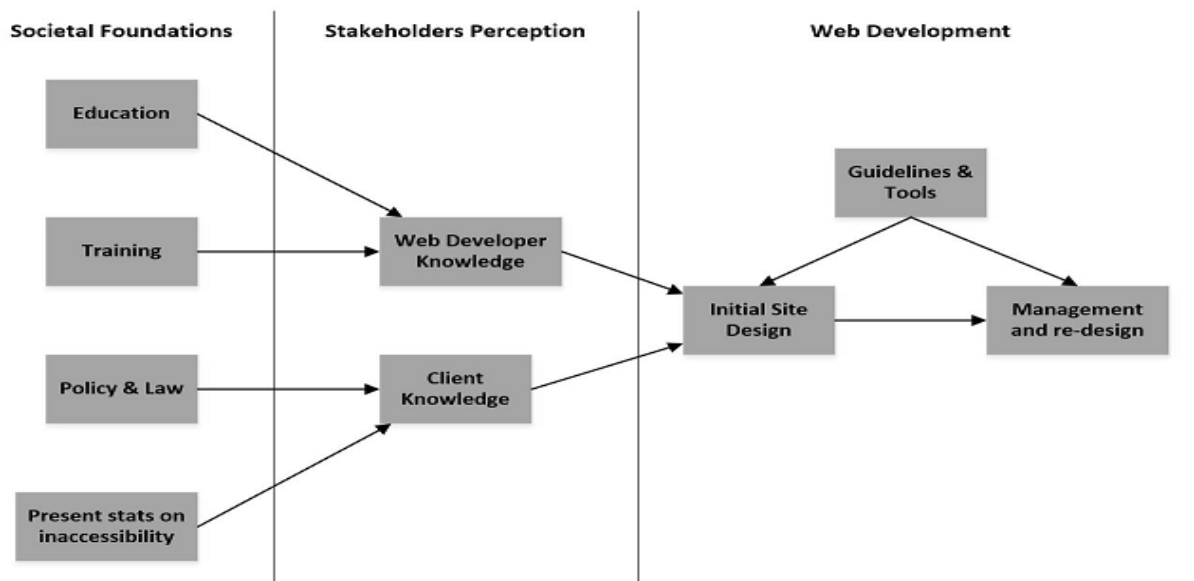


Figure 3.1: Web Accessibility Integration Model (Source: Lazar et al., (2004))

3.3.2 Summary of other accessibility models

Other accessibility models in existence include the composite practice (Leung et al., 1999), holistic framework (Kelly, Phipps & Howell, 2005) and contextualized model (Seale, 2006). The composite practice emphasises the significant role of assistive technologies (AT) in enhancing accessibility to online systems for PWD. It places responsibility on institutions to provide the needed AT to suit specific disabilities with less cost burden to PWD to improve accessibility. The model also argues that AT ought to be developed using a universal design

approach to ensure that they meet the needs of users with diverse disabilities. Leung et al., (1999), recommend the need for implementation of AT policy that to ensure available funding and affordability of AT for PWD.

The holistic model argues that the use of accessibility guidelines by developers do not necessarily guarantee the development of accessible online services. For example, a website may conform to accessibility guidelines yet may not be usable by PWD. Kelly et al. (2005), explained that accessibility guidelines are often difficult to follow due to their theoretical nature, ambiguity and differences in interpretation by web developers. They suggested that in addressing accessibility to services, emphasis should not be placed on total online services. To this end, they proposed a user-centric approach to provide accessibility for diverse disabilities. The holistic framework demands that the accessibility needs of PWD are discussed to ensure the necessary considerations are made right from the start. It recommends that resources are tailored to the need of each PWD instead of providing universally accessible services.

A contextualized model was proposed by Seale (2006), who identified key components of accessibility to include accessibility stakeholders, accessibility mediators, accessibility drivers, and stakeholder responses. The model contends that the context in which the stakeholders operate and how they interact with their context affect their response to the accessibility needs of PWD. According to the contextualized model, there are three main drivers of accessibility: guidelines, standards, and legislation. The model assumes that all key stakeholders build a community of practice over a period by engaging each other to determine solutions and define strategies. These models have so far addressed accessibility, mainly in the context of electronic learning.

3.4 Towards a conceptual framework for E-government accessibility

E-government is a complex system made up of social, technological and political components which interrelate in a way that subsequently affect accessibility. Both personal competence and the enabling environment are key to enhance participation of PWD in digital society. Apart from the impairment of PWD, external factors act as facilitators or impediments to their attainment of daily activities and social participation in digital society (Boussarhan & Daoudi,

2014). Technology is one aspect that helps to reduce the gap between personal capacities and what the environment or context demands (Bühler & Fisseler, 2007). To address E-government accessibility for PWD, context plays a vital role. Acknowledging context helps to better understand accessibility through the meanings stakeholder assign to them (Klein & Myers, 1999).

The review of the literature on E-government, accessibility, disabilities models and accessibility models all show that; in developing accessible services, certain key agents (human actors) are involved. Furthermore, the operation of these agents is influenced by some drivers (factors that interact with agents), which subsequently determine how services are developed within a specified context. In this study, concepts identified from the literature are used to develop a sensitising framework which was used as a reference for data collection. The meanings assigned to the concepts were derived from the empirical setting.

3.4.1 Sensitising concepts

Sensitising concepts originated with Blumer (1954), who argued that qualitative researchers require initial ideas to guide them to study a phenomenon of interest in their empirical settings. Sensitising concepts, therefore, provide clues for researchers to know what to look out for and what directions to explore their phenomenon of interest. These concepts ‘serve to guide initial observations as the researcher watches for incidents, interactions, and conversations that illuminate these sensitising concepts in a particular setting’ (Patton, 2015: 359). According to Charmaz (2003: 259), sensitising concepts refer to ‘those background ideas that inform the overall research problem and act as a starting point for building analysis’.

Similarly, Patton (1990), posits that the inductive application of sensitising concepts enable a researcher to examine how the concept is manifested in their empirical settings. Such concepts are mostly drawn from existing research studies, theory as well as from the researcher’s experience. In this regard, sensitising concepts are to help the researcher make sense of data, ‘but not to force an interpretive analysis’ (Patton, 1990: 391). As a result, sensitising concepts can be refined, modified and sometimes discarded by researcher depending on the empirical observation. The overall role of sensitising concepts is to act as a reference and provide an

effective framework for analysing empirical data to help develop a better understanding of the phenomenon under study (Bowen, 2006).

With regards to this study, my personal experience as a person living with a disability and a former employee at one of Ghana's most patronised government agency shaped my understanding of the sensitising concepts. All sensitising concepts employed in this study emanated from literature. Studies have shown that government officers, web developers and PWD are key stakeholders in developing accessible E-government services for PWD. Each of these stakeholders' operations is influenced by certain factors, which in the end affect the overall development of E-government services and accessibility experience for PWD. Table 3-2 indicates the sensitising concepts from literature.

Several researchers (Kuzma, Yen & Oestreicher, 2009; Goodwin et al., 2011; Yaokumah, Brown & Amponsah, 2015), have argued that policies and legislation implementations are essential to promote accessibility for PWD. Government officers' knowledge of these policies is crucial to help them make the right decisions with regards to PWD. With the right policies in place; government officers at various agencies would be guided to implement accessible E-government services. The awareness government officers have regarding accessibility will inform the accessibility interventions they put in place. For example, government officers will be more conscious of allocating adequate resources for the effective implementation of policies and legislation that would ensure accessibility for PWD (Chen et al., 2006; Rorissa & Demissie, 2010).

Web developers have long been identified as key players in improving accessibility for PWD (Jaeger, 2004; Abu-Doush et al., 2013; Malik et al., 2016). This is because E-government is mostly concerned with electronic services delivered via web-based applications and web developers design, implement and sometimes maintain these applications. As a result, the education and training acquired by web developers form an important aspect. The training and education on accessibility would enable developers to design more accessible E-government applications (Jaeger & Matteson, 2009; Yaokumah, Brown & Amponsah, 2015). Also, web developers' awareness of accessibility is useful to assist them to know how PWD interact with their applications (Freire, Russo & Fortes, 2008; Owusu-Ansah, 2014). These

factors influence the understanding of developers on accessibility and subsequently how to improve on it.

Previous studies (Jaeger, 2006; Abu-doush et al., 2013; Henry, Abou-Zahra & Brewer, 2014) have indicated that PWD ought to be involved in the development of E-government services to ensure accessibility for them. For instance, studies in (Rubaii-Barrett & Wise, 2008; Henry, Abou-Zahra & Brewer, 2014; Albalushi et al., 2016) show that developers who test their designs with PWD produce more accessible and usable applications. Many PWD (those with mobile, visual and cognitive impairment) are unable to access electronic services without AT (Pilling & Boeltzig, 2007; Lazar & Jaeger, 2011; Abu-Doush et al., 2013). To use AT proficiently, PWD need training (DRC, 2004; Pilling & Boeltzig, 2007). In this regard, the ability of PWD to access E-government services efficiently depends on the extent of training received in AT. Training in AT also enables PWD to choose appropriate technologies they require for specific functioning and efficiently manipulate them. E-government accessibility, therefore, can be ensured if the right stakeholders are involved in the development process.

This research aims to conduct an empirical study in Ghana regarding the accessibility of E-government services for PWD. Also, PWD have had a ‘history of exclusion in many areas of life, including the social, political, cultural and economic’ (Leung et al., 1999). Owing to accessibility issues, some PWD have lost trust in government (Jaeger & Matteson, 2009). This is because accessibility challenges deny them opportunities to harness the benefits of electronic services from the government in full. To investigate this phenomenon, an integrated approach considering the social and political elements that are involved in the technical development of E-government services is required. This study, therefore, requires an underpinning theory to help better understand the actions of E-government stakeholders, factors that influence their actions and the considerations made in the development of E-government services.

3.4.2 Social exclusion framework

Theory is important to inform research design and to understand and explain a phenomenon under study (Walsham, 1995). Studies in E-government accessibility have mostly employed the WCAG as a framework to evaluate the accessibility of E-government services for PWD

(Paris, 2006; Agbozo & Spassov, 2018). Many researchers have criticised the WCAG for its implicit application of the medical model of disability which fails to acknowledge the role of societal structures in addressing accessibility for PWD (Kelly et al., 2009; Cooper et al., 2012; Dobransky & Hargittai, 2016). To holistically address the accessibility challenges of PWD, it crucial to understand how the challenges come about and why they persist. Social exclusion framework is chosen as the sensitising lens for this study.

Social exclusion framework is accredited to the French scholar Lenoir (1974), who first used it to understand how certain groups of people were affected by the failure of integrative institutions in France. Social exclusion framework was developed in response to economic restructuring and technological change, which resulted in social disintegration (Fischer, 2008). Lenoir (1974), used the framework to understand poverty, its causes and the deprivations associated with it amongst the vulnerable, particularly the disabled (Estivill, 2003). Subsequently, it was adopted widely in Europe to explain the general lack of material resources (e.g. shelter, food, employment, etc.) for some groups of people within the population (Rawal, 2008). In his rendition of the social exclusion framework, Sen (2000) explained that it is an analytical framework useful to identify the causes of capabilities failure, which eventually leads to poverty. Also, the uniqueness of the social exclusion framework as compared to other frameworks for understanding deprivation is that; it offers a better insight to the experiences of those excluded or at risk of exclusion (Kabeer, 2005; Atkinson & Marlier, 2010).

Social exclusion is socially constructed and has related effects for the excluded, which varies depending on the context. Thus, exclusion results from several and different exclusionary spheres. For instance, lack of access to transport may lead to other effects such as; less interaction with relatives, limited opportunities to jobs and healthcare. For this reason, exclusion may be complete denial to access (active exclusion) or unequal access (passive exclusion) experienced by a group of persons in comparison to others (Sen, 2000; Fischer, 2008; Benbow et al., 2015). A group, in this case, refers to either people who have shared beliefs and values (e.g. religion, ethnicity) or people who share similar characteristics (e.g. AIDs, disabilities). Passive exclusion occurs through unintended consequences of structural change, institutional disjuncture or discriminatory acts. In passive exclusion, deprivation is one reason

for the exclusion, while active exclusion is when exclusion is the fundamental cause of deprivation. However, either form of exclusion has some effects on the affected. Social exclusion framework is useful to understand and explain how certain influences lead to the exclusion of a section of the populace (Sen, 2000; Lucas, 2012). It is an actor-oriented approach useful to understand ‘who is doing what’ in a relationship of actors to whom (Kabeer, 2000). The underlying principle is that certain groups of people are excluded by powerful agents or as a result of their limited capabilities. Exclusion is, however, not only in terms of materials but also the lack of agency (Fischer, 2008; Kidd, 2014). Consequently, social exclusion framework focuses on participation; thus, the lack of access to opportunities (Preston & Rajé, 2007; Lucas, 2012). To this end, exclusion is described as any missed opportunity (Soors, Dkhimi & Criel, 2013).

The literature in social exclusion indicates that exclusion is a process or an outcome. This study aligns with the perspective of several researchers (Sen, 2000; Phillips, 2008; Rawal, 2008; Fischer, 2011; Kidd, 2014) who argue that social exclusion is both a process and an outcome. Thus, social exclusion is a state where a section of the society is either partially or wholly denied opportunities enjoyed by others as well as the process that leads to or sustain such a state. Subsequently, exclusion can occur at different levels, such as individual and societal or structural levels (Letch & Carroll, 2008; Phillips, 2008). The various levels of exclusion are not isolated but interact in a way reinforcing exclusions (Phillips, 2008; Kidd, 2014). The cause of exclusion can be agentive obstruction, structural disadvantage or institutional disjuncture (Phillips, 2008; Kidd, 2014; Chereni, 2017). Social exclusion framework pays attention to both personal limitations and societal structures involved in the exclusionary process thereby helping to understand the causes of exclusions and to inform policymakers on how to design and implement appropriate intervention strategies (Adhikari, Tamrakar & Hagen-zanker, 2014). The literature in social exclusion shows that exclusion is an outcome of a process that involves agents and drivers (Barry, 2002; Mathieson et al., 2008; Kidd, 2014).

Agents of social exclusion refer to humans who have influence or whose actions and practices lead to the exclusion of others (Kabeer, 2000; Chereni, 2017). Agents owing to their socio-cultural practices or discriminatory acts may tend to exert exclusionary pressures which are

fed into policy decisions and implementation practices (Kabeer, 2000; Kidd, 2014). Agents require resources to exercise agency or control and make important decisions (Saith, 2001; Gallie & Paugam, 2004). Thus, the agency they can exercise is dependent on the resources available to them and those they can draw from within their environment. In the process, vulnerable people (e.g. PWD, children, ethnic minority groups) are most at risk of exclusion since they often have limited access to resources (Adam & Potvin, 2016). These result in unequal power relations among agents and the power differentials lead to the exclusion of some agents. For instance, Kabeer (2000), stated that even though public officers are meant to address the social needs within a community; they could be agents of exclusion by their way of practice and how they allocate resources to that need. However, exclusion is not always the actions of other agents but could be self-enforced (Barry, 2002; Rubaii-Barrett & Wise, 2008; Lucas, 2012); thus, those excluded contribute to their exclusion. While agents on their own can generate exclusions, they interact with drivers in the specified context which tend to shape or influence their actions and perceptions leading to exclusions.

Drivers are mainly contextual influences or factors which facilitate the exclusionary process either explicitly or implicitly using agents. Drivers produce and reproduce various forms of social exclusion. Drivers may be instrumental (vital and necessary) or constitutive (part of) reasons that produces the exclusion (De Haan, 1999; Sen, 2000). Several studies (Phillips, 2008; Benbow et al., 2015; Adam & Potvin, 2016) have shown that drivers of social exclusion mostly are structural elements which tend to disadvantage some sections of the population. This structural disadvantage though, may not be discriminatory, still, generate exclusions. Drivers of social exclusion could be physical (lack of roads, internet, ICTs) and non-physical (legislation, design procedures, enforcement). Also, different drivers impact differently on different vulnerable groups (Bradshaw et al., 2004). For example, government's implementation of policy to deny immigrants access to health benefits is an active form of exclusion towards immigrants (Benbow et al., 2015). Consequently, such a structural change will affect a particular group (immigrants) having no impact on other vulnerable groups.

Exclusionary process refers to various stages where limitations are placed on some individuals which tend to generate exclusions. At each stage, agents or drivers or both are involved in the

exclusionary process. This means exclusions can occur in diverse ways (1) agents can on their own generate exclusions; (2) drivers can on their own generate exclusions; and (3) interactions between agents and drivers can lead to exclusions (Estivill, 2003; Rawal, 2008; Kidd, 2014).

Social exclusion framework has been used extensively to understand and explain the lack of social participation and access to services by some group of persons within the society. For instance, the framework has been applied to understand accessibility issues relating to transport (Preston & Rajé, 2007; Stanley, 2007; Lucas, 2012), healthcare (Popay et al., 1998; Mathieson et al., 2008; Soors, Dkhimi & Criel, 2013; Benbow et al., 2015), internet usage (Foley, 2004; Chigona, Mbhele & Kabanda, 2008) and E-government services (Ochara, 2008; Makoza & Chigona, 2013; Fröhlich & Peters, 2017). In many developing countries, exclusion from political and civil rights is equated with being excluded from social rights (Soors, Dkhimi & Criel, 2013). Similarly, Sen (2000: 38), argued that “exclusion from the process of governance and political participation is an impoverishment of human lives”. For this reason, the framework has great potential in addressing accessibility issues in developing countries, particularly in sub-Saharan Africa, where inequalities exist in many spheres (Saith, 2001).

Studies (Heeks, 2002; Letch & Carroll, 2008; Ochara, 2008; Fröhlich & Peters, 2017) have shown that how E-government systems are designed and evaluated can contribute to the exclusion of already marginalised groups. Hence an appropriate approach to its development is needed to minimise exclusions. Accessibility in this study is expressed as a form of exclusion since the inability of PWD to patronise E-government services benefitted by the majority of citizens deprives them (Barry, 2002; Babajanian & Hagen-zanker, 2012). This is because governments provide monopoly services with no alternative source of supply (Zheng & Walsham, 2008; Leist & Smith, 2014). Also, access to E-government services can facilitate opportunities to jobs (e.g. online vacancies), health (e.g. E-medicals services), business (e.g. E-procurement) and productivity (e.g. G2E services). Subsequently, inaccessibility to E-government services leads to the deprivation of PWD (Makoza & Chigona, 2013). The use of the social exclusion framework in this study is appropriate because the development of E-government is a stage by stage process involving actors operating with contextual drivers (Heeks, 2005; Larkotey, Effah & Boateng, 2017; Jasmi et al., 2018). In line with the objectives

of this study, the theoretical lens will help identify drivers that impede accessibility of E-government services for PWD thereby restricting their full participation in digital society (Sen, 2000; Rawal, 2008). In doing so, it pinpoints key actors involved in the exclusion of PWD from E-government services because of their decisions or practices (Lucas, 2012).

3.4.3 Sensitising framework

Most E-government accessibility studies have pinpointed that PWD face several accessibility barriers using E-government services. However, E-government accessibility challenges have long been addressed as a technical problem rather than one of social exclusion (Cushman & McLean, 2008). The lack of access to E-government services amounts to social exclusion for PWD (Jaeger, 2006; Makoza & Chigona, 2013). Also, studies show that there is a lack of established frameworks for studying E-government accessibility (Jaeger & Matteson, 2009). In this study, a sensitising framework was developed with a theoretical perspective from social exclusion framework and integrated with the sensitising concepts from literature to provide a conceptual basis for the research. Figure 3.3 illustrates the particularisation of social exclusion framework for the study. A definition of concepts used in this study not described in social exclusion literature is offered in Table 3-2.

Social exclusion framework is used as a sensitising lens to understand the roles of E-government stakeholders and the contextual drivers that lead to the exclusion of PWD from E-government services in Ghana. Disability is one characteristic that put certain groups of persons at risk of exclusion (Saunders, 2003; Preston & Rajé, 2007; Peters & Besley, 2014). PWD bear a greater accessibility burden than others and experience exceptional accessibility challenges which need to be addressed.

In line with the objectives of this study, the following elements of social exclusion are particularised: (1) agents involved; (2) drivers of exclusion; and (3) the exclusionary process.

Agents of exclusion: With regards to this study, literature has identified three key agents; government officers, developers and PWD who play significant roles in determining and improving the accessibility of E-government services for PWD.

Drivers of exclusion- Evidence from literature show that accessibility of E-government services for PWD involves several drivers such as (1) policies and legislation; (2) PWD access to AT;

(3) literacy of PWD; (4) accessibility training of developers; (5) education of developers; (6) accessibility awareness of developers (7) training of PWD; and (8) accessibility awareness of government officers.

Exclusionary process- in this study, this process encompasses the role of agents and drivers in the development of E-government services and accessibility experience of PWD. Whiles either agents or drivers may generate exclusions, interactions between the two implicitly may exert exclusionary pressures which is fed into the development of E-government services leading to exclusions.

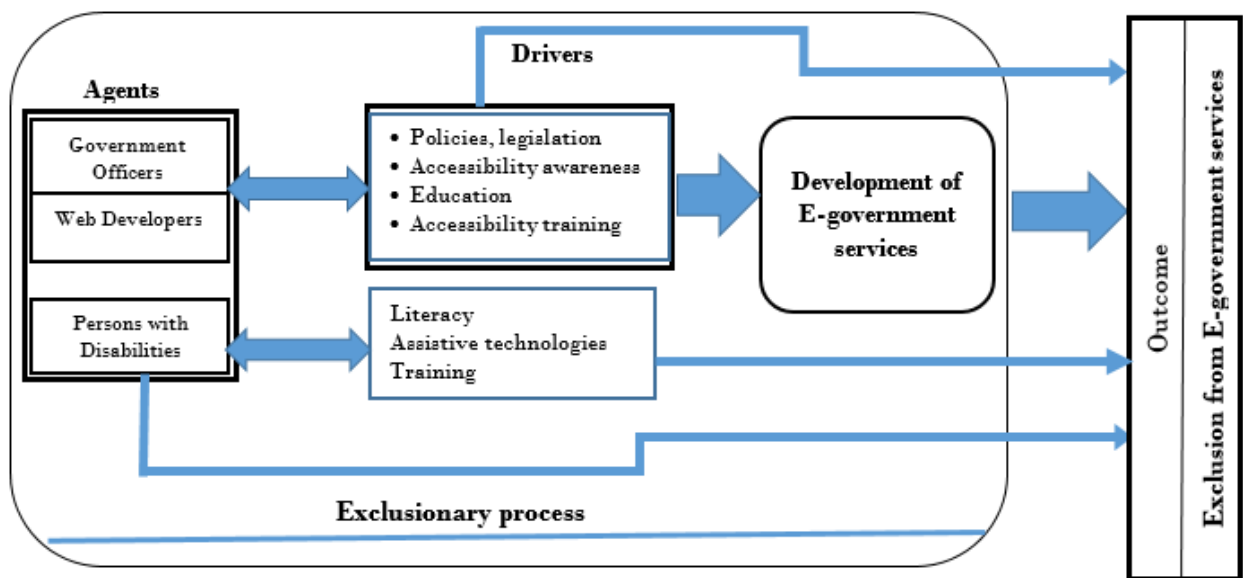


Figure 3.2: Particularisation of social exclusion theory to the study

Table 3-2: Sensitising concepts from literature

Focus	Definition	References in literature
Development of E-government services	The development and design of E-government services (e.g. inclusion of accessibility features and testing compatibility with assistive technologies)	Takagi et al.,(2004); Heeks (2005); Jaeger (2006); Kuzma (2010); Welle Donker-Kuijer et al., (2010); Kopackova et al., (2010); Goodwin et al., (2011); Al-Khalifa (2012); Power et al., (2012); Youngblood and MacKiewicz (2012); Makoza & Chigona (2013); Hsieh et al.,(2013); Cumbie and Kar (2014); Boussarhan and Daoudi (2014); Otniel (2015); Galvez & Youngblood (2014); King and Youngblood (2016); Al-khalifa et al., (2017); Darmaputra et al., (2017); Ismailova (2017)
Assistive Technologies (AT)	PWD (especially those with mobile, visual and cognitive impairment) need diverse forms of assistive technologies to access electronic government services.	Abanumy et al., (2005); Jaeger (2006); Pilling and Boeltzig (2007); Shi (2007); Rubaii-Barrett and Wise (2008); Jaeger and Matteson (2009); Kuzma (2010); Olalere and Lazar (2011); Abu-doush et al.,(2013); Henry et al., (2014); Boussarhan and Daoudi (2014); Cumbie & Kar (2014)
Policies and legislation	Implementation of accessibility policies and legislation to improve accessibility for PWD.	Lazar et al.,(2004); Kuzma et al., (2009); Kopackova et al., (2010); Kuzma (2010); Goodwin et al., (2011); Yaokumah et al., (2015); Ismailova (2017); Mtebe and Kondoro (2017)
Accessibility awareness of developers	Developers' awareness of accessibility to enable them to make considerations for PWD	Carter and Markel (2001); Abanumy et al., (2005); Bundrick et al., (2006); Paris (2006); Arrue et al., (2008b); Freire et al.,(2008); Kuzma (2010); Abu-doush et al.,(2013); Mourad & Kamoun, 2013; Hong et al.,(2015); Al-khalifa et al., (2017)
Training for developers	Training on accessibility for E-government developers.	Baguma et al.,(2007); Brophy and Craven (2007); Loiacono et al., (2009); Jaeger and Xie (2009); Abu-doush et al.,(2013); Galvez and Youngblood (2014); Yaokumah et al.,(2015)
Education of developers	Providing education for developers on accessibility (e.g. incorporating accessibility as part of learning curriculum for upcoming developers)	Lazar et al.,(2004); Heeks (2005); Jaeger (2006); Bundrick et al., (2006); Baguma et al.,(2007); Hong et al.,(2015); Yaokumah et al., (2015)
Training for PWD	Training in assistive technologies for PWD to enhance efficient use of E-government services	DRC (2004); Pilling and Boeltzig (2007); Abu-doush et al., (2013)
PWD literacy	The ability of PWD to read, write and understand web content	DRC (2004); Grantham et al.,(2012); Abascal et al.,(2016)
Accessibility awareness of government officers	Awareness of accessibility by government officers rendering E-government services	Jaeger (2004); Abanumy et al., (2005); Paris (2006); Makoza & Chigona (2013)

3.5 Theoretical foundations for data interpretation

Interpretive studies afford flexibility in the use of theory such that initial theories adopted by a researcher can be revised in order to align with concepts emerging from field data (Walsham, 1995). Consequently, initial theories for a research study could be revised or entirely abandoned at a later stage of the study (Walsham, 2006; Geeling, 2018). Data for this study was collected using the sensitising framework (figure 3.5) indicated in section 3.4.3. Data was analysed inductively using thematic analysis to identify themes. Findings from the data necessitated the need for other theories to provide a better understanding of the phenomena. For instance, the analysis of empirical data revealed that importance was afforded to the individual characteristics of PWD and contextual conditions that affected their capabilities to access E-government services. At this point, the researcher had to draw on concepts from Sen's capability approach to better interpret the empirical evidence. In another instance, it was found that structures and their interactions with E-government stakeholders afforded them agency and shaped their perceptions about accessibility. Here the researcher had to draw concepts from Giddens' structuration theory to elaborate on the empirical evidence. Again, empirical evidence afforded significance to power and influence among E-government stakeholders in the E-government development process. As a result, concepts from organizational influence theory were adopted to provide theoretical elaboration on the evidence. I discuss in brief these theories in the following sub-sections.

3.5.1 Capability approach

Capability approach developed by Amartya Sen is based on functionings and capabilities (Sen, 1999; Terzi, 2005; Vehmas & Watson, 2014). Capability approach focuses on the type of choices people can make and their capabilities to achieve them. Functioning refers to the states of a person such as being literate, skilful or wealthy. Capabilities, on the other hand, are the available opportunities to achieve functioning; thus, "what the person has or has access to, and what they can do with it" (Vehmas & Watson, 2014: 644). Capabilities are the factors that allow people to realize their achievements. For instance, literacy is a functioning whereas the opportunity to attain literacy is the corresponding capability. To this end, promoting

capabilities require that individuals convert available resources into functioning. Consequently, capability can enhance or limit one's functioning. Capability approach contends that both personal (e.g. impairment, financial resources) and environmental (economic, social, political) factors are significant to the achievement of human functionings/capabilities (Sen, 1999; Terzi, 2005; Mitra, 2006). For example, Sen (1999) indicated that developing the capabilities of PWD require several inputs which include resources, policies, socio-cultural changes to able them to be at par with the non-disabled. Similarly, Oosterlaken (2009), argues that from the capability approach perspective technologies are required to improve human capabilities and remove barriers to functionings. Thus, technology is able to provide people with the ability to achieve relevant functionings.

3.5.2 Structuration theory

Structuration theory developed by Giddens (1984) helps to understand how the human agency interacts with social structure. The theory views human agency and social structure as duality and not as separate concepts (Giddens, 1984, 1991). The theory contends that social structure is the outcomes of practices which happened in the past and it makes practices possible (the duality of structure). Structuration theory, therefore, places practices at the core of social analysis contending that practices need to be studied because they determine outcomes (Rose & Hackney, 2003; Whittington, 2010). According to Giddens (1991), structures are practices; so, as practices change over time, so do structures. Also, structures produce and reproduce rules over time that constrain or enable human actions. Structuration theory acknowledges that human actions have unintended consequences on institutional system where agents are located (Lyytinen & Ngwenyama, 1992). The theory argues that every human can exercise agency; thus, the “capability of individuals to act with conscious intention” (Giddens, 1984: 375). This means humans are knowledgeable agents who monitor their actions and their consequences as well as actions of others. Also, every human possesses the ability to change any situation because each person has unique abilities and innovativeness, so their actions cannot be absolutely predicted in advance. Giddens (1984) analyses social structure from three dimensions; signification, domination and legitimation. Further, he underscores three forms of interaction in which agency is performed; communication, the exercise of power and sanction.

To communicate effectively an agent must be knowledgeable to follow rules of conversation (Rose & Hackney, 2003; Goss, 2017). An agent can exercise power by dwelling on resources both individually and contextually (Lyytinen & Ngwenyama, 1992). Human agents draw on rules (e.g. policies) to sanction their social conduct and that of others where there are defined boundaries of expected behaviours in an organization or contextual culture. In practice, however, all three forms of structure and interactions are inextricably intertwined.

3.5.3 Organizational influence theory

Organizational influence theory helps to understand “how social actions of individuals enact influence on other individuals in order to achieve one or more goals” (Nielsen & Ngwenyama, 2002: 213). The theory argues that the ability for a person to exert influence is dependent on the resources he or she controls. For instance, a person’s expertise or skills can enable him or her to influence others. Thus, the organizational influence theory is an analytical framework to understand the sources of power, how individuals can obtain power and analyse power relationships (Ngwenyama & Nielsen, 2013). The organizational influence theory is used to understand influences in organizations as well as political behaviours of individuals within organizations. In an organization, understanding power dynamics among individuals is important as it influences the quality of organizational output (Kotter, 1977; Cohen & Bradford, 1989). The organizational influence theory also helps to explain “how change agents are able to make intended changes and achieve such changes” (Nielsen & Ngwenyama, 2002: 217). The theory defines two forms of influence; formal and informal. Formal influence sources of obtaining power include expert knowledge, authority and ability to coerce (Goodstadt & Hjelle, 1973; Drake & Moberg, 1986; Yukl & Falbe, 1990). Examples of informal influences are lobbying and persuading (Yukl & Falbe, 1990; Nielsen & Ngwenyama, 2002). Organizational influence theory points to several influence tactics that can be adopted by individuals who seek to influence others to attain specific goals. These tactics include consultations, exchange, coalition, pressure among others (Kipnis, Schmidt & Wilkinson, 1980; Yukl & Falbe, 1990). The choice of influence tactics should depend on the target (e.g. superior, colleague, subordinate) one seeks to influence (Kipnis, Schmidt & Wilkinson, 1980; Cohen & Bradford, 1989).

3.6 Chapter Summary

This study uses the social exclusion framework as a sensitising lens to study the accessibility of E-government services for PWD in Ghana. Sensitising concepts drawn from E-government accessibility literature have been particularised to the social exclusion framework to develop a sensitising framework presented in Figure 3-5. The sensitising framework is used in investigating the accessibility of E-government services for PWD to understand the roles of E-government stakeholders and to identify the contextual drivers in the exclusion of PWD from E-government services in Ghana. The framework indicates government officers, web developers and PWD are key agents of accessibility whose practices and actions are influenced by contextual drivers. The type of E-government services developed is determined by the agents and drivers. The framework recognises contextual drivers may alter the development of E-government services while acknowledging that ‘power in relationships work to put boundaries on participation, and to exclude certain agents’ views from entering the arena of E-government development in the first place (Gaventa, 2006: 29). This is key to the study of E-government accessibility in developing countries where there have been limited studies to investigate contextual phenomenon, particularly from the perspective of those at risk of exclusion. In the next chapter, the methodological approach adopted for this research is described and justified in the context of the application.

CHAPTER 4 : RESEARCH METHODOLOGY

4.1 Introduction

This chapter presents the research methodology used in this study. Specifically, it covers issues regarding research purpose, strategies, approach, research ontological and epistemological stances, research methods employed for data collection and their appropriateness and the context of their applicability. The process of data collection from three stakeholders: PWD, web developers and government officers, as well as document sampling, is also covered. The techniques used in the analysis of data are described. The ethical considerations followed to conduct this study are also discussed. The methods used in this study are thus described and justified in the context of the research.

4.2 Research purpose

Any research study aims to achieve some specific set of objectives. As a result, the purpose of the research is defined by its outlined goals. From the perspective of the research purpose, literature often has classified research studies into the following five categories (Mcelroy, 1982; Kumar, 2014):

- **Exploratory:** research that aims to discover or explore an area of research where little is known.
- **Descriptive:** research that seeks to describe or provide information about what is prevalent with regards to the problem or phenomenon under study.
- **Explanatory:** research that attempts to clarify or explain how and why a given phenomenon exists and to investigate the relationship between two situations.
- **Predictive:** research that is targeted at predicting certain phenomena.
- **Prescriptive:** research that seeks to develop a recommendation for a practical problem.

The purpose of research is, therefore, implicitly embedded in the research questions and guides the choice of appropriate methodology. To this end, a research study can have more than one purpose; for example, a research could be descriptive and same time predictive (Neuman, 2014). This study is exploratory in the sense that few studies have involved PWD in eliciting their contextual concerns; web developers and government officers to understand how their

practices and actions that lead to the exclusion of PWD. The study is also descriptive as it aims to describe the roles of agents and contextual drivers in the exclusionary process. The study investigates how these contextual drivers and the role of stakeholders reinforce the exclusionary process. On this basis, the study is explanatory in nature.

4.3 Research reasoning process

There are different reasoning processes or procedures used in conducting a scientific inquiry. A research reasoning process provides the logic for obtaining the research objectives set by a researcher or to answering the research questions. There are four strategies of reasoning relating to the conduct of scientific research: inductive, deductive, abductive and retroductive (Blaikie, 2010; Ngwenyama, 2014).

The inductive approach attempts to establish models or theory from empirical observations to better explain a phenomenon. The deductive strategy, on the other hand, seeks to test a theory or implication of theory empirically. Abductive approach tends to generate hypotheses or explanations of a phenomenon of behaviour while a retroductive approach aims to discover the underlying mechanisms that explain a phenomenal behaviour of interest (Ngwenyama, 2014). The type of reasoning chosen by a researcher is dependent on the nature of the phenomenon under study. According to Blaikie (2010), inductive and abductive strategies are more useful for exploratory and descriptive research studies; with deductive and retroductive more suitable for an explanatory research study. This study follows an inductive approach to explore and understand within a specified empirical setting the accessibility of E-government services for PWD. A sensitising framework is used to guide the construction of research instruments and to assist with the meaningful synthesis of data. The sensitising concepts in the framework were not pre-defined, but rather, their meanings were derived from the empirical setting.

4.4 Ontological and epistemological approach

Ontological assumption describes the nature of reality as it exists or perceives to exist (Creswell, 2003). Ontology, therefore, interrogates whether the existence of reality is objective (independent of those who live it) or subjective (exists only through the experience of it)

(Goertz & Mahoney, 2012). Traditionally, objectivity and subjectivity paradigms are two ways of describing reality (De Vaus, 2001; Kothari, 2004). Sometimes, however, both ontological stances are required to understand better a phenomenon leading to a mixed approach; a combination of both subjectivity and objectivity (Markus, 1994; Benbasat & Weber, 1996). A major distinction between subjective and objective study is that the former aims to understand a phenomenon from the participants' viewpoint and in so doing, helps to understand people within a specific context or cultural setting.

This study investigates the accessibility of E-government services for PWD in Ghana. IT artefacts in E-government are designed with perceptions of developers, policies and directives of implementers implicitly inscribed in them (Yildiz, 2007; Goldkuhl, 2016). It becomes important to understand the meaning these stakeholders assign to accessibility to better understand their actions. Ontologically, this study posits that all scientific interpretations are subjective. The assumption is that reality is not given out there but produced and reinforced by humans through actions and interactions (Orlikowski & Baroudi, 1991). E-government stakeholders (PWD, web developers and government officers) are active participants and therefore, their perceptions, experience and beliefs from their cultural setting shape their understanding of E-government accessibility in their social context. This study, therefore, aligns with the viewpoint that acknowledging the world of consciousness and humanly created meanings (Ngwenyama & Lee, 1997) is important to understand the behaviour and practices of people within a specific contextual and cultural setting (Alvarez, 2002). Thus this study seeks to develop subjective meanings through the unique experiences of participants (Creswell, 2009). Subjective researchers play an active role and intervene in the phenomenon of interest. As a result, the data gathered by the researcher cannot be “value-free data, since the enquirer uses his or her preconceptions in order to guide the process of enquiry, and furthermore the researcher interacts with the human subjects of the enquiry, changing the perceptions of both parties” (Walsham, 1995: 376).

The ontological stance of the researcher was justified by a number of reasons: (1) most accessibility studies ignore contextual settings (e.g. socio-economic and socio-political contexts (Abascal et al., 2016; Priandi, Fernandez & Sandeep, 2019); (2) E-government systems are implemented based on legal acts, policies and regulations operating within the context

(Goldkuhl, 2016); and (3) experiences of PWD differ from one social context to the other (Koca-Atabey, 2013).

While ontology indicates how a researcher perceives the world, epistemology is concerned with how a researcher acquires knowledge about a phenomenon of interest and how appropriate methods are; to obtain quality knowledge and an understanding that is valid (Hirschheim, 1985; Dixit & Stump, 2011; Goertz & Mahoney, 2012). In Information Systems research, three epistemological paradigms are commonly adhered to: positivistic, interpretive and critical (Orlikowski & Baroudi, 1991; Myers & Klein, 2011). These paradigms have a significant impact on how the research is understood; its reliability, validity and rigour (Becker & Niehaves, 2007; Easterby-Smith, Thorpe & Jackson, 2012). Researchers with objective and positivist stances tend to explain happenings in the social world through the use of structured instrumentation to test certain theories or hypotheses to produce a generalisable result (Orlikowski & Baroudi, 1991). In doing so, such researchers postulate that data is value-free since humans play a passive or neutral role in the social world (Creswell, 2009; Neuman, 2014). Methodologically, researchers who follow objective approaches mostly employ quantitative methods (Creswell, 2009).

Subjective researchers who adopt the interpretive paradigm seek to understand a phenomenon of interest within a particular cultural and context through in-depth interaction with participants in their given social context (Walsham, 1995; Kaplan & Maxwell, 2005). In subjective studies, the reality is not independent of the researcher, but rather is “an emergent social process- as an extension of human consciousness and subjective experience” (Burrell & Morgan, 1979: 253). In this regard, subjective researchers see humans as active makers of their social world and therefore intervene in the phenomenon of interest. Interpretive research aims to produce an understanding of a phenomenon by examining the phenomenon in the natural setting through the meanings participants assign to them (Klein & Myers, 1999; Kaplan & Maxwell, 2005). Through the use of interpretive research, IS researchers can better understand human thoughts and actions in their social contexts (Klein & Myers, 1999).

This study adopts an interpretive stance to understand better how accessibility is perceived by the various E-government stakeholders (PWD, web developers and government officers).

Using this approach, the researcher can understand and identify contextual challenges PWD encounter in accessing E-government services through their shared experiences and the roles E-government stakeholders play in that regard. Also, interactions with the web developers and government officers would help the researcher to know and understand contextual drivers and they shape their actions and practices in the development of E-government services.

4.5 Research strategy

Research strategy refers to the way a researcher enquires about a particular phenomenon and links the research questions to the methods of data collection and process of analysis to ensure that results obtained are valid (Kothari, 2004). The choice of the research strategy is dependent on the research paradigm and the phenomenon of interest being understudied (Yin, 1994). According to Creswell (2009), the most common research strategies identified in qualitative studies are phenomenology, grounded theory, ethnography and case study. This study adopts a case study strategy as a means of investigating the accessibility of E-government services for PWD in Ghana. A case refers to any human activity or event that can be studied only in its contextual existence, while the unit of analysis refers to who or what is being studied (Yin, 1994). This research involves the study of the visually impaired, web developers and government officers in their natural setting. It, therefore, utilised three units of analysis. The first units of analysis are visually impaired, sharing their experiences regarding access to E-government services in Ghana. The second units of analysis are web developers working in various software companies who are mostly were contracted by government to develop E-government services. The last units of analysis are government officers working in various government ministries and agencies rendering E-government services to the public.

A case study is used to provide a description, test theory or generate theory (Eisenhardt, 1989). A case study involves an in-depth understanding of complex issues within a single setting, extensive description of the situation and analysing data contextually for key themes (Eisenhardt, 1989; Yin, 1994; Creswell, 2009). In this regard, a case study is more suitable for exploratory, descriptive or explanatory studies. The use of case study for this research is justified by the fact that it is an ideal strategy to gain an in-depth understanding of a phenomenon in a given context where limited studies have been conducted (Yin, 1994; Noor,

2008). Empirical studies on accessibility to E-government services for PWD is generally low in developing countries (Adepoju, Shehu & Bake, 2016; Mtebe & Kondoro, 2017) and particularly in Ghana. Case study thus provides a framework to gain a better understanding of the status of E-government in Ghana, the process of developing E-government services and accessibility perceptions of key implementers towards PWD. Moreover, a case study is seen as a most appropriate strategy for interpretive research that enables a researcher to study the nature and complexity of phenomena in their natural settings (Benbasat, Goldstein & Mead, 1987; Walsham, 1995). The case study approach is therefore apt to study a complex phenomenon like E-government to understand how the social, technological and political issues in Ghana interrelate and influence the development and accessibility of E-government services for PWD. The use of case study approach would help to develop a theory that is novel, linked closely to data and empirically valid (Eisenhardt, 1989).

4.6 Research methods

Research methods refer to the techniques employed by a researcher in the collection, analysis and interpretation of data while conducting a research study. This study employed multiple data collection methods to help get rich understanding (Benbasat, Goldstein & Mead, 1987) on how PWD in Ghana access electronic government services and interpret E-government accessibility from different stakeholder perspectives. The use of multiple methods also helped to enhance the reliability and validity of the research output (Kelliher, 2011).

4.6.1 Data collection

In any research, data is the main source of evidence that provides tools to make robust findings and draw clear conclusions. Data can be obtained from experience, observation, survey, experiment, among others, and it could consist of words, images or numbers (Creswell, 2009). Data for this research were obtained from observation, face-to-face, in-depth interviews, and document sampling (Benbasat, Goldstein & Mead, 1987; Creswell, 2009).

Observation was used in this research as a valuable technique to understand the contextual challenges PWD face while accessing E-government services. Observation as a technique in this study was motivated by the fact that the researcher would be able to learn and understand

the experiences of PWD. The observation of the visually impaired using ICTs such as computers and mobile phones afforded the researcher an idea of how they were likely to access electronic government services without asking directly from participants (Kothari, 2004). The researcher, as part of the data collection process, made trips to two ICT laboratories for the visually impaired to partake in their ICT lectures. The first trip was undertaken on 22nd October 2015 to an ICT centre which organises ICT training specifically for the visually impaired. The training centre is operated by one of the organisations for PWD in Ghana. Here, I observed how the visually impaired were taught to use various ICT gadgets such as computers, mobile phones and do internet browsing. The centre was resourced with desktop computers which had screen readers installed on them. While some visually impaired were taught, others came in to book for training appointments. I deduced from informal conversations that most of them were late blind (i.e. they became visually impaired after many years of seeing). The operators of the centre charged fees for the training, and there seemed to be an increment at the time of the visit as some visually impaired were seen complaining about the sudden increment of fees. I could feel the anxiety in their voices as they desired to know how to use screen readers efficiently as quickly as possible so that they could go back to their routine lives. From my observations, most of the visually impaired at the centre were highly educated, including the director of the centre who held a doctorate and was also visually impaired.

The second observation trip took place on 19th January 2016 at another ICT centre; this centre was part of a higher education institution. I was afforded the opportunity by the ICT coordinator who is also visually impaired to sit in the class of the visually impaired students to observe how they used computers and other electronic gadgets to accomplish their various tasks. The ICT lab had two lab assistants (all visually impaired) helping the coordinator to run the session. Some students had recorders with materials on them, which I presumed they used in the lecture rooms, and I witnessed how they were transcribing their lectures. In overall, both trips afforded me the opportunity to appreciate and develop a deeper understanding of how the visually impaired were acquiring ICT skills and training in AT which were important to the use of electronic services. Notes were taken on both trips. In the next stage, interviews were scheduled to interact more closely with participants.

Interviews are the most common, flexible and powerful qualitative research method. Interviews provide in-depth understanding relating to the participants' experiences, attitudes, perceptions, feelings and viewpoint on a phenomenon of study (DiCicco-Bloom & Crabtree, 2006; Turner, 2010). Interviews are grouped into three major categories: structured, unstructured or semi-structured. Semi-structured interviews provide flexibility enabling the researcher to ask additional questions, guided by the responses from participants. They are, therefore, suitable in cases where the researcher needs to carry out an in-depth interview only at once (DiCicco-Bloom & Crabtree, 2006). As a result, this study employed semi-structured interviews to allow the visually impaired respondents explain their experiences with accessing E-government services and to help the researcher understand their role in the exclusionary process. Web developers and government officers, on the other hand, got to share from their perspectives the meaning they assigned to accessibility and how they perceived it. In-depth interviews for each stakeholder were conducted face-to-face by the researcher using the research instruments outlined in Attachment 10.2. The research instruments were constructed using the sensitising concepts outlined in Table 3-2.

In addition to observation and interviews, document sampling was used. Document sampling involved desktop search and review of relevant documents relating to the phenomenon of study such as E-government development strategy documents and PWD legislation documents (Yin, 1994). Documents are a reliable secondary data source that consists of text and images recorded without the researcher's involvement (De Vaus, 2001; Bowen, 2009). This study examined some key documents to help obtain essential data and understanding of the context in which research participants operated (Bowen, 2009). The study used some documents which include ICT4AD Policy, E-Government Interoperability Framework, Persons with Disability Act and District Assembly Common Fund Act. These documents were reviewed to support the data collected from the interviews by way of validating and giving clarification to some of the issues raised in the interviews.

4.6.2 The Sampling Process

Sampling is the process of selecting a few or sample population from a larger population to become the basis of exploring or understanding a phenomenon of interest in the larger

population (Kumar, 2014). This study employed a non-probabilistic sampling approach in the data collection. Purposeful sampling was used to select respondents from the representatives hence, the selection was very subjective. By the use of this approach, the researcher was able to select the most useful sample to investigate the phenomenon of study (Marshall, 1996). Purposeful sampling enabled the researcher to select representatives from the visually impaired, web developers and government officers who were capable of providing rich and useful data.

To begin the data collection, a letter of introduction was obtained from the University of Cape Town to help get the permission to conduct the research in Ghana and seek consents of stakeholders involved in this study (see Attachment 10.3). Data collection started in September 2016. Interviews started with visually impaired participants so that the researcher could later clarify some of their concerns with web developers and government officers. The Ghana Blind Union (GBU), an association for the visually impaired in Ghana was contacted to assist with information on highly educated members who were likely to use E-government services. High literacy was an important criterion for selecting the visually impaired participants because studies have shown that literacy significantly affects the use and access to electronic services (Grantham, Grantham & Powers, 2012; Abascal et al., 2016). The list of members was provided by GBU and each member was contacted via telephone to explain the purpose of the study and book interview appointments. Through the snowballing technique, other participants were recruited and booked for interviews. Selected participants were spread across different regions of Ghana. Interviews with the visually impaired were conducted from September to October 2016 and February to March 2017. Interviews were carried out at a place of convenience for participants mostly in their homes, workplaces and university campuses in the case of student participants. The profile of visually impaired participants is presented in Attachment 10.4. The duration of each interview session was set at half an hour to one hour and thirty minutes to ensure participants had enough time to respond to interviews. Each interview was audio-recorded. A total of 18 visually impaired participants were interviewed. Interviews with web developers followed after the visually impaired. The researcher, through desktop search, identified contact addresses of well-known software development companies

in Ghana, particularly those who develop E-government applications. These companies were then contacted on the phone to seek their consent regarding the study. Most companies requested official written letters that would explain the purpose of the study, which was physically delivered by the researcher. Subsequently, interview schedules were arranged for developers who were willing to participate. Web developers, in this case, refer to individuals who either develop E-government applications or web applications and are in a position to tender for the development of E-government applications. The research instrument illustrated in Attachment 10.2 was used to guide the interviewing of participants. Interviews were carried out between February and March 2017 at the work premises of participants. Selection preference was given to web developers who had experience with building E-government applications and who had worked for two or more years. The duration of each interview session was set at half an hour to one hour and thirty minutes to ensure web developers were not under pressure to respond to interviews. Interviews were audio-recorded. Web developers with experience ranging from 2-24 years in web development participated. The profile of web developers who were interviewed is presented in (Attachment 10.4). A total of 10 web developers were interviewed; out of which 8 were E-government developers.

Finally, interviews were conducted with government officers. Government officers, in this case, implied individuals working in the government agencies or ministries in positions linked to the implementation of E-government services. The researcher had beforehand contacted the National Information Technology Agency (NITA); the official body mandated by law (Act 771, 2008) to oversee the implementation of all ICT-related services on behalf of the Government of Ghana and the implementer of E-government. This made it easier to link up with some officials in NITA via telephone to schedule for interviews. Other government officers were contacted by the use of the snowballing technique. Interviews were carried out in March 2017. The research instrument illustrated in (Attachment 10.2) was used to guide the interviewing of participants. The duration of each interview session was set at half an hour to one hour and thirty minutes ensure government officers had enough time to respond to interviews to ensure the information supplied was credible. All interviews were audio-recorded. A total of 9 government officers participated in the interviews. Government officers who were

interviewed had worked on 9 average years in their agencies. The profile of government officers who were interviewed is presented in (Attachment 10.4).

In overall, 37 participants were interviewed in this study with a total interview length of approximately 1,503 minutes and on average 41minutes per participant. A total of 210,788 words were transcribed from the interviews. It is important to note that sample sizes are generally small in qualitative studies to help investigate the phenomena in-depth (Marshall, 1996). Furthermore, several qualitative studies have shown that 4 -12 participants are sufficient for a homogeneous population whiles 12-30 participants are enough to reach data saturation for a heterogeneous population. (Kuzel, 1992; Marshall et al., 2013; Saunders & Townsend, 2016).

4.6.3 Data Analysis

Thematic analysis was selected for data analysis to identify and interpret patterns within the data that emerged as being valuable to the description of the phenomenon through a careful repetitive reading of data (Daly, Kellehear & Gliksman, 1997; Ryan & Bernard, 2003). The data corpus was subjected to a rigorous and thorough analysis pattern identification process of reviewing data into organised categories (themes) in a manner that can explain data. Thematic analysis was chosen for this purpose because (1) it is a flexible and simple method for analysing qualitative data; (2) independent of theory and epistemology hence suits different research questions and theoretical perspectives; (3) and can be applied to produce data-driven or theory-driven analyses (Clarke & Braun, 2013).

Thematic analysis is useful for examining the perspectives of different research participants, highlighting similarities and differences (Braun & Clarke, 2006). Thematic analysis also can report experiences, perspectives and realities of people and how they come about and represent the construction of a particular phenomenon in a given context (Braun & Clarke, 2006; Jebreen, 2012). In thematic analysis, themes are identified in two ways: inductively or deductively. With the use of an inductive approach, themes are generated through the process of data coding without the researcher attempting to fit it into a pre-existing frame or using his/her preconceptions (Braun & Clarke, 2006). The process is highly data-driven, allowing themes to emerge directly from raw data. In deductive thematic analysis, data is coded to

align with a specific research model such that themes generated meet researcher’s analytic interest or preconceptions. Several researchers (Attride-Stirling, 2001; Ryan & Bernard, 2003; Braun & Clarke, 2006; Thomas & Harden, 2008) have proposed guidelines for conducting thematic analysis. In this study, guidelines provided by Braun and Clarke (2006) as depicted in Table 4-2 are adopted for analysing interviews of all participants; PWD, web developers and government officers.

Table 4-1: Phases of thematic analysis (Braun & Clarke, 2006: 87)

Phase	Description of the process
Familiarising yourself with your data	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas
Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code
Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme
Reviewing themes and relationships	Checking if the themes work in relation to the coded extracts and the entire data set
Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells
Producing the report	Selection of vivid, compelling extract examples, analysis of selected extracts, relating back of the analysis to the research question and literature

The data analysis adopted an inductive coding approach. Data was coded without associating any interpretations to it. Codes and themes emerged from the content of data rather than searching for pre-defined themes. This ensured that the sensitising lens used by the researcher did not override the experiences of the participants (Braun & Clarke, 2012). Throughout the analysis, text-based ‘thematic maps’ (Frith & Gleeson, 2004) were used to help identify themes, sub-themes and the relationships between themes and sub-themes. The following sections indicate in detailed how themes were arrived at for the 37 interview transcripts. Participant verification took place for most interviews to ensure that the researcher’s transcriptions represented the precise views expressed by participants and also as part of an audit trail to ensure trustworthiness (Hagens, Dobrow & Chafe, 2009; Jugder, 2016).

4.6.3.1 Familiarising oneself with the data

Familiarisation is the first phase of thematic analysis whose purpose is to identify interesting features within the dataset that are relevant to the phenomenon of study. Notes taken during observations were typed in electronic format. The audio-recorded interview data was carefully listened to prior to transcription. This was to help get every detail of the interview discussion and obtain grounding of each interview session. After this process, each interview was orthographically transcribed by the researcher reproducing all spoken words and sounds including hesitations, intonation, false-starts, long pauses (indicated by ‘pause’), repetitions and editing (indicated by three full-stops ...) and laughter (Braun & Clarke, 2012). The name of people and places that could contradict with ethical issues were anonymised. The researcher paid close attention to non-linguistic gestures such as body language, vernacular, emotions and facial expressions. Interviews were mostly in English language except for certain portions where vernacular (Twi; a local dialect) was used. All portions in vernacular were translated directly during transcription. Interviews were carefully listened and typed to avoid transcription errors, which could lead to misinterpretation, wrong inference or inaccurate analysis (Easton, McComish & Greenberg, 2000). This level of detail, according to Braun & Clarke (2012) is sufficient to produce rich and rigorous analysis.

Interviews were transcribed using otranscribe (<http://otranscribe.com/>); an open software for transcribing. They were later exported in a text file on the computer with back up stored in Google cloud. Each interview was also transferred into MS Word and in some cases printed to make reading and editing much more flexible. The interviews were then listened again alongside reading the transcripts to cross-check if all data have been captured. All 37 interview transcripts and a memo from observations were then imported into NVivo (NVivo Pro version 11); a qualitative data analysis computer software package developed to manage the coding process (Hilal & Alabri, 2013). To have a general idea of what participants were focusing on in their interview discussions, several queries were used to explore the data. For example, the word frequency query was used to find out the common words used by participants. The query results showed that the three most used words were government, followed by people and services, as illustrated in figures 4-1 and 4-2. Further, a text search query was used to analyse

Word Frequency Query Result

Word Frequency Criteria

Search in: All Sources, Selected Items..., Selected Folders...

Display words: 1000 most frequent (radio selected), All (radio unselected)

With minimum length: 6

Grouping:

- Exact matches (e.g. "talk")
- With stemmed words (e.g. "talking")
- With synonyms (e.g. "speak")
- With specializations (e.g. "whisper")
- With generalizations (e.g. "communicate")

Word	Length	Count	Weighted Percentage (%)
government	10	1051	1.17
people	6	840	0.94
services	8	539	0.60
disability	10	528	0.59
persons	7	497	0.55
access	6	482	0.54
accessibility	13	395	0.44
person	6	368	0.41
something	9	353	0.39
information	11	327	0.36
training	8	324	0.36
accessible	10	322	0.36
really	6	299	0.33
online	6	296	0.33

Figure 4.2: NVivo output Word frequency query (Summary) from transcripts

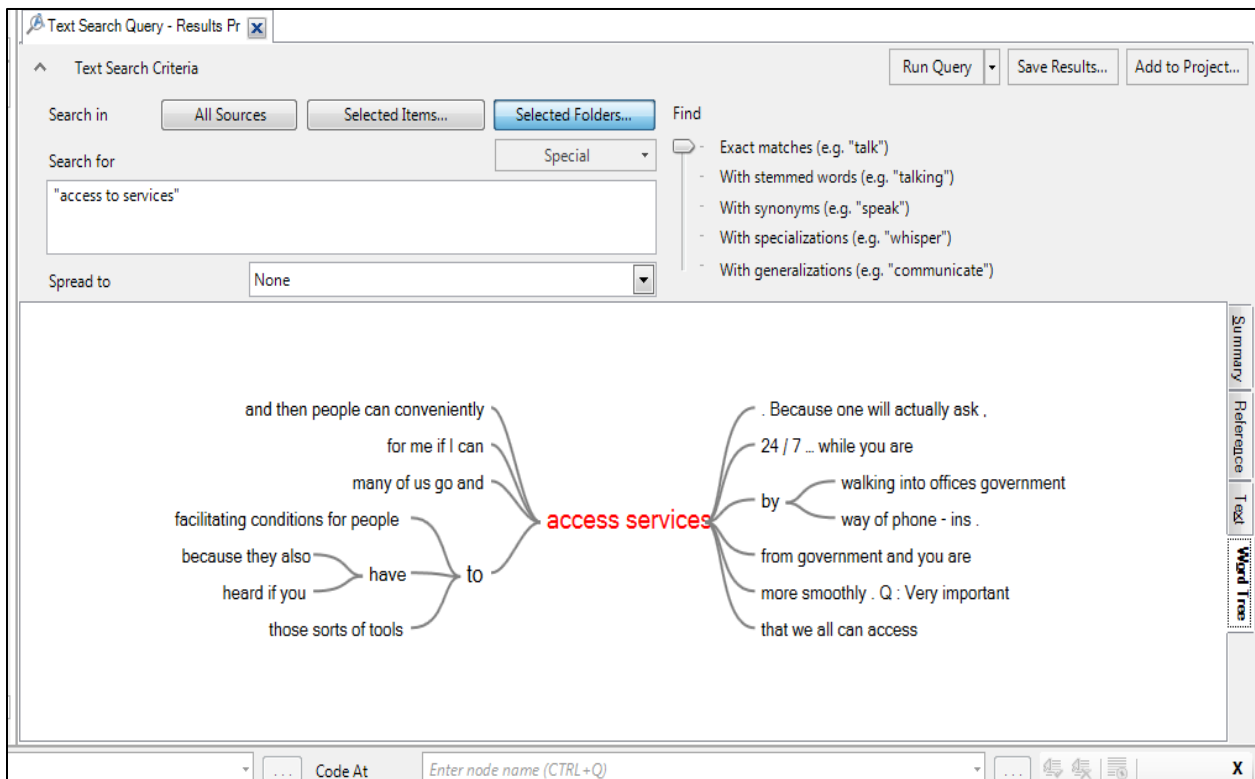


Figure 4.3: NVivo output word tree (access to services)

After exploring the data in this manner, the researcher read transcripts participant by participant grouped according to stakeholders involved in this study: PWD, web developers, government officers. Interesting concepts and key ideas relating to the context of E-government accessibility towards PWD identified from transcripts were manually jotted down. The note-making helped to understand the data; make sense of participants' experiences and how they interpret their experiences.

For example, it was observed that one of the participants (PWD₉) felt that lack of access to E-government services by PWD affect their livelihood: *“It [accessibility].... affects the quality of your livelihood. So, you are left with ... fewer options; you live what I will say a deprived life! As an ordinary citizen of the state, you live a less appreciable life than the able-bodied person simply because, ...what others would simply reach out and grab, you have to beg for”*. Reading the response from PWD₉, the researcher made these initial observations: (1) lack of access leads to deprivation (2) lack of access affects quality of life (3) lack of access deepens discrimination against PWD. From this response, the researcher also speculated that: (1) PWD₉ felt a sense of exclusion from the government (2) PWD₉ thought society had wrong attitudes towards the needs of PWD. The researcher read through all transcripts, one after the other, making notes of concepts related to the phenomenon under study. These initial observations and note-making provided a good grounding for further analysis.

4.6.3.2 Generating initial codes

This stage involved thorough and systematic analysis through coding. Codes are unit blocks of analysis that provide data that describe participants' meanings closely (Braun & Clarke, 2012). Codes identify a feature of data that is useful for understanding the phenomenon of study. Braun and Clarke (2006), defined two ways of coding: semantic (descriptive) or latent (interpretative). Semantic coding is close to data content and participants' meaning while latent, on the other hand, goes beyond the participants' meaning to provide an interpretation of the data content. Semantic coding was mainly employed in the analysis. Initial codes were generated participant by participant to help to reduce the raw data into smaller blocks. The coding process was iterative to ensure all relevant themes were captured. In NVivo, each initial code was created as a node.

For example, it was noticed how DEV₇ felt that there was a need for implementation of policy to enforce accessibility: *“if there is a policy that is forcing me to do it I will be doing it though. Maybe policy maybe a sense of awareness that ermm such people would also access the application, it would also force me to do something for them”*. From this extract, a node “policy needed for accessibility” was formed. Within the same extract, DEV₇ suggested creating more awareness on accessibility was required to prompt implementers of E-government, which became the second node ‘creating accessibility awareness.’

This phase is a repetitive process, and so as coding progressed, some initial nodes were modified to capture new materials. For instance, the node *“Assistive technologies have limited capabilities”* was initially entitled *“Assistive technologies cannot read graphics”*. However, because some participants also reported poor labelling, operating system compatibility and inappropriate naming of links as affecting assistive technologies, the node was expanded beyond graphics to represent better what participants said. Through repetitive coding, it was observed that some nodes were closely related or the same. This is because some participants emphasised the same issue at different times in the interview. For example, from the extract of GOV₈: *“assistive technology... because... basically they [PWD] will need that; so, if it's made available... affordable, ermm then it will help them to be able to use the system. Apart from that, I don't know how they are going to access”* researcher generated a node “Assistive technologies affect access”. Another extract from the same participant, *“assistive technologies, we need to have them also in place because if the policy is there and after doing update trying to get there and you don't have the technology that will help them [PWD] to use the system, then work done is zero”* was coded “Assistive technologies required for access”. Researchers, however, represented both extracts by the node “Assistive technologies required for access” since it encapsulates both codes. Figure 4-4 is a screenshot of coding at an early stage.

Nodes			
Name	Sources	References	
Access to ICTs		7	13
Accessibility cost		9	18
Accessibility a trend		2	4
Accessibility an afterthought		4	5
Accessibility has greater benefit		10	21
Accessibility increases coverage		6	12
Accessibility initiative from client		6	15
Accessibility needs time		3	4
Accessibility policy		24	67
Accessibility promotes inclusiveness		1	1
Accessibility require more awareness		20	55
Accessibility requires knowledge and expertise		10	28
Accessibility tools exist		6	7
Accessibility training		8	17
Accessibilty reduces cost		1	1
Accessible design more usable		7	11
Agencies rendering public services		6	8
Amendment of PDA		7	11
Assistive technologies have limited capabilities		13	27
Assistive technologies required for access		23	56
Availability of assistive technologies		17	35

Figure 4.4: A screenshot of coding at an early stage

4.6.3.3 Searching for Themes

Themes were constructed from nodes that seemed to share a common feature, such that they described the coherent and meaningful pattern in the data. Using the initial nodes, the researcher identified nodes which described or related to the same incident to form a sub-theme. Figure 5-5 illustrates a snapshot of the categorisation of the subtheme “Inclusive education”. Sub-themes were grouped to form the main theme. For example, there was a theme “Accessibility requirements” under which there was a sub-label “Accessibility awareness”, and under this sub-label, there was a sub-sub-label “Creating accessibility awareness”. In this sub-sub-label “Creating accessibility awareness”, there were thirty-six (36) references coded to it;

22 coded from web developers, 10 coded from government officers and 4 coded from the visually impaired.

Nodes			
Name	Sources	References	
Collective responsibility		10	15
Developers		5	9
Government agencies		2	2
Government responsible for accessibility		20	50
Top management		4	6
Engaging PWD		3	8
Equality		6	14
Exclusive content		2	4
Funding		2	5
government needs a push		4	5
Government officers perceptions		4	11
Government support		14	28
Guidelines for development		12	25
Hardware design considerations		8	20
Inclusive education		13	30
inclusive education challenges		6	11
inclusive education solution		7	13
inclusive policy enforcement		4	4
Inclusive society		14	25
Industry and private partner support		14	21

Figure 4.5: Categorising nodes to form subtheme (Inclusive education).

In grouping nodes to form sub-themes, nodes were compared, some instances clustered, and extracts coded to each node re-read to identify how they relate with each other and produce a meaningful pattern. For example, when the nodes “Accessibility awareness” and “Accessibility needs and benefits” were compared, it was noticed that they were several common extracts coded to both nodes. In this case, both common and differing extracts were re-read to understand how they relate as a whole. The two nodes were then grouped under a node “Accessibility requirements”. Figure 4-6 shows a comparison diagram of the nodes “Accessibility awareness” and “Accessibility needs and benefits”.

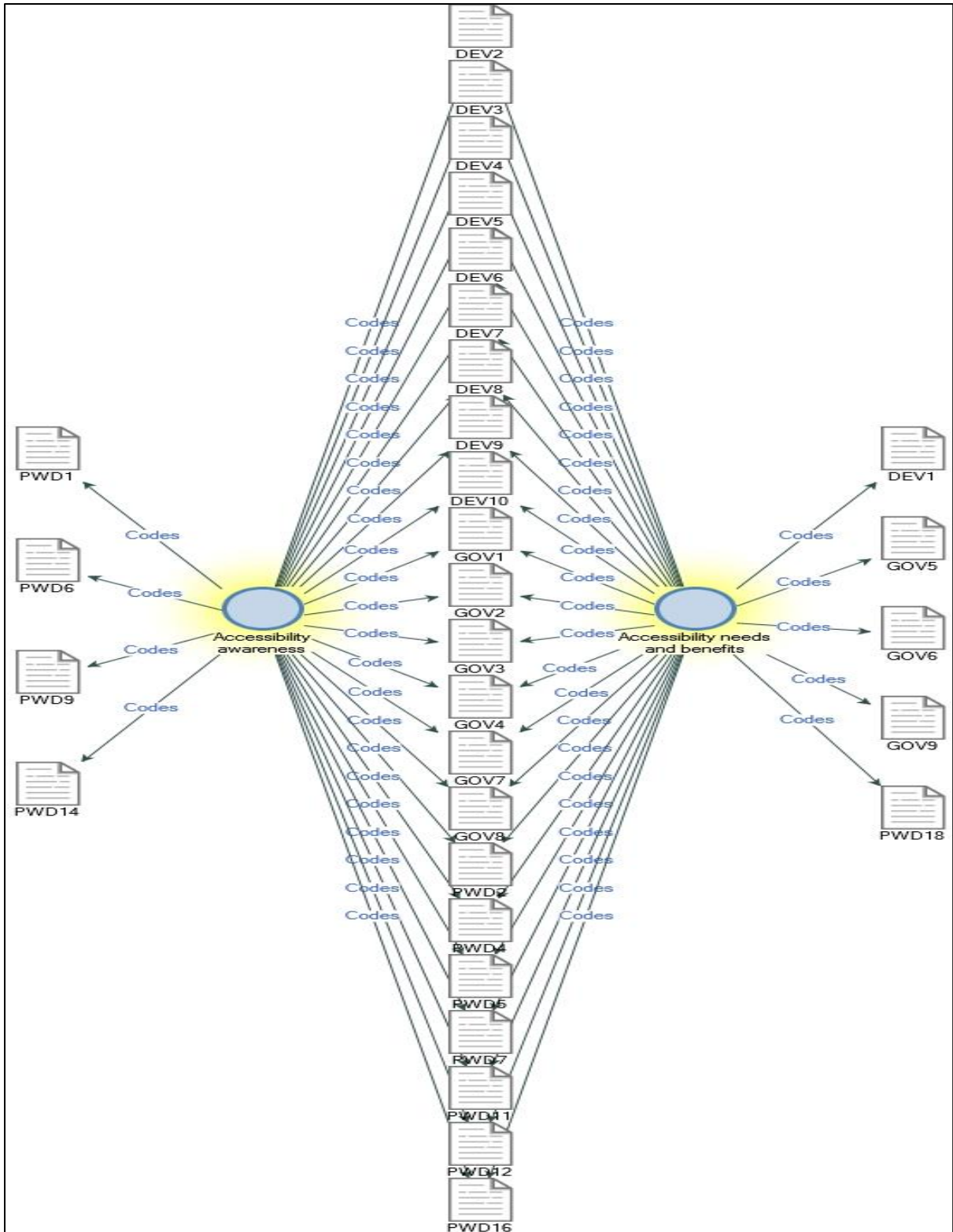


Figure 4.6: Comparison diagram between “Accessibility awareness” and “Accessibility needs and benefits”

A sample of sub-themes forming a theme is illustrated in Table 4-3. The name of the theme is given in column 1. The description of the theme is given in column 2. Sub-themes that formed the main theme are in column 3, and a sample of data extracts used to support how the subthemes were derived are in column 4. For example, sub-themes “AT policy implementation”, “AT required for access”, “Availability and affordability of AT”, “Government interventions needed on AT”, “Limited capabilities of AT”, “Local production”, “Stakeholders’ knowledge in AT” and “Training in AT”, all described the same incidence: issues associated with AT acquisition and usage. These sub-themes were grouped to form the overarching theme “AT acquisition and usage”.

A theme in this case “captures something important about the data in relation to the research question and represents some level of patterned meaning within the data set” (Braun & Clarke, 2006: 82). The patterns that recurred across participants interviews around the E-government accessibility phenomena formed themes. For instance, the theme “AT acquisition and usage” is able to explain: AT is a requirement to access E-government services; challenges relating to their acquisition; training in them and how to use them efficiently according to respondents. The researcher by this theme could establish that acquiring AT and training in them played a significant role in improving access for PWD. However, challenges such as high cost, low availability and lack of local production made it difficult to acquire them. Also, limited training facilities and lack of expertise affected training in AT. In a similar light, data incident related by GOV₉ in Table 4-3 fitted under the node “AT policy implementation” while data occurrences related by PWD₁₅ came under the node “AT required for access”; data occurrences related by GOV₈ placed under “Availability and affordability of AT”; data incident related by PWD₁₁ came under the node “Government interventions needed on AT”; data incident related by PWD₅ was placed under “Limited capabilities of AT”; data occurrences related by GOV₂ came under “Local production”; data incidents related by DEV₁₀ came under “Stakeholders’ knowledge in AT” and data occurrences related by PWD₄ was placed under “Training in AT”. These nodes grouped formed the overall theme in column 1 called “AT acquisition and usage”. This theme indicates that accessibility challenges for PWD are related to AT acquisition: for example, visually impaired respondents felt that the high cost of screen readers forced them to

adopt for unlicensed versions (‘cracked’) which provided them limited functionalities. Respondents in this study pinpointed Assistive technologies is one of the factors that lead to accessibility challenges.

4.6.3.4 Reviewing Themes

This phase is a repetitive process which involves quality-checking and reviewing of themes in relation to coded data as well as the entire dataset. Each theme was checked against the organised extracts of data to ensure that the theme ‘works’ in relation to data (Braun & Clarke, 2012: 8). The researcher first and foremost identified enough data that supported each theme. Instances where not much data was found in relation to the theme were not discarded but regarded as being the view of a specific sample. In the reviewing phase, some themes were renamed while others were collapsed to form one theme.

For example, the theme “E-government status, benefits and access options” was changed to “E-government challenges and benefits”. Also, the theme “Inclusive society” was renamed “Making society inclusive” while the theme “PWD E-readiness” was changed to “PWD lack E-readiness”. These changes were made to ensure that the themes captions related more closely to what participants reported. The theme “Enforcing accessibility” was relocated under the theme the “Institutions, policies and enforcement”. After reviewing the extracts from both nodes; it was found that enforcing accessibility required that institutions implemented the necessary policies and firmly enforced them. A cluster analysis of similarity coding between the nodes resulted in a coefficient close to 1 (see figure 4-6).

Nodes			
Name	Sources	Referenc	
Accessibility requirements and benefits	33	360	
Acquisition of assistive technologies and u	37	405	
Effect of inaccessibility for PWD	24	135	
E-government development	33	309	
E-government status, benefits and access	23	115	
Enforcing accessibility	35	233	
Inclusive society	23	101	
Institutions, policies and enforcement	37	275	
PWD voicing out	29	85	
PWD E-readiness	22	81	
Societal perceptions and beliefs	20	69	

Nodes clustered by coding simi		
Node A	Node B	Jaccard's coefficient
Nodes\Institutions, policies and enforce	Nodes\Enforcing accessibility	0.945946

Figure 4.7: Coding similarity between ‘Institutions, policies and enforcement and Enforcing accessibility’

Table 4-2: Searching for themes

Theme	Description	Subtheme	Data Extracts
AT acquisition and usage	challenges relating to tools, gadgets and technologies PWD use; how to acquire them, train in them and efficiently use them	AT policy implementation	If there is a policy [assistive technology policy], and it will cut across the entire nation, it will help disabled persons to have free access. ... (GOV ₉)
		AT required for access	I use a screen reader; JAWS on my laptop so it reads anything anywhere I direct it to read it, it reads it for me... JAWS does for me what your eyes will do for you when you are browsing.... (PWD ₁)
		Availability and affordability of AT	Like the assistive technology... because... basically they will need that so if it's made available... affordable, ermm then it will help them to mm be able to use the system.... (GOV ₈) I will say... availability in Ghana is the challenge. There are erhh varied degrees of assistive technologies for persons with visual impairments and all other persons with disability that I am aware of; their presence in Ghana is low (PWD ₉)
		Government needed interventions on AT	Then again, the technologies too are very expensive so government at least ... can be subsidised to an extent... (PWD ₁₁) On the part of government, there is nothing like that and I think it is high time for our government to take into consideration the needs in this aspect for persons with disability to have a big store... a warehouse somewhere where these things [AT] are kept for easy access to persons with disability... (GOV ₉)
		Limited capabilities of AT	Most of the graphic that's ... pictures that are on the Ghana government websites you don't really get to know what it is because the software generally cannot read pictures...(PWD ₅) Another disadvantage is the JAWS you can't use it with any other person ... if you are using the JAWS on the laptop with speech software on it. you are using the key pad ... if another person uses the mouse it disturbs the JAWS...(PWD ₆)
		Local production	We need to get more research done in that area [assistive technologies] so that we can have that local content...(GOV ₂) You know each time someone sees me use my laptop or my phone he says ooohh do we have that in Twi? Basically, do we have that in the local language? (PWD ₉)
		Stakeholders' knowledge in AT	I have to know the devices that they use or they can use to access the software, so that I can tune my software to be compatible with them...(DEV ₁₀) I have heard it [AT] but I'm not familiar with any. I saw one on television but physically I have not even seen one...(GOV ₈)
		Training in AT	Training is very important, very significant because the JAWS is a technology on its own. So, if you have the software without getting the training you can't use it. It will be difficult for you to use it (PWD ₇)

Table 4-4, shows, for example, the theme ‘Developing E-government’ had a total of 300 references coded which comprised the following: 74 describing design considerations needed for accessibility ; 67 discussing the determinants that define the final design of E-government; 43 stating the perceptions and inner feelings developers hold which influence their style of development; 40 describing the development guidelines that developers follow in the development process; 43 discussing the need for accessibility component to be spelt out in E-government contracts; and 33 stated how software development features incorporated in designs are driven by the market size, the target groups, resource and time.

Table 4-3: Reviewing of themes

Reviewed Theme	Theme	Description	Subtheme	No. of sources coded	References coded	Data Extracts
Developing E-government	E-government development	factors that explicitly or implicitly influence the development of E-government applications	Design considerations	18	74	Ahaa so it's a matter of not really considering them at all, yes, we don't have them in mind when programming... (DEV ₁₀)
			Determinants of final design	19	67	People or ordinary people should come and test, play with it once they play with it, you get issues and then factor into the application, refine it and come out with better solution... (DEV ₄)
			Developers' perceptions	14	43	It has never really come to mind that people with disabilities <u>actually access</u> content like that okay? That's the fact of the matter! I think it has been an issue of awareness okay? So yeah, we develop with some assumptions in mind that whoever is going to access it can see, can feel, can you know exactly! So, we do not really think about the people with impairment or disabilities... (DEV ₆)
			Development guidelines	13	40	A lot of companies or developing institutions have their own guidelines, procedure so once you are in that company you follow it. For instance, here, those doing development they have their own guidelines so for instance, they have...solution document, so looking at the practical problem, how it translates into solution for the institution you are developing for, it's there so you follow it and then you do the development... (DEV ₄)
			E-government contracts	12	43	If you are coming to bid for a government contract we must see your PWD strategy. What you plan to do with persons with disability? It <u>has to</u> be visible in your proposal before you can move to your next stage so they can do that by regulation... (DEV ₅)
			Market force drivers	12	33	In that case when you enter a market and you have a lot of people, the amount of efforts you put and the returns you get, the returns are far more than a place where there aren't so many people you might put the same effort as cannot get so much returns. So, similarly, a typical business which is not a social enterprise is usually looking at ok I have this service, I am making money from it, if I consider the disabled people, how many are they? (DEV ₅)

4.6.3.5 Defining and naming themes and producing the report

In this phase, each theme was refined to identify the specific data it conveyed. This involved reviewing and re-checking themes against the entire dataset for relevance and coherence. In all, the analysis of 37 interview transcripts and observation memo produced 168 nodes categorised into 14 sub-sub-sub-labels, 103 sub-sub-labels and 41 sub-labels (sub-themes); logically organised into ten key themes: 1) Institutions, policies and enforcement; 2) AT acquisition and usage; 3) Accessibility requirements; 4) Developing E-government; 5) Effects of inaccessibility; 6) E-government challenges and benefits; 7) Making society inclusive; 8) PWD lack E-readiness; 9) PWD role in accessibility ; and 10) Societal perceptions and beliefs. The final codebook for the analysis is illustrated in (Attachment 10.7). Table 4-5 shows the themes, their descriptions, the number of sources coded, and the references coded. The significant theme among respondents was ‘Institutions, policies and enforcement’ while the theme ‘Societal perceptions and beliefs’ featured the least.

Table 4-4: Themes emerging from the analysis

Theme	Description	Number of sources coded	References coded
Institutions, policies and enforcement	existing policies (Act, laws, bills) that protect the interest of PWD and how institutions are enforcing them to improve accessibility	37	508
AT acquisition and usage	challenges relating to tools, gadgets and technologies PWD use; how to acquire them, train in them and efficiently use them	37	397
Accessibility requirements	benefits of accessibility for PWD and the requirements necessary to improve accessibility	33	352
Developing E-government	factors that explicitly or implicitly influence the development of E-government applications	33	300
Effects of inaccessibility	existing challenges PWD face and potential consequences they will encounter due to lack of access to E-government services	24	136
E-government challenges and benefits	benefits and challenges relating to E-government such as levels of E-government maturity and the need for multi-channel access to E-government services	23	114
Making society inclusive	the significance of inclusion for PWD in the society and how this could be achieved	23	98
PWD lack E-readiness	factors that affect PWD preparedness to take advantage of E-government services	21	87
PWD role in accessibility	importance of PWD making known their challenges and the difficulties they face in voicing out their grievances	29	78
Societal perceptions and beliefs	beliefs and negative perceptions the Ghanaian society hold regarding disabilities	20	70

4.6.4 Content analysis of policies

Policy documents were analysed using content analysis to determine the frequency of words, phrases or in-text relationships (Boettger & Palmer, 2010). Content analysis is a systematic approach of analysing the content of a message to make replicable and valid inferences from data (e.g. text, images, symbols etc.) to their context of use (Neundorf, 2002; Krippendorff, 2004). Content analysis is “empirical and, therefore, includes a series of fixed characteristics that enhance its validity and reliability” (Boettger & Palmer, 2010: 347). The technique is unobtrusive; and useful for reducing data, examining trends and patterns in documents. To allow for replication, the content analysis should be applied to documents that are durable

(Stemler, 2001). According to Krippendorff (1980), every content analysis should address the following questions:

- Which data are analysed?
- How are they defined?
- What is the population from which they are drawn?
- What is the context relative to which the data are analysed?
- What are the boundaries of the analysis?
- What is the target of the inferences?

Guided by these questions, ten policy documents were selected for analysis. These documents were perceived to be representative of policies which addressed the concerns of PWD and regulated the development of E-government in Ghana. Again, the selected documents were those that several of the interview participants referred to in their discussions that related to the rights of PWD and E-government development in Ghana. Hence, aside from providing contextual richness, these documents were useful in post-interview checking. The documents were read and re-read severally with the intent of understanding the government's stance on E-government development and the provision of equal access to services for all particularly PWD. The documents were then analysed in the context of E-government and the related phenomena being investigated (i.e. E-government development and accessibility for PWD).

4.6.4.1 Analysis process

To begin the content analysis, the researcher read through all ten policy documents paying particular attention to their objectives. This helped to categorise the ten documents into two groups: policies regulating E-government development and provision of electronic services in Ghana and policies promoting the interest of PWD in Ghana. The categorisation and aim of each policy document are summarised in Table 4-6. After this process, documents were uploaded into NVivo. Policy documents were read severally, analysed in the context of E-government bounded by issues pertaining to E-government development and accessibility for PWD. For each policy document, keywords were identified based on the aim of the policy and bearing in mind the phenomenon under study. A word frequency query was also used to help

choose appropriate keywords relating to the study. Although these keywords may not be exhaustive, they represent in overall the vital issues within the policies that relate to the phenomenon of study.

While identifying the keywords for each policy, it was observed that many of the policies had similar or closely related keywords. For instance, keywords identified from the policy document, E-Government Interoperability Framework (E-GIF) included E-government, Access/Accessibility, Services, Standards/Policies, Developers, Internet Disability, Develop/Development, Applications and Compatible/Compatibility. Similarly, keywords for Ghana Government Enterprise Architecture (GGEA) Framework included Develop/Development, E-government, Services, Access, Applications, Standards/Policy Technology(ies), Portal/Websites, Disability. In this case, duplicate words (e.g. E-government, Services, etc.) were written once. After duplicates words were removed, the final keywords to be used for the search was obtained. Table 4-5 indicates the final keywords with their descriptions.

Table 4-5: Summary of keywords with their description

Keyword	Description
Services	The electronic delivery of products from the government (e.g. information, services) to the public
E-government	The use by government of web-based Internet applications and other information technologies to enhance the access to and delivery of government information and services to the public.
Disability/Disabilities/Disabled	Any form of physical impairment, e.g. mobility, speech, visual or cognitive
Access/Accessible/Accessibility	The ease with which users can obtain information and services electronically from the government.
Develop/Development	The design of ICT applications to deliver services to citizens or enhance agency business functions
Standards/Policy/Guidelines	Frameworks or specifications use to ensure consistency in the development of E-government applications
Training/Education	The learning process to acquire relevant knowledge to use ICTs or technologies effectively or handle accessibility issue efficiently

Keyword	Description
Applications	Government-designed ICT solutions particularly web-based for use by the public
Support	Any form of assistance offered to PWD to empower them and to improve upon their livelihoods
Implementation/Implement	The process of setting up relevant and facilitating structures for E-government
Compatible/Compatibility	The ability of E-government applications to execute on different platforms and with different devices
ICTs/Information and communication technology(ies)	Technologies deployed to promote and facilitate the delivery of government services
Developers	Individuals who build E-government applications using specified requirements from government
Enforce/Enforcement/ Compliance	Compelling adherence to policies, standards or guidelines that regulate the development of E-government applications
Portal/Websites	Web-based applications that serve as the focal point and offer a comprehensive range of functionality including a single point of access to various government services
Assistive devices/technologies/tools	Technologies or devices that facilitate access for PWD by enhancing their functional performance
Participation/ Inclusion	Involvement of persons with disabilities in all aspects of life to enhance their sense of belongingness in the society
Independence	Ability for PWD to be self-reliant and make their own choices
Discrimination	Any exclusion or restriction of PWD which has effect on their human rights and fundamental freedoms in the political, economic, social, cultural, civil or any other field.
Equality	Same treatment for PWD as for their non-disabled counterparts
Awareness	The process of advocating for the rights of PWD and intensifying sensitisation on disability issues
Funding (Funds)	Financial assistance available or offered to PWD to support their livelihood
Challenge(s)	Difficulties associated with E-government developments and implementations
Privacy/ Protection	The ability to protect data of E-government users by regulating how data is processed, used or disclosed
Internet	Technologies that help users to connect to online government services

Text query search was then performed for each keyword on all ten policy documents at once. Word count summary of each keyword was taken. For example, the word count for Service(s) in all the policy documents totalled 1830 as seen from Figure 4-7. However, the number of times a keyword appeared did not give insight into the meaning of the text but indicated its dominance in the discourse (Krippendorff, 2004). To this the end, the researcher further read through the references for each keyword to understand the context in which it was used. For instance, in figure 4-8, it was observed that the keyword “Access/Accessibility/Accessible” was mostly used in relation to public places or government information and services.

The screenshot shows a software interface for text search results. The search criteria are set to 'Selected Folders...' and the search term is 'services or service'. The results are displayed in a table with columns for Name, In Folder, References, Coverage, and a Summary/Reference/EDF/Word Tree indicator.

Name	In Folder	References	Coverage	Summary/Reference/EDF/Word Tree
Data-Protection-Act-2012-Act-843	Internals\\Documents\\All	21	0.09%	
District Assembly Common Fund	Internals\\Documents\\All	2	0.08%	
Electronic Transaction Act	Internals\\Documents\\All	163	0.44%	
Ghana eGovernment Interoperability Framework	Internals\\Documents\\All	333	0.62%	
Ghana-Government-Enterprise-Architecture	Internals\\Documents\\All	948	0.55%	
Ghana-National-Communications-Authority-Act-7	Internals\\Documents\\All	39	0.47%	
ICTAD-policy	Internals\\Documents\\All	272	0.57%	
NITA	Internals\\Documents\\All	10	0.14%	
Persons With Disability Act-2006 Act 715	Internals\\Documents\\All	9	0.12%	
UNCRPD	Internals\\Documents\\All	33	0.17%	

Figure 4.8: Summary of word count for ‘Service(s)’ from all policy documents

The screenshot shows the same software interface, but with the search term 'Access or accessibility or accessible'. The results pane displays several references with their respective coverage percentages.

Reference	Coverage	Sample Text
Reference 24	0.01%	of ICTs to facilitate universal access to public and government information
Reference 25	0.01%	effective and productive and readily accessible to the public at large
Reference 26	0.01%	in particular by increasing their access to information, support services and
Reference 27	0.01%	

Figure 4.9: Sample of references to the keyword ‘Access/Accessibility/Accessible’

Table 4-6: Policy documents selected for content analysis

Document Selected	Dated	Aim of policy document	Type of document	Data Analysed
Information and Communication Technology for Accelerated Development (ICT4AD) Policy	2003	To promote the implementation of initiatives that would improve the socio-economic well-being of the Ghanaian people through the development, deployment and exploitations of ICTs	Policies regulating E-government development and provision of electronic services in Ghana	Keywords relating to the aim of policy examined in line with E-government development and accessibility for PWD in Ghana
E-Government Interoperability Framework (E-GIF)	2009	To improve the delivery of services from government to citizens using IT systems developed with defined standards and policies		
Ghana Government Enterprise Architecture (GGEA) Framework	2009	To help define better technological decision-making and effective prioritisation of programme management that could facilitate enhanced collaboration between government and citizens, business and other governments.		
National Information Technology Agency (NITA) Act 771	2008	To regulate the provision of information communications and technology to ensure quality and promote standards of efficiency in all ICT-related services		
Data Protection Act (DPA) Act 843	2012	To protect the privacy of personal data by regulating how data is processed, used or disclosed		
Electronic Transactions Act (ETA) Act 772	2008	To provide for and facilitate electronic communications and related transactions in the public interest		
Ghana National Communications Authority (GNCA) Act 769	2008	To regulate communications activities and services in Ghana.		
Persons with Disability Act (PDA) Act 715	2006	To provide for, and promote the rights of persons with disabilities	Policies promoting the interest of PWD in Ghana	
United Nations Convention on Rights of Persons with Disabilities (UNCRPD)	2006	To promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity		
District Assembly Common Fund (DACF) Act 455	2010	To minimise poverty among PWD and to enhance their social image through dignified labour		

Table 4-7: Keywords used in content analysis with their frequencies

Keywords	Frequency										Total
	ICT4AD	E-GIF	GGEA	NITA	DPA	ETA	GNCA	PDA	UNCRPD	DACF	
Service(s)	272	333	948	10	21	163	39	9	33	2	1830
E-government	26	137	138	1	0	4	3	0	0	0	309
Disability/Disabilities/Disabled	4	2	8	3	0	3	5	127	223	41	416
Access/Accessible/Accessibility	71	82	263	4	21	73	7	13	64	4	602
Develop/Development	521	35	173	4	0	6	8	3	19	6	775
Standards/Policy/Guidelines	339	306	30	16	2	16	20	4	17	14	764
Training/Education	132	3	90	0	6	1	2	35	33	1	303
Applications	14	72	195	5	1	0	5	0	0	1	293
Support	86	54	185	0	3	0	1	2	16	5	352
Implementation/Implement	93	36	123	5	3	2	6	2	17	0	287
Compatible/Compatibility	1	14	6	0	4	0	0	0	0	0	25
ICTs/Information and communication technology(ies)	171	4	0	1	0	5	0	0	1	0	182
Developers	0	6	2	0	0	0	0	0	0	0	8
Enforce/Enforcement/Compliance	2	47	122	4	42	46	3	4	1	1	272
Portal/Websites	0	9	77	1	1	7	0	0	0	0	95
Assistive devices/technologies/tools	0	0	0	0	0	0	0	1	7	2	10
Participation/ Inclusion	8	3	7	0	2	0	0	4	27	0	51
Independence	2	0	4	0	0	0	0	0	4	0	10
Discrimination	1	1	0	0	0	0	0	2	27	0	31
Equality	3	0	2	2	1	1	2	1	4	0	16
Awareness	4	12	0	0	1	1	0	0	8	2	28
Funding/Funds	7	3	34	5	4	8	9	3	1	37	111
Challenge(s)	95	4	16	0	1	2	0	0	0	0	118
Privacy/ Protection	16	23	92	1	61	18	1	0	29	0	241
Internet	7	76	87	6	0	10	2	0	3	0	191

4.6.4.2 Linking content analysis to themes

At the end of the content analysis, there was a need to establish how these keywords were associated with the themes derived from the thematic analysis to find out if policies were addressing issues raised by participants and to corroborate findings from observations and interviews. As indicated in Table 4-5, the keyword ‘Service(s)’ focuses on delivery products from the government to citizens. For instance, a portion of the ETA policy indicates that the government aims to “*promote E-government services and electronic communications and transactions with public and private bodies, institutions and citizens*” (Page 6). Similarly, an aspect of the E-GIF policy states that “*the E-GIF is seen to be the bedrock of business transformation of government in the delivery of services to citizens*” (Page 4). Likewise, a section GGEA policy emphasises that “*one of the primary roles of government is to provide services to citizens and residents of Ghana*” (Page 186). In this regard, services ought to be accessible for all citizens to harness the benefit. Subsequently, the keyword ‘Service(s)’ would fall under the theme ‘Accessibility requirements.’

The keyword ‘Access/Accessible/Accessibility’ deals with making electronic information and services from government easy to obtain and use. For example, GGEA policy highlights that “*accessibility involves the ease with which users obtain information*” (Page 175). Similarly, E-GIF states that “*E-government services should be designed to be accessible via multiple channels*” (Page 33). A section of ICT4AD indicates the need “*to promote equal and universal access to information and communications technologies services and resources to all communities, and within this context, policy directives shall be put in place to ensure and facilitate equal access for... the disadvantaged, the disabled*” (Page 58). As a result, this keyword was also placed under the theme ‘Accessibility requirements’ which mirrors the need to make services accessible to all.

The keyword ‘Awareness’ focuses on educating and sensitising the public on disability issues. For example, one of the objectives of the DACF is “*to build the capacity of Organisations of Persons with Disability (OPWDs) in the districts to enable them to advocate and assert their rights and undertake awareness raising and sensitisation on disability issues*” (Page 4). Similarly, one core aim of the UNCRPD is “*to raise awareness throughout society, including at the family level, regarding persons with disabilities, and to foster respect for the rights and dignity of persons with*

disabilities” (Page 9). Awareness is key to understand disability issues and subsequently to improve accessibility; hence, it was accordingly placed under the theme ‘Accessibility requirements.’ Following a similar procedure, all the keywords were aligned with themes from the thematic analysis. Table 4-8 illustrates the keywords with their corresponding themes.

Table 4-8: Summary of keywords with their corresponding themes

Keywords	Themes from thematic analysis
Enforce/Enforcement, Compliance, Implementation	Institutions, policies and enforcement
Training/ Education, Assistive devices/technologies, tools	Acquisition of AT and usage
Service(s)/Access/ accessible Accessibility/ Awareness	Accessibility requirements
Develop/Development/, Standards/Policy/Guidelines, Protection, Privacy, Compatible/Compatibility, Developers	Developing E-government
Independence	Effects of inaccessibility
E-government, Applications, Portal/Websites, Challenges	E-government challenges and benefits
Participation, Inclusion/Inclusive, Support, Equality, Disability/Disabilities/Disabled, Discrimination	Making society inclusive
ICTs/Information and communication technology(ies), Funding, Education, Training, Internet	PWD lack E-readiness

4.7 Ethical Considerations

Ethics is an important aspect of research which requires that the researcher treats the study participants in a manner that; research objectives are achieved with minimal risk or harm to the study participants (Neuman, 2014). This emphasis is more critical for such a qualitative study which involves observing human subjects in their natural settings. In this case, the researcher directly interacts with participants; thus, creating a relationship between the two. Subsequently, there is a likelihood of creating tension between; knowledge generation and the privacy of participants being studied (Dowling, 2000). This study made use of observations, interviews, and documents. To ensure ethical issues are adhered to, the researcher first obtained Ethical approval from the University of Cape Town Ethics Committee.

Additionally, the researcher sought the consent of NITA via formal writing. The Ghana Blind Union was also contacted in formal writing to seek their consent. Again, the researcher sought the consents of participants. All participants (visually impaired, web developers and

government officers) in this study were informed about interviews ahead of time (via phone, official letters or face-to-face visit). Also, participants were made aware that participation was entirely voluntary and that they were at liberty to quit the study at any point or refuse to give information that could identify them. In accordance with ethical principles, participants names and key identifiers have been anonymised (e.g., PWD_{1,2,3}; DEV_{1,2,3}; GOV_{1,2,3})

4.8 A reflection on the Methodology Used

Disability ‘plunges an individual into a state of psychological limbo’ (PWD₁₀); hence, many disabled individuals are reserved to avoid others from exploiting them. Using observation as a starting research technique was useful to understand the reaction of the visually impaired and develop an appropriate strategy to closely interact with them in the future. In this study, it was vital that the views of key E-government implementers (government officers and web developers) and the voice of the visually impaired be heard hence interviews were made the primary data collection method. Researching in the field of governance is challenging in most developing countries such as Ghana where getting access to government officers is a hectic task, especially for data collection. Though Ghana has a very stable democratic process, differences in ideologies of the major political parties have a strong influence on the governance process. Hence government officers are sceptical about providing information, especially where their voices would be recorded. Specifically, in this study, government officers were interviewed at a time that elections (2016 elections) had been conducted and they had been a change of government (in January 2017). As a result, government officers were initially reluctant about their voices being recorded for the study as they felt it could be politically aligned or have political implications.

Web developers, on the other hand, are always tight with deadlines and had initially indicated a preference for answering online surveys in place of face-to-face interviews. It took lots of time and efforts to schedule informal interview sessions with them to convince them about the study. The informal sessions afforded me the opportunity to closely interact and explain further the research purpose to them before the study interviews. Examining government policies is critical as it has a bearing on online government services and equal participation for citizens (Gulati, Yates & Williams, 2012). Most policy documents analysed in this study were

mentioned by participants as having an impact on E-government development and promoting the interest of PWD.

4.9 Chapter Summary

This chapter described in detail the methodological approach adopted for the conduct of this study. The study is qualitative and interpretive to afford the research opportunity to gain in-depth insight into the phenomenon of study and to understand better E-government implementers' role in the exclusionary process and the contextual drivers facilitating the exclusion. The case study approach is employed as the most suitable strategy to understand the phenomenon in the Ghanaian context since it has received so far limited attention. The study employs observation as a powerful tool which enabled the researcher to appreciate how the visually impaired generally interact with ICTs and to become familiarised with the common AT they use. This research mainly used interviews as a data collection method 'to access people's experiences and their inner perceptions, attitudes, and feelings of reality' (Denzin & Lincoln, 1994). In-depth interviews with the visually impaired were to help capture their sentiments and challenges regarding access to E-government as well as their role in the exclusionary process. Interviews were conducted with web developers and government officers to capture their perceptions of accessibility and to understand how these perceptions influence their practices and reinforce the exclusionary process. Thematic analysis was chosen as the technique to analyse interview data. The rationale for content analysis was to understand the policy directives of government regarding the phenomenon and to compensate for the gap in data obtained from interviews. Following the methodological approach outlined in this chapter, the findings are presented in the next chapter.

CHAPTER 5 : PRESENTATION OF FINDINGS

5.1 Introduction

The previous chapter described the techniques and process for data analysis of transcribed interviews and observation notes as well as documents. This chapter reports the findings obtained from the data analysis. The chapter, therefore, provides an understanding of E-government accessibility from the perspectives of the visually impaired, web developers and government officers. The extent to which policy documents addressed concerns of E-government development and accessibility for PWD in Ghana is also discussed.

The chapter is arranged as follows: Section 5.2 covers the description of themes that emerged from thematic analysis corroborating with findings from content analysis while Section 5.3 entails established relationships among themes and presents a summary of the chapter.

5.2 Findings

The findings are generalised from empirical observations, interview sample of 18 visually impaired, 10 web developers and 9 government officers (refer to Table 4-4). It also involves a content analysis of 10 key policy documents that regulate the development of E-government and promote the rights of PWD in Ghana (refer to Table 4-6). The following sub-sections elaborate on the findings from thematic analysis corroborating alongside those derived from the content analysis.

5.2.1 Institutions, policies and enforcement

The study revealed that state institutions in Ghana were either weak or reluctant to implement existing legislation that promotes the interest of PWD. While the visually impaired participants mentioned the Persons with Disability Act (PDA) and Inclusive Education policy as key legislation that ought to be enforced to integrate PWD into the mainstream society, many web developers and government officers were unaware of their existence.

The sub-themes which made up this theme are: (1) Enforcing accessibility, (2) Persons with Disability Act (PDA) (3) Institutions enforcing laws, (4) Inclusive education. Fig 5-1 shows sub-themes in ascending order.

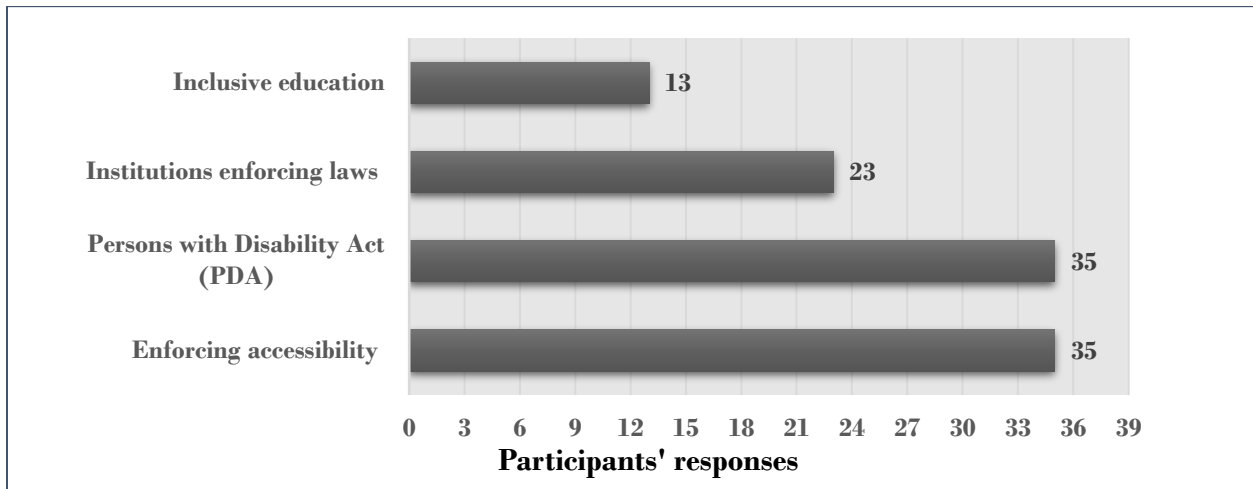


Figure 5.1: Frequency analysis of Institutions, policies and enforcement

5.2.1.1 Enforcing accessibility

Findings of the study show that the majority of the participants (35 out of 37) felt there was a need to enforce accessibility for it to be taken seriously by the Ghanaian people. Many participants stated that one way to enforce accessibility was for the government to implement an accessibility policy because *“Ghana does need a strong policy on E-services”* (PWD₉). They indicated that if *“government doesn't have any policy that will direct accessibility, then certainly people will take advantage and ignore”* (GOV₂). Moreover, if a policy is implemented and *“it's a requirement, it will be better off; because at whatever point you are developing there is the tendency you might just go ahead and do it without considering the accessibility options”* (DEV₆).

In this regard, respondents stated that enforcing accessibility should be the responsibility of government since it had every mandate to implement policies to regulate the development of software and the manufacturing or importation of hardware that are usable by PWD. Some developers (DEV_{2,4} and 10) stressed the need for appropriate hardware to be used by PWD to enhance accessibility. They indicated that most modern software development platforms had embedded in them *“frameworks that incorporate best practices for practically every kind of user and those frameworks might have those capabilities built-in and then those capabilities are taken advantage of by the hardware they are using to access it”* (DEV₂).

For instance, DEV₁₀ stated that the enforcement should start with the hardware to the software as he indicates:

...right from the hardware development level, through to the software programming level, otherwise we will be trying to program for devices that don't support some features of our applications.

Similarly, GOV₈ explained that a strict accessibility policy with clearly spelt out penalties were necessary to deter people from flouting the law. She explains:

If there is a strong policy that will force you whether you like it or not, then you have to. Or if there is any penalty that if you don't do...it this and that is what is for you, then maybe we will be compelled to so.

Some participants also shared the view that developers play a key role *“because definitely, the government will ... consult or contact developers”* (PWD₉) to build E-government applications. Besides, most people in the government agencies may not know about accessibility hence *“it is also up to the developer to draw their attention”* (PWD₁₆) and *“as the technology partners mention that to them”* (DEV₃). Others also believed that industry and the private sector have a duty to ensure accessible services because *“most of the applications out there are being produced by the private sector”* and *“even what government wants to come out with is not developed by government itself but by the private sector”* (DEV₂). For this reason, some participants felt that *“every individual or entity rendering goods and services has a crucial role to play”* (PWD₉) in enforcing accessibility. In other words, ensuring accessibility should be a collective effort of all *“because if we have to depend on the government alone, it will take centuries”* (PWD₆) to realise equal access for all citizens. For example, DEV₆ states:

if we don't push it if the expertise or the stakeholders don't push it, and the teachers; lecturers don't push it, academia doesn't push it; the government won't see as important. So, we must all play a role; if we see it to be important, then we must all play a role.

PWD₄ had expressed similar sentiments and indicated that accessibility issue should be taken up by everyone as he states:

I think that is an issue that should be taken up by everybody, the business community or the corporate affairs people and the civil society.

5.2.1.2 Persons with Disability Act (PDA)

The study revealed that there is existing legislation for PWD in Ghana to help address their needs; the Persons with Disability Act (PDA). Most participants acknowledged having heard about PDA; however, a few of them knew in details the rights of PWD enshrined in it. For instance, more than half of the developers indicated that they “*have heard about PDA but don't know the exact details*” (DEV₁₀). This lack of awareness was due to poor publicity and education on the Act. Participants felt that the “*publicity and enforcement on the part of the government hasn't been enough*” (DEV₇) to make them aware of the Act. For instance, DEV₃ stated that if he were made aware of the existence of PDA, he would have acted on it. He explained that:

this is my first time hearing it! I think with education, in terms of making information available for we the engineers, if we have this information at our disposal, personally I will do something about it.

The researcher, at this point, deduced that the PDA could not influence how developers designed and built applications since there were ignorant about it.

Many of the participants felt that the PDA was “*not effective because...most of the provisions made there are not working*” (GOV₉). The assessment was that the PDA was not being complied with because “*there is nothing for the company to lose if you don't initiate that, and there is nothing for any institution to lose if they don't initiate*” (PWD₁₃). For most visually impaired participants, the PDA was having no impact on their lives but a “*blanket just there to signify that there is an intention or there are efforts being made towards addressing the needs of the disabled*”(PWD₁₀). For example, PWD₁₆ stated:

For me, it is just a law and ... it is there! For me, I don't think that ... the government is intentionally or consciously doing something for persons with disabilities because of the Disability Act. I don't see it that way. I don't think that [sighs] it is affecting my life in any way! And I don't know about others whether it's affecting them!

The notion of many participants was that PDA addressed accessibility regarding physical infrastructure rather than electronic services. The PDA “*is more of accessibility to buildings, ... but not for technologies in Ghana*” (DEV₇) and hence was “*effective in industries like construction*” (DEV₅) and not in software development industries. For instance, DEV₁ indicated that because

of PDA, accessibility was becoming a standard in the construction sector, and similar efforts were required to make electronic services accessible as he states:

of late in construction, I have realised every bridge that is built; they consider disabled people and how they are going to use it and then in buildings and all of that so that should also become the standard in our industry.

For this reason, there were calls for amendments to the PDA because it does “*not say anything about E-services because I know though 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). The assertion by some participants was that PDA required an amendment to address some challenges PWD face in the digital age. For instance, some respondents suggested that “*the Act should be repealed and be replaced by the United Nations Convention of Disabled*” (PWD₁₀) which is more elaborate and addresses the challenges relating to accessibility in the digital era. For example, PWD₁₁ stated that:

There should be amendments regarding the disability Act to suit some of those areas or.... I know that with the United Nations Convention on Persons with Disability there are a lot of things in there that have not been incorporated into it. So, you hear some PWD calling that it should be amended to suit that of the United Nations Convention on Persons with Disability.

Others (PWD₁₀ and 11) criticised the PDA of being discriminatory among diverse disabilities based on its provisions and hence the urgent need for the amendment. GOV₉ hinted that efforts were underway to make changes to the Act so it could be more effective. Similar sentiments were expressed by GOV₈ who argued that with the implementation of E-government, “*the Act needs to be updated... so that all the other agencies and departments will be forced to use*”.

5.2.1.3 Institutions enforcing laws

The findings of the study point to the fact that the National Information Technology Agency (NITA) was the institution responsible for the implementation of all ICT-related services, including E-government in Ghana. NITA’s “*core mandate is in leading, developing and in assisting most government agencies in developing E-government services*” (GOV₄). According to GOV₄, it is the responsibility of NITA “*to ensure that services are universally accessible, universally open and more transparent*”. Owing to its mandate, NITA “*checks to make sure all*

government applications are in conformity with the policies of the government” (DEV₇). However, the study revealed that NITA was operating at the status of an agency and required more legislative powers to become an autonomous body to forfeit that mandate fully. For instance, GOV₃ stated that NITA needed to build its regulatory functions to enable it to enforce accessibility of services, especially those not under their supervision. He further explains:

If we had a very good system where anybody who is going to implement such services will first come to us; for us to look at the requirements, then maybe NITA can rather send out...the request for proposal then when the proposal comes, we evaluate through the owner of that application. This is an example of how maybe if you are able to do that, then you see the check and balances coming from every angle but when it's done per agency on its own but introducing it to you, then you find that you don't have much power and authority to really say much!

There was the sense that NITA was struggling to enforce its mandate in that; it could put in place the necessary implementing measures for the government agencies *“but immediately you leave they also neglect it because there is no enforcement”* (GOV₅). For that reason, NITA was *“working towards becoming... an authority where we can now do serious enforcement and those who violate some of these things can be sanctioned”*(GOV₃). The visually impaired on the other hand were of a different view. They felt the major challenge regarding lack of enforcement had to do with the *“political will of the government”* (PWD₁₆) because *“leaders are not concerned about issues bothering on PWD”* (PWD₁₁).

Some participants also expressed that many state institutions lack adequate resources which tend to hamper their efficiency. Again, in *“Ghana, our institutions are weak”* (PWD₇) because *“it's one thing having the law, and another thing working with that”* (PWD₁₄). If institutions *“who passed the law are not doing anything, then now much more the others?”*(PWD₁₆). The assertion by some respondents was that Ghana has *“beautiful laws except that they don't work, the person to implement it is not there, even the needed facilitation by government, to make it effective is zero”*(PWD₁₄).

5.2.1.4 Inclusive education

Inclusive education was mentioned by several participants as one of the means through which the government could promote accessibility and equity for PWD. Inclusive schools, in this

case, refer to schools which *“admit persons with visual impairment because they have a resource centre with resource personnel who have done special education for the blind”* (PWD₁). According to participants, although the inclusive education policy was promulgated several years ago in Ghana, its implementation had rather been slow. This is because resource allocation to educational institutions to make the policy workable had been woefully inadequate. As a result, PWD *“struggle”* (PWD₁₇) when integrated into mainstream schools because integration *“goes with facilities and professionals that most of the institutions do not have”* (GOV₂). In line with this, some respondents felt *“government is not serious”* about disability issues but only paying *“lip service”* to PWD (DEV₄). They indicated that the government needed to hold accountable institutions responsible for the implementation to sure that policies did not just exist but were in operation. For instance, DEV₅ quizzed:

Who is enforcing the law [inclusive education]? It's one thing passing the law and someone else enforcing it. So,... the Ghana Education Service needs to implement the laws passed.

A fair number of participants perceived that inclusive education policy if well implemented could help create long-term awareness of disability and accessibility issues. According to them, the *“biggest awareness that may last starts from our schools”* and that is why *“we are all advocating for inclusive education”* (PWD₁₆). For instance, DEV₃ felt that his perception of PWD and way of developing could be different if he had the opportunity to socialise with PWD in school. He explains:

If you get the chance to socialise with PWD for at least a year or two, then it becomes natural. I'm sure it's gonna become natural that when you are designing a solution whether it's a software or whatever, you know that you have to consider them in your solution. So, I think if we are to have people who are blind, deaf and all that and... together in a class, then you will learn more about them because you interact with them and then when you are developing a solution you just because you know how they could go by their stuff, you can factor that in your solution.

Promoting inclusive education would also help to debunk from the minds of people their wrong perceptions about disabilities and create a *“very strong bonding between the abled and the disabled”* (GOV₉). It could also afford PWD equal opportunity to be trained so there would be

more “*professionals that are persons with disability themselves to assist in training more PWD*” (GOV₂).

5.2.1.5 Related findings from content analysis

The results of the content analysis show that the arguments raised by respondents on this theme are justified. Although the analysed policy documents outline procedures for the development and implementation of E-government, emphasising that institutions enforce and adhere to them; this was not the reality. It was therefore not surprising that most developers and government officers in this study did not know about these policies. For instance, the ETA states that E-government implementers ought to “*ensure that, in relation to the provision of electronic transactions services, the special needs of vulnerable groups and communities and persons with disabilities are duly taken into account*” (Page 7). However, government institutions were not complying with the policies, thereby making it difficult to address accessibility challenges for PWD. In another instance, the E-GIF explains that “*there is the need to test for compliance and this is done by checking whether or not the MDA systems in place or to be implemented conform to policies and standards listed in the E-GIF*” (Page 16). This checking and supervision of E-government systems stated in E-GIF were not effective because the agency (NITA) responsible for ensuring that government agencies comply with the needed policies lack the authority to enforce these policies.

The results of the content analysis confirm findings of thematic analysis that the implementation of policies and their enforcement is necessary for addressing accessibility challenges. The arguments raised by the visually impaired that most policies had no impact on their lives because they were not enforced are also justified. A notable observation was that the keyword ‘E-government’ was not found in any of the policies on PWD. The calls by the visually impaired participants for the amendment of policies on PWD in the information era could also be well justified.

5.2.2 Assistive Technologies acquisition and usage

Evidence from this study shows that assistive technologies (AT) play a critical role in accessing E-government services. All the visually impaired participants reported they used one or more

forms of AT to interact with E-government platforms. Issues and challenges related to AT that appeared consistent among most respondents were (1) AT required for access (2) availability and affordability of AT (3) training in AT; (4) government needed interventions on AT (5) stakeholders' knowledge in AT (6) limited capabilities of AT; (7) local production of AT; (8) AT policy implementation. Figure 5-2 shows sub-themes related to assistive technologies acquisition, training, and usage in ascending order.

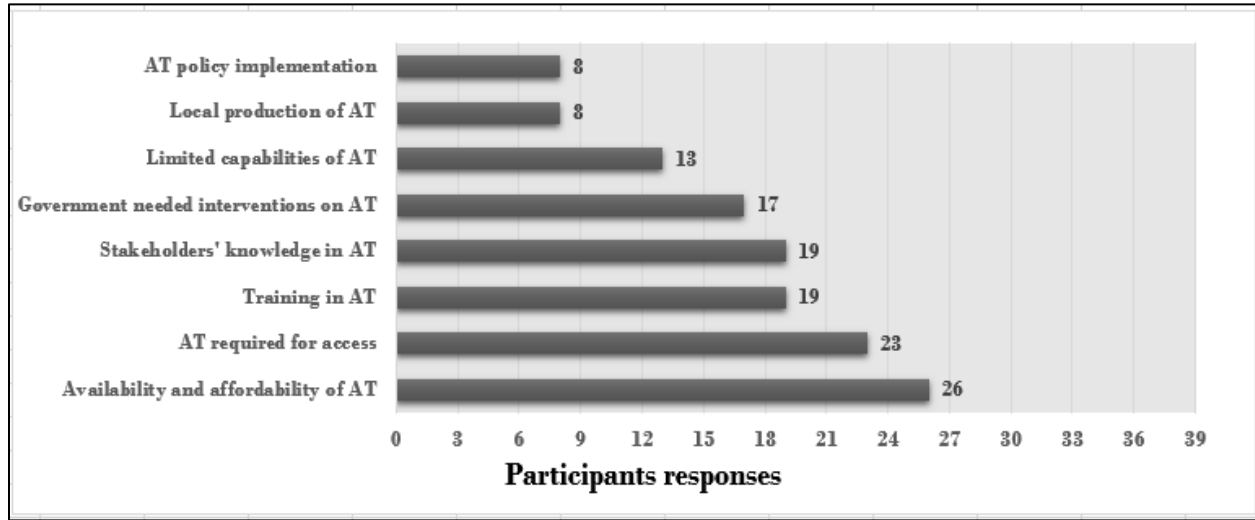


Figure 5.2: Frequency analysis of Assistive technologies acquisition and usage

5.2.2.1 Assistive Technologies required for access

Findings from the study show that about 62 per cent of the participants indicated that assistive devices and technologies were required to improve accessibility for PWD. They explained that without AT, especially for the visually impaired, they “*don't know how they are going to access*” (GOV₈). For example, the visually impaired “*need a key a braille-like keyboard to be able to access the web, and then they hear the computer now translates to them audibly*” (GOV₁). They suggested that there was a need for “*government agencies and then all their systems... to have this assistive technology in place for these people so that they can also access our system*” (GOV₈). If government agencies even improve their E-government solutions, without AT, the visually impaired would still encounter challenges. GOV₈ explains:

assistive technologies, we need to have them also in place because if the policy is there and after doing update trying to get there and you don't have the technology that will help them [PWD] to use the system, then work done is zero.

The visually impaired participants concurred with the assessment stating that without AT it was impossible to access electronic information and services because AT “*does for me what your eyes will do for you when you are browsing*” (PWD₁). They stated that AT such as “*screen reader makes it easy to get access*”(PWD₁₀). For instance, PWD₁₇ a participant with low vision stated:

I cannot read anything by myself whether it has been enlarged to font 72 or what; I cannot read; so, without the screen reader it means I cannot access the web at all

The visually impaired believed they could compete equally with their non-disabled peers only with AT because while “*technologies make things easier for others, they make things possible for us*” (PWD₂). Also, different AT are required at different times to compensate disabilities and enhance functional capabilities of PWD hence E-government applications ought to be designed in a way that is “*compatible with the assistive device that they will use to access*”(GOV₂).

PWD₉ elaborated on the diverse AT and explains:

There are different kind types of ... assistive technology for persons with visual impairment... totally blind once we are looking at screen reader users; low vision persons we are looking at screen magnifiers. And various kinds of devices for persons with a physical disability by way of ... upper limbs, you have the various... speech to text programs; you are looking at ... persons with hearing impairment, looking at various ... speech programs that would facilitate their work.

Some participants (PWD_{3,6} and 13) who were employees in the government sector expressed similar sentiments that without AT, it was difficult for them to interact with printed documents or be efficient. A noticeable observation was that none of the developers expressed an opinion about this sub-theme.

5.2.2.2 Availability and affordability of Assistive Technologies

Despite the benefits AT offered PWD, 70 per cent of the participants stated that AT were not affordable and readily available, which impeded accessibility. Particularly, for the visually impaired if AT are made “*available and affordable, then it will help them to ...use the system*’

(GOV₈). There was the need, therefore, to ensure that AT were “*accessible and maybe free for everybody*” (GOV₃). However, all the visually impaired participants had stated ‘*assistive technology is very expensive in Ghana*’(PWD₁). For instance, they cited screen readers were the most common AT they used while accessing electronic services with JAWS being the popular brand. They reported that a single-user license JAWS cost slightly over \$1000 and queried “*how many people will be able to purchase this?*” (PWD₁₁). PWD₉ further narrates:

Assistive technology generally is not affordable... 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...program single-user license is gonna cost you about a \$1,095.

The visually impaired lamented “*majority of them are within the ... poverty bracket. So, it does mean that if affordability is an issue, then you are cutting a chunk of persons with disabilities out*” (PWD₉). Aside from the cost, the next challenge was the availability of AT 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*” (PWD₉). Some participants (GOV₉, PWD₃ and 14) reported that there was only one centre in Ghana and the whole of West Africa (Ghana Material Resource Centre for the Disabled) that sold AT which was located in Accra, Ghana. As a result, disabled persons from other neighbouring countries came to Ghana to buy AT from the centre. In this regard, PWD were forced to travel long distances to the capital in search of AT. GOV₉ illustrates:

nationwide that is the only place [Ghana Material Resource Centre for the Disabled] you can get some of these things. Apart from that, you may get some from... the open market but that may not fit ... because the people handling those things there are not specialists.

The general concern was that “*if accessibility and availability and affordability are not there*” (GOV₈) how were they going “*to access these E-government systems and then the portals that we've been developing or been using in the country?*” (GOV₈). Again, it was noticed that none of the web developers expressed an opinion about this sub-theme.

5.2.2.3 Training in Assistive Technologies

Aside from the acquisition of AT, interviewees mentioned training was critical to gain the required knowledge. For most of the visually impaired, without training, they would not be able to use these technologies because there are certain commands and shortcuts one needs to know (PWD₁₇). So even *“if we have the technology and we don't know how to use it, there is also a problem; so, there is a need for us to be trained”* (PWD₁₁). PWD₂ and ₈ rated that training makes up 60-80 per cent of successful AT implementation and use. However, the expertise to train PWD in AT was lacking. Even for PWD in educational institutions, there was a lack of expertise to train the high numbers of students (GOV₇, PWD_{5,11} and ₁₄). This is because, training PWD demand special skills such that *“if you are not someone who has been trained in terms of how to relate with the disabled, you will always find problems with the disabled”*(PWD₁₀). And so, *“not anybody who has done ICT can be put in charge because if the person doesn't know about ICT for the blind, he will not be able to help us”* (PWD₁₇). PWD₉ explained the need for expertise in AT this way:

One thing that can make it easily accessible is for you; is to have a script ... developer who knows what screen reader usage all about is. And will develop the relevant script to fit the... program and it becomes easily usable. But we don't have that in Ghana neither do we have it in West Africa.

The cost of training in AT was another challenge reported by the visually impaired. According to participants, most training in AT were provided at exorbitant fees which they could not afford easily. A participant (PWD₄) at an ICT training centre confirmed this and explained that the level training offered was dependant on how much an individual could afford as he illustrates:

What we do at our computer centre here, the people pay for the training themselves, and therefore we are not able to give them the full course of the training. If we should give them the full course, they will not be able to afford it.

In addition to the lack of expertise, limited training facilities was a challenge. Training facilities in Ghana are very limited, particularly for those PWD who were currently not enrolled in schools and wanted to upgrade their knowledge on AT. There were calls for the establishment of training centres across the country to help reduce training cost. It was

reported that AT trainers in Ghana were not earning deserved wages because of inadequate training facilities. A trainer in AT (PWD₉) expressed dissatisfaction stating that the few training centres in existence were all centralised in the capital; as a result, most PWD ended up calling on the phone for voluntary training in AT since they were unable to travel the long distances. He further explains:

One thing is that ...there are very limited training facilities. Very limited training facilities...which are available for further places. So, what we end up doing especially as training in assistive technology, what I'm doing a lot of pro bono [working without fee]. We are supposed to be earning money from it, but because of the challenge in accessing, you know ... training in their various localities, they have to call you from where they are and, you have to give free training.

The study also revealed that PWD also needed consistent training for diverse reasons: (1) whenever they acquired new AT; (2) in the case of an upgrade on AT where new features were added; and (3) to resolve compatibility issues which they faced with the use of different operating systems or browsers. This sub-theme was majorly discussed by PWD (15) and few (GOV_{6,7 and 9}) government officers.

5.2.2.4 Government needed interventions on Assistive Technologies

Government interventions needed on AT appeared consistent among 46 per cent of the participants. They perceived that government interventions were needed in the areas of providing free access to AT, resourcing schools with AT, supporting with training in AT and providing grants and subsidies on AT. They felt that *“it is high time for the government to take into consideration the needs of persons with disability”*(GOV₉) so they could have easy access. Some participants argued that there was a need for *“free access to AT so that the poor, disabled person can have access”* (GOV₉). Respondents indicated that *“government should make deliberate efforts to buy some of these things”* (PWD₁₂) for PWD so *“they can be independent and compete with other people”* (GOV₉). There was also a suggestion that *“government can buy them [assistive technologies] in bulk put it somewhere for everyone who wants it to go for it”* (PWD₁₅). Some participants believed that the government had the resource and only had to prioritise the needs of PWD. For example, PWD₄ sentiments expressed that:

all it will take is for the government to sign one cheque and I'm sure we could have a lot of these things [assistive technologies] made available

A section of the participants advocated for subsidies from the government on AT to ensure that *“once you are a person with a disability, you can get it perhaps at a cheaper price”* (PWD₁₆). They contended that such a subvention was necessary because *“the role of government is to provide equal access for... every citizen”* (PWD₁₀). Alternatively, the government could provide grants to assist PWD to acquire the AT they required. Although GOV₂ stated that government had allocated *“3% district fund ...which is meant for persons with disability”*, some respondents felt it was inadequate and suggested that *“government can also negotiate with international partners or donors to bring in more investment”* (PWD₁₂) to cushion PWD.

The need for government to resource educational institutions with AT to create a conducive learning environment for PWD also featured strongly. For instance, PWD₈ suggested AT should be provided at public centres such as community libraries, internet cafes among others *“so that when you go there [public centres], you may get the access to the screen reader which will enable you to use the machine [computer] independently”*. The understanding was that *“government cannot provide for every individual, but then that is why we have institutions where the government can make these resources or these facilities available”* (PWD₇).

Again, it was observed that the discussion of this sub-theme was dominated by PWD (15) and three government officers (GOV_{2,7 and 9}).

5.2.2.5 Limited capabilities of Assistive Technologies

This sub-theme was reported only by visually impaired participants, all of whom mentioned using screen readers. Due to the high cost of screen readers, many visually impaired participants were engaged in the illegal use of screen readers instead of buying the licensed one. The illegal version which they referred to as *‘cracked’* enabled them to install a single-user license screen reader for as many people who needed it. The students among them reported that *“even the institutions which are supposed to get them are not getting them for us, so we get the crack version then we install it”* (PWD₅). However, the *“cracked”* was not robust because some functionalities were not activated. For instance, PWD₁₀ explains:

If you are not having the brand new [licensed], 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 [licensed] package.

Respondents indicated that it was frustrating using the “*cracked*” because “*every 40 minutes...you restart your computer*” (PWD₁₀). They explained that restarting their computers or electronic devices to avoid being blacklisted by the manufacturers (PWD_{10 and 12}). Aside from the “*cracked*”, screen readers still have some limitations. For example, a screen reader cannot read graphics as PWD₁ explains:

I use a screen reader JAWS on my laptop so, it reads anything anywhere I direct it to read. So,... far as it is there and is in readable text, JAWS will read it for me... So, the pictures and all the other ones, of course, JAWS hasn't gotten to those levels where it can describe pictures yet.

For this reason, some participants (PWD_{1, 2,9,12, and 17}) indicated the need for developers to have knowledge on the capabilities of AT so, they could design with their compatibility in mind. Another disadvantage of the screen reader is that “*you can't use it with any other person ... for example, if you are using the JAWS on the laptop; you are using the keypad ... if another person uses the mouse it disturbs the JAWS*” (PWD₆). There was a mention of open source screen readers by participants (PWD_{2,9 and 12}); however, these screen readers were not “*robust enough to deal with the various things one would want to do using various E-platforms*” (PWD₉).

5.2.2.6 Local production of Assistive Technologies

Findings from the study show that most AT in Ghana were imported from abroad due to the lack of local production. There is low expertise in the field of AT and lack of research hence the need to “*get more research done in that area so that we can have that local content*”(GOV₂). A section of the participants attributed the high cost and low availability of AT to the lack of local production contending that local production would make AT affordable and readily available. The assertion was that “*because we have to import it, we now have to pay some duty charges on it and all that add up to the cost*” (PWD₁₂). Respondents perceived that local production would reduce the cost of AT to a large extent. For instance, PWD₉ indicated there are no screen readers in local Ghanaian languages because we do not produce them locally. He explains:

Each time people see me use my laptop or my phone they say oooh do we have that in Twi? Basically, do we have that in the local language? And I say no we don't. And we simply don't because we don't produce them locally. Where they are produced, it's available you can have this thing in various languages in French, German, Russian, etc. Production cost if it is produced here, will also be relevantly low.

Participants mentioned that adequate investment and research were required to stimulate local production of AT (GOV₂, PWD_{2 and 9}). So that *“if we can do research here in Ghana, then we will develop the text to speech in our local languages”* (PWD₂). According to PWD₉, educational institutions ought to come on board and conduct more research in AT to identify the existing gaps. He narrates:

We need to research into ... what ... the loopholes are where the gaps are; it is only through research that we will know where the gaps are. And then we would be able to make an appropriate recommendation to fill in those gaps.

5.2.2.7 Assistive Technologies' policy implementation

One of the reasons cited for the several challenges associated with the acquisition of AT was the lack of policy from the government. As a result, a section of the participants indicated that the government ought to formulate a policy to regulate the sale and use of AT countrywide. Some respondents (PWD_{2 and 11}) argued that such policies existed in developed countries, making it much easier and flexible for PWD to acquire AT and similar steps ought to be taken the government. For example, PWD₂ stated that such a policy in developed countries provided subsidies on AT, ensured institutions are resourced with AT and supported with training in them. Other participants also had expressed frustration and felt somehow exploited with the high prices they were paying for AT and advocated for the government as part of a policy initiative to take full control of the Ghana Material Resource Centre for the Disabled which was the sole vendor of AT in Ghana. PWD₃ explains:

We have only one place in the whole West Africa which is not even to me it's not productive; we don't even know whether it's for the government or it's for an individual now. Entire West Africa, we have one in Ghana, and that office is the only place you can get ... our equipment [assistive technologies] ... people come from Nigeria, Cote

D'Ivoire, Burkina Faso come to Ghana Material Resource Centre for the Disabled (G.M.R.C.D). The best thing government can do from my perspective is to set up one Ghana Material Resource Centre for the Disabled and should be controlled by the government full stop.

According to GOV₉, PWD were '*not third-class citizens*' and should benefit equally from the government like all other citizens. There was a suggestion that a part of the policy, when AT are imported government '*should not take any tax*' so that '*it will help disabled persons to have free access*' (GOV_{9 and 6}). The lack of policy on AT was confirmed by GOV₂, who stated that:

I will say that government hasn't; we haven't got any deliberate policy to ensure that these assistive devices... the which is assisting persons with disability to access information are either subsidised or either made free or whatever. We don't have any policy in place.

The study revealed that there was a National Council on Persons with Disabilities (NCPD) in place whose function "*is to propose policies and strategies to the government to ensure that services, information services everything that we do is suitable or disability-friendly*" (GOV₂). GOV₂ who was working at the presidency and also was an executive member of the NCPD hinted that efforts were underway and there was "*draft that we are working on, eventually when this document is developed we will have to make a provision for that*".

5.2.2.8 Stakeholders' knowledge in Assistive Technologies

Evidence from the study shows that most developers and government officers acknowledge that PWD would require additional technologies to access web-based services conveniently. They envisaged that persons with physical (e.g., by way of upper limbs), speech and visual impairment would have more challenges accessing electronic services. However, they felt that the visually impaired would experience the most challenges (GOV_{1,2 and 6}, DEV_{4,7, and 10}). The findings pointed to the fact that many developers and government officers neither knew about AT nor had knowledge of how they functioned. For example, DEV₅ stated "*I think I have heard about assistive technologies. However, I don't remember exactly what it is*". For many developers, they had heard about AT but "*not read into how they fully assist people with disabilities*" (DEV₈).

Others also had misconceptions about accessibility features and technologies and they referred to them as technologies meant for “*lazy people*”. For instance, DEV₅ indicated:

I’m being honest with you I have seen them but, I haven't seen them as things built for persons with disabilities, I have seen them as things built to make us lazier.

In the opinion of the visually impaired participants, developers have a critical role to play in accessibility in comparison to the government officers. For this reason, there was a suggestion for developers to be trained in AT to understand their competencies so that they could include in their designs the necessary considerations. There was a sense that “*developers who build these online platforms have no clue or whatever when you talk about issues of accessibility where ... assistive technology is concerned. So, they don't factor these basic features into the development of these programs*” (PWD₉). Hence the need to provide accessibility training for them to get first-hand information on the challenges PWD face when accessing E-government services. For example, PWD₁₁ stated that accessibility training is important because:

most developers don't really know the needs of the disability and how to make this software accessible to them; so, it is important that they get ...trained in that aspect.

Developers concurred with this assertion indicating that they “*have to know the devices that PWD use or they can use to access the software*” so that they can tune their “*software to be compatible with them*” (DEV₁₀).

This sub-theme threw light on why the voice of developers was not heard on any of the sub-themes on “AT acquisition and usage”. Since most developers did not know about AT and how they functioned, it would be difficult for them to relate with challenges on AT usage.

5.2.2.9 Related findings from content analysis

From the results of the content analysis, the theme ‘AT acquisition and usage’ has not been captured in most key policy documents. Even though all the participants in this study asserted that issues with AT and training in them are crucial to improving accessibility, the policy documents examined do not adequately address this issue. For example, the problems associated with the acquisition of AT and training in them did not feature in any of the policy documents on E-government development. Contrary to the findings from the thematic analysis where most participants stated that AT should be readily available to enable PWD

access E-government services, the E-government policy documents analysed do not address challenges relating to AT. Even with the policy documents on PWD, AT and its related issues have not received the needed attention; thus, in DACF, PDA and UNCRPD the keyword AT appeared ‘2 times’, ‘1 time’ and ‘8 times’ respectively.

For example, one aim of the DACF is *“to support persons with disabilities have access to technical aids and other assistive devices”* (Page 4). However, findings from the thematic analysis indicate that PWD were receiving very little support regarding access to AT. Similarly, the UNCRPD admonishes governments to make conscious efforts in *“facilitating access by persons with disabilities to quality mobility aids, devices, assistive technologies and forms of live assistance and intermediaries, including by making them available at affordable cost”* (Page 15). On the contrary, interview participants, especially the visually impaired, reported that AT were very expensive, and their presence in Ghana was low. Also, none of the developers and government officers had received any training on accessibility although the government has *“to provide training for stakeholders on accessibility issues facing persons with disabilities”* (UNCRPD, Page 10). The overall assertion is that, though challenges regarding AT are high on the radar of participants, policy documents seem to underplay their significance. This could explain why all the visually impaired respondents reported facing challenges with acquisition AT in Ghana.

5.2.3 Accessibility requirements

The findings of the study show that there are requirements needed to improve accessibility to E-government services for PWD. Participants mentioned the lack of awareness as the biggest hindrance to accessibility. They perceived awareness was an important catalyst to promote and create sensitisation about accessibility issues. Three key sub-themes emerged related to this theme: (1) Accessibility needs and benefits, (2) Accessibility awareness, and (3) Education on disabilities and accessibility. Figure 5-3 shows the sub-themes in ascending order.

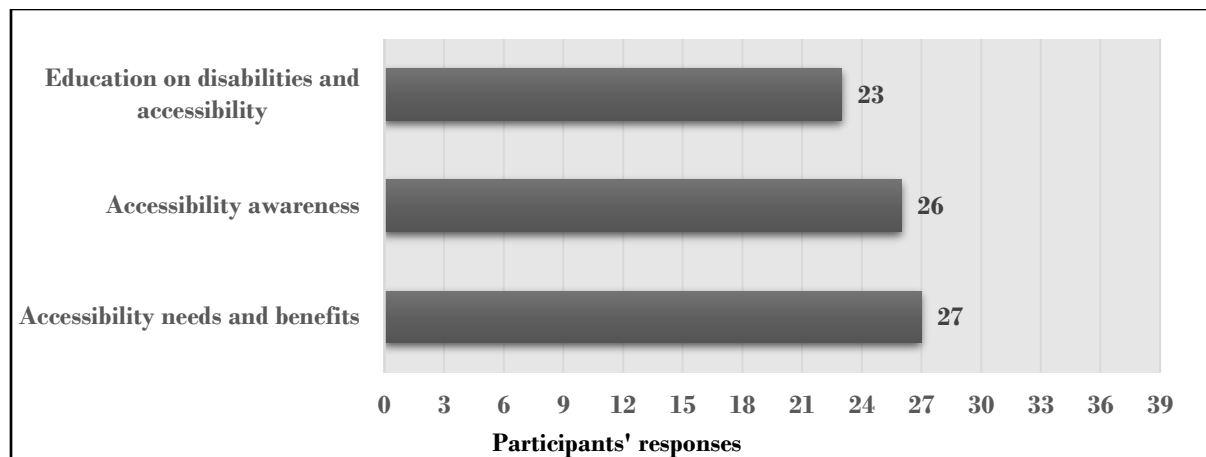


Figure 5.3: Frequency analysis of Accessibility requirements

5.2.3.1 Accessibility needs and benefits

This sub-theme was broad and captured discussions on benefits of accessibility to PWD, resources and requirements of accessibility and the various accessibility views expressed by developers and government officers. Under this sub-theme, I further discuss these three sub-sub-themes in turns.

Accessibility benefits

Participants felt that accessibility would promote greater inclusion for all. This is because an accessible service is usable by a wide range of people. In the opinion of developers, accessibility is important if *“you want to cover a wide range of people and then all people from all walks of life and with different backgrounds”* (DEV₁). For example, accessibility features support the illiterates and the aged (DEV_{1,2}, PWD₄, GOV₄). Including accessibility features denotes that a developer thinks about all its stakeholders (DEV₄). They indicated an accessible application was more usable because in application development, *“what is the most important is that the user can get access to what he wants when he wants it, and it will always be there”*(DEV₁₀). Lack of accessibility then renders application *“somehow somehow not very useful”* (DEV₁) for its users. Also, accessibility increases the reach of services and *“institutions rather benefit because sometimes the things that we do usually thinking that we are doing it for only persons with disabilities; but usually it tends to help many other persons”* (PWD₁₆).

For instance, GOV₄ indicated that accessibility is a key attribute for usability and he states:

If people can't access these services, then why did you create the platform in the first place ok? So, we have to put in all the enhancing tools and mechanisms for people to be able to access your services

Other respondents also emphasised that accessibility constitutes an important characteristic for any electronic application because “*even for those who are not disabled sometimes some designs are not favourable to...them*’ (GOV₃).

Accessibility needs

Findings from the study show that certain conditions were necessary to improve accessibility for PWD. For instance, improving accessibility required that developers learn on technological (accessibility) tools and “*look for how to integrate them*”(DEV₇) into their applications. Surprisingly, all the developers in this study had stated at some point in their interviews they had never made use of such accessibility tools. However, they believed that ‘*I.T has a wide range of tools in existence* (DEV₄) and technologies had far advanced, making all things doable. For example, DEV₅ stated that he felt ashamed because he was aware accessibility tools existed but never learned about how they could be implemented as he illustrates:

technology to do some of these things exist. It's not ... a technological challenge but it's awareness and while you might find some people counting the numbers to determine this is a worth-while business to turn on you will also find other people who are willing to do this... their own time. I am willing; I just don't know that it exists. I know they exist but I don't think of it in relation to technology.

According to participants, the development of accessible solutions also required diverse resources including time, money, appropriate hardware and human expertise. Developers explained that they needed time “*to really learn about all the technologies*” (DEV₅) and “*understand how PWD interact with them*” (DEV₆) if they were to implement them in their applications. This was because accessibility had naturally not been part of their development cycle. Other developers perceived accessibility considerations for PWD “*will be extra work*” (DEV₁₀).

According to participants, improving accessibility also had financial implications such as training and hiring expertise. From the perspective of the developers, to improve accessibility, one would need to understand how assistive devices work and develop appropriate software

solutions. In instances where a developer lacked the prerequisite knowledge, he may have to hire other expertise on the project, increasing the cost of development.

From the perspective of the government officers, demanding accessibility from developers would mean the agency might be spending more on developing E-government services. GOV₄ explains:

If we want to develop E-government services, ... requirements are straightforward but if we have to put in place accessibility tools, it will mean that the vendor will charge you more, right? Maybe you have to put magnifiers on the website and put multiple languages, put this you know stringent guidelines for them... to adhere to colour schemes. Because they might have their own templates, we are ... telling them that this is the standard to follow and so on, all of that will require... will mean that its website that will cost say \$20,000 could shoot up to up to maybe \$50,000 because other considerations will have to be taken.

Other participants perceived that to make E-government services accessible to PWD, *“we can have the same web content dynamically created in a certain portion of that site especially for them”*(GOV₁) while maintaining a regular for the rest of the citizenry.

From the viewpoint of the visually impaired, government officers and developers ought to undergo accessibility training to understand the needs of PWD, so they can improve accessibility. They perceived that developers particularly need to *“require training to be able to understand the issues of persons with disability and then to understand why they should make information belonging to government accessible and why they should include everybody in the decision-making process”*(PWD₇).

Accessibility views

Developers and government officers expressed their views on accessibility and its perceived importance. Largely, they felt accessibility had great value but may depend on the type of services to be developed. For many government officers, accessibility should be prioritised in the provision of E-government services because citizens have equal rights and access to services so, E-government services cannot be an exception. For instance, GOV₂ argued that the

operations of government are run by the taxes of citizens and hence, all services provided by the government should be accessible to everybody. He illustrates:

Accessibility should be a priority! It is a priority because government exists for all and government is run by our taxes and therefore whatever services that government institutions provide, they should make sure that they are accessible to everybody including persons with disability.

It is of utmost importance that E-government developers have the “*mindset that, different stakeholder groups have to access services*”(GOV₄) and make considerations for them not thinking that they are “*just doing it for a minority of people*” (GOV₇). GOV₈ disclosed that Ghana was ranked high by the World Bank regarding doing business hence improving accessibility was critical for her agency which was providing several online services such as personal enterprise, company, and marriage registrations to the public.

For most developers, previous applications they had included accessibility features came as an afterthought and not part of the initial design. For example, DEV₁ narrated a typical case where he had developed an application targeted at lazy persons who do not want to use parts of their body. However, after some engagements with stakeholders, he realised the application could fit disabled persons. While some developers (DEV_{1,3 and7}) felt accessibility should be an agenda going forward; be prioritised and seen as a social responsibility because of its usefulness, others explained accessibility “*will not be a top priority because you are looking at the market, which is driving development*” (DEV₄). For instance, DEV₂ stated that the market force and competition were driving the development industry to the extent that it was difficult to make accessibility a top priority.

5.2.3.2 Accessibility awareness

A high percentage of participants (70 per cent) indicated that the lack of awareness was one major hindrance to improving accessibility in Ghana. Most developers mentioned that accessibility issues related more to lack of awareness than a technological challenge. Owing to the lack of awareness, issues of disabilities hardly come to mind in the process of development. Some developers even admitted they did not know PWD access online services. For example, DEV₆ stated he had no clue PWD also access web content as he indicates:

it has ... never really come to mind that people with disabilities actually access content like that okay? That's ... the fact of the matter! I think it has been an issue of awareness okay?

Developers limited knowledge on assistive technologies attests to the fact that they lacked awareness regarding PWD and accessibility. For instance, DEV₅ associated accessibility for the visually impaired with braille. In this regard, it was difficult for him to understand how braille could be used to browse the internet or access the web. He explains:

I don't know how things are done in fact when you talk about blind people the only that comes to mind is braille. I am thinking how on earth do you browse the internet with... what is it called Braille right? Yeah, how do you browse the internet with braille?

As a result, some developers felt they had been “*quite discriminatory*” by their development style (DEV₆). Most developers emphasised at different times in their interviews that though development was money-driven; more awareness could make them address basic challenges PWD face in accessing E-government services. The assertion was that awareness on PWD and accessibility issues had generally been low in Ghana as compared to the Western world where “*they've made sufficient noise about accessibility that it's on everybody's mind*”(DEV₂). Some developers did not know “*there are ways to develop to aid people with disabilities*”(DEV₆); so, “*if they are made aware, they will be able to do it*” (GOV₂). Similar sentiments were expressed by PWD₂ as he explains:

Somebody who can ... maybe a PhD holder in like Computer Science and he doesn't know that a blind person can use the computer... so it's the awareness... I will not say people don't want to do it ... they are not aware of it.

Many of the visually impaired shared similar sentiments stating that “*awareness is the biggest challenge. 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*” (PWD₁₆). Others, however, felt that E-government implementers especially the government agencies ought to be aware because of the provisions in the law. PWD₁₁ explains:

it is their fault not to be aware, you understand? Especially with the government agencies you... they need to know. They have to be aware of any available law that

...will be necessary to their operation or existence so... though it may be ignorance, I don't see that as an excuse.

The need, therefore, to intensify and create more awareness featured strongly in the discussions of many participants. For example, 90 per cent of the developers reported that there was a need to consciously promote accessibility awareness across different sectors (banks, school, private enterprises) within the Ghanaian society. They felt that especially “*government agencies responsible for people with disabilities*” (DEV₇) should spearhead such awareness creation. However, a section of the developers posited that since the neglect came from them; they were “*responsible for correcting that mistake. It means that they will in their small way, try to disseminate information, maybe hold some meetings or conferences, specifically for that to correct it*” (DEV₁₀). PWD also should help “*raise awareness so high so that people will know*” (PWD₁₆) their needs. Creating awareness, therefore, is a “*multi-sectorial matter*” which should be handled from “*multiple fronts from those who are affected*” (GOV₄) to all E-government implementers and the society at large.

5.2.3.3 Education on disabilities and accessibility

Given that most developers and government officers did not have adequate knowledge of AT and the technological tools to use in developing accessible services for PWD, accessibility training was suggested to help them acquire this knowledge. Many developers and government officers agreed that training in accessibility would be useful “*because not everyone knows that there are ways by which people with disabilities can use a computer*” (DEV₂). Through such training sessions, they could learn more about accessibility, its importance, and how to enforce it because; “*if they don't know, they will not enforce it*” (PWD₄).

Many participants, however, felt these training should be organised for practising professionals; while accessibility should be incorporated into the educational curriculum to create awareness from an early stage. The lack of accessibility component in study curricula, therefore, was seen as one impeding factor for improving accessibility. Many developers mentioned that particularly in IT and programming courses, there was a need to introduce accessibility in study curricula to sensitise young developers on accessibility. The assertion was that if accessibility were taught in schools, it would create awareness for upcoming developers

“so, as people get out of school because it is part of the syllabus, they will certainly use it” (DEV₄). In the view of the developers’, accessibility in education syllabus should not be targeted only at them but form part of the entire “*curriculum for the universities; that's where people begin to learn the practical knowledge on how to develop solutions*” (DEV₆). Some government officers echoed the same sentiments that it was important for educational institutions to include accessibility components in their syllabus. For instance, GOV₂ illustrates:

Schools, universities, colleges and other private institutions which train these IT officers and professionals, they also need to include that in their curriculum.

Participants also reported that education on disabilities was important because “*people’s understanding of disability issues will push them to either make sure that services, information, everything is made disability-friendly or not*” (GOV₂). There was a suggestion that education on disabilities “*be part of our curriculum in schools so that everybody gets an orientation on issues concerning the disabled*” (PWD₇). Moreover, education is “*part of raising awareness of whatever that you want the people to know on disability*” (GOV₉). With such education, people would become conscious of the fact that “*people with disabilities live among us, so we need to give them some priority, and we need to think about them every day in everything that we do*”(GOV₁). Education on disabilities and accessibility as reported by participants are key remedies to creating a long-lasting awareness in efforts to improve accessibility for PWD and

until we do very intensive public and social education to educate members of our community to change their mindset and attitude towards persons with a disability, we will give them very little support- GOV₉

5.2.3.4 Related findings from content analysis

The results from the content analysis revealed that the government is cognizant of the fact that citizens should “*be able to access government information and services at their convenience*” (GGEA, Page 95). According to the PDA, “*a person who provides service to the public shall put in place the necessary facilities that make the service available and accessible to a person with disability*” (Page 4). These documents, however, do not stipulate how government information and services could be made accessible. For instance, several policy documents (ETA, GNCA, ICT4AD) pointed to the fact that the government desire to promote “*universal access, which*

means access by all citizens of Ghana to ... electronic transactions” (ETA, Page 64). These documents neither provide guidelines for E-government implementers nor explicitly state the inclusion features to make electronic services accessible to PWD. These findings confirm those of the interview respondents who argued that improving accessibility required commitment and prioritisation from government alongside intensive education and awareness-raising.

Educating and creating more awareness is seen as a means to make people understand accessibility issues better so they can prioritise accessibility. For example, the UNCRPD highlights the need for governments to promote “awareness-training programmes regarding persons with disabilities and the rights of persons with disabilities” (Page 10). This contradicts findings from the thematic analysis which indicated low awareness among E-government implementers especially the developers. Most developers did not know that PWD could access E-government services and largely attributed their ignorance to lack of awareness.

5.2.4 Developing E-government

The findings of the study revealed that various factors influence the way developers design applications. These factors, in the end, explicitly or implicitly affect the accessibility of E-government services developed. Six sub-themes were identified with the theme: Developing E-government. Figure 5-4 shows the sub-themes in ascending order.

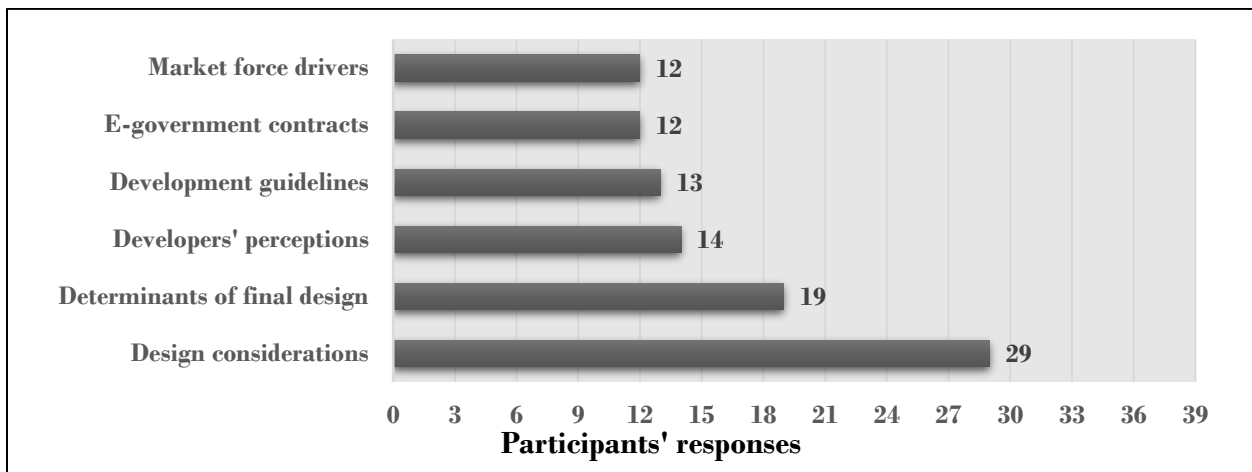


Figure 5.4: Frequency analysis of Developing E-government

5.2.4.1 Design considerations

A high number of participants (78 per cent) perceived that design considerations made by developers largely affected the way E-government services were developed. This is because developing accessible services require that certain design specifications are incorporated by the developer and

so, when that consideration is in mind, at the back of the minds of those who are designing services, not only will they put those considerations in the systems but also create other facilitating conditions for people to access services more smoothly- GOV₄. And so in instances where developers “*don't have PWD in mind when programming*” (DEV₁₀), solutions become not usable for them because “*they did not take into cognisance the needs of assistive technology users*” (PWD₉). There was a sense that E-government implementers “*hardly consider accessibility*” (DEV₁) in designing their solutions. For example, GOV₈ explained that although her agency was offering several E-government services, accessibility was not part of the design considerations; hence, PWD could struggle using such systems as she illustrates:

My applications I have here when we were at the initial stage when we were gathering data, we never considered... in fact, it didn't even cross the mind to factor such people [PWD] into this application that we built. So, as we speak, it will be difficult for them to use our system.

The use of AT required that designs are structured in a specific manner to ensure compatibility. For example, PWD₂ indicated that the arrangement and naming of links on a webpage could affect screen reader users. He states:

If you are using a screen reader, for instance, we have a way to follow the link quickly. If two different links have the same name, but they are doing different things for screen readers, it is difficult for it to identify it.

Likewise, PWD₁₆ accentuated that design considerations ought to be made across the different disability groups. For instance, a low vision person should have an alternative font size or means to enlarge the fonts and change certain colours if the need be. The contention was that:

Technology is becoming agile, and every time... things are changing! So, if... you are building a system for the government and you develop the system ... and you say; this system cannot be compatible with any other system, it's not acceptable! - GOV₃

Once the necessary design considerations are made, and solutions are “*constructed with the relevant accessibility features*” (PWD₉), they become easy for PWD to use. Accessibility remains a “*major component*” (GOV₄) of web design; hence, either consideration is made for it or not determines the development outcome.

5.2.4.2 Determinants of final design

Evidence from the study shows that two key issues determined the final design of E-government services: stakeholder engagement and user-test outcomes. Government officers indicated that consultative meetings were held with stakeholders to get their inputs before settling on the final requirements for development. Developers, on the other hand, mentioned they tested with users to see how they interacted with their systems and to retrofit any design challenges that may be highlighted through user-testing before concluding on development.

According to the government officers, stakeholders are “*those who would use the system*” (GOV₈) hence are consulted for their inputs before they drew up requirements for developers bidding to design E-government solutions. Alternatively, they “*develop to a point and continue deliberating with stakeholders, and keep building*” (GOV₁) until the development is complete. However, none of the government officers mentioned engaging PWD or any of the disability organisations for their inputs to be factored in the requirements for development.

All the developers in this study reported that they tested their applications with users before concluding the development of the applications. They mentioned that two different types of testing were usually conducted; automatic and user testing. Automatic testing though was useful, did not guarantee accessibility or usability hence the need for user-testing. Automatic testing helped to detect coding errors and platform compatibility issues to ensure “*your apps don't crash when you open on different platforms*” (DEV₉). On the other hand, the role of user testing was to validate user requirements: “*users to go through and be sure that the application you are developing meets the requirements*” (DEV₆) and also help to identify difficulties users may

encounter interfacing with the application.

Despite the significance of user-testing, all developers admitted that they had never tested their applications with a disabled person. The researcher inferred at this point that since PWD had never been used in testing applications most applications developed did not factor in their challenges as users of the system.

5.2.4.3 Developers' perceptions

Findings of the study show that E-government developers services held certain notions about PWD as well as individual assumptions that informed their way of development. Firstly, developers perceived PWD as non-technology users and therefore did not consider them during development. They stated that when *“you look at people who use technology, PWD don't really come to mind”* (DEV₁₀). The notion was that *“probably PWD might not even bother using the applications”* (DEV₆).

The other reason was that developers envisioned accessibility was not achievable and that *“PWD always will need some kind of assistance before they can complete a process that's online”* (DEV₁). With that mindset, they did not cater for the needs of PWD during development. They also felt that PWD would face challenges in any way because *“it's a challenge to be impaired in some way, it makes ... doing everything difficult”* (DEV₁₀). In this regard, they argued that if PWD need *“services, they can walk in here and somebody will assist them”* (DEV₇) if they cannot complete it online by themselves. Some visually impaired participants echoed similar sentiments indicating that sometimes applications are designed in a way that they are unable to complete except they relied on sighted persons. For instance, PWD₁₈ cited his experience in filling the Ghana E-passport form as he narrates:

filling the form online, sometimes certain number of characters or figures will be displayed on the screen to be keyed in to open another page to complete the form, and that will call for a sighted person to assist you.

The assumptions that developers make in the development process featured as part of what formed their perceptions. Many developers stated that they were not opposed to making their systems friendly to PWD, but because of the way they use the systems; they tend to design

applications with the assumption that the end-user was likely to interact the same way with applications. They explained that they assumed *“the person can see, there is an underlining assumption that the person has fingers, there is an underlining assumption about a whole lot because that's the experience you have”* (DEV₅). Such assumptions implicitly influenced their development in the end as DEV₃ illustrates:

when I build the product, I think of the user like myself, ok? And then I'm lucky I don't have any disability so...I think it comes from that point. Since I think the person going to use the product is just like me, so I don't consider any form of disability and then I don't [stutters] I wouldn't even factor it inside my solution.

Other developers never tried integrating accessibility features in their developments because they assumed that it was not *“easy to create such applications for PWD like you will create normal applications for people without disabilities”* (DEV₈). There was also an assumption that developers could do nothing to improve accessibility and that it solely relied on the devices PWD were using to access applications. DEV₂ explains:

from my perspective of software development, I haven't yet figured out what we could do in developing software especially the kind of software we develop to make it easier for those with a disability to use because ... I tend to see that's the function of the... device they are using to access whichever service.

5.2.4.4 E-government contracts

One another factor identified to influence the development process was the contract documentation signed between clients (in this case government agencies and ministries) and developers. Many developers reported that they would comply to design accessible applications if it were part of the contract agreement they signed. They contended that accessibility could become a necessity only *“when it is clearly spelt out in the contract agreement”* (DEV₁₀) else by default accessibility would always be overlooked. For example, DEV₂ was part of the team that developed the E-passport in Ghana. He explained that before the development, they had several meetings with the Passport office before concluding on the contract documents and accessibility was not part of the contract. He indicates:

If I take the passport, for instance, where we started somewhere in February meetings upon meetings never once did it [accessibility] come up. Yeah, it's ... not something on the radar of most people.

Similarly, DEV₄ stated that if the government made accessibility a requirement in the bidding document, developers would have no option but to abide by the contract.

If the government says...for instance, the standard document that should guide you in ... your contract bidding it's in it, you have to add it! The feature has to be added then why not?

The assertion was that accessibility would gain the deserved priority if it is a requirement in E-government contracts. For instance,

“if you are coming to bid for a government contract, we must see your PWD strategy; what you plan to do with persons with disability. It has to be visible in your proposal before you can move to your next stage so they can do that by regulation” (DEV₅). This is because most developers don't think beyond the contract documents in the development of applications so accessibility *“doesn't come to mind until it's stated in the documentation”* (DEV₃).

The study also revealed there are policies and guidelines that developers of E-government ought to follow. E-government projects were developed by strict adherence to some policies which included the ICT for Accelerated Development, E-government Interoperability Framework, Enterprise Architecture Framework and Data Privacy (GOV_{3,4 and 8}). These policy documents are to be complied with when developing E-government services irrespective of the consultants contracted.

However, many of the developers indicated Data Privacy was *“the only thing that the government asked us to comply by”* (DEV₂). Subsequently, it was the only policy at the time of research which influenced the development of E-government services and all government applications at large. For example, DEV₁₀ indicated that developers were mandated to comply with Data Privacy by including necessary security features to ensure public data was kept private as much as possible. He narrates:

The only thing that I can think of now is the confidentiality of information. Yes, because if you are working for a government sector, they expect that ... their data will be confidential, ... so there are policies in place that will do with security

5.2.4.5 Development guidelines

Developers indicated that they followed specific guidelines to develop their applications. Guidelines mentioned in this study included international guidelines (such as those from Apple, Google, Android), institutional or company guidelines and personal guidelines learnt from school. Software companies involved in this study which did not have guidelines on their own relied on international standards to guide their development. For instance, DEV₅ indicated his company was still in the process of developing guidelines, however, other international guidelines were followed to develop applications.

Developers follow several guidelines depending on the institutions they worked with; and varied their development approach to suit the institutional guidelines. Developers felt, however, *“policy in the form of a standard that if you are coming out with an application for a government agency, it should conform to this standard”* (DEV₇) was necessary. A common standard could help developers to incorporate accessibility into their solutions (DEV_{1 and 5}).

The study also revealed that the majority of developers (80 per cent) were either not aware of W3C guidelines or were they using them. Those developers with an awareness of W3C guidelines or had limited knowledge of its relevance in the development of web applications. For instance, DEV₆ states:

I know about W3C, I mean I know they are like the standard for building web applications and web websites everything web, they are like the standard, the global standard.

Government officers sided with the importance of having contextual guidelines for developers to follow. GOV₂ had hinted that efforts were being made by the NCPD to formulate guidelines for developers to use in developing government services. He illustrates:

Because of the nature of the design, so that is something that we are working on, we... in fact, we want to come out with the... guidelines on making information and services accessible to persons with disability.

PWD shared in this view, stating that unless developers are *“guided by the existing policy of the day: they would always gloss over these crucial issues. And thereby cut out a section of the citizens”* (PWD₉).

5.2.4.6 Market force drivers

Evidence from the study shows that developers are mostly money-driven and design with the notion of a ‘majority’ mindset. As a result, developers invest time and tools to design based on how much profit they could make (DEV_{2, 4 and 10}). For many of the developers, PWD by default fell in the minority group, and hence their needs were mostly overlooked. For example, DEV₄ explained that the market size of PWD in Ghana as compared to the mainstream population was small; hence, the needs of PWD were easily overlooked in applications development because:

We are a profit-oriented organisation, or I develop ... for money. And in Ghana the size of the market for the disability who will be in demand for our products is small. So... I have not invested in any tool that will help me to develop for them that I should say.

Moreover, *“businesses are often looking at numbers to make money”*(DEV₅) so, if PWD had *“huge bargaining power and commanded a certain percentage of the business and they said things should be done this way, probably everybody will be...following suit”* (DEV₂). A developer is mostly constrained with stringent guidelines and deadlines so he *“wants to come out quickly, he wants to get his product in the market, so it is not driven by all the stakeholders” it is driven by how quickly he can get his product out there into the market and move on’* (DEV₄). Because of these constraints, developers adopt the fastest and cheapest possible approach (DEV_{2,4 and 10}) in development. In this regard, to include accessibility features, developers indicated they required a larger disabled population to make the cost of development economically viable.

In the end, developers, after weighing the options tend not to bother with accessibility features if it would not increase their profit margin. *“So, you might just go ahead and do it without the accessibility options because you might ...be considering that you have a fair market with the people who don't have impairment anyway”*(DEV₆). For example, DEV₅ stated that the development features to include in designs is determined by how much profit he would earn. He illustrates:

If I consider the disabled people, how many are they? Ermm if they are not many, how long will it take me to improve whatever I’m thinking and developing. Ahaa... so in my head, the commercial consideration also, unfortunately, interferes with judgement about what features to release.

5.2.4.7 Related findings from content analysis

The content analysis results show that E-government development factors mostly centre around the use of standards or guidelines and policies to ensure compatibility, keep data protected and private. Similar to the findings from the thematic analysis, the policy documents reveal that there are standards and guidelines that govern the development and implementation of E-government in Ghana. The content analysis also confirmed that the DPA was among the key policy documents to be followed in the development of E-government services. Several policy documents (DPA, E-GIF, GGEA, ICT4AD) covered issues of compatibility but mostly with reference to technologies, systems and different deployment platforms. Compatibility in these documents does not explicitly capture issues of AT used by PWD. According to the policy documents, E-government developers are expected to know and apply these standards.

For instance, the E-GIF states that *“in the event of application development of a system, the developers need a thorough understanding of the E-GIF to adopt relevant specifications as directed during system design and development”* (Page 17). Again, developers are required to *“ensure compliance with accepted international technical standards in the provision and development of electronic communications and transactions”* (ETA, Page 7). However, developers in this study seemed unaware of such standards as most developers during the interview mentioned the DPA as the only existing policy document that had an impact on their development (DEV_{2,3} and 10). The interviews also revealed while policy documents have spelt out certain standards for developers to follow, they were more clued to contract documents they signed with the government agencies in the development of E-government services as revealed by the interviews. Hence one can conclude that the arguments made by developers in the interviews seem to override policy directive which states E-government systems should be *“implemented in accordance with accepted policies, technical standards, and guidelines”* (E-GIF, Page 5).

5.2.5 Effects of inaccessibility

This theme was mostly reported by visually impaired participants. They reported several consequences they faced and the possible challenges they envisaged if accessibility issues were

not resolved. Accessibility issues prevent PWD from benefitting fully from E-government. A prolonged case of inaccessibility, therefore, could further exacerbate the exclusion of PWD. Five sub-themes are related to ‘Effects of inaccessibility’: low productivity; deprived life for PWD; lack of independence and privacy; increased cost and risk; and negative emotions. Figure 5-5 shows the five sub-themes which relate to this theme in ascending order.

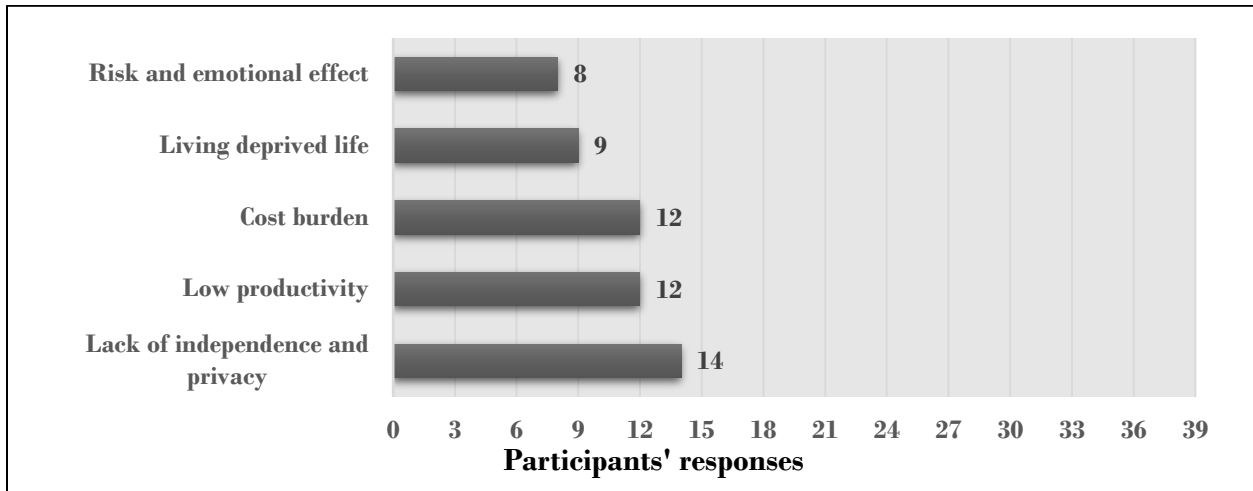


Figure 5.5: Frequency analysis of Effects of inaccessibility

5.2.5.1 Lack of independence and privacy

PWD feel more satisfied when they can do things by themselves than to rely on others for assistance (GOV₇ and 9). This is because *“usually people with disability ... desire more to be independent and do things on their own than those without”*(DEV₂). The visually impaired participants had a high level of formal education and therefore were well placed to live independent lives. However, they indicated that the way E-government services were developed forced them to involve third parties in their transactions. The introduction of third parties to *“provide assistance is what is still going to end up in corruption”* (DEV₂) which government wants to curb by reducing human interactions. The visually impaired explained that third-party assistance infringed on their independence and privacy. For example, PWD₁₇, a government employee expressed worry because using E-payslip (a G2E initiative) because he always had to seek assistance due to the inaccessible nature of the platform. This he explained intruded on his privacy since he was not comfortable with people knowing about his salary. He further narrates:

there's one challenge I've been having with E-payslip right now. Thus, they give you a particular code and that code the screen reader...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 independence 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.

PWD₁₃ expressed similar sentiments regarding the inaccessibility of E-government platforms and felt that:

There is no privacy! No! There is no privacy... and you lose a lot! You don't have anything confidential when it comes to that, so you lose self-independence.

Until E-government services are “*constructed with the relevant accessibility features*” (PWD₉), PWD “*can't be independent*” (PWD₂). Meanwhile, the “*whole purpose of integration is to make me self-reliant to be able to do some of these things on my own*” (PWD₁₂). Accordingly, the government should do whatever possible to make PWD independent, so they become competitive.

5.2.5.2 Cost burden

The visually impaired participants mentioned that various categories of disabilities required the help of ‘assistants’ to move; to and from government offices access services. They stated that most of these assistants charged fees for their services except for relatives or close friends, which increased the cost associated with access to government services. Whereas if E-government services were accessible, they would save cost sitting at their place of convenience to access information and services. For instance, PWD₄ explained that making multiple trips to government offices increased their cost to access services as he illustrates:

the cost for a visually impaired person is sometimes thrice or triple...If today I wanted some information from the Ministry of Education I should be able to take my laptop, go to their website, find where it should be, click and get it down. I can't get that, so I have to call, and they say so and so is not in I have to wait, then so and so will be in on Thursday at 2:00'o clock. At 2:00'o clock guide who will take me there says he is

travelling so I should ... wait until Wednesday and... Wednesday, I go, my guide is around, the man I want to see is not there.

Owing to the inaccessibility of E-government services, PWD had to spend time and money “*calling and shuttling ... or falling on other colleagues*” (PWD₃) for information and services. The assertion was that already “*disability comes with cost*” (PWD₃) and so inaccessibility meant “*extra cost to access E-services*” (PWD₉). Many PWD were within the poverty bracket; many unemployed and several of them earning low salaries makes it difficult to cope with the extra cost (PWD_{4, 6 and 9}). The assertion by the visually impaired was that PWD required the total support and benevolence of everyone to overcome E-government accessibility challenges they faced and to harness the total benefits of E-services.

5.2.5.3 Living deprived life

Other challenges associated with the lack of access to E-government services are stagnation and deprivation. An average of 50 per cent of PWD participants shared the view that inaccessibility to E-government services could amount to deprived life in the digital age. They perceived that the purpose of E-government was to create an integrated society where everyone “*irrespective of your status, irrespective of your condition and irrespective of where you are found*” (PWD₇) can have a 24/7 access to government information and services.

The fear was that PWD “*will be deprived of essential information that could have obtained from the government portals because if the website is not accessible*” (PWD₁₂) since an assistive technology user would find it difficult to access its content.

Some participants also reported that inaccessibility would deprive them of the opportunity to contribute to the political front since they would not have enough knowledge regarding the happenings in government. PWD₁₀ states:

If I can't access information, ... I will be obsolete; I will be outdated, ok? And I mentioned bounded rationality, that is the lack of information in doing things. So, if you don't have enough 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.

The perception of visually impaired was that because some government services were still operating manually, the total effect of inaccessibility to E-government was not felt. However, they stressed the need to resolve accessibility issues promptly since it could have a devastating effect on the livelihoods of PWD. In their view, deprivation would be one major challenge PWD might face if issues of accessibility are not taken seriously because they would lack *“knowledge and information that we really need; if you don't know you will remain stagnant”*. Again, with most government agencies offering lots of informational services, PWD would be *“deprived of essential information”* (PWD₁₂) that ought to be available to them as citizens. To this end, the lack of *“an accessible E-platform for goods and services ends up depriving PWD”* (PWD₉) and eventually affecting their livelihood.

5.2.5.4 Low productivity

A high number of visually impaired perceived low productivity as a challenge that relates to E-government inaccessibility. They felt that society already had strong misperceptions about disabled people; so, if their productivity became low, they could easily be relegated from employment. Some employed respondents thought that if their work output became poor, it could deter other employers from hiring disabled people. According to PWD₁₆, inaccessibility would slow down his progress as a journalist since he depended a lot on government information to do his work. PWD₁₆ states:

As a journalist... I cannot do something on my own; I always have to rely on somebody. And I think 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?

Accessibility challenges make it difficult for PWD to interact effectively with E-government systems reducing their efficiency in the end *“because things that you need to do in 30 minutes you end up doing it in 3 hours”* (PWD₁₃). And when PWD become *“ineffective... many people will think that because of our disability, we are ... unable to function properly”*(PWD₁₆). For this reason, some visually impaired feared that given the competitive nature of the job market, if they did not get access to information inopportune time, they were likely to lose a lot. If PWD

cannot “*get the information online as their colleagues would get it, then they have to... get somebody to download it, get somebody to read, it delays the process and affects their level of productivity*” (PWD₄).

In “*Ghana now, the largest employer of PWD is the government*” (PWD₃); and since most job vacancies are advertised online, they would elude them because of inaccessibility (PWD₅ and 13). In their opinion, inaccessibility could render them “*handicapped*” (PWD₂). Some student participants (PWD_{10,11} and 12) in the field of political science and employee participants (PWD₆ and 13) pursuing further studies in law reported that aside the E-services, they depended a lot on government information (e.g., procurement laws, decentralization Act, parliamentary minutes, constitutions) to enable them to complete their academic projects. In this regard, inaccessibility adversely affected their academic output.

5.2.5.5 Risk and emotional effect

The visually impaired reported on how inaccessibility caused them to be frustrated, developed unnecessary anxiety, feel discriminated against and sometimes harbour emotional pains. They explained that the lack of access affected their livelihood and particularly because E-government services are meant for all citizens; inaccessibility deepened discrimination against PWD as PWD₉ illustrates:

It further enhances the unfortunate attitude of discrimination against persons with disabilities, it ... does indicate that I’m still being discriminated against because of my disability though indirectly. Again, it limits me to the kind of services I can access.

The government offer critical services; hence, E-government services must be accessible to all. Moreover, these government portals are what “*we citizens count on to get information so when it is made in such a way that it becomes exclusive, it’s kind of discriminates some people*” (PWD₅). If other citizens have access and “*we don't get access to information from government... you feel like you are not even part of the country*” (PWD₇). Some visually impaired also expressed concern that they sometimes had to go the extra mile just because E-government services were not accessible; which was not the same experience for their non-disabled peers which made them feel a sense of exclusion. They pinpointed “*the frustrating part of it is that my non-blind*

counterpart has all these things at his disposal. Just because it's not accessible, but it's there... that's the frustration the thing” (PWD₄). PWD₁₈ expressed similar sentiments stating that inaccessibility affects his emotions because:

something is there for you to tap and you are not getting it; meanwhile, other people are tapping it. So, that is the emotional pain I am talking about.

The accessibility challenges expose PWD to risk such as fraud since they sometimes have to give out their personal information. The use of third parties “increases fraud” so as online government services are rapidly increasing, the “need for making sure that the application is accessible by those with a disability becomes more and more important” (DEV₂). Inaccessibility also poses a risk “health-wise” (PWD₃), especially in the case of an emergency where services such as E-medicals are required. PWD₉ explains:

When you look at and... I just want... to give you know an example like ...there are E-medical services available. And these things become essential or become helpful in cases of emergency. It also becomes convenient. Now as a user of assistive technology if I'm unable to access the platform or these programs, then where does that leave me?

5.2.5.6 Related findings from content analysis

Contrary to the findings from the thematic analysis, policy documents did not highlight much on the consequences of inaccessibility for PWD. Many participants had mentioned several problems associated with E-government services but the policy documents do not seem to address these concerns. The only problem mentioned in the documents about accessibility is low independence. Even that the keyword ‘independence’ appeared in only 3 (GGEA, ICT4AD, UNCRPD) from the 10 policy documents. Another observation was that both GGEA and ICT4AD discussed independence with regards to technology platforms and not in relation to PWD. For example, GGEA states that “*applications are independent of specific technology choices and therefore, can operate on a variety of technology platforms*” (Page 53). The UNCRPD is the only policy document that stipulated measures the government ought to take to improve accessibility and total independence for PWD. The UNCRPD indicates that government should take effective measures to ensure personal mobility with the greatest possible independence for persons with disabilities by: “1) *facilitating access by persons with disabilities*

to quality mobility aids, devices, assistive technologies and forms of live assistance and intermediaries, including by making them available at affordable cost; 2) providing training in mobility skills to persons with disabilities and specialist staff working with persons with disabilities; 3) Encouraging entities that produce mobility aids, devices and assistive technologies to take into account all aspects of mobility for persons with disabilities” (Page 17). It follows to conclude that because accessibility has not been prioritised in most policy documents, the consequences PWD would face due to the lack of it has not been evaluated. It is also understandable why the visually impaired reported that PDA ought to be replaced with the UNCRPD since it covers most accessibility issues facing PWD.

5.2.6 E-government challenges and benefits

Electronic services are important in digital society and so should be accessible to everyone regardless of disability. Most of the visually impaired participants envisaged E-government services could offer more benefits if they were made accessible. As evident from this study, thirteen participants (PWD_{1, 2, 3, 5, 7, 9, 10, 11, 12, 14, 16, 17} and 18) indicated that they were aware of E-government services and had used it either for purposes of information or services. Three participants (PWD_{4, 8} and 13) were aware but had not used the services for various reasons. Only two participants (PWD₆ and 15) lacked awareness of E-government services. Participants mentioned wide-range of challenges relating to E-government; described the benefits or potential benefits of E-government and argued the need for variable access to E-government services. Figure 5-6 shows sub-themes related to E-government challenges, maturity, and benefits in ascending order.

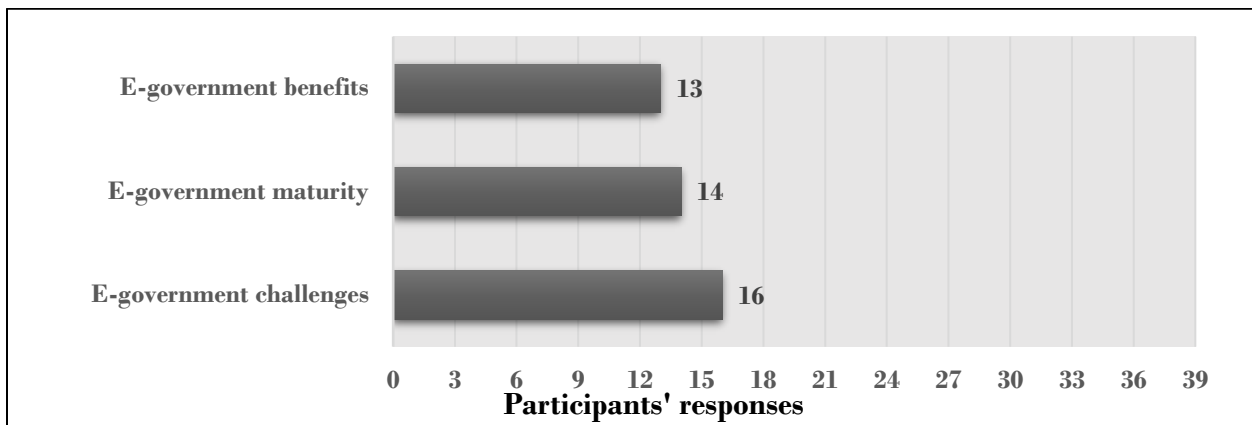


Figure 5.6: Frequency analysis of E-government challenges and benefits.

5.2.6.1 E-government challenges

This sub-theme was mostly discussed by visually impaired, indicating the challenges they encountered in accessing E-government services. Participants mentioned that E-government was confronted with several challenges impeding its successful implementation. First, the adoption of E-government was perceived to be low due to the lack of awareness. While agencies were “*at the supply side of putting out services; now... at the demand side, the challenge has been ... getting people to use services*” (GOV₄). Government agencies rendering E-services should ensure “*that the public is aware and... a lot of information is provided on its use*” (GOV₂) to encourage adoption. For instance, E-payslip a G2E initiative implemented by the Controller and Accountant General for public workers in Ghana but GOV₂ wondered how many of the public workers were of it as he states:

I know Controller and Accountant General they are also using is the... E-payslip? Yes, where you can go online and check your salary information and all that. So, how many people know?

Another challenge reported by respondents was that many E-government platforms were not accessible. For many agencies, “*most of their websites are not accessible, so it's very difficult to even know the services*” (PWD₄) being offered by them. Inaccessible portals could be affecting adoption since many found it prudent to physically visit the government offices rather than struggle with inaccessible portals. When portals are not very accessible, “*you can read around it, but you cannot work with it very efficiently*” (PWD₃); hence, one is unable to complete transactions.

Some participants employed in the government sector expressed the difficulty they faced with E-Payslip. For example, PWD₁₇ explains:

I'm a teacher, so I have been accessing E-Payslip online...so, I want to go there I type in the address, and it opens; but there's one challenge I've been having with that place right now. Thus, they 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 independence that you want to get... you know matters of payslip...

For many of the accessibility issues, the visually impaired associated them with the poor structure and design of E-government portals and websites. They indicated that many E-government platforms lacked design considerations for disabled people. Many of the accessibility barriers could easily be resolved if the special needs of PWD are factored into the development. PWD₅ illustrates:

one bigger challenge ... here with the E-government in Ghana also is sometimes in terms of the password and stuff, they will ask you; maybe the normal comment they put there is to see that you are not a robot enter the following characters. Ahaaaa so, the characters should be in a picture form. In an advanced world, what they do is they give an audio version beneath. So, you will see a link that is telling you that click to listen.

The visually impaired extended their definition of E-government accessibility to include accessible digital documents (e.g., constitutions, policies, parliamentary hansards, etc.), multimedia (e.g., advertisements on digital televisions), social media and email conversations from government agencies. The lack of variable access options to enable everyone to take advantage of E-services also featured as one of the challenges. There was a suggestion that particularly in cases where the E-government platforms were not accessible to PWD, other alternative means such as emails, phone calls could be used by government agencies to address their needs (PWD₃ and 9). Additionally, owing to the high use of mobile devices countrywide, many of the visually impaired thought that E-government applications needed to be mobile-ready to promote greater inclusivity. Government agencies ought to develop mobile versions of their E-government solutions to allow for more flexibility. For example, PWD₂ felt that the use of E-government websites restricted and excluded some citizens hence the need for mobile applications. Moreover, many advanced mobile devices have assistive technologies (e.g. voice-over, talkback) installed or certain features embedded for accessibility (PWD_{9,12} and 16) which made them easy for them to use. The contention was that the essence of E-government services was to provide more convenience and flexibility to citizens irrespective of their status or geographical location.

5.2.6.2 E-government benefits

Despite the E-government challenges stated by participants; they also outlined some benefits they derived from E-government. They indicated that with E-services “*where goods and services are offered online, it becomes easy*”(PWD₉) for PWD to do business with the government because you “*can sit in the comfort of his or her home and do it so far as you are you can access*”(GOV₆). In this regard, E-government helps to save the cost of travelling sometimes long distances severally to government offices for services. According to GOV₄, E-government services seem more targeted at the marginalised like PWD to make their access to government services easier and provide them with more independence. He explains:

because one will actually ask if the convenience of E-services and E-government services is mainly targeted at persons with disability if you look at it basically. If I can sit in the comfort of my home and access a service, and do all the online completion instead of taking multiple trips to a government agency. Disabled people become more independent because they have a dependency in their lives already, so you want to create an environment where you give more independence to the citizens.

E-government also allows some flexibility to an extent. The assertion was that since most government agencies worked for eight hours in the day, E-government platforms act as an extension to interact with the agencies on a 24/7 basis. In addition, E-government services provide wider access than traditional governance system. The assumption was that a person could physically visit one government office at a time. However, there are instances where services required by the individual is provided by two or more government agencies located at different places. E-government platforms in this regard, help to interact with these agencies concurrently. PWD₇ illustrates:

you cannot go to every ... each ministry going to request for a single sheet of paper or document to access but you can sit in the comfort of your bed with internet or computer you will be able to access information from a wider variety of area.

Some participants expressed the view that the use of E-government services promotes inclusiveness for all by eliminating human interactions, which sometimes lead to discrimination against PWD. For example, GOV₅ illustrates:

you'll be sitting in the comfort of your home to do it, so PWD can also do same because that one you don't go to the person one on one, you will be in your home. We are here then you apply for any of the services, so when you apply we follow up, so we wouldn't know whether this person is disabled or not.

So, as E-government services “*get more into the transactional area...the benefits will become more pronounced*” (GOV₄) hence the urgent need to resolve accessibility issues for PWD.

5.2.6.3 E-government maturity

Evidence from the study pinpointed that E-government was not fully matured as there were still several government services which demand physical visits to government offices because they could not be completed online. Implementation of “*E-services, online services, is not fully out there yet, many of us go and access services by walking into offices government offices*” (GOV₄). For instance, one could fill online business registration forms but required a visit to the government agency in-charge to complete registration and to obtain a business registration certificate. For instance, PWD₁ shared the experience she went through to get her business registered as she narrates:

I have registered a business...and... it was easy to go onto the Registrar General Department website to download the form, fill and all that. But in getting your forms there... to the Registrar General's Department, you know the way the environment is... so many people, so many desks, you don't know who to go first and all that so you really need a guide to help you go from here to here.

E-government in Ghana was still at an infant stage with “*anecdotally 80-90 per cent of informational and few transactional services across Ministries, Department, and Agencies*” (GOV₄). The assumption was that the higher the maturity level of E-government, the more independence it would create for PWD. For example, they would be able to download, fill and submit forms online and receive the needed feedback (PWD₂). Some participants emphasised the need for government to advance in the provision of more transactional services to save PWD from mobility issues. There was an indication that the government was progressing

steadily and moving most of its services online. For example, DEV₂, an E-government developer illustrated:

here we've done everything from application ... police service, for fire service, for prisons to immigration ...to the courts, we were doing work in courts, now passport office so as more and more become computerized then they are online, and you have to go and access it

The low level of maturity also affected the reliability of E-government services such that the E-government platforms did not provide the needed response or feedback to citizens. PWD₁₃ explained the unreliable nature of E-government this way:

E-government platforms are not reliable...Oh, you send a message, or you send email to any of the government sectors, you are doing inquiry ...the feedback you are expecting you don't get.

Participants implied lack of reliability also to mean that E-government websites were unable to provide accurate and up to date information on the government's operations. PWD₁₀ explained that most information on the E-government websites was irrelevant and outdated as such, it was not possible to rely on. PWD₁₀ illustrates:

Sometimes you go on the various websites of the...government agencies and all that you realise that information there at...are not relevant; are not really... some information is outdated. Yesterday I went to the Ghana Parliament website, and I was looking for... a hansard (parliamentary minutes) which ... I needed the 29th June's hansard, but when I got there, the last time they had uploaded, or they uploaded a hansard was back I think April something.

5.2.6.4 Related findings from content analysis

Findings from the thematic analysis show that challenges associated with E-government services mostly related to its maturity level, lack of diverse access options, inaccessible websites, portals and web applications developed for use by citizens. According to the policy documents, "*E-government services means a public service provided by electronic means by a public body in the country*" (ETA, Page 59). In line with the government's strategy for E-government, services would be mainly web-based. For instance, "*portals are web-based applications that will*

serve as the focal point of government's Knowledge and Content Management initiatives and a comprehensive range of functionality including a single point of access to various services, such as e-Payment, e- Forms and Identity management" (E-GIF, Page 34). Again, "the Internet is a major channel for delivering E-government services" (E-GIF, Page 19). It implies, therefore, that accessibility is an important component of E-government services to make them usable by citizens. Results from the content analysis reveal otherwise; there are no stringent rules in place by the government regarding accessibility.

From the participants' responses, access options to E-government services are limited contrary to what is stated in the policy documents. For instance, the E-GIF clearly states that "*E-government services should be designed to be accessible via multiple channels" (Page 33). For example, "the mobile phone is an important channel for E-government in the delivery of Government services" (GGEA Page 83). It seemed that these options had not been fully implemented at the time of the study, as reported by respondents. The challenges of E-government are, however, undisputed in the policy documents as there was an anticipation of "political and implementation challenges"(GGEA, Page 115) as well as technological and infrastructural issues (GGEA, Page 205).*

5.2.7 Making society inclusive

Inclusivity featured as an important aspect needed to address accessibility challenges for PWD. Involving PWD in all facets of governance issues is vital to promote equal participation for them and to make them "*feel part and parcel of the entity Ghana and the governance process" (PWD₉). Regarding accessibility, participants felt that "once ... a service being rendered to ... the Ghanaian populace, then it should be accessible to persons with disabilities" (PWD₉). Two sub-themes related to this theme: (1) governmental support and (2) societal and family support. Figure 5-7 shows the sub-theme in ascending order.*

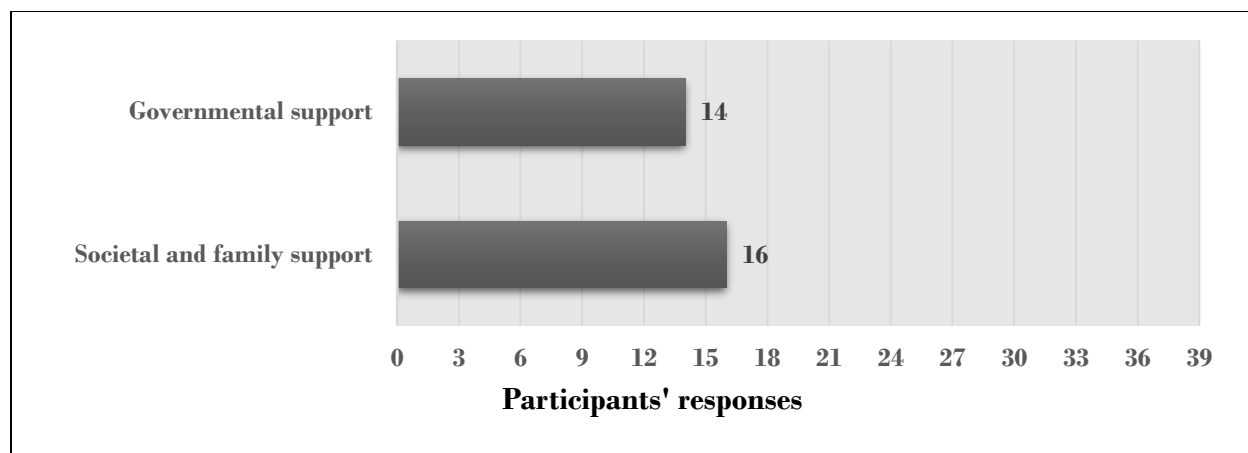


Figure 5.7: Frequency analysis of Making society inclusive

5.2.7.1 Societal and family support

Family support was mentioned by respondents as a key foundation to improve the lives of PWD and increase their sense of belongingness. The family should invest in their education and equip them with needed skills, so they do not “*become a burden on society*” (PWD₁₅). Visually impaired respondents indicated that family support was critical to making a disabled person feel loved and cherish, which eventually translated to how the society would treat them. For instance, PWD₁₃ narrated that she had a lovely family which made others around value and support her. She illustrates:

it's been good for me because I have a lovely family... they all like me so much, and I think as a blind person, the first people to love you should be your family

Likewise, GOV₇, who was also disabled narrated how the care and attention of her parents impacted on her life. She illustrates:

I was sort of lucky because, at the time that I was...9 years old, my father had the opportunity to go to Canada. And that was the period that this fight for persons with a disability was very high over there, so he learned something so when he came back, he made sure that I went to school and completed school to become independent.

In the view of the visually impaired, the family “*must give special attention to the disabled person before other people can also do so*” (PWD₁₅). The assertion was that “*if somebody finds a disabled person amongst the family, that person who is disabled must be given the best attention*” (PWD₁₅) so that the individual does not “*feel neglected or abandoned*” (PWD₄). Although “*it's becoming*

obvious that people are rising ... up to see the need for the inclusion” (PWD₁₀) for PWD; still a lot more was expected from society.

Participants shared a common view that *“the society being a better place to live, you can't do that without persons with disability”* (PWD₁₁). To this end, the society had a key role to play to make everyone *“at least feel included”* (PWD₁₂). For society to be inclusive; *“they should include everybody in the decision-making process”* (PWD₇). The society should value the concerns of all members; so that in developing services (e.g., E-government services), needs of PWD are taken on board to ensure they are accessible to them. For instance, the developers of E-government services would *“rope in the persons with disabilities so that they can also be able to function successfully in the community or the society”* (GOV₇). In doing that, developers should work together with disability organisations to achieve the needed results. Involving PWD in the development of E-government services is important because:

I can sit here and say well accessibility or content for disabled people should be this, and so on. But persons with disability or their representative will be able to speak from a more practical and emotional point to forcefully make a point and emphasis on certain portions of the guidelines than what “normal” people who have policy decisions can make- GOV₄

The assertion was that previously the society *“used to neglect disabled a lot, but now it is time we involve them, because they are just like us, and it can happen to anybody at any time”* (GOV₅). Respondents felt that people in the society needed to *“re-orient themselves that disability is no respecter of persons so if we develop our mechanisms to take care of persons with disability”* (GOV₇) and *“we are able to make our society in general inclusive”* (GOV₂), would serve the interest of everybody. There were calls for individuals within the society to attach urgency to the concerns of PWD because *“potentially, all of us are disabled, so when it comes to issues on disabilities, let's do our best we can in whatever way to support them”* (GOV₉).

5.2.7.2 Governmental support

Some participants, mostly the visually impaired, felt that the government was not concerned about their plights hence was slow to respond to their needs. They perceived the government as *“individualistic and not caring about PWD”* (PWD₁₅). Respondents indicated that they

“expect the government to be more inclusive” (PWD₄) and to provide the needed support to help PWD compete equally with all others in society. For example, those visually impaired employed in the government sector reported that facilities which they needed to work efficiently *“and the labour law even explained it; that every impaired person needs”* (PWD₁₃); *“they are not provided by the government”* (PWD₆). They had to acquire tools by themselves, so people would not see them as incompetent. They contended that the role of government is to *“make sure that everyone is ... treated fairly by the law in order to create an even playing field”* (PWD₁₂). The visually impaired lamented that disability concerns were not a priority for government and accessibility challenge was not an exception. They indicated that the government ought to set the pace by making conscious efforts *“to provide the platform for every individual to be able to...access every information that they need about the government”* (PWD₇). PWD₁₀ states:

the role of government is to provide equal access to ...every citizen. So, if a facet of... the citizens finds themselves in the deprived facet of the society, the government must step in.

Some visually impaired even though commended government’s effort in assisting PWD with the 3 per cent funds from the District Assembly Common Fund, they felt it was inadequate. Others also expressed the view that instead of government giving the funds to individuals, it could be channelled into project implementation, which would give a long-term benefit to PWD. One way was for the government is to invest the fund into ICT learning and to equip disabled people with skills to live independent lives (PWD₁₈). The government also needs to ensure that when it is *“coming out with any policy that will serve the interest of the citizenry, they include disabled persons needs as part of it”* (GOV₉). It is only when government policies have disability components to cater for the needs of PWD that issues of accessibility would be taken seriously. It is when *“government sees accessibility as important that the citizens will also see it as important”* (PWD₁₆).

5.2.7.3 Related findings from content analysis

Participants in this study indicated that total support from family, the society and the government is required for PWD to have equal participation in the digital era. Participants believed that a more inclusive society would be swift to prioritise accessibility needs of PWD

rather than relegating them to the background. Policy documents though seem to suggest the need for inclusivity; they do not provide further guidance on how this could be achieved; hence, people tended to ignore it. For instance, the GGEA indicates that *“the implementation of the E-Government channel strategy will include user profiling that will show the different segments such as meeting requirements of the uneducated citizen or a disabled person”* (Page 55). This notwithstanding, many respondents in this study, including the developers, stated that the requirements of PWD were not part of their considerations in the development of E-government services. Another policy document, the UNCRPD mandates that the government puts in place *“effective and appropriate measures... to enable persons with disabilities to attain and maintain maximum independence... full inclusion and participation in all aspects of life”* (Page 20). Despite what is written in the policies, responses from participants points to the fact that the needs of PWD were not the radar of the government, which made PWD felt neglected by the government and society. Making the society inclusive require that the government ensures that the rights of all citizens are *“realised without discrimination on the basis of disability”* (UNCRPD Page 20). Also, government by ratifying the UNCRPD is bounded *“to promote appropriate forms of assistance and support to persons with disabilities to ensure their access to information”* (Page 10). However, the total inclusion of PWD in the Ghanaian society was yet materialised from the responses of participants.

5.2.8 PWD lack E-readiness

The findings of this study show that PWD perceived E-readiness had a substantial influence on their ability to efficiently access E-government services. E-readiness in this study refers to the preparedness of PWD to fully utilise E-government services. Developers and government officers felt PWD were not ready for online services. They mentioned that utilising ICT required that a person *“can read and write, has access to a phone or a computer”* (DEV₅) which many PWD lacked. Five sub-themes which affected E-readiness for PWD in Ghana identified in the study are arranged in ascending order as depicted in figure 5-8.

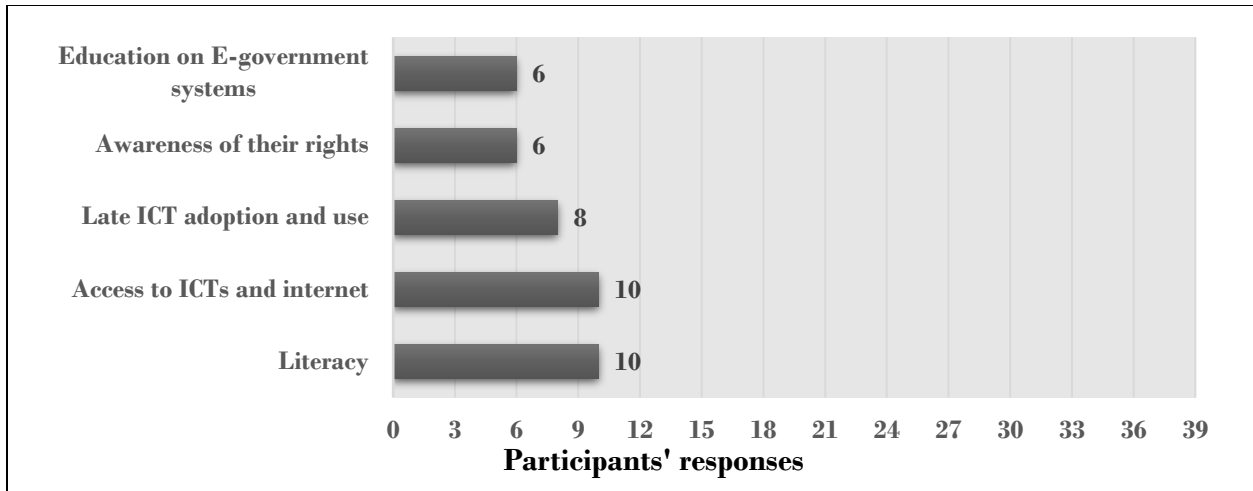


Figure 5.8: Frequency analysis of PWD lack E-readiness

5.2.8.1 Literacy

Some respondents indicated that PWD’s ability to read, write and utilise ICT efficiently affected how they would perceive accessibility. They felt that the basic knowledge that PWD were supposed “*to have to be able to read and write in our situation, there are less of them*’ (DEV₁). The visually impaired also acknowledged that the benefits of E-government services would only be harnessed by “*those visually impaired who are educated and are digitalised*’ (PWD₁). Owing to the lack of or low level of education, it was difficult for PWD to acquire ICT training and skills necessary to maximise the benefits of E-government. For instance, GOV₉ narrated that the Government of Ghana some years back had a partnership with an ICT company to offer free ICT training for PWD in the capital city, Accra. However, many PWD could not take advantage of that opportunity because they either had low education or lacked basic education, which was a mandatory requirement. He illustrates:

if you check most persons with disability don't have the basic education that is the major problem. So, lack of education; I mean formal education is a problem. So, if the person is not having any level of education, it will be difficult to train such a person.

Some participants accentuated that the use of any electronic services such as E-government demands that a person has “*knowledge in ICT to be able to access whatever information that is placed on the computers or the internet*” (GOV₉). Most of the visually impaired who participated

in this study were highly educated, which means the ability to read and write could not be a hindrance. However, most of them reported several accessibility challenges. According to PWD₁₄, some persons could be educated but would not have the prerequisite ICT skills to utilise E-government services because being literate and having ICT literacy are different two things. He explains:

I think a distinction also should be made between individuals who can on their access the information, and those who for instance educated, but could not manipulate the computer and access it on their own.

5.2.8.2 Access to ICTs and internet

Lack of access to ICTs and stable internet connectivity was mentioned as a hindrance to addressing accessibility in Ghana. A section of the participants reported that the cost of ICT was high and the training thereof. Moreover, training on ICT for PWD was time-consuming, resource-intensive and required special expertise, particularly for late adopters (PWD_{6, 11, 13} and 17). There was an indication that Ghanaian schools were not well-resourced with ICTs and that *“there are some of the schools, they don't have computers ... especially at the basic and the secondary level”* making it difficult to train students in ICT at an early level (GOV₇). Inadequate ICTs in Ghanaian schools was seemed to be challenge affecting PWD because they need to *‘have access to their computers...either the talking one or the one with the braille on it’* (GOV₇). Some participants expressed the need for easy access to ICT to make *‘technology... inclusive’ and to ‘help... persons with disability’* (PWD₂).

Another accessibility challenge identified *“has to do with the... level of penetration of the... internet services”* (GOV₂) in Ghana. Many vulnerable persons like PWD lived in rural Ghana. However, people living in rural areas in Ghana did not have regular access to internet facility hence may be deprived of the benefits of E-government. For instance, GOV₂ quizzed:

somebody is in a remote area... do they have internet service so that wherever they are they can have access to that facility and therefore use it?

Some respondents felt that one way to address accessibility for PWD was to have available ICT *“which could be in the form of a phone or a laptop... with internet service available”* (GOV₆). Reports from the interviews indicated that internet access in Ghana was expensive, and many

people relied on internet modems from telecommunication companies. However, some visually impaired participants complained that the even the *“modem setup that you have to go to before you can connect to the internet is not accessible to the screen reader”* (PWD₁₇) making connectivity difficult. However, good internet connectivity is important to enhance accessibility (PWD₁₄). There was an indication that the government was making efforts by *“providing computers and internet service”* (PWD₇) to schools to equip students with ICT skills. If the challenge to access ICTs and the internet is addressed, it could help PWD to enjoy the use of E-services better (GOV₂).

5.2.8.3 Education on E-government systems

The study identified inadequate education on E-government systems as one of the factors that hinder accessibility for PWD. Education on E-government systems includes understanding how to use the system and having the willingness and skills to use it. The perception of some developers was that PWD were not ready for online services. They felt that PWD still needed assistance because most of them were not well educated on technologies. They emphasised the need to *“take some time and educate persons with disabilities about technology and how it works”* (DEV₁). A section of developers perceived that without education on E-government systems PWD might not be enthused to use them so *“we should rather train them first on this technology, the essence and then how far it can go and then we just let them sit back and then use the system”* (DEV₁). Education would also get PWD informed on the available services agencies are rendering out to citizens. For instance, GOV₂ stated that first, people ought to know the services provided by agencies followed by education on the systems. He indicates:

the education of persons on how to use these services. People need to know that they exist, for example, if you take the passport office, how many people know that you can go online and do your registration?

Good education on E-government systems would also *“develop the knowledge of the people to be able to access”* (GOV₉). Prior to educating PWD on E-government systems, the necessary retrofitting should be done to accommodate their concerns to ensure they are accessible (GOV₈). PWD, on the other hand, should show interest to use these systems because if *“they don’t show any zeal to access what someone has developed”* (DEV₉) such attitudes may also cause developers to lose interest in designing any applications with PWD considerations. GOV₈

expressed similar sentiments about PWD interest to use E-government systems and states she quizzed:

Are they yearning to use the thing? Then we see that they are yearning to use it then we come on board with those updates and policies to help them achieve what they want but if not...

5.2.8.4 Late ICT adoption and use

The visually impaired respondents majorly reported this sub-theme. A fair number of them shared the view that ICT training was one important aspect the government should intervene to enable them to become E-ready. Some participants felt that if “*they don't have that skill, then whether the website is accessible or not, it doesn't make any difference to them*” (PWD₄). Interviewees indicated that late adoption and use of ICT influenced their readiness and ability to utilise E-services efficiently as their abled-peers. The researcher’s visit to the ICT centre for the blind saw several visually impaired undergoing ICT training. Many of the trainees were individuals who were ‘late blind’ (those who become blind at a later stage in life). The feeling was that without ICT training, it would be difficult for them to compete with their non-disabled peers as PWD₆ states:

And then we [PWD] are always behind, always behind our colleagues! Yea, our input, our efficiency it [late ICT adoption] will affect everything about us. But if we are able to use other gadgets like our colleagues, then we are always at parallel with them.

Respondents posited that the late adoption affected them because of their great dependence on ICT and other related technologies in performing daily activities. They lamented the late adoption of ICT in Ghanaian schools tend to affect more disabled persons because they required more training time owing to their various limitations (PWD_{6, 11, 13 and 17}). As a result, PWD have *limited knowledge in the use of IT*” (PWD₅). For instance, PWD₁₂ stated that until he got to high school, he “*never knew...persons with a disability could use computers*”. For some others “*even back in Senior High School (SHS), we are not allowed to use the computer*” (PWD₁₀). The use of ICT in Ghanaian schools was generally late as compared to other developed countries because:

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, Ghana is the only country I so far know that technologies are not used in schools except the university- PWD₁₀

There was a suggestion that Ghanaian schools should allow the adoption of ICT to start from basic school level instead of restricting ICT use to the tertiary level. PWD₅ explains:

Right from the basic school... so that... in the sense that you don't have to wait till you get to the tertiary level before you are put to some of these things. We need them at the basic, in the middle and then at the tertiary level.

5.2.8.5 Awareness of their rights

Some participants asserted that PWD were unable to access electronic services because the government had not created a conducive environment to enable them to compete fairly with abled-peers. They perceived this could be because PWD were not standing up for their rights in the digital era. Participants felt that PWD needed to create more awareness on what they required to take advantage of E-government fully; and not assume that others know and understand their challenges. Even if others did, there was still the need to consistently remind authorities because *“it is their right; it is not a favour we are doing them it's their rights, they are citizens, they voted”* (GOV₉). So, *“more advocacy should go into it; let people know what we want, what we are not getting, what we are entitled to be getting”* (PWD₁). For example, PWD₆ indicated that PWD need to know their entitlements and demand for their rights as she illustrates:

it may also be those of us you who have to ensure that right things should be done for us... So, now if they don't do it; who do we shift the blame to? Because they are not in this situation, so they don't feel for you. You have to inform them [authorities] that this is the position even if they're aware, you still have to let them know.

A section of the respondents believed that PWD should know the laws regarding their entitlements, so they could hold responsible authorities accountable to them. For instance, *“Act 715, a part of it states that ...same education must be given to a disabled person as it is given to the abled person”* (PWD₁₅). Similarly, PWD₁₄ states:

I think also it's left with ourselves to read and know what the law is. How many persons with disabilities may even know that there is something called disability law?

Knowledge of the policies is important so PWD can at advocate at individual levels and make their voices heard; in this way, civil societies and disability organisations could complement their efforts. Such advocacies would cause society to rise and stand with them to find a formidable solution to their challenges as he explains:

I think we ourselves we 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, those interested in disability issues ... they should be up and doing. 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.

Other respondents also indicated that the government was mostly faced with many responsibilities, however, constrained by tight financial budget. For this reason, there was a need to advocate more explicitly for their urgent needs. Also, constant advocacy would serve as a reminder to authorities, so they take actions, as PWD₁ explains:

They [authorities] will say there is no money so, but I think that more advocacy should go into it. Let them know what we [PWD] want what we are not getting, what we are entitled to be getting... Then they will come in and then modify the structures.

5.2.8.6 Related findings from content analysis

E-readiness featured as a key aspect to improving accessibility to electronic services and E-government in particular for PWD from the thematic analysis. E-readiness, as reported by participants, required available ICT, accessible internet, funding support, education and training. Since literacy is crucial to the use of E-government services, education of PWD becomes an important component of E-readiness. Although many participants mentioned that most PWD were not educated, the policy documents seem to suggest that government has in place measures to offer “*free education for a person with disability*” (PDA, Page 6). Policy documents also postulate that there exists “*inclusive education system at all levels of education*” (UNCRPD Page 17) and hence “*persons with disabilities can access an inclusive, quality*

education” (UNCRPD, Page 18). This was, however, not the case as the visually impaired participants reported of limited inclusive schools in Ghana which were also under-resourced.

As specified in the UNCRPD, the government should ensure that *“persons with disabilities receive the support required, within the general education system, to facilitate their effective education”* (Page 18). In this regard, the government should *“ensure the provision of support to increase access to... education and training to all categories of persons with disabilities”* (ICT4AD, Page 34). As reported by respondents, the use of ICT is vital to quality education; moreover, the policy stipulates that government ought to *“enact laws that provide equal access to ... vulnerable groups to ICT training and education”* (ICT4AD, Page 34). This was however, not the case as visually impaired lamented about inadequate ICT in schools and the limited use of ICT at basic and secondary school levels contrary to the policy directive of government to ensure that *“ICTs are widely deployed to facilitate the delivery of educational services at all levels of the educational system”* (ICT4AD, Page 26). With the internet as the main delivery channel for E-government, its availability and measures to ensure access for all Ghanaians are very little discussed in the policy documents. The UNCRPD states that the government should *“promote access for persons with disabilities to new information and communications technologies and systems, including the Internet”* (Page 11). Only one E-government development policy points to the fact that there should be *“access by all citizens of Ghana to internet connectivity”*(ETA, Page 64) however, how this directive is not implemented as stated. The assertion on this theme could be justifiable; hence, most of the directives in the policy documents seem vague with little or no implementation.

5.2.9 PWD role in accessibility

Evidence from the study shows that 78 per cent participants shared a common opinion that accessibility for PWD was important; however, PWD should play a significant role to ensure E-government services are made accessible to them. The perception was that access to online is critical for everyone because they *“can't imagine life without been able to read online”* (DEV₅). Participants, therefore, charged PWD to push the accessibility agenda and voice out often their needs. Three sub-themes are associated with the theme: PWD role in accessibility. Figure 5-9 shows the sub-themes in ascending order.

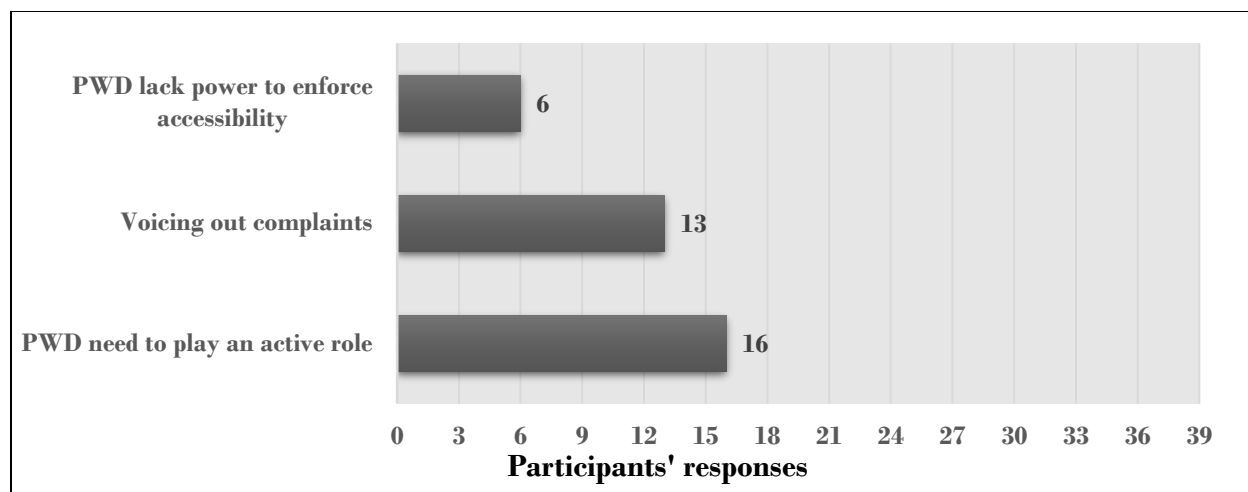


Figure 5.9: Frequency analysis of PWD role in accessibility

5.2.9.1 PWD lack power to enforce accessibility

A section of the participants asserted that PWD needed to command some influence if their needs were to be prioritised. They felt that PWD lacked the power to enforce accessibility in any way. Although they perceived PWD had a role to play in ensuring services became accessible to them, they indicated it was going to be a tall order. They contended that if *“people with disability ... had huge bargaining power and commanded a certain percentage of the business”* (DEV₂) then their power to enforce accessibility could be greater. From this perspective, PWD were seen as having low ‘bargaining power’ to push developers to act in their favour. The lack of power by PWD was also attributed to the fact that they were ‘pushed to the back’ in society and not seen in the limelight. For example, DEV₁ indicated that PWD had a role to play with regards to accessibility but expressed doubt about their ability to enforce accessibility. He states:

And if there is an impact, it's, of course, the first people to actually feel whatever is going on. So, they have a major role to play, but I doubt if they can push it with their own strength but still have a role to play in it.

Some participants also believed PWD *“can only make so much noise... because they don't form the majority”* (GOV₁) so they cannot enforce accessibility. Rather, *“they need to get it from a much stronger or a much higher governmental force”* (GOV₁). Until the government enacted an

Act or law on accessibility, it was unclear how PWD could enforce accessibility by themselves. For instance, DEV₇ indicates:

For them [PWD] I don't know; I don't know how they are going to ensure accessibility because it's more like... I just don't know! I'm thinking of a way they will be able to do that but how are they going to enforce if there is no ermm law or an...Act?

From the perspective of PWD, E-government implementers are reluctant to act regarding accessibility *“because they know that you cannot do anything to them. You are the minority. You can't fight the government”* (PWD₁₆).

5.2.9.2 Voicing out complaints

This sub-theme was discussed by the visually impaired regarding how they voiced out their grievances relating to access to government services. They indicated that was a difficult task to seek attention from the government concerning their needs because sometimes they were not sure *“who to complain to”* (PWD₂). Most of the efforts PWD made *“venting spleens to the government ...didn't work”* (PWD₁₀). The majority of visually impaired indicated getting the needed attention from the government was so difficult that sometimes they had to *“disturb them...or threaten government”* to warrant response (PWD₁₀). For instance, PWD₄ stated that sometimes the only way out is to embarrass government as he explains:

as for government...there are two ways to get your voice heard. Well, you can go and see them and try and talk it over which most of the time don't do ... much, or you try and find a way to embarrass them. You know ... governments don't like to be embarrassed!

The notion was that *“mostly is very difficult when you want to get your voice heard most especially for the government to notice something”* (PWD₈). In light of these difficulties, PWD had formed alliances to have a much stronger force. Each disability group had their union. For instance, the visually impaired belong to the Ghana Blind Union (GBU). All the Disabled Unions join to form the Ghana Federation of Disability Organisations. For example, PWD₇ indicated that he mostly channelled his concerns to the government through GBU as he indicates:

we have associations such as the Ghana Blind Union and the Ghana Federation of Disabled. These are established institutions in Accra around the ridge, which normally

deal with the policy initiative and policy implementation when it comes to issues of PWD. So, most of our concerns get to the government through these institutions.

For some participants, although GBU is an official mouthpiece for voicing out their concerns to the government, *“normally it takes so much long time for it to be met but... with the media is quite swift and faster”* (PWD₅). The understanding was that airing their concerns on media received needed attention within the shortest possible time.

5.2.9.3 PWD need to play an active role

Evidence from the study shows that PWD did not voice out their E-government accessibility challenges, making it difficult for implementers to address their accessibility needs. According to them, PWD ought to make their voice heard and engage with especially developers to ensure their accessibility requirements are considered.

From the viewpoint of developers, *“if PWD are not being treated fairly, I think they have to talk about it”* (DEV₁₀). For example, DEV₂, a developer of several E-government applications stated, *“I don't think we've ever even had a complaint that someone with a disability was not able to access an application”*. Some expressed the view that PWD need to bring to the notice of agencies rendering E-government services their accessibility challenges. They perceived PWD were customers to the various agencies and so their complaints could be addressed if they voiced out. If the service providers become aware of the fact that their services are not accessible, they could be pushed to act.

Some developers also called on disability associations to help collectively solicit from PWD *“exactly what they expect, what they think or what is not going well for them, their difficulties”* (DEV₁) in accessing E-government services to assist developers in the development of accessible services. Such information they perceived could be used to develop *“proper standard or guide or policy”* (DEV₁) for developers. The association for the disabled should help make known the challenges of PWD because *“they are the major stakeholders who are being affected”* (DEV₁₀) of developers. Developers called on disability societies to provide more education because they need to understand *“how they access or how they use E-government services”* (DEV₉ and 4) E-government services. For example, DEV₄ indicates:

The... disability society must push and let people hear them; we are also here. Once that

noise is made, I think that other stakeholders will also take them seriously.

From the perspective of government officers, PWD need to push the accessibility agenda because *“we don't hear anything... hardly hear any of them”* (GOV₈). PWD have a greater responsibility to advocate to ensure their accessibility needs were addressed. Most of the government officers acknowledged that the accessibility needs of PWD could easily be ignored and so the *“disabled community has the responsibility of reminding us every once in a while”* (GOV₄). For instance, GOV₁ explained that even if accessibility policy was passed; it would not guarantee accessibility for PWD unless they pushed to ensure the right things are done *“else everybody does exactly what they want to do, and they go scot-free”*. There was the need, therefore, for PWD to *“go out and do sensitisation”* (GOV₇) and to *“voice out what the limitations of the services out there are”* (GOV₃), so their challenges could be appropriately addressed. The Ghanaian society is not so much enthused about disability issues; hence, many people do not take accessibility issues seriously unless their attention is drawn to it (GOV_{2 and 3}). For this reason, they tasked disability organisations to act as a pressure group on government and state agencies offering E-services. For example, GOV₂ explains:

DPOs that is Disabled Peoples Organisations, they also have a role to play. And their role is to act as a pressure group on government. Because for disability issues, if you always want to leave it in the hands of government officers, people who do not understand disability issues, they will always not do what they have to do. So, DPOs also and persons with disabilities themselves have a role to play.

PWD shared the sentiments of both developers and government officers and stated it was about time they made complains relating to their challenges. They indicated that they *‘have to find a way of ... increasing and making our voice heard’* (PWD₅) to implementing authorities and *‘even if ... they don't do it; we still have to put on pressure on them ... till we get what we want’* (PWD₆).

5.2.9.4 Related findings from content analysis

A high number of the respondents (78 per cent) in this study indicated that PWD need to take up active roles and become more vocal in attempts to put pressure on implementing authorities to address their accessibility needs. The results of the content analysis show otherwise since

this opinion is not captured by policy documents. None of the policies neither on E-government development nor on PWD mentioned that active participation of PWD is required to make government and the public disability-sensitive. The only clause that involved PWD was captured in the DACF, which states that the council on disability would help “to build the capacity of Organisations of Persons with Disability (OPWDs)... to enable them to advocate and assert their rights” (Page 4). The policy documents contrary to the responses from participants do not seem to suggest that PWD have a leading role to play with regards to addressing accessibility challenges.

5.2.10 Societal perceptions and beliefs

This study identified societal perceptions and beliefs as one element that impedes accessibility. More than half of the respondents indicated that contextual conditions prevailing in Ghana and the socio-cultural beliefs of the Ghanaian people influenced how issues relating to PWD were addressed. They believed that Ghanaians held certain beliefs which translated into wrong attitudes they exhibited towards disabled people. Two key issues were mentioned by participants: Contextual conditions and Social-cultural beliefs. Figure 5-10 shows the two sub-themes which relate to ‘Societal perceptions and beliefs’ in ascending order.

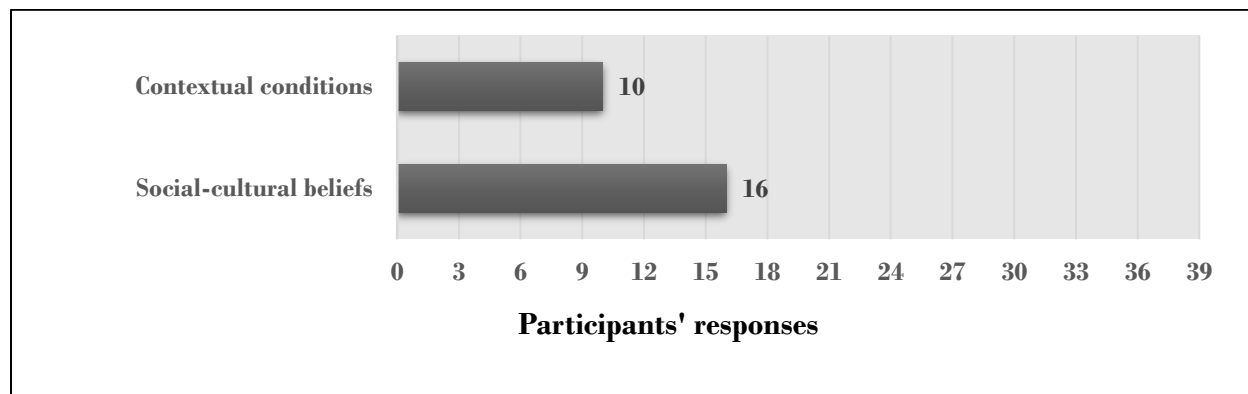


Figure 5.10: Frequency analysis of Societal perceptions and beliefs

5.2.10.1 Social-cultural beliefs

Evidence from the study shows that the perceptions society held with regards to PWD influenced the way they prioritised issues that affected them. Some respondents believed that socio-cultural beliefs could be one reason why society was mostly slow to take actions

concerning challenges PWD faced. The assertion was that in *“our part of the world, we still lack behind when it comes to perceptions about persons with disability”* (PWD₁₁). For instance, many people within the Ghanaian society avoided interacting with PWD because they *“think that when you even hold a disabled person, you also become one”* (PWD₁₅). The *“perception of disabled persons is too great”* (PWD₁₅) in Ghana such that; it negatively affects how people respond to the needs of PWD.

Many of the participants shared the view that *“when it comes to disability issues, perception plays a major part. People’s understanding of disability issues will push them to either make sure that services, information, everything is made disability-friendly or not”* (GOV₂). They contended that the strong misconceptions about PWD in Ghana further exacerbated their exclusion. For instance, GOV₇ explains:

there are a lot of people who still believe that the persons with disability should be somewhere are you getting it? They believe that the visually impaired should go to the visually impaired school, they believe that the physically challenged should go to a physically challenged school and some I mean there are people who should be cared for... not to be trained to care for themselves

Some respondents felt that Africans generally have wrong attitudes towards PWD (GOV_{1,5,7,9}, PWD_{9,11,16,18}); they are seen as incapable people who should be cared for instead of supporting them to be self-reliant. Making PWD dependent is *“dehumanising”* and makes them feel inferior compared to the rest of society. For example, GOV₁ narrated that some people felt involving PWD in online services was a waste of time and resource. Socio-cultural beliefs were also mentioned as an influencing factor that contributed to people’s perceptions of disabilities. Various ethnic groups in Ghana have different superstitions regarding disabilities. For example, *“in certain ethnic groups, they believe that a visually impaired person must not live in a community where the king lives; the king is not supposed to see a blind person”* (GOV₉). So, right from infancy people are fed with fallacies about disabilities, and they grow to form a mentality that shapes their attitudes and behaviours towards PWD. GOV₉ further explained that when such an individual eventually grows to a position of authority, he would render little support to PWD because of his upbringing.

These perceptions have made Ghanaians develop “*wrong attitudes, toward dealing with matters pertaining to persons with disabilities*” (PWD₉). They indicated that some Ghanaians also felt that disability issues had been discussed for far too long and was being overly emphasised such that when they see any news “*about persons with disabilities, they just skip it; they don't even read what is in it*” (PWD₁₆). According to the visually impaired, such wrong attitudes held by society affected every aspect of their lives, including their chances of gaining employment (PWD₁₆ and 18). Some participants (GOV_{1,2,5} and 9) therefore, advocated the need for more education on disabilities to change such negative societal perceptions. They believed this would make people in society get more informed about disabilities and know how to handle them.

5.2.10.2 Contextual conditions

Some respondents reported that certain prevailing conditions in Ghana made it easy for people to gloss over accessibility issues. For instance, the Ghanaian people are naturally “*not so much enthused about disability issues*” (GOV₂) so, issues of accessibility would not be taken seriously unless people’s attention was drawn to it. Also, many people in Ghana did not see accessibility as a pressing issue because they perceived PWD as a minority. There are “*more people who don't see accessibility as an issue*’ because ‘*we live in a society where we have the majority of people who think that they are okay*” (GOV₃). Owing to this mentality, policies across all sectors of government did not factor in disability component as GOV₄ states:

if we are, to be honest with ourselves; by and large policies not just in E-government but across all sectors don't really pay attention to PWD.

A section of respondents felt that the way of living of the Ghanaian people “*creates an environment where someone who has a disability can patronise services*” (DEV₂) without any difficulty. They explained that in Ghana, many people preferred third parties to perform for them tasks they could have easily done themselves. DEV₂ explains:

because of the nature in which we do things here in Ghana; often, we want people to... to perform the task for us. So, although we have the ability to do, we are comfortable going to someone else to perform the activity for us... instead of doing it ourselves. So, like the example with the passport; instead of someone going online to apply himself, he will rather go to a communication centre and let them apply for him. You ... get it?

Most Ghanaians seem to downplay the issue of accessibility because they are “*quite okay with the fact that people with disability can get help from those with the abilities... to perform the task they want*” (DEV₂). Some developers mentioned that the non-existence of applications with accessibility options in the Ghanaian context influenced the way they also designed as DEV₅ states:

And to be honest with you I don't remember seeing an app that was designed with options for accessibility, so in a certain sense, the bad examples we've seen the influence the way we design.

Others also indicated that accessibility challenges had to do with the developer stereotype in Ghana. In Ghana, ‘*most of the developers we have are self-taught*’ (DEV₆). Self-taught developers refer to those who learn to develop through self-learning without undergoing any formal development or programming tuition. According to DEV₆, such developers were not likely to learn about accessibility as a component of web development. He explains:

when you are self-taught, you will most likely not go and learn about accessibility and developing for PWD. It is when you go through a very scrutinised and standard means of learning programming, you know, then these things will come up.

There were calls by some participants for society to take accessibility seriously because prevailing conditions (e.g. bad road networks, limited health infrastructure) in Ghana naturally put people at high risk of becoming disabled (GOV₉).

5.2.10.3 Related findings from content analysis

More than half of the respondents (57 per cent) in this study mentioned that perception of the society regarding disabilities and the cultural beliefs of the Ghanaian people in overall influenced how they prioritised accessibility challenges for PWD. However, this theme was conspicuously missing from the results of the analysis of policy documents. None of the policies that regulate E-government development discussed this theme and those on PWD mainly covered issues of inclusivity, suggesting possible exclusion but was not clear on reasons why PWD may be excluded. This could serve a hidden hindrance to accessibility since most developers, and government officers admittedly stated that perceptions and beliefs could not be ruled out in disability matters in Ghana.

5.3 Summary of findings

5.3.1 Relationships among themes

All ten themes were examined to explore how they relate to each other based on empirical evidence provided by participants; thus, the relationships defined are grounded in data. Establishing the relationship among themes was necessary to find out how they provide a complete narration regarding the phenomenon of study (Braun & Clarke, 2006; Nowell et al., 2017). The NVivo software was used to create the relationships among themes by identifying sample extracts of data to prove an association between two themes and coding them onto the relationship link. For instance, the empirical data provided by participants showed that accessibility requires assistive technologies hence the relationship ‘requires’ was created between the themes ‘Accessibility requirements’ and ‘AT acquisition and usage’ to show an association between the two themes. Twelve references (5 government officers and 7 visually impaired) were coded on this relationship.

For example, PWD₁₇ explained that without assistive technologies like screen readers, he could not access the web as he indicates:

for somebody like me who cannot read anything by myself whether it has been enlarged to even 72 or what I cannot read; so, without the screen reader it means I cannot access the web at all.

Similarly, GOV₈ believed that assistive technologies are required to enhance accessibility for PWD and that even if the government agencies were to redesign their E-services; without the availability of these technologies, accessibility would not be achieved. She explains:

assistive technologies, we need to have them also in place because if the policy is there and after doing update trying to get there and you don't have the technology that will help them [PWD] to use the system, then work done is zero.

An association was also established between the themes ‘Institutions, policies and enforcement’ and ‘Developing E-government.’ Empirical data show that participants held the view that policies and their strict enforcement would have an impact on the development of accessible E-government services. For example, DEV₂ underpinned that developers could add

accessibility features, but without policy forcing them to do so they would be reluctant as he indicates:

developers can do it [adding accessibility features], but without the awareness and the motivation which is like a policy, it won't be done because you see everybody is trying to do it the fastest and cheapest way they can.

DEV₄ expressed similar sentiments as he states:

a key thing will be governmental policy. I think ... that will be a key thing that even though as I said our motive is for profit and business, but if government policy is strict on that, all of us will jump into it.

Subsequently, the association impact was established between the themes ‘Institutions, policies and enforcement’ and ‘Developing E-government.’ Following similar steps, associations denoting relationships were established among the rest of the themes. In some instances, one theme was found to have associations with more than a theme. For example, the theme ‘AT acquisition and usage’ had associations with the themes ‘E-government challenges and benefits’, ‘Accessibility requirements’ and ‘Developing E-government.’ Table 5-1 illustrates themes with their corresponding relationships while figure 5-11 shows a screenshot of relationships among themes.

Table 5-1: Themes with their corresponding relationships

No.	Theme 1	Type of association	Theme 2
1	Accessibility requirements	Requires	AT acquisition and usage
2	Accessibility requirements	Lack of	Effects of inaccessibility
3	AT acquisition and usage	Help to harness	E-government challenges and benefits
4	Developing E-government	Impact	Accessibility requirements
5	Societal perceptions and beliefs	Affect efforts	Making society inclusive
6	Institutions, policies and enforcement	Impact	Developing E-government
7	Developing E-government	Results in	E-government challenges and benefits
8	AT acquisition and usage	Knowledge required for	Developing E-government
9	Making society inclusive	Enhances	Accessibility requirements
10	PWD lack E-readiness	Impedes	Accessibility requirements
11	PWD role in accessibility	Enhances	Making society inclusive

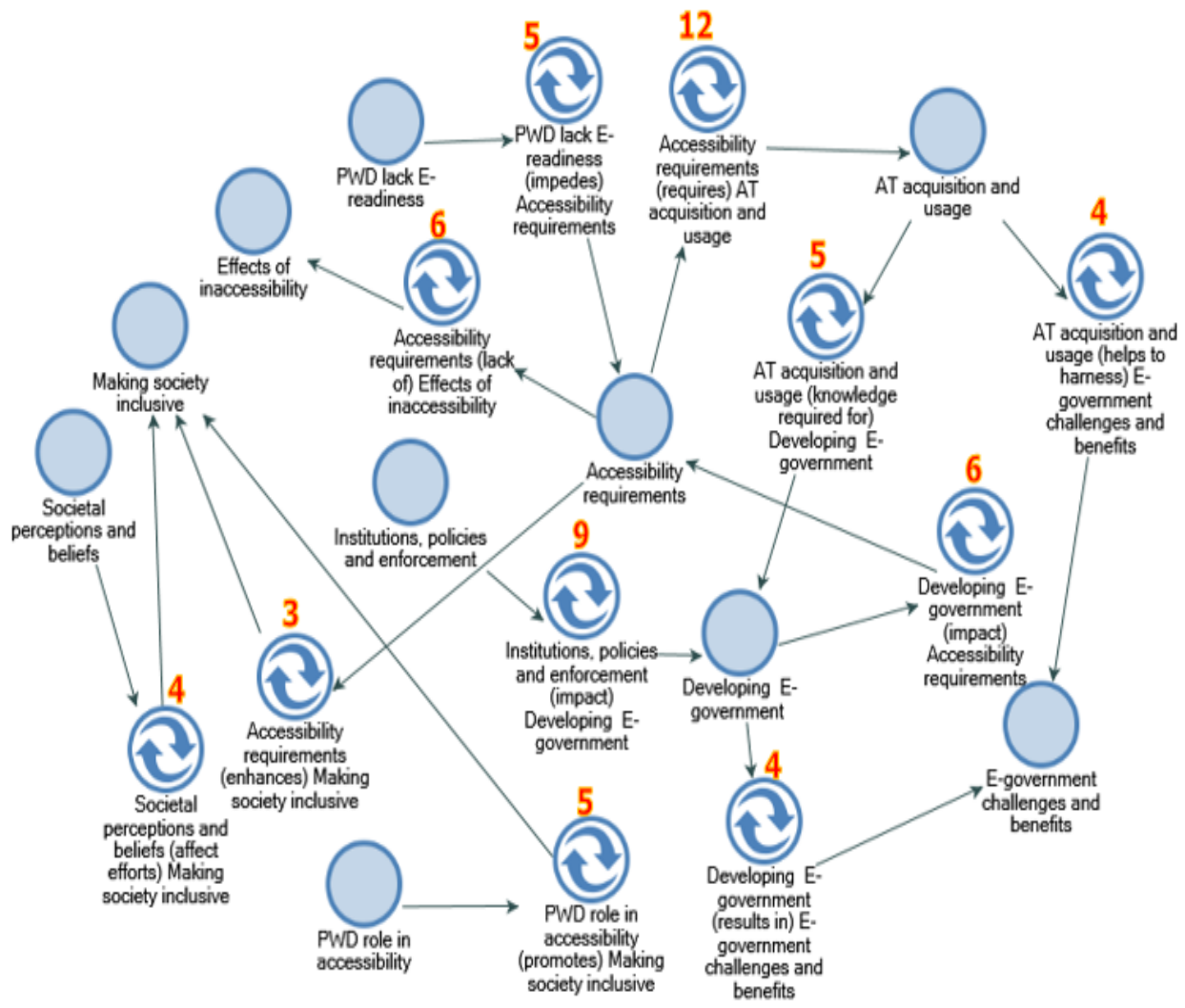


Figure 5.11: A screenshot of relationships among themes in NVivo

5.3.2 Chapter Summary

This chapter reports the findings of an analysis of data collected from observations, interviews and policy documents. It provides descriptions of ten themes and forty-one sub-themes which emerged from thematic analysis of data collected for this study. Each theme was compared with the results obtained from the content analysis of policy documents to clarify and verify issues raised by interview respondents. Content analysis results largely confirm concerns raised by interview participants. The themes were carefully examined by reading and re-reading extracts associated with a particular theme to understand how it relates to the others. Following this exercise, relationships among themes were coded in NVivo as illustrated in Figure 5.11. The findings also show varying opinions in among stakeholders.

Empirical findings show that PWD faced several challenges regarding access to E-government services. Acquisition of assistive technologies featured as a major challenge for PWD in the digital era. For most PWD, their inability to purchase these technologies and train in them to efficiently use them contributed to their lack of E-readiness. PWD in this study mentioned government support as a critical factor in their successful integration into the digital society. This support they lamented was lacking, which made other industry players not to yield to their plights. PWD also felt that the implementation of most legislation that would protect their interest was slow. In their opinion, the legislation was not enforced because of the attitudes and perceptions held by the Ghanaian society towards disabled persons. They also felt that developers were inconsiderate with the designs which made them struggle using E-government portals. PWD reported that issues of inaccessible and unreliable E-government portals, limited access options to E-services and the fact that E-government implementation in Ghana had not fully matured hindered them from harnessing the benefits of E-government fully.

Developers outlined several factors which guided how they developed E-government applications but indicated accessibility had not been on their '*radar*'. They admitted to lacking knowledge on accessibility needs of PWD because there was no policy to force them to mandatory include accessibility features. They felt that the lack of awareness on accessibility

was a major hindrance. However, they blamed the government who had the power to insist on the inclusion of accessibility features describing the government as *'not serious with PWD'*. They believed until the government was ready to act, developers were driven by profit margin and by default would not prioritise accessibility for PWD. For instance, they stated that if accessibility requirements are drafted into E-government contracts, developers would be forced to comply. Findings also revealed that developers' design of E-government applications were largely informed by their perceptions of PWD. For instance, they felt that PWD could easily be assisted by their non-disabled counterparts if applications were not accessible to them. Developers also held the view that PWD in Ghana were not making their voice heard, which partly contributed to their neglect.

Government officers, on their part raised several enabling conditions necessary to ensure access to E-government services for PWD. For example, they mentioned that PWD required ICT literacy and easy access to assistive technologies while instituting accessibility policy was necessary to address accessibility issues. Government officers believed that the government agencies, ministries and PWD had to collaborate to create the desired equality in the digital society. While admitting that the lack of awareness influenced their actions, they called for disability organisations to be more vocal and advocate intensively for their needs. The next chapter discusses these empirical findings in the context of literature.

CHAPTER 6 : DISCUSSION OF RESEARCH FINDINGS

6.1 Introduction

The aim of the study was to investigate the accessibility of E-government services for PWD in Ghana by identifying contextual drivers involved in exclusion of PWD from E-government services as well as the role of E-government stakeholders in the exclusionary process. The study further sought to examine how the stakeholders and contextual drivers reinforced the exclusionary process. While the preceding chapter provided empirical findings, this chapter interprets and discusses the research findings in the context of literature. The chapter is organised as follows: Section 6.2 presents a discussion of empirical findings in the context of literature, while Section 6.3 concludes the chapter.

6.2 Discussion of empirical findings

The findings of the study indicate that most of the visually impaired respondents (89 per cent) were aware of E-government services, and many (72 per cent) of them had utilised for various purposes. This high number of users was to be expected because all the visually impaired participants were highly educated and literature has shown there is a positive correlation between literacy and use of electronic services (Gauld, Goldfinch & Horsburgh, 2010; Dobransky & Hargittai, 2016).

The empirical analysis of this case study provides some insights into various drivers that influence E-government development, thereby impeding accessibility. The study also highlights several challenges relating to the accessibility of E-government services for PWD in Ghana. The findings were generalised from an empirical sample of 18 visually impaired, 10 developers and 9 government officers. While it is generally believed that low or lack of literacy affect accessibility (DRC, 2004; Grantham, Grantham & Powers, 2012; Abascal et al., 2016), the findings from this study show that even with high literacy, accessibility challenges may persist. The ten themes (Figure 5.11) that emerged from empirical findings border on issues of technology, societal and cultural beliefs, political influence, limitations for PWD and the development of E-government services. Subsequently, they were grouped under the categories:

technological, socio-cultural, political and personal drivers and development of E-government services. I proceed to discuss each category in detail in the following sub-sections.

Table 6-1: Grouping of themes

Category	Themes
Technological drivers	AT acquisition and usage, Accessibility requirements,
Socio-cultural drivers	Making society inclusive, Societal perceptions and beliefs
Political drivers	Institutions, policies and enforcement
Personal drivers	PWD lack E-readiness, PWD role in accessibility
Development of E-government services	Developing E-government, E- government challenges and benefits, Effects of inaccessibility

6.2.1 Technological drivers

The findings of the study show that technological drivers influence the development of accessible E-government services. From the responses of participants, knowledge in AT was crucial for E-government developers to understand which approach to adopt and the appropriate tools to use for the development of accessible services. Participants contended that for developers to acquire this knowledge, training in AT was necessary to build their capacities. The findings also suggested that accessibility training should be conducted for both web developers and government officers periodically to provide them with the technical know-how and in-depth understanding of the needs of PWD. Such accessibility training participants perceived would enable E-government implementers to make the necessary design considerations for PWD. These findings reflect earlier studies (Freire, Goularte & Fortes, 2007; Arrue, Vigo & Abascal, 2008a; Lazar & Jaeger, 2011) which indicate that accessibility training is important particularly for web developers to acquire more knowledge regarding accessibility guidelines and tools to improve accessibility. Several studies (Jaeger & Xie, 2009; Abu-Doush et al., 2013; Galvez & Youngblood, 2014; Adepoju, Shehu & Bake, 2016) in the past have also shown accessibility training is crucial for E-government implementers to make them cognizant of the needs of PWD and to enable them to put in place the necessary design considerations for them. Moreover, understanding the needs of PWD is considered one sure way to improving accessibility (Owusu-Ansah, 2014). Aside from having the knowledge of PWD needs, developers in this study emphasised the essence of development guidelines to assist in designing

accessible solutions. The study indicated that there were no accessibility guidelines in Ghana. Government officers confirmed the lack of accessibility guidelines but stated that the government was in the process of formulating such guidelines. Respondents believed that the type of guidelines developers followed during the design of E-government services determined the resultant outcome. These findings corroborate those of previous studies (Lazar, Dudley-sponaule & Greenidge, 2004; Welle Donker-Kuijer, de Jong & Lentz, 2010; Mtebe & Kondoro, 2017) which reiterated the need for developing guidelines to enable developers to improve accessibility for PWD.

Further, the empirical findings indicate that the development of accessible services requires additional resources. For example, expertise in web accessibility and AT was found to be key for E-government developers to design accessible services. However, most developers in the study reported that they did not have the needed expertise to develop solutions that could be used by PWD. To this end, they explained that there would be the need to hire additional expertise leading to an increase in the cost of development and subsequently, services. The contention was that the development of accessible E-government services required resources such as accessibility tools, time, finance, expertise, among others. These findings mirror those of earlier studies (Becker, 2004; Brophy & Craven, 2007; Jaeger & Xie, 2009) which show that the development of accessible services increases cost and time of development while necessitating additional expertise from developers. According to Jaeger (2006), an adequate financial resource is vital for web developers to comply with accessibility policies. These findings also confirmed those of Brophy and Craven (2007) and Abu-Doush et al., (2013) which found that expertise on accessibility among E-government developers was low. The need to assess developers on accessibility skills has, therefore, been suggested to help enhance the design of accessible solutions (Bundrick et al., 2006; Yaokumah, Brown & Amponsah, 2015).

Thus, from the technological perspective, the empirical findings show that important drivers for developers and government officers to improve accessibility of E-government services include: (1) knowledge of AT; (2) training in AT; (3) accessibility training; (4) E-government development guidelines; (5) design considerations for PWD and (6) available resources

6.2.2 Socio-cultural drivers

Evidence from the findings shows that socio-cultural factors play a significant role in addressing accessibility to E-government services for PWD. Participants in this study mentioned the lack of accessibility awareness as a major hindrance to addressing accessibility challenges faced by PWD. Some developers believed that accessibility issues could be attributed more to the lack of awareness than a technological challenge. These findings echo those of previous studies (Freire, Russo & Fortes, 2008; Lazar & Jaeger, 2011; Mourad & Kamoun, 2013; Al-khalifa, Baazeem & Alamer, 2017) which argue that though accessibility is integral to usability; awareness is key to improving it. The study participants felt that E-government implementers would act more swiftly if they were aware of the accessibility requirements of PWD. The findings mirror those of Henry et al., (2014), which state that awareness would cause E-government implementers to be more proactive and allocate more resources to accessibility issues. Findings from this study show that participants tied closely developers' awareness of accessibility to their education. They stated that society had to commit resources to education on accessibility to create more awareness. The recommendation to include accessibility as part of the learning curriculum also featured strongly among respondents, especially web developers. The assertion was that inculcating accessibility into educational syllabus would help build a solid foundation for up and coming developers influencing their style of development in the end. Similarly, several studies (Lazar, Dudley-sponaule & Greenidge, 2004; Jaeger, 2006; Hong et al., 2015; Yaokumah, Brown & Amponsah, 2015) in the past have argue that inclusion of accessibility in educational syllabus is critical to help developers become aware of the accessibility needs of PWD and to promote accessibility awareness among the general populace in a given context.

Education on disabilities within the Ghanaian context was mentioned as an important step to transform the beliefs and perceptions of the Ghanaian people given that societal perceptions and beliefs featured as one of the challenges that impeded accessibility to E-government services. This was to be expected as previous findings by Sullivan (2011) and Hill (2013), show that societal perceptions and attitudes are important as they shape and direct the actions of the people within the society towards PWD. The findings of this study show that the Ghanaian

society had strong superstitions about disabled people, which made them overlook their needs. These include the belief that disability is communicable, a manifestation of witchcraft and other socio-cultural beliefs. These findings mirror those of Nkansah and Unwin (2010), which found that societal perception is a major cause of the neglect of PWD in Ghana. PWD also felt that such perceptions and beliefs contributed to their accessibility challenges as E-government implementers side-lined them and did not solicit their views prior to development. These findings also corroborate those of Ratliffe et al., (2012) who indicate that until perceptions on disability shift, it would be difficult to make any progress towards integrating PWD into the digital society. This is because societal perceptions and beliefs tend to increase stigmatisation, deprivation and further exclude PWD from the rest of the society (Mitra, Posarac & Vick, 2011; Koca-Atabey, 2013).

Studies (Heeks, 2005; Bühler & Fisseler, 2007; Jaeger, 2008; Latif & Masrek, 2010; Mourad & Kamoun, 2013) have long shown that the perceptions of developers influence how they design E-government systems. This assertion is confirmed by this study, as participants indicated that developers' perceptions of accessibility influenced their views and how they prioritised accessibility issues. Some respondents believed that the upbringing of individuals and the beliefs instilled in them shaped their perceptions, which was the case for E-government developers. To this end, the perceptions of society tend to reflect the kind of support they render to PWD. The visually impaired lamented on inadequate support, especially from the government. They stressed that support from the immediate family and the government were important to make them feel belonged in the digital society.

From the socio-cultural viewpoint, the empirical evidence shows that intensifying education and creating more awareness on accessibility is crucial to transform the cultural beliefs and societal perceptions of the Ghanaian people, so they become more supportive of PWD.

6.2.3 Political drivers

From the political perspective, the study identified challenges including weak state institutions, poor implementation of policies, lack of law enforcement and lack of political will as drivers that influenced the accessibility of E-government services. Participants perceived

that the drafting of policies by the government was important because if the rights of PWD ‘are actively enshrined in legislation; it could make a gradual difference to the expectations of society’ (Adam & Kreps, 2009: 1050). Evidence from the study shows that two policies; Persons with Disability Act (PDA) and Inclusive Education Policy (IEP) were supposed to resolve the needs of PWD. Participants argued that though these policies had been passed to promote equal access to education, ICTs and services, among others; their implementation had rather been slow (Ametepee & Anastasiou, 2015). While respondents perceived these policies (PDA and IEP) as enablers of accessibility, their poor implementation hampered the desired results. Despite the existence of PDA, there were calls for the implementation of the United Nations Convention on Rights of Persons with Disabilities (UNCRPD) which Ghana had signed in 2006 and ratified in 2012. The contention was that the PDA was outdated and did not incorporate solutions to most of the challenges PWD faced in the digitalised society. These findings confirm those of Lazar and Jaeger (2011) who argue that the inability of policies to keep pace with technology, impact on addressing challenges of PWD. Also, a major hindrance regarding the implementation of policies was the lack of enforcement by mandated institutions. This was because in Ghana, ‘*institutions are weak*’ to enforce the laws. Also, state institutions were not well equipped to expedite their mandate. These findings are consistent with those of Rorissa and Demissie (2010), which indicate that most institutions in developing countries, particularly in Africa, are weak to implement legislation and policies firmly.

Findings from the study reveal the lack of accessibility policy in Ghana. Many respondents believed that policy was necessary to enforce the accessibility of E-government services for PWD. This is not surprising, as studies (Goodwin et al., 2011; Bertot, Jaeger & Hansen, 2012) in the past have shown that most developing countries lack accessibility policies which make it challenging to tackle accessibility problems. The lack of legislation and policies are, therefore, setbacks to tackling accessibility challenges effectively (Kuzma, Yen & Oestreicher, 2009; Ismailova, 2017). The findings also suggest that the Government of Ghana lacked the political will to enforce the implementation of policies that would protect the interest of PWD. Participants perceived the lack of political will as a barrier to addressing the needs of PWD because previous studies (Stanforth, 2006; Voida et al., 2014) confirm that E-government

implementation is inherently a political process and therefore requires a strong political will from government to succeed (Cordella & Iannacci, 2010; Thakur & Singh, 2013).

For this reason, the *'political will of the government'* to act and provide a swift response to accessibility needs was critical. For instance, the visually impaired felt that *'E-government applications possess political properties that can be applied effectively by the political leadership as instruments'* (Ahn & Bretschneider, 2011: 414); hence a strong political will was needed to address accessibility. Further findings from the study indicate that apathy from government implicitly affected the response from the industry partners. Participants felt that if the government could set the pace by prioritising accessibility, partners from the industry would be cautious to follow suit. Moreover, they perceived that if the government could make industry partners aware of the needs of PWD; they could render some support (for example, in the form of funding to provide ICT, AT and training). These findings echo those of Ratliffe et al., (2012), who indicate that the industry would offer the necessary support if they became aware of the pending needs of PWD. For instance, *'businesses would be willing to donate used ICTs if they are aware of the needs'* (Ratliffe et al., 2012: 220). It also confirms argument by Oh and Chen (2015), that the industry has a corporate social responsibility to promote equal access for vulnerable groups such as PWD in the digital era to bridge the digital divide. While support from industry was dependant on the government's priorities; these priorities aligned with the government's political agenda hence the need for political will.

Thus, from the political viewpoint, the empirical findings point to: (1) the existence of strong institutions; (2) enforcement of laws; (3) implementation of appropriate policies to fit the Ghanaian context; and (4) the political will of the government to prioritise the needs of PWD were key to addressing accessibility challenges.

6.2.4 Personal drivers

Contextual drivers are important to enhance the understanding of the underlying forces that would promote or impede accessibility (Yildiz, 2007). This study identified specific challenges, which made it difficult for PWD in Ghana to harness the full benefits of E-government services. One of such barriers is the lack of access to ICTs and reliable internet connectivity.

ICTs such as personal computers, laptops or mobile phones are required to access any electronic information or services such as E-government services (Al-jaghoub, Al-yaseen & Al-hourani, 2010; Babalola, 2013). However, the findings of the study suggest that the cost of ICTs in Ghana were high, particularly mobile phones, which PWD considered portable and more convenient. Previous studies have reported similarly, that the cost of ICTs in many developing countries is high which leads to unequal access thereby creating a digital divide among citizens (Almarabeh & AbuAli, 2010; Kaisara & Pather, 2011; Hoque & Sorwar, 2015). Access to the internet was also another challenge identified in the Ghanaian context. The evidence from the study shows that the cost of internet in Ghana was high while its access was limited. These findings mirror those of Lin et al., (2011), who stated that internet penetration in many developing countries is low yet with high tariffs.

Respondents also emphasised on the high cost and low presence of AT in Ghana as a major challenge to accessibility. This is not surprising, as most developing countries, lack regulative measures or policies to ensure availability of AT (Borg & Östergren, 2015). On the contrary, AT policies and strategies exist in developed countries making AT more available and affordable (Borg & Östergren, 2015; Gould et al., 2015). These findings reflect earlier studies (Borg, Larsson & Östergren, 2011; Matter et al., 2016; Visagie et al., 2017) which report that AT in developing countries is limited with only about 5-15 per cent of those who need them having access. The lack of access was also partly attributed to the lack of expertise in AT. The limited expertise hampered training in both ICTs and AT which many participants claimed affected the E-readiness of PWD in Ghana and subsequently their accessibility experience. These findings corroborate previous studies (Almarabeh & AbuAli, 2010; Kaisara & Pather, 2011) that show that high digital literacy is a requirement for accessibility and overall adoption of E-government services. Training in AT was mentioned as another hindrance to accessibility confirming findings of Visagie et al. (2017), who indicate that training is important to ensure PWD get up to date information on the use of AT to enable them to maintain these technologies properly. Some respondents stated the need for regular upgrade of AT as a challenge because of the rapid change in AT designs which called for an additional cost many PWD could not afford. This latter challenge mirror findings of Dobransky and Hargittai

(2016), who indicate that the pace of technological change is one underlying factor for the exclusion of PWD in the digital society.

Late adoption of ICT in Ghana was identified as another challenge which affected the ability of PWD to use electronic services efficiently. The assertion by the visually impaired was that ICTs usage in Ghanaian schools was late and mostly started at the tertiary level. This situation they perceived made it difficult for them to master ICT usage because they required a lot more time to train compared with their non-disabled counterparts. As a result, PWD felt lagged behind because ‘*Ghana is the only country... so far that technologies are not used in schools except the university*’ (PWD₁₀). Consequently, 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*’ (PWD₁₄) because of late adoption. These findings resonate those of Chadwick et al. (2017), who indicate that many PWD who have literacy skills are not accessing the Internet to the same degree as others.

Some respondents (the web developers and government officers) held the perception that PWD ought to become more vocal and advocate intensively for accessible services from government. There were concerns that the disabled population ought to take charge of issues that directly affect them instead of leaving them in the hands of non-disabled persons. There was a sense that PWD in Ghana were not part of the driving force to push the agenda of accessible E-government services. A contributing factor to this was that many PWD did not know about their rights enshrined in existing legislation hence their inability to push the accessibility agenda. Consequently, this acted as an obstacle for PWD to demand accessible services from government. These findings substantiate the argument by Adam and Kreps (2009), that until disability activists are involved in the policy-making agenda regarding PWD; accessibility challenges would continue to exist. Additional findings show that unemployment was high among PWD in Ghana, and this was an underlying factor for poverty. These findings corroborate those of previous studies (Loeb et al., 2008; Mitra, Posarac & Vick, 2013) which reveal that poverty is high among PWD in many developing countries. Such financial constraints made it difficult for PWD to afford modern technologies which they required to become well integrated into the digital society. The overall effect was that these challenges

contributed to the lack of E-readiness for PWD in Ghana. Thus, these outlined personal drivers affected the ability of PWD to access E-government services and to use them efficiently.

6.2.5 Development of E-government services

The development of an electronic service requires a unique approach depending on the type of service (e.g. E-learning, E-commerce, E-government) to be developed (Arrue, Vigo & Abascal, 2008a). The development process, therefore, plays a critical role in defining features of services to be developed. To this end, the E-government development process also plays a significant role in determining the accessibility of E-government services. From the findings of the study, the visually impaired respondents attributed most of the E-government accessibility challenges to the poor structure of E-government portals, websites and web applications. They reported difficulties navigating and perceiving content on E-government websites due to their poor design layout, images without alternative text, lack proper labelling of forms and links. For example, *'some images can be there to convey some information but the way the website is designed it does not give you access to it'* (PWD₂) because screen readers cannot read images.

These findings reflect those of previous studies (Boussarhan & Daoudi, 2014; Yaokumah, Brown & Amponsah, 2015; Oni, Okunoye & Mbarika, 2016; Al-khalifa, Baazeem & Alamer, 2017; Mtebe & Kondoro, 2017) which concluded that poor design and layouts are reasons why many E-government websites are inaccessible for PWD. These studies attributed the lack of accessibility of E-government websites to lack of conformity to international accessibility guidelines such as WCAG or Section 508. The findings also echo those of earlier studies (Stewart, Narendra & Schmetzke, 2005; Boussarhan & Daoudi, 2014) which argue that even with the most advanced AT; PWD are likely to encounter challenges if E-government portals and websites are designed without accessibility in mind.

A crucial step in the development of E-government services, as evident in this study, is the testing of E-government applications. From the perspective of the developers, testing outcomes aid in detecting challenges users may face using the services. For this reason, testing is an important step to detect accessibility problems (Serra et al., 2015; Darmaputra, Wijaya & Ayu, 2017). All web developers in this study confirmed testing as part of their development cycle; which included automatic and user-testing. However, none of the developers had tested

their applications with PWD or users of AT to ascertain the possible accessibility challenges they might face.

Contrary to this observation, testing with AT is recommended to ensure compatibility and to help improve accessibility (Abanumy, Al-badi & Mayhew, 2005; Boussarhan & Daoudi, 2014). Evidence from the study indicates that PWD were not at all involved in the development of E-government services. The development of E-government services was determined based on the contract agreement between the government agencies or ministries and developers. However, several studies (Jaeger, 2008; Abu-doush et al., 2013; Henry, Abou-Zahra & Brewer, 2014) have long shown that the inclusion of PWD in the development is a necessary step to improve accessibility. The lack of involvement of PWD in the development of E-government services also suggests that E-government implementers are indirectly adopting the medical model of disability (Adam & Kreps, 2009).

The content of E-government portals and websites was another issue raised in this study. Some participants described government online content as unreliable and irrelevant, thereby rendering them not usable. Some respondents reported that several E-government websites in Ghana contained outdated information making them not reliable to the citizenry. These findings are similar to past studies (Oni, Okunoye & Mbarika, 2016; Tashtoush, Darabseh & Al-sarhan, 2016; Fröhlich & Peters, 2017) which indicate that many E-government websites are static, non-interactive and do not disseminate information that citizens require. The assertion by participants was that E-government services ought to be targeted at the needs of citizens confirming earlier studies (Bertot, Jaeger & McClure, 2008; Tashtoush, Darabseh & Al-sarhan, 2016) which argue that E-government services should be developed to meet citizens' expectations and to promote good user experience while reducing barriers to access.

The findings obtained in this study, albeit corroborated in literature, present some unique observations. Firstly, the empirical findings highlight the role of agency among E-government stakeholders to accessibility; which previous studies did not emphasise. The findings of this study show that developers and government officers influenced how E-government services are developed. Government officers draft E-government contracts in consultation with

developers which serves as a guideline for developers when designing E-government services. It was not surprising at all that the developers in this study conceded the lack of accessibility requirements in E-government contracts is a great setback to addressing accessibility challenges for PWD in Ghana. Also, contrary to past studies which mainly found accessibility as a technical problem, the empirical findings show that socio-cultural and political structures influence developers and government officers by shaping their perceptions regarding accessibility of E-government services. Power differentials among government officers, developers and PWD played key role in addressing accessibility. Again, limitations in capabilities of PWD owing to personal drivers impact either explicitly or implicitly on their accessibility experience. In light of these empirical findings, a framework (Figure 6.1) is developed to illustrate the development of E-government services and how PWD become excluded in the Ghanaian context.

Agents refer to individuals doing the exclusion with regards to E-government services (Atkinson, 1998). As evident in Figure 6.1, three agents are involved; government officers, web developers and PWD. The drivers relate to the factors that influence the development of E-government services or affect accessibility experience of PWD, leading to their exclusion (Kabeer, 2000). The study identified four categories of drivers; technological, socio-cultural, political and personal. In this study, the personal drivers were drawn from a sample of visually impaired, and there are possibilities of additional concerns with the involvement of other disability categories hence the use of broken lines. Both agents and drivers are involved in the exclusionary process (Burchardt, Le Grand & Piachaud, 2002). The next section provides a theoretical discussion of the empirical findings.

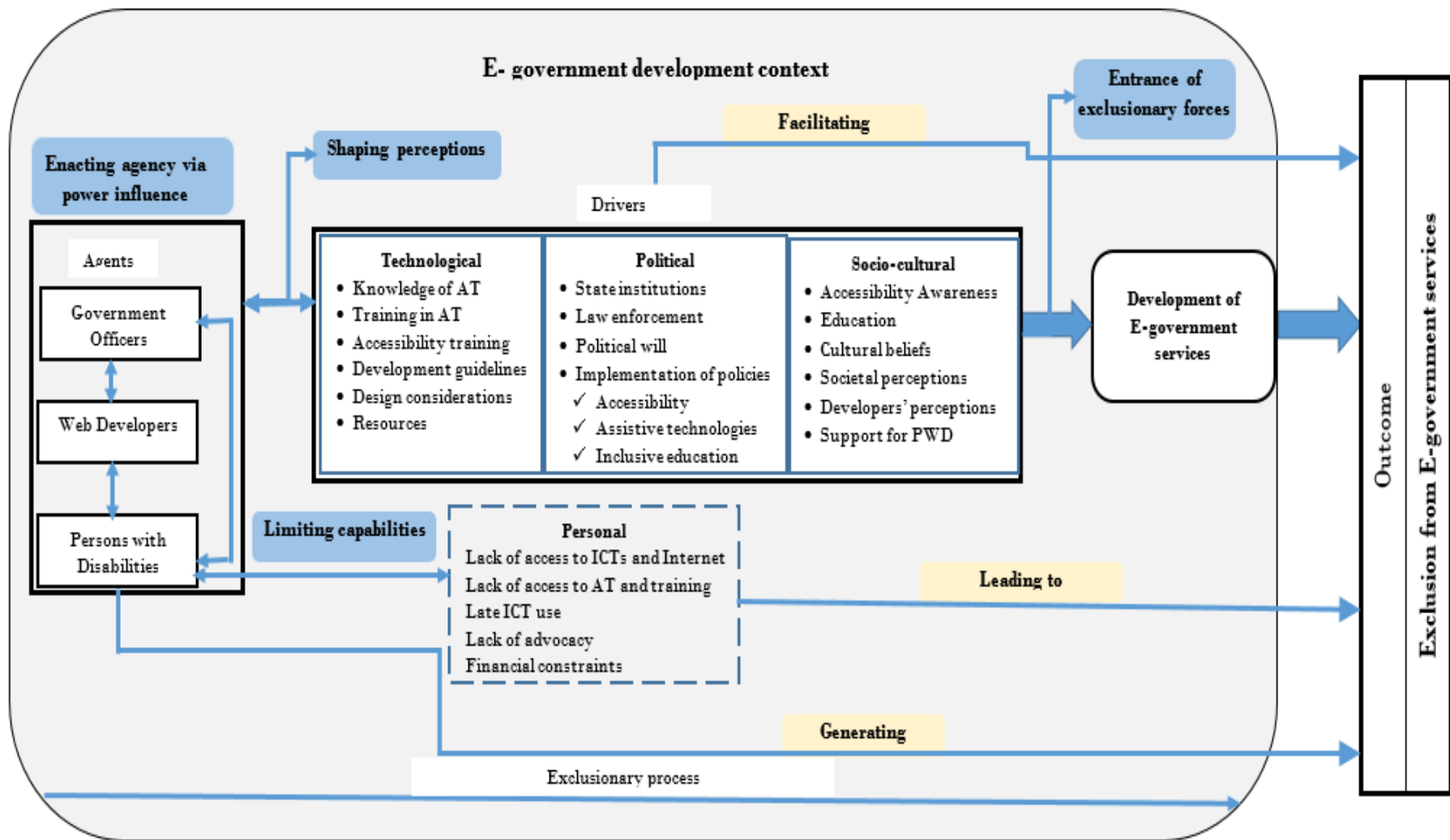


Figure 6.1: E-government accessibility framework from empirical observations

6.3 Chapter Summary

This chapter discusses the empirical findings of the study and corroborates with literature to assess their validity. Themes obtained from the analysis are categorised based on the empirical data associated with them. Four categories of drivers were identified namely: technological, socio-cultural, political and personal. These drivers influence the development of accessible E-government services and affect accessibility experience for PWD in Ghana and are inextricably intertwined. From the perspectives of government officers and developers, technological, socio-cultural and political drivers were interrelated in a way that shaped their perceptions, influenced their decisions and practices on what requirements to include in the development of E-government services which eventually impacted on accessibility. On the other hand, PWD were affected by personal drivers that constrained their abilities to use E-government services affecting their overall accessibility experience. The summary of the empirical observations (Figure 6-1) provides the basis of the theoretical discussions in the chapter that follows.

CHAPTER 7 : THEORETICAL ELABORATION

7.1 Introduction

The empirical analysis of the study pinpointed several contextual conditions, which led to the exclusion of PWD from E-government services. Following the empirical observations, these contextual conditions have been grouped under three categories, namely:

- 1) Agents involved in the exclusion of PWD
- 2) Drivers facilitating the exclusion
- 3) Exclusionary process

This chapter provides theoretical interpretations of the empirical findings. Following the elaborations, nine theoretical propositions have been formulated based on the empirical findings and corroborated in the literature. The rest of the chapter is divided into two sections: Section 7.2 presents elaboration on the empirical findings while Section 7.3 concludes the chapter.

7.2 Theoretical elaborations

The visually impaired respondents in this study were highly educated; consequently, it was expected that they should have the capacity to easily access E-government services, but this was not the case as they reported of several challenges. Furthermore, government officers and developers in this study even though acknowledged that the accessibility of E-government services was critical for PWD, they were sidelined during the development process. The accessibility needs of PWD were not captured as part of the requirements for E-government services. Empirical findings show that E-government stakeholders enacted agencies via power influence. While technological, socio-cultural and political drivers shaped perceptions and actions of government officers and developers to accessibility, PWD were constrained by personal drivers. The empirical observations from the case study, therefore, suggest a need to place emphasis and to elaborate on the following concepts: (1) agents of exclusion; (2) drivers of exclusion; and (3) exclusionary process.

7.2.1 Agents of exclusion

The empirical analysis of this study shows that government officers have the power to oblige E-government developers to design accessible. For example, many developers mentioned that they would be compelled to incorporate accessibility features into E-government services if made mandatory requirement in E-government contracts by government officers. They also indicated that it was the responsibility of the government officers to formulate guidelines for E-government developers to follow. However, evidence from the study showed that accessibility was not part of requirements enlisted in E-government contracts. Also, the study found no existing development guidelines hence integrating accessibility features into E-government services was optional for developers. To this end, practices of government officers tended to unofficially perpetuate exclusion and, in a way, institutionalise discrimination. The empirical analysis also showed gaps between E-government and disability policies and their implementations in Ghana. Again, government officers were blamed for these gaps since they were powerful agents in the decision-making arena of E-government development. They occupied an evident space of power in determining ‘what and how’ E-government services are developed. Thus, government officers drafted E-government contracts and stipulated conditions of acceptance for E-government developers. By virtue of their award of E-government contracts, developers were invited into the power space. As a result, they obtained a high agency to operate. Accordingly, developers influenced the outcome of E-government services through their practices and style of development. For example, although developers conducted user testing after the development of E-government services, users with disabilities had never been involved. Also, developers, when designing E-government services, prioritised project deadlines and profit margins ahead of accessibility needs of PWD.

The empirical observations further reveal that PWD were neither involved in the consultative processes leading up to E-government development nor during the development process. Rather decisions regarding the development of E-government services were taken by government officers relying on the expertise of the developers. Subsequently, these powerful actors of E-government operated in a closed space of power and did not broaden consultations to include PWD. These power differentials among E-government stakeholders created

boundaries and prevented the views of PWD from entering the arena of E-government development. These empirical observations suggest the following theoretical proposition:

P1: WHEN government officers do not broaden consultations on E-government to include PWD, they fail to inscribe accessibility into E-government contracts, AND developers are unable to enact it, AND PWD are passively excluded from E-government services.

This theoretical proposition derived from the empirical analysis is corroborated in the existing literature. For instance, several researchers (Sen, 2000; Gallie & Paugam, 2004; Benbow et al., 2015) have acknowledged that when there are unequal power relations among agents, some agents become excluded. This is because those agents with strong influence do not broaden boundaries for the inclusion of agents with little influence (Gaventa, 2006). Rather, they exert their influence by making an invisible impact on those agents with little power through their values, ideas and practices (Kabeer, 2000; Sen, 2000; Foley, 2004; Rawal, 2008). Nahuis (2014), Oni et al., (2016) and others have also argued that government officers have the power to make developers design accessible services. Further, Nahuis (2014) indicated that inaccessibility of E-government services exclude sections of the population hence government officers by their inactions perpetuate exclusions. Again, studies (Jaeger & Xie, 2009; Kuzma, 2010) have established that it is the responsibility of government officers to document guidelines for the development of E-government services to ensure they are accessible. Clearly, in this case, government officers neither provided accessibility guidelines for developers nor were they implementing policies regarding E-government and disabilities, leading to the exclusion of PWD. Evidently, there were gaps between policies and their implementations. Kabeer (2000), vehemently posits that when policies relating to PWD are not well implemented can lead to their exclusion.

Government officers as evident in this study were powerful people who controlled critical resources and therefore, enacted agency via their strong influence on the development of E-government services. They initiated the development process, drafted contract terms for developers and also approved of E-government services developed. In this way, government officers had direct influence over developers. In a similar light, developers having expert

knowledge as an important resource were able to enact agency. The empirical evidence reveals that while many government officers believed that accessibility was important, they were doing very little to affirm this belief. Developers, on the other hand, had low motivation due to the absence of accessibility policy and exhibited poor attitudes towards resolving accessibility challenges PWD faced. PWD reported that even though they had made initial persuasive efforts to get the attention of the government, that did not yield much results. For example, GBU had made several appeals and offered to provide free training to make E-government implementers aware of the needs of PWD. These efforts, however, had not translated into the desired expectations. PWD were unable to enact agency and felt powerless with regards to influencing the E-government development process. For this reason, they believed pressuring the government was the way out to get the needed attention. For instance, PWD₄ indicated accessibility could not be a priority for government officers unless they find a way to make them uncomfortable and because ‘*politicians don't like embarrassment*’ they would act swiftly. Similarly, PWD₆ stated ‘*if we say and they don't do we still have to put pressure on them*’ until the needed attention is received. Given these empirical observations, the following proposition can be formulated:

P2: WHEN the development of accessible E-government services is dependent upon government officers and developers, YET PWD lack agency to exert authority over them, THEY will exercise coercive powers such as employing pressure tactics to make them responsive to their needs.

This proposition is substantiated by earlier studies (Goodstadt & Hjelle, 1973; Kipnis, Schmidt & Wilkinson, 1980; Cohen & Bradford, 1989; Yukl & Falbe, 1990; Nielsen & Ngwenyama, 2002; Ngwenyama & Nielsen, 2013). For example, Kotter (2003), Cohen and Bradford (1989) and others have argued that agency is necessary to exert influence on people. Also, the appropriate influence tactics to be used should be consistent with prevailing norms. Past studies (Kipnis, Schmidt & Wilkinson, 1980; Yukl & Falbe, 1990) show that persuasion influence strategy helps to generate commitment from the target of influence. Further, Kotter (2003), indicates that when there is an agency, persuasive techniques are more appropriate since they do not result in resistance. However, as evident in this study, PWD lacked agency hence persuasion did not

yield results. When individuals feel ‘psychologically powerless, they are more likely to employ coercive power’ than persuasion (Goodstadt & Hjelle, 1973: 195). For instance, Goodstadt and Hjelle (1973) and Kipnis et al. (1980) have argued that people who are powerless and have difficulty exerting influence easily incline towards the use of coercive power. Thus, coercive power offers the powerless an opportunity to be influencing agents and to ‘elevate their sense of dignity’ (Goodstadt & Hjelle, 1973: 190). The use of coercive power is particularly employed, where individuals are unsuccessful in attempts to influence governments or social institutions (Goodstadt & Hjelle, 1973). Coercive power is also applied in cases where people face resistance from the target of influence owing to lack of motivation (Goodstadt & Hjelle, 1973; Cohen & Bradford, 1989). Clearly, in this study, government officers and developers had low motivation regarding accessibility, which explains why PWD believed exercising coercive power is most appropriate.

Further, from the empirical evidence, government officers and developers contended that if PWD felt excluded, they should have reported their accessibility challenges. Such reports from PWD to E-government implementers, however, were conspicuously lacking from the empirical observations. For example, a leading developer of several E-government services stated that no complaints so far about accessibility had been received from the disability fraternity. For this reason, respondents believed that the silence from PWD contributed to their exclusion. Many PWD in Ghana perceived themselves as belonging to a minority and had a sense of powerlessness to influence happenings in society. Subsequently, they were reluctant to complain about their challenges having the perception that Ghanaians are not enthused about disability matters. Such self-perceptions affected their capabilities to claim their rights and subsequently, led to their deprivation, stigmatisation, and further exclusion. Thus, the voice of PWD in Ghana was either not heard or not loud enough to compel decision-making authorities to pay attention to their accessibility needs. These empirical observations support the following theoretical proposition:

P3: WHEN PWD fail to be change agents, their constraints and concerns regarding the accessibility of E-government services are LIKELY to be overlooked by government officers and developers during the development process.

This theoretical proposition is corroborated in the existing literature. For example, Barry (2002) and Lucas (2012) pointed out that those individuals at risk of exclusion or the excluded could be contributing to their exclusion. They contended that exclusion could be self-enforced when those excluded fail to act as change agents. According to Silver (1994), known social problems have vast implications in the formulation of policies by decision-making bodies. Consequently, the ‘discourse of exclusion may serve as a window through which to view political cultures’ (Silver, 1994: 543). It is, therefore, important for PWD to voice out their challenges relating to E-government services so that implementers can find suitable solutions. Similarly, Soors et al., (2013), posit that while the integration of technical and political approaches is crucial to addressing social exclusion; more importantly, however, those excluded ought to champion their interest if they desire to be on par with the population mainstream.

7.2.2 Drivers of exclusion

The empirical analysis of this study shows that technological, socio-cultural, political and personal drivers impede the accessibility of E-government services for PWD in Ghana; excluding them from equal participation. Issues bothering on technology as outlined in figure 6-1 which operated in the Ghanaian context shaped perceptions and informed practices of government officers and developers during the E-government development process. For instance, because government officers and developers were not knowledgeable in AT hence they did not bear in mind the needs of users with AT during the E-government development process. Again, matters relating to education, societal awareness of disabilities and accessibility, preconceptions and cultural beliefs about disabilities shaped the understanding of government officers and developers regarding the accessibility of E-government services for PWD. For example, there was a lack of awareness of disabilities amongst government officers and developers to the extent that some did not know that PWD could use E-government services. The development of E-government was also influenced by the political landscape of Ghana. For example, how the state institutions formulated policies, implemented and enforced them was dependent on the availability and the amount of resources allotted to them. Allocation of resources to state institutions depended on the political agenda of the

government. For instance, a respondent from NITA (GOV₃) lamented that though there may be legislation instructing state institutions to provide accessible services, limited resources hindered their compliance. Also, developers indicated that including accessibility features into E-government applications would increase the cost of development because it was expensive to hire people with such expertise in Ghana. Thus, these contextual drivers (technological, socio-cultural and political) were structural elements that shaped the perceptions and practices of developers and government officers and determined the outcome in the development of E-government services. In line with these empirical observations, the following theoretical proposition can be formulated:

P4: WHEN technological, socio-cultural and political drivers shape perceptions of government officers and developers such that THEY inscribe inherent requirements into the development of E-government services, THEY constitute crucial exclusionary forces for reinforcing the exclusion of PWD.

This theoretical proposition is substantiated by previous studies (Sen, 2000; Bradshaw et al., 2004; Seale, 2006; Rawal, 2008; Kidd, 2014) which acknowledged that exclusion is usually facilitated by different drivers within a specified context. For instance, the responses of E-government implementers to the accessibility needs of PWD are mediated by the contextual drivers (Seale, 2006; Kelly et al., 2009). Contextual drivers, therefore, either explicitly or implicitly perpetuate exclusions using actors, institutions and processes. For example, Kidd (2014) contended that exclusionary forces are often derived from prejudices held by powerful members of society which manifest in discriminatory practices such as institutional biases and institutional blindness to the needs of PWD. Also, the exclusion is generated by an interplay of contextual drivers that are ‘linked and mutually reinforcing’ (Bradshaw et al., 2004: 103). Evidence from this study has shown that the interplay of technological, socio-cultural, and political drivers caused government officers and developers to form preconceptions prior to the development of E-government services, which reinforced the exclusion of PWD. Thus, while drivers on their own facilitate exclusions, their interactions with agents constitute exclusionary forces which are fed in the development of E-government services. For instance, in the development of E-government services, developers made assumptions that all users can see,

feel and touch; which relegated PWD to the background. The theoretical proposition also resonates with the findings of Heeks (2005), which posits that many developers design E-government systems with perceptions of their world view in mind rather than that of the users.

From the viewpoint of PWD, personal drivers reduced their functioning and capacities, which led to their exclusion from E-government services. Thus, independent of how E-government services are developed, these drivers directly affect the performance and accessibility experiences of PWD. Personal drivers identified in this study which include lack of access to ICTs and Internet; lack of access to AT and training; late ICT use; lack of advocacy; and financial constraints made it difficult for PWD to attain full ‘functionings’. Functionings in this regard refer to those things that PWD may value doing via the use of E-government services (Sen, 2000). For example, the ability of PWD to be connected to digital society depends on their ability to afford and use ICT and AT. Any difficulty of PWD reaching ‘functioning’ therefore leads to their deprivation and exclusion. For instance, from the empirical observations, the inability of PWD to afford ICT and AT and proficiently train in them was seen as a setback to their efficient usage of government electronic services. This is because, without screen readers and training in them, all the visually impaired were unable to use E-government portals and websites successfully. For this reason, PWD lamented that though the digitalization of government services makes it possible to obtain services at convenience, it comes with high cost implications. Also, an observed trend from the empirical studies is the high poverty rate among PWD in Ghana, which constrained their E-readiness in several ways. The study points out that PWD require the availability of diverse resources (ICTs, assistive technologies, internet, training, etc.) to improve their capabilities and enhance their accessibility experience. These empirical observations lead to the following theoretical proposition:

P5: WHEN PWD are constrained by personal drivers such that THEY are unable to improve capabilities and achieve functionings, their likelihood of experiencing accessibility challenges becomes potentially high.

Several studies (Foley, 2004; Cushman & McLean, 2008; Ochara, 2008; Watling, 2011; Fröhlich & Peters, 2017) in the past have shown that digitalisation such as the use of E-government services results in a technological divide leading to the exclusion of certain individuals. This is because digital engagement increases the cost burden and responsibility for citizens who do not have the necessary resources and prerequisite skills (Cushman & McLean, 2008). For instance, Foley(2004) and Watling (2011) have emphasized the importance for governments to make conscious efforts at equipping those socially excluded by providing them with resources to enable them to be at par with the population mainstream. Similarly, in this study, PWD called for support from the government in the form of subsidies on ICTs and AT and associated training with them. Owing to diversity among citizens, there is a need for governments to apportion specific resources for the vulnerable to improve their capabilities (Ochara, 2008; Watling, 2011). This proposition is also substantiated by earlier studies (Kidd, 2014; Fröhlich & Peters, 2017) which argue that when PWD lack the prerequisite resources to be competitive, they tend to be limited in capabilities which put them at risk of exclusion.

Government officers and developers predefine the rules and guidelines for developing E-government services via the signing of E-government contracts. Evidence from the study shows that many respondents believed that the passing of an accessibility policy is a sign of strong commitment from government to addressing accessibility challenges for PWD. They perceived that the existence of such a policy would make accessibility a mandatory requirement thereby causing developers to prioritise it. They asserted that in that case, developers would become accessibility conscious since they could be held liable. PWD respondents indicated that the passing of an accessibility policy would afford them means to exercise agency. For instance, PWD₂ stated that elsewhere in countries where accessibility policies exist, it affords PWD opportunity to sue defaulting developers in court. Though developers claimed no knowledge of existing policies regarding E-government and disabilities, PWD argued that if the policy is passed they could hold developers in check independent of their knowledge of the policies. This is because “*ignorance of the law is no excuse*” (PWD₉) for flouting it. These empirical findings suggest the following theoretical proposition:

P6: WHEN government officers legitimize accessibility requirements by inscribing them into E-government contracts, THEN PWD can exercise influence by invoking sanctions on developers who fail to conform.

E-government services in this study are structures that constrain and also resources which support citizens (Rose & Hackney, 2003; Zheng & Walsham, 2008). As a result, E-government services serve as a medium that transforms interactions between governments and citizens (Schuppan, 2009; Gyaase & Gyamfi, 2012; Jasmi et al., 2018). Developers who design E-government services enact structures that form and shape their practices stemming from their upbringing and education (Heeks, 2005; Bertot, Jaeger & McClure, 2008). In designing E-government services, developers integrate rule-governed practices of computer programming which define important aspects of social conduct. Therefore, agents can sanction social conduct where there are defined boundaries of expected behaviours in a contextual culture (Lyytinen & Ngwenyama, 1992). For this reason, PWD as agents can exercise power by dwelling on rules provisioned within accessibility policy to sanction E-government developers.

The proposition is also substantiated by several studies (Lazar, Dudley-sponaule & Greenidge, 2004; Kuzma, Yen & Oestreicher, 2009; Bradbard & Peters, 2010; Goodwin et al., 2011) in the past which found that when accessibility is passed into legislation, it increases awareness on accessibility and makes developers cautious about accessibility requirements. For instance, Goodwin et al.,(2011) found that in countries where accessibility is legitimized, developers are held liable for flouting it hence they are more complying. Similarly, a study by Kuzma et al., (2009) shows that accessibility to E-government services are much improved when accessibility is a legal requirement.

Many of the PWD acknowledged that there is a need for them to have knowledge of the policies relating to disabilities and E-government to be informed on the roles of government and developers in addressing accessibility challenges. In that way, they can effectively communicate with E-government implementers about their needs and make demands congruent with the policies to the appropriate authorities. Evidence from the study shows that although there was no accessibility policy at the time of the study, some existing policies (e.g. ICT4D, E-GIF, PDA) admonished that government services ought to be accessible to all.

Interestingly, PWD in this study lacked knowledge about such policies. Many PWD had little knowledge regarding the content of the disability policy. Subsequently, accessibility to E-government services was not a priority because PWD were not engaging with implementers. For instance, PWD₁₄ quizzed *‘how many persons with disabilities even know that there is something called disability law?’* By acquiring such knowledge, PWD can also do effective advocacy thereby creating awareness given that *‘some people have not even heard of the law’* (PWD₁₅). To this end, participants were of the view that PWD were unable to demand their rightful entitlements enshrined in the policies about accessibility because they were not knowledgeable about them. They asserted such knowledge is required to enable them communicate, advocate and challenge decisions of E-government implementers. In line with these empirical observations, the following theoretical proposition can be formulated:

P7: WHEN PWD are knowledgeable about policies on disabilities and E-government development, THEN they can effectively engage and communicate with government officers and developers and advocate about their accessibility needs.

This theoretical proposition derived from the empirical findings is corroborated in previous studies (Amsbary & Staples, 1991; Bisel, 2010; Nicotera, Mahon & Zhao, 2010; Goss, 2017) which argue that to communicate effectively, an agent must be knowledgeable to follow rules of conversation. For instance, Goss(2017) argues that knowledge is a prerequisite to effectively communicate with specific intentions to people with influence. Given that communications can facilitate or interfere with actions of organizational managers and their positioning towards specific issues effective communication becomes necessary (Bisel, 2010). Moreover, studies have long shown that effective communication has the ability to influence decision-makers alongside ensuring satisfaction for both parties (Amsbary & Staples, 1991; Nicotera, Mahon & Zhao, 2010). Knowledge of policies is required to make demands congruent with them concomitantly ensuring productive communication with people of influence (Goodstadt & Hjelle, 1973; Goss, 2017).

7.2.3 Exclusionary process

Exclusionary process refers to elements that facilitate, generate or lead to exclusion of PWD from E-government services. The findings from the study show that the exclusionary process started with agents. For instance, government officers who set out the requirements for the development of E-government services side-lined PWD at the consultation stage while soliciting views from stakeholders to draft requirements. Many government officers in this study admitted that no PWD or disability organisation was consulted before concluding on requirements of E-government contracts terms with developers. For example, GOV₈ indicated that her auspices “*didn't consider PWD*” because “*it escaped us, is not intentional*”. Other respondents also justified that many PWD were not likely to use such electronic services hence their exclusion from such consultations.

In a likewise manner, empirical observations show that developers did not involve PWD throughout the development process. Subsequently, E-government services were developed with no design considerations made for PWD. Even at the point of user-testing before E-government services were deployed for the citizenry, PWD were not involved. The developers assumed that PWD are not ‘*technology-users*’. Other developers argued that they were reluctant to invest in accessibility issues because PWD formed a minority of the market force hence did not make profit-sense investing in designs for them. The exclusionary process involved agents who were influenced by drivers (e.g. technological, socio-cultural, political, personal etc) which shaped their perceptions, actions and practices constituting exclusionary forces. Thus, these exclusionary forces were inscribed in the development of E-government services resulting in the exclusion of PWD. Furthermore, differential powers among government officers, developers and PWD reinforced the exclusion.

However, both government officers and developers argued that if the needs of PWD would be taken seriously; they should exercise agency. Agency in this regard refers to actions and attempts by PWD to find solutions to their accessibility challenges. They posited that exercising agency would help minimize the consequences PWD encounter while accessing E-government services. These empirical findings suggest the following theoretical propositions:

P8: WHEN exclusionary forces are exerted by government officers and developers in the E-government development process YET PWD have limited capabilities to act, THEN their exclusion is LIKELY to be reinforced.

P9: WHEN PWD have the agency to constrain exclusionary forces associated with the development process of E-government services, THEN the services developed are likely to be accessible.

These theoretical propositions derived from the empirical findings are substantiated by previous studies (Sen, 2000; Goetz & Gaventa, 2001; Estivill, 2003; Rawal, 2008; Kidd, 2014, 2015; Adam & Potvin, 2016). For instance, Estivill (2003) argue that when there is exclusion by powerful agents, those disadvantaged should find a way to fight against the circumstances of their exclusion. One way to do this is to “construct their own voice” (Gaventa, 2006: 28). Voice in this case ‘refers to the range of measures- such as complaints, organised protest, lobbying and participation in decision-making’ to draw the attention of decision-makers (Goetz & Gaventa, 2001: 5). In doing so, PWD can guard against their exclusions or mitigate the effect. Another way is to form interest groups to get a stronger bargaining power (Goetz & Gaventa, 2001; Rawal, 2008). In this study, the Ghana Blind Union (GBU) was one such network employed by the visually impaired to seek redress to their challenges. Some visually impaired reported that they sometimes logged complaints to GBU to be channelled to government agencies on their behalf. Despite the efforts, the general assertion by many was that PWD were not doing enough to warrant urgent attention from the government. Some studies (Sen, 2000; Gaventa & Cornwall, 2006; Kidd, 2014; Adam & Potvin, 2016) in the past have pointed out that the exclusionary process is evolving and has several dimensions. These include social, cultural, political, economic, among others. Also, the differences in power between decision-makers and those at disadvantage often underpin exclusions. Furthermore, exclusions are higher where individuals use discretion, assumptions or make personal judgments (Kidd, 2014).

7.3 Chapter Summary

The purpose of this chapter was to provide a theoretical explanation of the empirical findings of this study. In the end, nine theoretical propositions were presented grounded in empirical evidence and supported with literature to show their relevance and validity. Table 7-1 shows a summary of the theoretical propositions and how they relate to the research questions.

Table 7-1: Research questions and their relationship to theoretical propositions

<p>1. Who are the stakeholders of E-government, and how do they perceive E-government accessibility for PWD?</p>
<p>P1: <i>WHEN government officers do not broaden consultations on E-government to include PWD, they fail to inscribe accessibility into E-government contracts, AND developers are unable to enact it, AND PWD are passively excluded from E-government services.</i></p> <p>P2: <i>WHEN the development of accessible E-government services is dependent upon government officers and developers, YET PWD lack agency to exert authority over them, THEY will exercise coercive powers such as employing pressure tactics to make them responsive to their needs.</i></p>
<p>2. What are the contextual drivers in Ghana that lead to the exclusion of PWD accessing E-government services?</p>
<p>P4: <i>WHEN technological, socio-cultural and political drivers shape perceptions of government officers and developers such that THEY inscribe inherent requirements into the development of E-government services, THEY constitute crucial exclusionary forces for the exclusion of PWD.</i></p> <p>P5: <i>WHEN PWD are constrained by personal drivers such that THEY are unable to improve capabilities and achieve functionings, their likelihood of experiencing accessibility challenges becomes potentially high.</i></p>

P6: *WHEN government officers legitimize accessibility requirements by inscribing them into E-government contracts, THEN PWD can exercise influence by invoking sanctions on developers who fail to conform.*

P7: *WHEN PWD are knowledgeable about policies on disabilities and E-government development, THEN they can effectively engage and communicate with government officers and developers and advocate about their accessibility needs.*

3. How do contextual drivers and the role of stakeholders reinforce the exclusionary process?

P3: *WHEN PWD fail to be change agents, their constraints and concerns regarding the accessibility of E-government services are LIKELY to be overlooked by government officers and developers during the development process.*

P8: *WHEN exclusionary forces are exerted by government officers and developers in the E-government development process YET PWD have limited capabilities to act THEN their exclusion is LIKELY to be reinforced.*

P9: *WHEN PWD have the agency to constrain exclusionary forces associated with the development process of E-government services, THEN the services developed are likely to be accessible.*

The next chapter concludes the thesis and presents a discussion on how study contributes to theory and provides practical suggestions on addressing accessibility for PWD.

CHAPTER 8 : CONCLUSION AND RECOMMENDATION

8.1 Introduction

The aim of this study, as indicated in Chapter 1, was to investigate the accessibility of E-government services for PWD. In doing so, the study sought to understand the roles of E-government stakeholders and the contextual drivers involved in the exclusion of PWD from E-government services in Ghana and how the exclusionary process is reinforced. The review of literature on E-government and accessibility phenomena was detailed in Chapter 2. The philosophical underpinning of the study was presented in Chapter 3. Research methodology, data collection and analysis are covered in Chapter 4. The findings of the study are reported in Chapter 5. Discussions of empirical findings in the context of literature are covered in Chapter 6. Theoretical elaborations of the empirical findings are presented in Chapter 7. This chapter concludes the thesis.

The rest of this chapter is structured as follows: Section 8.2 presents the study overview. Section 8.3 discusses the contributions of this study to theory and practice, the limitations of the study are covered in Section 8.4. Section 8.5 highlights suggestions for possible future research directions and Section 8.6 concludes the study.

8.2 Overview of the study

While studies in E-government accessibility continue to upsurge owing to increased digitalisation in the operations of governments, not much attention has been given to the vulnerable in society such as persons with disabilities (PWD). Also, technological determinism approach has dominated E-government accessibility studies to the neglect of the social context in which E-government developed. This has made it difficult to holistically address accessibility challenges regarding E-government for PWD. As a result, this study posed the following research questions to improve understanding and offer explanations on the role of stakeholders and contextual drivers in the E-government development process and how they reinforce the exclusion of PWD from E-government services.

1. Who are the stakeholders of E-government, and how do they perceive E-government accessibility for PWD?
2. What are the contextual drivers in Ghana that lead to the exclusion of PWD accessing E-government services?
3. How do contextual drivers and the role of stakeholders reinforce the exclusionary process?

An interpretive approach used as the underpinning philosophical approach in this study helped to gain a better understanding of the phenomenon and thereby enabling the building of an explanatory theory. The use of case study strategy allowed for face-to-face interactions affording opportunities to capture the experiential experiences of government officers, developers and PWD in their natural settings. The reliability and validity of research findings were enhanced via the use of multiple research methods; observation, interviews and analysis of policy documents. Thematic analysis revealed important themes and how they are related to each other which contributed to the development of the E-government development framework. The framework provided the basis for theoretical elaboration and a set of propositions to be tested in empirical studies.

8.3 Contributions of the study

This section discusses the contribution of the study to theory and its implication to the development of E-government and accessibility for PWD in practice.

8.3.1 Contribution to theory

For many of the studies investigating the accessibility of E-government services for PWD, researchers tend to use technological determinism and follow a positivist philosophical approach. The dominant use of this approach has tended to ignore contextual elements which may be inscribed into the development of E-government systems and subsequently the delivery of services. For instance, it is erroneous to assume that E-government systems are only made up of hardware and software because every technology is adopted within a particular context (Orlikowski & Baroudi, 1991; Rose & Hackney, 2003). E-government systems are complex; intertwining of technology and context in such a way that context

implicitly or explicitly is embedded in them (Heeks, 2005; Larkotey, Effah & Boateng, 2017). The neglect of contextual structures in E-government development could, therefore, lead to ‘contextual collision’ and ‘mismatch’ in E-government designs and contribute to its subsequent failure (Heeks, 2005: 51). This study strongly acknowledged the importance of the context in which the E-government accessibility phenomenon is being investigated.

Many studies in E-government accessibility lack theoretical foundations. Using social exclusion theory as a sensitising lens, this study developed a conceptual framework from literature (Figure 3.5) which was used in data collection. E-government accessibility framework (Figure 6.1) is also developed from empirical findings which offer an understanding of E-government stakeholders, contextual drivers and how their roles reinforced the exclusion of PWD from E-government services. Further, nine clear propositions grounded in empirical evidence have been outlined to aid future research studies and to validate the E-government development framework. This study, therefore, has given a new understanding to E-government accessibility for PWD. This is the first time so far as the researcher knows that E-government accessibility for PWD has been espoused with a theoretical perspective. Thus, the methodological contribution of the research lies in the unique blending of theoretical perspective and the methods that oriented it. And that although the data collection techniques are not new, their combination with the theory is innovative.

The findings of this study are useful to the understanding of E-government accessibility for PWD in developing countries, especially, those in Africa as it highlights some areas of neglect in the research of this phenomenon. Theoretically, the study links the discourse of the Ghanaian society and E-government and provides guidelines for those developing or implementing E-government and others intending to implement electronic services that are to be accessed by all. It contributes to the E-government accessibility debate in developing countries in the following ways:

- i. Provides a theoretical understanding of the development of E-government in Ghana and how accessibility is perceived by various E-government stakeholders.
- ii. Identifies contextual drivers in the development of E-government services in Ghana, given the context of E-government in developing countries.

- iii. Shows how these contextual drivers influence the development of E-government services. Thus, it explains critical elements to consider in the development and implementation of electronic services.
- iv. Shows how contextual drivers and E-government stakeholders reinforce the exclusion of PWD from E-government services.

8.3.2 Contribution to Practice

This study has several implications for the development and implementation of E-government services in Ghana. This is the first time so far as the researcher knows that a study on the accessibility of E-government services, particularly for PWD has been conducted in Ghana. Practically, this study is *'focusing on something that has been neglected'* (DEV_4) in the Ghanaian context. This research, therefore, creates awareness of the phenomenon in the Ghanaian context ($PWD_{5,16}$, $DEV_{3,4,7}$, $GOV_{4,8}$) and offers several practical recommendations for government agencies, ministries and departments providing electronic services to the public. Further, it makes useful suggestions for PWD and disability-oriented organisations regarding means to intensify the promotion of their accessibility needs. The findings could also be relevant for any institution rendering services via electronic platforms (e.g. hotels, banks). The suggestions for practice are derived from the theoretical propositions that emerged from the study.

The findings of the research identify influences in the development of E-government services that result in accessibility challenges thereby excluding PWD. Practical approaches to ensure accessibility needs of PWD are catered for by E-government implementers and their accessibility experience improved are outlined in Table 8.1.

Table 8-1: Practical approach to improving the accessibility of E-government services

Practical suggestion	Associated proposition
Government officers should incorporate accessibility requirements into the drafting of E-government contracts to compel developers to design accessible services. Subsequently, design considerations for PWD should be clearly indicated in the	P1, P6

Practical suggestion**Associated proposition**

execution plan of developers before they are awarded E-government contracts. In so doing, accessibility would become legitimized and would receive apt attention from the developers' community. The development of E-government services like any other electronic service involves several steps which include analysis of users needs, system design, programming, program testing for users, implementation and maintenance (Jasmi et al., 2018). Government ministries, departments and agencies should broaden consultations leading to the development of E-government services by involving PWD from the stage of analysing user needs where they solicit views from different stakeholders to gather requirements. In this way, the accessibility needs of PWD would easily be incorporated into the drafting of E-government contracts. Governments and organisations should recognise that it is cost-effective to develop accessible E-government services from the start than to do a retrofitting at a later stage (Rubaii-Barrett & Wise, 2008; Abu-Doush et al., 2013).

State institutions should be aware that perceptions play an important role in the development of accessible E-government services for PWD. They should recognise perceptions influence actions and the response of E-government implementers towards accessibility. Such perceptions which are formed and shaped through interactions of E-government implementers with their contextual settings are fed into the development process (Yildiz, 2007; Rowley, 2011; Sullivan, 2011; Kettani, 2014; Larkotey, Effah & Boateng, 2017). For this reason, institutions should make efforts at creating the enabling environment that would foster equal opportunities for PWD. Measures such as providing appropriate training on accessibility for developers and government officers, incorporating accessibility and disability content into educational syllabus would help reshape any negative perceptions of E-government implementers and the population at large. Also, there is need to implement policies on accessibility and AT to provide strong backing to the disability fraternity.

P4

Practical suggestion	Associated proposition
<p>PWD should take up the role of being frontrunners in propagating the accessibility agenda. Disability organisations and individual PWD should create greater awareness of their accessibility needs through diverse means such as informal education various levels (e.g. family, community) and providing training for E-government implementers. This would help not only to shape perceptions of society but they would become familiarise with their accessibility needs. The disability fraternity should recognise that the lack of awareness of their accessibility needs is one cause of their neglect. PWD should take a keen interest in the development of E-government services going forward as the government is advancing steadily in the provision of electronic services to ensure their needs are incorporated from start. They should make their voices heard by ensuring their representation at all levels (e.g. local, national) of decision making. Failure to take control of their lives and demand their rightful place in the public sphere will lead to their continual neglect and exclusion (Fontes et al., 2014; Roca & Bernal, 2016).</p>	P3, P9
<p>PWD should endeavour to improve their capabilities to become a force to reckon within society. PWD should strive to remove barriers to accessing E-government services where efforts are dependent on them. They should educate themselves about policies and legislation that is pertinent to their well-being. Their abilities to constrain E-government implementers and mitigate attempts to overlook their needs would largely depend on their knowledge resource (Lyytinen & Ngwenyama, 1992; Rose & Hackney, 2003; Goss, 2017).</p>	P5, P7

8.4 Limitations of the study

While this study was conducted following a systematic approach to ensure rigour and validity of the findings, there are few limitations that may arise regarding the participants, context-specific understanding of E-government, the study approach, the theory that espouses the study. Firstly, this study was conducted in Ghana; a developing country where E-government implementation has not reached its full maturity. The Government of Ghana at the time of

data collection was offering mostly informational with few transactional services. E-government implementation was also not well decentralised, and so, its impact was not much felt at the local and district levels. The adoption of mobile technologies by the government to deliver services in Ghana was also limited at the time of research. For this reason, the assessment of E-government accessibility was somehow skewed to the use of E-government websites and portals. Therefore, the participants perceived and understood E-government in the light of the services available to them and thereby provided their responses along those lines.

Secondly, government officers who participated in the study though were involved in E-government projects, were necessarily not the ultimate decision-makers to determine what E-government services got developed. Consequently, their responses were in accordance with the level of authority they exerted regarding the development of E-government services.

Political leaders are expected to demonstrate inclusiveness and to lead public policies that discriminate against stigmatised minorities (Barry, 2002). Disability matters play a significant role in political campaigns in Ghana as political parties often seek to capture the attention of PWD by making them feel belonged via their parties' manifestos. Against this background, responses by government officers might have been influenced by politics for fear of being victimised or seen to be running down the government since interviews were conducted at a time there had been a change in the political dispensation.

The use of the social exclusion theory was useful in identifying key E-government stakeholders and contextual drivers that shaped the exclusionary process with regards to accessibility for PWD. The theory also provided a comprehensive understanding of how stakeholder, together with contextual drivers, reinforced the exclusionary process. Subsequently, the theory enhanced understanding of how to promote accessibility for PWD. Further, from a critical realist standpoint, social exclusion theory emancipates PWD by providing policy direction (Fontes et al., 2014) that would improve accessibility for PWD. However, using the social exclusion theory, the researcher was more concerned with the social practices and processes and therefore, paid little attention to the E-government system as a technological artefact. For instance, E-government websites, portals and applications rendering services to citizens in

Ghana were not technically evaluated by the researcher (e.g. through the use of assistive technologies) or disabled users to detect accessibility errors.

8.5 Suggestions for future studies

This study employed the social exclusion framework as a sensitising lens which was useful to achieve the objectives of this research. However, findings of this study reveal that power differences among agents and influence processes are key to developing accessible E-government services for PWD. These concepts could be better explored in future empirical studies using organisational influence theory to analyse and understand in-depth the power relationships among agents (Ngwenyama & Nielsen, 2013). Understanding the power dynamics among agents in any organisation is important as it influences the quality of organisational output (Kotter, 1977; Cohen & Bradford, 1989). Also, ‘how change agents are able to make intended changes and achieve such changes can better be understood’ through the framework of organisational influence theory (Nielsen & Ngwenyama, 2002: 217). In this way, the choice of influence tactics devised by each agent to influence accessibility could better be explored (Kipnis, Schmidt & Wilkinson, 1980; Cohen & Bradford, 1989).

The findings of this study show that several structures place PWD at a disadvantage hindering their access to E-government services. Further, structures and their interactions with agents shape the development of E-government services. Future empirical studies to investigate further on the concepts of structures and their interactions would help to enhance the understanding of accessibility challenges of PWD. Structuration theory introduced by Giddens (1984) could be a useful lens to understand how the human agency interacts with social structure and how structures produce and reproduce rules over time that constrain or enable human actions. According to Giddens (1991), structure does not exist outside the individual but practices; so as practices change over time, so do structure. From this perspective, how practices of developers and government officers change and enact structures over time and their linkage to accessibility could be well interrogated. Similarly, unintended consequences PWD encounter as a result of E-government implementers’ actions could also be examined (Lyytinen & Ngwenyama, 1992). Also, since structuration theory places practices at the core of social analysis, practices of developers could be studied in relation to E-government development outcomes (Rose & Hackney, 2003; Whittington, 2010).

Future studies to examine from the perspective of PWD factors that influence their adoption of E-government services will be useful to understand the extent to which accessibility plays a role. For instance, the inclusionary framework of e-government adoption proposed by Pethig and Krönung, (2015) indicate that accessibility is one of the factors that influence adoption. Also, the present study observed and interviewed the visually impaired among the broader category of PWD. The inclusion of diverse disability categories is recommended for future studies to throw light on accessibility experiences of each category of impairment. This could help compare similarities and differences in accessibility challenges according to the category of impairment. Again, a nationwide data collection should be undertaken in the future to enable comparative studies among regions and to identify if any, variations with regards to opportunities the different categories of PWD have and the challenges relating to the accessibility of E-government services amongst regions.

The observations made during the study and the findings show that E-government services in Ghana were mostly informational. It is recommended that a similar study be carried out when all government services have moved completely online (obtained full maturity).

8.6 Research conclusions

This chapter concludes the thesis titled: ‘Accessibility of E-government Services for Persons with Disabilities in Developing Countries- The Case of Ghana’. The overview of the study has been presented by revisiting the research questions, study approach and reiterating, in brief, the research findings. This research proposed an explanatory framework of E-government accessibility for PWD. The components and relationships in the framework were developed inductively from different data sources and multiple stakeholders which allowed emanating themes and relationships to be validated. The study contributes to a better understanding of influences on the E-government development process, how services become inaccessible and the accessibility challenges PWD face. The research implications for both theory and practice have been discussed. In light of this, research limitations with suggestions for future research studies have been presented.

9. REFERENCES

- Abanumy, A., Al-badi, A. & Mayhew, P. 2005. e-Government Website Accessibility : In-Depth Evaluation of Saudi Arabia and Oman. *Journal of e-Government*. 3(3):99–106.
- Abascal, J., Barbosa, S.D.J., Nicolle, C. & Zaphiris, P. 2016. Rethinking universal accessibility: a broader approach considering the digital gap. *Universal Access in the Information Society*. 15(2):179–182. DOI: 10.1007/s10209-015-0416-1.
- Abu-doush, I., Bany-mohammed, A., Ali, E. & Al-betar, M.A. 2013. Towards a more accessible e-government in Jordan: an evaluation study of visually impaired users and Web developers. *Behaviour & Information Technology*. 32(3):273–293.
- Abu-Doush, I., Bany-Mohammed, A., Ali, E. & Al-Betar, M.A. 2013. Towards a more accessible e-government in Jordan: an evaluation study of visually impaired users and Web developers. *Behaviour & Information Technology*. 32(3):273–293. DOI: 10.1080/0144929X.2011.630416.
- Adam, A. & Kreps, D. 2009. Disability and discourses of web accessibility. *Information, Communication & Society*. 12(7):1041–1058. DOI: 10.1080/13691180802552940.
- Adam, C. & Potvin, L. 2016. Understanding exclusionary mechanisms at the individual level : a theoretical proposal. *Health promotion international*. 32(5):778–789. DOI: 10.1093/heapro/daw005.
- Adepoju, S.A. & Shehu, I.S. 2016. Accessibility Evaluation and Performance Analysis of e-Government Websites in Nigeria. *Journal of Advances in Information Technology*. 7(1):49–53. DOI: 10.12720/jait.7.1.49-53.
- Adepoju, S.A., Shehu, I.S. & Bake, P. 2016. Accessibility Evaluation and Performance Analysis of e-Government Websites in Nigeria. *Journal of Advances in Information Technology*. 7(1):49–53.
- Adesola, S. 2012. Entrenching democracy and good governance: The role of ICT. *Mediterranean Journal of Social Sciences*. 3(15):423. DOI: 10.5901/mjss.2012.v3n15p80.
- Adhikari, T., Tamrakar, S. & Hagen-zanker, J. 2014. How does social protection contribute to social inclusion in Nepal ? Evidence from the Child Grant in the Karnali Region. London: ODI.

- Adrees, M.S., Omer, M.K. & Sheta, O.E. 2015. Recommend Stages Model to Implement E-Government Application Strategies. *International Journal of Core Engineering & Management*. 2(3):31–40.
- Agangiba, M. & Kabanda, S. 2016a. E-Government Accessibility Research Trends in Developing Countries. In *Tenth Mediterranean Conference on Information Systems (MCIS)*. Paphos, Cyprus: University of Nicosia.
- Agangiba, M. & Kabanda, S. 2016b. Towards a conceptual framework for e-government accessibility for persons with disabilities in developing countries. In *Proceedings of the International Conference on Information Resources Management*. Paper 7.
- Agangiba, W.A. & Agangiba, M.A. 2013. E-governance justified. *International Journal of Advanced Computer Science and Applications*. 4(2):223–225. DOI: 10.1017/CBO9781107415324.004.
- Agangiba, W., Kontoh, M.S. & Ansah, A.K. 2013. E-governance public key infrastructure (PKI) model. *International Journal of Electronic Governance*. 6(2):133–142.
- Agboh, D. 2017. An Assessment of Ghana's global E-government UN ranking. Available: <http://www.aabri.com/AC2017Manuscripts/AC17046.pdf> [2017, March 02].
- Agbozo, E. & Spassov, K.B. 2018. Evaluating Metropolitan Assembly Web Sites in Ghana : Accessibility , Compatibility and Usability. *Webology*. 15(1):46–60.
- Ahn, M.J. & Bretschneider, S. 2011. Politics of e-government: e-government and the political control of bureaucracy. *Public Administration Review*. 71(3):414–424.
- Al-jaghoub, S., Al-yaseen, H. & Al-hourani, M. 2010. Evaluation of Awareness and Acceptability of Using e- Government Services in Developing Countries : the Case of Jordan. *The Electronic Journal Information Systems Evaluation*. 13(1):1–8.
- Al-khalifa, H.S., Baazeem, I. & Alamer, R. 2017. Revisiting the accessibility of Saudi Arabia government websites. *Universal Access in the Information Society*. 16(4):1027–1039. DOI: 10.1007/s10209-016-0495-7.
- Aladwani, A.M. 2016. International Journal of Information Management Corruption as a source of e-Government projects failure in developing countries : A theoretical exposition. *International Journal of Information Management*. 36(1):105–112. DOI: 10.1016/j.ijinfomgt.2015.10.005.

- Albalushi, T., Ali, S., Ashrafi, R. & Albalushi, S. 2016. Accessibility and Performance Evaluation of E-Services in Oman Using Web Diagnostic Tools. *International Journal of u- and e- Service, Science and Technology*. 9(7):9–24.
- Almarabeh, T. & AbuAli, A. 2010. A General Framework for E-Government : Definition Maturity Challenges , Opportunities , and Success. *European Journal of Scientific Research*. 39(1):29–42.
- Alshawi, S. & Alalwany, H. 2009. E-Government Evaluation : Citizen ’ s Perspective. *Information Technology for Development*. 15(3):193–208. DOI: 10.1002/itdj.
- Alshehri, M. & Drew, S. 2010. Challenges of e-Government Services Adoption in Saudi Arabia from an e-Ready Citizen Perspective. *World Academy of Science, Engineering and Technology*. 4(6):1086–1092.
- Altman, B.M. 2013. Another Perspective: Capturing the Working-Age Population With Disabilities in Survey Measures. *Journal of Disability Policy Studies*. 25(3):1–8. DOI: 10.1177/1044207312474309.
- Alvarez, R. 2002. Confessions of an information worker: A critical analysis of information requirements discourse. *Information and Organization*. 12(2):85–107. DOI: 10.1016/S1471-7727(01)00012-4.
- Aman, A. & Kasimin, H. 2010. E-government evaluation: The case of e-procurement in Malaysia government. In *Internet Technology and Secured Transactions (ICITST), 2010 International Conference*. 1–6.
- Ametepeee, L.K. & Anastasiou, D. 2015. Special and inclusive education in Ghana: Status and progress, challenges and implications. *International Journal of Educational Development*. 41:143–152. DOI: 10.1016/j.ijedudev.2015.02.007.
- Amsbary, J.H. & Staples, P.J. 1991. Improving Administrator/Nurse Communication: A Case Study of“ Management byWandering Around”. *The Journal of Business Communication* (1973). 28(2):101–112. DOI: 10.1177/002194369102800202.
- Arrue, M., Vigo, M. & Abascal, J. 2008a. Including Heterogeneous Web Accessibility Guidelines in the Development Process. In *Engineering Interactive Systems*. Springer Berlin Heidelberg. 620–637.
- Arrue, M., Vigo, M. & Abascal, J. 2008b. Web accessibility awareness in search engine results.

- Universal Access in the Information Society. 7(1–2):103–116.
- Asamoah, P.K.. 2016. Ghana Blind Union disappointed in government. Available: www.dailyheritageonline.com/index.php/component/k2/item/2580 [2016, April 07].
- Atkinson, A.B. & Marlier, E. 2010. *Analysing and Measuring Social Inclusion in a Global Context*. New York. Available: <http://www.un.org/esa/socdev/publications/measuring-social-inclusion.pdf>.
- Attride-Stirling, J. 2001. Thematic networks: an analytic tool for qualitative research. *Qualitative Research*. 1(3):385–405. DOI: 10.1177/1468794107085301.
- Babajanian, B. & Hagen-zanker, J. 2012. *Social protection and social exclusion: an analytical framework to assess the links*. ODI Background Note: Overseas Development Institute, London.
- Babalola, Y.T. 2013. Nigeria’s Information Infrastructure Policy: Implications for E-Government. *Arabian Journal of Business and Management*. 2(11):8–15.
- Backus, M. 2001. *E-Governance in Developing Countries*. (N0-1).
- Baguma, R., Wanyama, T., Bommel, P. V. & Ogao, P. 2007. Web Accessibility in Uganda: A study of Webmaster perceptions. In *In proceedings of the 3rd Annual International Conference on Computing & ICT Research (SREC’07)*. 183–197.
- Bal, M., Biricik, C.G. & Sari, A. 2015. Dissemination of Information Communication Technologies : Mobile Government Practices in Developing States. *Int. J. Communications, Network and System Sciences*. 8(13):543–551.
- Barry, B. 2002. Social exclusion, Social Isolation and the Distribution of Income. In *Understanding Social Exclusion*. D. Hills, J., Le Grand, J., Piachaud, Ed. Oxford, UK: Oxford University Press. 13–29.
- Basu, S. 2004. E-government and developing countries: an overview. *International Review of Law, Computers & Technology*. 18(1):109–132. DOI: 10.1080/13600860410001674779.
- Becker, S.A.N.N. 2004. E-Government Visual Accessibility for Older Adult Users. *Social Science Computer Review*. 22(1):11–23. DOI: 10.1177/0894439303259876.
- Becker, J. & Niehaves, B. 2007. Epistemological perspectives on IS research: a framework for analysing and systematizing epistemological assumptions. *Information Systems Journal*. 17(2):197–214.

- Bekkers, V. & Homburg, V. 2005. The Back Office of E-Government; Managing Information Domains as Political Economies. In *The Information Ecology of E-Government; E-Government as Institutional and Technological Innovation in Public Administration*. 89–103.
- Bélanger, F. & Carter, L. 2008. Trust and risk in e-government adoption. *The Journal of Strategic Information Systems*. 17(2):165–176. DOI: 10.1016/j.jsis.2007.12.002.
- Benbasat, I. & Weber, R. 1996. Research commentary: Rethinking “diversity” in information systems research. *Information systems research*. 7(4):389–399.
- Benbasat, I., Goldstein, D.K. & Mead, M. 1987. The case research strategy in studies of information systems. *MIS quarterly*. 369–386.
- Benbow, S., Forchuk, C., Gorlick, C., Berman, H. & Ward-griffin, C. 2015. Social Exclusion and Health : The Development of Nursing Knowledge en sciences infirmières. *Canadian Journal of Nursing Research*. 47(3):56–72.
- Bengisu, M. 2010. Assistive technologies for visually impaired individuals in Turkey. *Assistive technology : the official journal of RESNA*. 22(3):163–71. DOI: 10.1080/10400435.2010.492773.
- Berners-Lee, T. 1997. The power of the web. Available: www.w3.org/standards/Webdesign/accessibility [2016, February 02].
- Bertot, J.C., Jaeger, P.T. & McClure, C.R. 2008. Citizen-centered e-government services: benefits, costs, and research needs. In *Proceedings of the 2008 international conference on Digital government research*. 137–142.
- Bertot, J.C., Jaeger, P.T. & Grimes, J.. 2010. Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools for societies. *Government Information Quarterly*. 27(3):264–271.
- Bertot, J.C., Jaeger, P.T. & Hansen, D. 2012. The impact of polices on government social media usage : Issues , challenges , and recommendations. *Government Information Quarterly*. 29(1):30–40. DOI: 10.1016/j.giq.2011.04.004.
- Bhatnagar, S. 2002. Egovernment : Lessons from Implementation in Developing Countries. *Regional Development Dialogue*. 23(2):164–175.
- Bhatnagar, S. 2003. E-government and access to information. Available:

- <http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan008435.pdf>.
- Bhatnagar, S. & Singh, N. 2010. Assessing the impact of e-government: A Study of Projects in India. *Information Technologies and International Development*. 6(2):109–127.
- Bisel, R.S. 2010. Ontology of Organization ? A Description , History , and Critique of CCO Theories for Organization Science. *Management Communication Quarterly*. 24(1):124–131. DOI: 10.1177/0893318909351582.
- Blaikie, N. 2010. *Designing Social Research*. second ed. N. Blaikie, Ed. Cambridge: Polity Press.
- Bloch, P.H. & Richins, M.L. 1983. A theoretical model for the study of product importance perceptions. *The Journal of Marketing*. 69–81.
- Blumer, H. 1954. What is Wrong with Social Theory ? *American Sociological Review*. 19(1):3–10.
- Boateng, J.K. 2015. Accessibility considerations for e-learning in Ghana. Available: http://transform2015.net/live/Resources/Papers/Accessibility_considerations.pdf [2016, April 10].
- Boettger, R.K. & Palmer, L.A. 2010. Quantitative Content Analysis : Its Use in Technical. *IEEE transactions on professional communication*. 53(4):346–357.
- Bolgherini, S. 2007. The technology trap and the role of political and cultural variables: A critical analysis of the e-government policies. *Review of Policy Research*. 24(3):259–275. DOI: 10.1111/j.1541-1338.2007.00280.x.
- Bonacin, R., Melo, A.M., Simoni, C.A. & Baranauskas, M.C.C. 2010. Accessibility and interoperability in e-government systems : outlining an inclusive development process. *Universal Access in the Information Society*. 9(1):17–33. DOI: 10.1007/s10209-009-0157-0.
- Borg, J. 2011. Assistive technology, human rights and poverty in developing countries: Perspectives based on a study in Bangladesh. *Asia Pasific Journal on Human Rights and the Law*. 2(2):70. DOI: 10.1163/157181501400649053.
- Borg, J. & 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):301–308.

- Borg, J., Lindstrom, A. & Larsson, S. 2009. Assistive technology in developing countries: national and international responsibilities to implement the Convention on the Rights of Persons with Disabilities. *The Lancet*. 374(9704):1863–1865. DOI: 10.1016/S0140-6736(09)61872-9.
- Borg, J., Larsson, S. & Östergren, P.-O. 2011. The right to assistive technology: for whom, for what, and by whom? *Disability & Society*. 26(2):151–167. DOI: 10.1080/09687599.2011.543862.
- Boussarhan, I. & Daoudi, N. 2014. The Accessibility of Moroccan Public Websites : Evaluation of Three E-Government Websites. *Electronic Journal of e-Government*. 12(1):67–81.
- Bowen, G.A. 2006. Grounded Theory and Sensitizing Concepts. *International Journal of Qualitative Methods*. 5(3):12–23. DOI: 10.1177/160940690600500304.
- Bowen, G.A. 2009. Document analysis as a qualitative research method. *Qualitative Research Journal*. 9(2):27–40.
- Bradbard, D. & Peters, C. 2010. Web accessibility theory and practice: An introduction for university faculty. *The Journal of Educators Online*. 7(1):1–46.
- Bradshaw, J., Kemp, P., Baldwin, S. & Rowe, A. 2004. The drivers of social exclusion: A review of the literature for the Social Exclusion Unit in the Breaking the Cycle series. London: SEU/ODPM.
- Braun, V. & Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 3(2):77–101.
- Braun, V. & Clarke, V. 2012. Thematic analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds), *APA handbook of research methods in psychology Vol. 2: Research designs: Quantitative, qualitative, neuropsychological, and biological*. Washington, DC: American Psychological Association. 57–71.
- Brophy, P. & Craven, J. 2007. Web Accessibility. *Library Trends*. 55(4):950–972. DOI: 10.1353/lib.2007.0029.
- Bühler, C. & Fisseler, B. 2007. Accessible E-Learning and Educational Technology - Extending Learning Opportunities for People with Disabilities. In Conference ICL2007, September 26 -28, 2007. 11 pages. Available: <https://hal.archives-ouvertes.fr/hal-00257138/>.
- Bundrick, M., Goette, T., Humphries, S.A. & Young, D. 2006. Communications of the IIMA

- An Examination of Web Site Accessibility Issues An Examination of Web Site Accessibility Issues. *Communications of the IIMA*. 6(2):9–18. Available: <http://scholarworks.lib.csusb.edu/ciima%5Cnhttp://scholarworks.lib.csusb.edu/ciima/vol6/iss2/2>.
- Burchardt, T., Le Grand, J. & Piachaud, D. 2002. Introduction. In *Understanding Social Exclusion*. J. Hills, J. Le Grand, & D. Piachaud, Eds. Oxford: Oxford University Press.
- Burell, G. & Morgan, G. 1979. Sociological paradigms and organisational analysis. In *Elements of the sociology of corporate life*.
- Bwalya, K.J. 2009. Factors Affecting Adoption of E-Government in Zambia. *The Electronic Journal on Information Systems in Developing Countries*. 38(4):1–13.
- Carter, J. & Markel, M. 2001. Web Accessibility for People With Disabilities : An Introduction for Web Developers. *IEEE transactions on professional communication*. 44(4):225–233.
- Carter, L. & Belanger, F. 2003. Diffusion of innovation & citizen adoption of e-government. In *The Fifth International Conference on Electronic Commerce (ICECR-5)*. 57–63.
- Chadwick, D.D., Quinn, S. & Fullwood, C. 2017. Perceptions of the risks and benefits of Internet access and use by people with intellectual disabilities. *British Journal of Learning Disabilities*. 45(1):21–31.
- Charmaz, K. 2003. Grounded theory: Objectivist and constructivist methods. In *Strategies for qualitative inquiry*. N.K. Denzin & Y.S. Lincoln, Eds. Thousands Oak: Sage Publications. 249–291.
- Chaudhry, V. & Shipp, T. 2005. Rethinking the Digital Divide in relation to Visual Disability in India and the United States: Towards a Paradigm of Information Inequity. *Disability Studies Quarterly*. 25(25).
- Chen, Y.N., Chen, H.M., Huang, W. & Ching, R.K. 2006. E-Government Strategies in Developed and Developing Countries : An Implementation Framework and Case Study. *Journal of Global Information Management*. 14(1):23–46.
- Chereni, A. 2017. Researching the dynamics of birth registration and social exclusion for child rights advocacy : the unique role of qualitative research. *Qualitative Social Research*. 18(1):1–29.
- Chigona, W., Mbhele, F. & Kabanda, S. 2008. Investigating the impact of internet in

- eliminating social exclusion: The case of South Africa. PICMET '08 - 2008 Portland International Conference on Management of Engineering & Technology. (c):2094–2101. DOI: 10.1109/PICMET.2008.4599831.
- Chipeta, J. 2018. A Review of E-government Development in Africa: A case of Zambia. *Journal of E-Government Studies and Best Practices*. 10:13–19. DOI: 10.5171/2018.973845.
- Choi, H., Jae, M., Jeung, J. & Zo, H. 2016. Rethinking the assessment of e-government implementation in developing countries from the perspective of the design – reality gap : Applications in the Indonesian e-procurement system. *Telecommunications Policy*. 40(7):644–660. DOI: 10.1016/j.telpol.2016.03.002.
- Choudrie, J. & Alfalah, A. 2016. Older Adults in Households and e-Government services in Saudi Arabia , Hail City : A digital Divide Study of Adoption , Use and Diffusion . In *PACIS 2016 Proceedings*. Paper 338.
- Christensen, T. & Lægheid, P. 2007. The whole-of-government approach to public sector reform. *Public Administration Review*. 67(6):1059–1066.
- Clarke, V. & Braun, V. 2013. Teaching thematic analysis : Overcoming challenges and developing strategies for effective learning. *The Psychologist*. 26(2):120–123.
- Cocchiglia, M. & Vernaschi, S. 2006. E-Government for Development E-Government for Development : Rhetoric and Reality. *Journal of E-Government*. 2(2):3–18. DOI: 10.1300/J399v02n02.
- Cohen, A.R. & Bradford, D.L. 1989. Influence without authority: The use of alliances, reciprocity, and exchange to accomplish work. *Organizational Dynamics*. 17(3):5–17.
- Cooper, M., Sloan, D., Kelly, B. & Lewthwaite, S. 2012. A challenge to web accessibility metrics and guidelines: putting people and processes first. In *Proceedings of the international cross-disciplinary conference on Web accessibility*. 20.
- Cordella, A. & Iannacci, F. 2010. Information systems in the public sector: The e-Government enactment framework. *Journal of Strategic Information Systems*. 19(1):52–66.
- Coursey, D. & Norris, D.F. 2008. Models of E-Government : Are They Correct ? An Empirical Assessment. *Public Administration Review*. 68(3):523–536.
- Creswell, J.W. 2003. *Research design: Qualitative, quantitative and mixed methods*

- approaches. second ed. California: Thousands Oak: Sage Publications.
- Creswell, J.W. 2009. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Third ed. California: Thousands Oak: Sage Publications.
- Crook, R.C. 2017. Democratic Decentralisation, Clientelism and Local Taxation in Ghana. *IDS Bulletin*. 48(2):15–30. DOI: 10.19088/1968-2017.114.
- Cumbie, B.A. & Kar, B. 2014. Information Technology for Development A Study of Local Government Website Inclusiveness : The Gap Between E-government Concept and Practice. *Information Technology for Development*. 22(1):15–35. DOI: 10.1080/02681102.2014.906379.
- Cushman, M. & McLean, R. 2008. Exclusion, inclusion and changing the face of information systems research. *Information Technology & People*. 21(3):213–221. DOI: 10.1108/09593840810895993.
- Dada, D. 2006. The failure of e-government in developing countries: A literature review. *The Electronic Journal of Information Systems in Developing Countries*. 6(7):1–10.
- Daly, J., Kellehear, A. & Gliksman, M. 1997. *The public health researcher: A methodological approach*. Melbourne, Australia: Oxford University Press.
- Darmaputra, I.G.E.N., Wijaya, S.S. & Ayu, M.A. 2017. Evaluating the Accessibility of Province s ' E-Government Websites in Indonesia. In *I5th Cyber and IT Service Management*. STIKOM Bali. 1–6.
- Dawes, S.S. 2008. An exploratory framework for future e-government research investments. In *Proceedings of the Annual Hawaii International Conference on System Sciences*. 1–8. DOI: 10.1109/HICSS.2008.57.
- Deloitte, T. 2001. The citizen as customer. *CMA Management*. 7(10):58.
- Denzin, N.K. & Lincoln, Y.S. 1994. *Handbook of qualitative research*. Thousands Oak: Sage Publications.
- DiCicco-Bloom, B. & Crabtree, B.F. 2006. The qualitative research interview. *Medical Education*. 40(4):314–321. DOI: 10.1111/j.1365-2929.2006.02418.x.
- Disability Rights Commission. 2004. *The Web: Access and Inclusion for Disabled People; a Formal Investigation*.
- Dixit, P. & Stump, J.L. 2011. A response to Jones and Smith: It's not as bad as it seems; or,

- five ways to move critical terrorism studies forward. *Studies in Conflict & Terrorism*. 34(6):501–511.
- Dobransky, K. & Hargittai, E. 2006. The disability divide in internet access and use. *Information, Communication & Society*. 9(3):313–334. DOI: 10.1080/13691180600751298.
- Dobransky, K. & Hargittai, E. 2016. Unrealized potential : Exploring the digital disability divide. *Poetics*. 58:18–28. DOI: 10.1016/j.poetic.2016.08.003.
- Dollie, M. & Kabanda, S. 2017. E-Government in Africa : Perceived Concerns of Persons with Disabilities (PWDs) in South Africa with regards to accessibilities of Services. In *The Proceedings of 17th European Conference on Digital Government*. 63.
- Dowling, R. 2000. Qualitative Research Methods in Human Geography. In *Power, subjectivity and ethics in qualitative research*. I. Hay, Ed. Melbourne, Australia: Oxford University Press. 23–36.
- Drake, B.H. & Moberg, D.J. 1986. *Communicating Influence Attempts in Dyads : Linguistic Sedatives and Palliatives* Published by : Academy of Management *Communicating Influence Attempts in Dyads : Linguistic Sedatives and Palliatives*. *The Academy of Management Review*. 11(3):567–584.
- DRC, D.R.C. 2004. *The web: Access and inclusion for disabled people*. Available: https://www.city.ac.uk/__data/assets/pdf_file/0004/72670/DRC_Report.pdf. [2015, November 04].
- Dzidonu, C.K. 2003. *An Intergrated ICT-Led Socio -Economic Development Policy Plan Development Framework*.
- Dzomeku, A.S. 2014. *What User Experience Considerations will go into the Design of a Government Portal in Ghana?* Ashesi University College.
- Easterby-Smith, M., Thorpe, R. & Jackson, P.R. 2012. *Management research*. Fourth ed. K. Smy, Ed. Sage Publications.
- Easton, K.L., McComish, J.F. & Greenberg, R. 2000. Avoiding Common Pitfalls in Qualitative Data Collection and Transcription. *Qualitative Health Research*. 10(5):703–707.
- Ebrahim, Z. & Irani, Z. 2005. E-government adoption: architecture and barriers. *Business Process Management Journal*. 11(5):589–611. DOI: 10.1108/14637150510619902.
- Eide, A.H. & Øderud, T. 2009. Assistive Technology in Low-Income Countries. In *Disability*

- & International Development. Springer International Publishing. 149–160.
- Eisenhardt, K.M. 1989. Building Theories from Case Study Research. *Academy of management review*. 14(4):532–550.
- Elbahnasawy, N.G. 2014. E-Government , Internet Adoption , and Corruption : An Empirical Investigation. *World Development*. 57:114–126. DOI: 10.1016/j.worlddev.2013.12.005.
- Elliman, T., Irani, Z. & Jackson, P. 2007. Developing the e-government research agenda. *Proceedings of European and Mediterranean Conference on Information Systems (EMCIS)*. 1(4):364–376.
- Elwan, A. 1999. Poverty and disability: A survey of literature. *Disability & Society*. 26(7):888–891. DOI: 10.1080/09687599.2011.618747.
- Estivill, J. 2003. Concepts and strategies for combating social exclusion: an overview. Geneva: International Labour Organisation.
- Evans, D. & Yen, D.C. 2006. E-Government: Evolving relationship of citizens and government, domestic, and international development. *Government Information Quarterly*. 23(2):207–235. DOI: 10.1016/j.giq.2005.11.004.
- Fang, Z. 2002. E-Government in Digital Era : Concept , Practice , and Development. *International journal of the Computer, the Internet and management*. 10(2):1–22.
- Filgueiras, L., Sales, E., Gruenwald, L., Barbosa, A.M. & Facis, R. 2007. Accessibility of assistive software installation interfaces. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*. 4662 LNCS(PART 1):393–396. DOI: 10.1007/978-3-540-74796-3_37.
- Fischer, A.M. 2008. *Resolving the Theoretical Ambiguities of Social Exclusion with reference to Polarisation and Conflict*. London.
- Fischer, A.M. 2011. *Reconceiving social exclusion*. (Working Paper 146). Manchester. Available: www.manchester.ac.uk/bwpi.
- Foley, P. 2004. Does the Internet help to overcome social exclusion ? *Electronic Journal of e-Government*. 2(2):139–146.
- Fontes, F., Martins, B.S., Hespanha, P., Fontes, F., Martins, B.S. & Hespanha, P. 2014. The emancipation of disability studies in Portugal The emancipation of disability studies in Portugal. *Disability & Society*. 29(6):849–862. DOI: 10.1080/09687599.2014.880332.

- Fosu, A.K. 2009. Country role models for development success: The Ghana case. Helsinki.
- Fountain, J.E. 2001. Building the virtual state: Information technology and institutional change. Washington, DC: Brookings Institution Press.
- Freire, A.P., Goularte, R. & Fortes, R.P.M. 2007. Techniques for Developing More Accessible Web Applications : a Survey Towards a Process Classification. In SIGDOC. 162–169.
- Freire, A.P., Russo, C.M. & Fortes, R.P.M. 2008. A Survey on the Accessibility Awareness of People Involved in Web Development Projects in Brazil. In In Proceedings of the 2008 international cross-disciplinary conference on Web accessibility (W4A). 87–96.
- Frith, H. & Gleeson, K. 2004. Clothing and embodiment: men managing body image and appearance. *Psychology of Men & Masculinity*. 5(1):40–48. DOI: 10.1037/1524-9220.5.1.40.
- Fröhlich, K. & Peters, A. 2017. E-Government Social Exclusion and Satisfaction Among Namibian Citizens: A Case of a Namibian Government Ministry. In Proceedings of SAICSIT '17, Thaba Nchu, South Africa. 1–6. DOI: 10.1145/3129416.3129435.
- Gallie, D. & Paugam, S. 2004. Unemployment, poverty, and social isolation: an assessment of the current state of social exclusion theory. In *Resisting marginalization. unemployment experience and social policy in the European Union*. D. Gallie, Ed. Oxford: Oxford University Press. 34–53.
- Galvez, A.R. & Youngblood, N. 2014. e-Government in Rhode Island: what effects do templates have on usability , accessibility , and mobile readiness ? *Universal Access in the Information Society*. 15(2):281–296. DOI: 10.1007/s10209-014-0384-x.
- Gauld, R., Goldfinch, S. & Horsburgh, S. 2010. Do they want it? Do they use it? The “demand-side” of e-government in Australia and New Zealand. *Government Information Quarterly*. 27(2):177–186.
- Gaventa, J. 2006. Finding the Spaces for Change : A Power Analysis. *IDS bulletin*. 37(6):23–33.
- Gaventa, J. & Cornwall, A. 2006. Challenging the Boundaries of the Possible : Participation , Knowledge and Power. *IDS bulletin*. 37(6):122–128.
- Geeling, S. 2018. The entanglement of culture, leadership and performance in information systems development projects. University of Capetown.

- Gichoya, D. 2005. Factors Affecting the Successful Implementation of ICT Project in Government. *Journal of e-Government*. 3(4):175–184.
- Giddens, A. 1984. *The Constitution of Society*. Cambridge: Polity Press.
- Giddens, A. 1991. *Modernity and self-identity: Self and society in the late modern age*. Stanford university press.
- Goertz, G. & Mahoney, J. 2012. Concepts and measurement: Ontology and epistemology. *Social Science Information*. 51(2):205–216. DOI: 10.1177/0539018412437108.
- Goetz, A.M. & Gaventa, J. 2001. *From Consultation to Influence: Bringing Citizen Voice and Client Focus into Service Delivery*. (working paper 138). Brighton.
- Goldkuhl, G. 2016. E-government design research: Towards the policy-ingrained IT artifact. *Government Information Quarterly*. 33(3):444–452.
- Goodstadt, B.E. & Hjelle, L.A. 1973. Power to the Powerless: Locus of Control and the Use of Power. *Journal of Personality and Social Psychology*. 27(2):190–196.
- Goodwin, M., Susar, D., Nietzio, A., Snaprud, M. & Jensen, C.S. 2011. Global web accessibility analysis of national government portals and ministry web sites. *Journal of Information Technology & Politics*. 8(1):41–67.
- Goss, A.C. 2017. Power to Engage , Power to Resist : A Structuration Analysis of Barriers to Parental Involvement. *Education and Urban Society*. 3:1–18. DOI: 10.1177/0013124517747363.
- Gould, M., Leblois, A., Cesa Bianchi, F. & Montenegro, V. 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):295–300. DOI: 10.3109/17483107.2014.979332.
- Grantham, J., Grantham, E. & Powers, D. 2012. Website accessibility: an Australian view. In *Proceedings of the 13th Australasian User Interface Conference*. 126 (pp. 21-28).
- Grimsley, M. & Meehan, A. 2007. e-Government information systems: Evaluation-led design for public value and client trust. *European Journal of Information Systems*. 16(2):134–148. DOI: 10.1057/palgrave.ejis.3000674.
- Grönlund, Å. & Horan, T.A. 2005. Introducing e-Gov : History , Definitions , and Issues. *Communications of the Association for Information Systems*. 15(39):713–729.

- GSS. 2018. Statistics for Development and Progress: Provisional 2017 Annual Gross Domestic Product. Available: www.statsghana.gov.gh.
- Gulati, G.J. “Jeff”, Yates, D.J. & Williams, C.B. 2012. Understanding the Impact of Political Structure, Governance and Public Policy on E-Government. In 45th Hawaii International Conference on System Sciences. 2541–2550. DOI: 10.1109/HICSS.2012.617.
- Gupta, M.P. & Jana, D. 2003. E-government evaluation : A framework and case study. *Government information quarterly*. 20(4):365–387. DOI: 10.1016/j.giq.2003.08.002.
- Gyaase, P.O. & Gyamfi, S.A. 2012. Transparency, equity and accessibility to secondary education in Ghana through E-Governance: Stakeholder perspectives of the Computerised School Selection and Placement System (CSSPS) in Ghana. *International Journal of Basic Education*. 2(2):104–116.
- De Haan, A. 1999. Social Exclusion: Towards a holistic understanding of deprivation.
- Hafkin, N.J. 2009. E-government in Africa: An Overview of Progress Made and Challenges Ahead. In Prepared for the UNDESA/UNPAN workshop on electronic/mobile government in Africa: Building Capacity in Knowledge Management through Partnership. United Nations Economic Commission for Africa. 17–19.
- Hagens, V., Dobrow, M.J. & Chafe, R. 2009. Interviewee transcript review: Assessing the impact on qualitative research. *BMC Medical Research Methodology*. 9:47–56.
- Hasselbring, T.S. & Baugh, M.E. 2005. Assistive Technologies for Reading. *Educational Leadership*. 63:4(December 2005):72–75.
- Heeks, R. 1999. Information technology and the management of corruption. *Development in Practice*. 9(1–2):184–189.
- Heeks, R. 2002. e-Government in Africa Promise and Practice. *Information Polity*. 7(2,3):97–114.
- Heeks, R. 2003. Most e-government-for-development projects fail: how can risks be reduced. *iGovernment Working Paper Series, IDPM, University of Manchester*. 14:1–19.
- Heeks, R. 2005. e-Government as a Carrier of Context. *Journal of Public Policy*. 25(1):51–74. DOI: 10.1017/S0143814X05000206.
- Heeks, R. 2006. Benchmarking e-Government: improving the national and international measurement, evaluation and comparison of e-Government. 257–301.

- Heeks, R. & Santos, R. 2009.
- Henry, S.L., Abou-Zahra, S. & Brewer, J. 2014. The Role of Accessibility in a Universal Web. In Proceedings of the 11th Web for All Conference. ACM,.
- Hilal, A.Y.H. & Alabri, S.S. 2013. Using NVivo for data analysis in qualitative research. *International Interdisciplinary Journal of Education* -. 2(2):181–186. DOI: 10.1016/j.icarus.2010.01.030.
- Hill, H. 2013. Disability and accessibility in the library and information science literature : A content analysis. *Library and Information Science Research*. 35(2):137–142. DOI: 10.1016/j.lisr.2012.11.002.
- Hiller, J.S. & Belanger, F. 2001. Privacy Strategies for Electronic Government.
- Hirschheim, R. 1985. Information systems epistemology: An historical perspective. In *Research methods in information systems*. E. Mumford, R. Hirschheim, G. Fitzgerald, & A.T. Wood-Harper, Eds. 13–35.
- Homburg, V. 2008. *Understanding e-government: Information systems in public administration*. London and New York: Routledge.
- Hong, S.G., Trimi, S., Kim, D.W. & Hyun, J.H. 2015. A Delphi Study of Factors Hindering Web Accessibility for Persons with Disabilities. *Journal of Computer Information Systems*. 55(4):28–34.
- Hoque, R.M. & Sorwar, G. 2015. ICT based e-government services for rural development: a study of union information and service center (UISC) in Bangladesh. *The Electronic Journal of Information Systems in Developing Countries*. 71(8):1–19.
- Horst, M., Kuttschreuter, M. & Gutteling, J.M. 2007. Perceived usefulness, personal experiences, risk perception and trust as determinants of adoption of e-government services in The Netherlands. *Computers in Human Behavior*. 23(4):1838–1852.
- Huang, Z. & Bwoma, P.O. 2003. An Overview of Critical Issues of E-Government. *Issues of Information Systems*. 4(1):164–170.
- Hurst, A. & Tobias, J. 2011. Empowering individuals with do-it-yourself assistive technology. DOI: 10.1145/2049536.2049541.
- Ifinedo, P. 2006. Towards E-Government in a Sub-Saharan African Country: Impediments and Initiatives in Nigeria. *Journal of E-Government*. 3(1):3–28. DOI:

10.1300/J399v03n01.

- Ifinedo, P. & Singh, M. 2011. Determinants of eGovernment maturity in the transition economies of Central and Eastern Europe. *Electronic Journal of e-Government*. 9(2):166–182.
- Internet World Stats. 2016. Internet Penetration in Africa. Available: <http://www.internetworldstats.com/stats1.htm> [2016, July 20].
- Irani, Z., Al-Sebie, M. & Elliman, T. 2006. Transaction stage of e-government systems: identification of its location and importance. In *Proceedings of the 39th Annual Hawaii International Conference on System Sciences (HICSS'06)*.
- Ismailova, R. 2017. Web site accessibility , usability and security : a survey of government web sites in Kyrgyz Republic. *Universal Access in the Information Society*. 16(1):257–264. DOI: 10.1007/s10209-015-0446-8.
- IWS. 2018. Internet World Stats: Ghana internet usage and population statistics. Available: <https://www.internetworldstats.com/africa.htm> [2018, May 05].
- Jacko, J.A. & Vitense, H.S. 2001. Review paper A review and reappraisal of information technologies within a conceptual framework for individuals with disabilities. *Universal Access in the Information Society*. 1(1):56–76.
- Jaeger, P.T. 2004. Beyond Section 508: The spectrum of legal requirements for accessible e-government Web sites in the United States. *Journal of Government Information*. 30(4):518–533. DOI: 10.1016/j.jgi.2004.09.010.
- Jaeger, P.T. 2006. Assessing Section 508 compliance on federal e-government Web sites: A multi-method, user-centered evaluation of accessibility for persons with disabilities. *Government Information Quarterly*. 23(2):169–190. DOI: 10.1016/j.giq.2006.03.002.
- Jaeger, P.T. 2008. User-Centered Policy Evaluations of Section 508 of the Rehabilitation Act Evaluating E-Government Web Sites for Accessibility for Persons With Disabilities. *Journal of Disability Policy Studies*. 19(1):24–33.
- Jaeger, P. & Bertot, J.C. 2010. Designing, implementing, and evaluating User-Centered and Citizen-Centered E-Government. *International Journal of Electronic Government Research (IJEGR)*. 6(2):1–17.
- Jaeger, P. & Matteson, M. 2009. e-Government and Technology Acceptance : The Case of the

- Implementation of Section 508 Guidelines for Websites. *Electronic Journal of E-Government*. 7(1):87–98.
- Jaeger, P.T. & Thompson, K.M. 2003. E-government around the world: lessons, challenges, and future directions. *Government Information Quarterly*. 20(4):389–394. DOI: 10.1016/j.giq.2003.08.001.
- Jaeger, P.T. & Xie, B. 2009. Guidelines for Persons With Disabilities and Older Adults. *Journal of the American Society for Information Science*. 20(1):55–63. DOI: 10.1177/1044207308325997.
- Janssen, M., Van Der Voort, H. & van Veenstra, A.F. 2015. Failure of large transformation projects from the viewpoint of complex adaptive systems: Management principles for dealing with project dynamics. *Information Systems Frontiers*. 17(1):15–29.
- Jasmi, K.A., Basiron, B., Huda, M. & Maselena, A. 2018. Tactical Steps for E-Government Development. *International Journal of Pure and Applied Mathematics*. 119(15):2251–2258.
- Jebreen, I. 2012. Using Inductive Approach as Research Strategy in Requirements Engineering. *International Journal of Computer and Information Technology*. 1(2):162–173.
- Joi, L.A. 2004. Bridging the digital divide: some initiatives in Brazil. *Electronic Government, an International Journal*. 1(3):300–315.
- Joia, L.A. 2004. Developing Government-to-Government enterprises in Brazil: a heuristic model drawn from multiple case studies. *International Journal of Information Management*. 24(2):147–166. DOI: 10.1016/j.ijinfomgt.2003.12.013.
- Joseph, R.C. 2009. Government-to-Business (G2B) Perspectives in E-Government. In *Northeast Decision Sciences Institute Proceedings*. 192–199.
- Jugder, N. 2016. The thematic analysis of interview data: an approach used to examine the influence of the market on curricular provision in Mongolian higher education institutions.
- Kaaya, J. 2004. Implementing e-Government Services in East Africa: Assessing Status through Content Analysis of Government Websites. *Electronic Journal of E-government*. 2(1):39–54.
- Kabeer, N. 2000. Social exclusion, poverty and discrimination towards an analytical

- framework. *IDS bulletin*. 31(4):83–97.
- Kabeer, N. 2005. Social exclusion: concepts, findings and implications for the MDGs. *IDS Bulletin*. 37(3):1–33.
- Kaisara, G. & Pather, S. 2011. The e-Government evaluation challenge : A South African Batho Pele -aligned service quality approach. *Government Information Quarterly*. 28(2):211–221. DOI: 10.1016/j.giq.2010.07.008.
- Kaplan, B. & Maxwell, J.A. 2005. Qualitative research methods for evaluating computer information systems. In *Evaluating the organizational impact of healthcare information systems*. C.E. Aydin, Ed. 30–55.
- Karokola, G. & Yngström, L. 2009. Discussing E-Government Maturity Models for the Developing World-Security View. In *ISSA*. 89–98.
- Katsioloudis, P. & Jones, M. 2013. Assistive Technology: Fixing Humans. *Technology and Engineering Teacher*. 72(7):26–31. Available: <http://eric.ed.gov/?id=EJ1014022>.
- Kelliher, F. 2011. Interpretivism and the pursuit of research legitimisation: an integrated approach to single case design. In *Leading issues in business research methods*. A. Bryant, Ed. 45–110.
- Kelly, B., Phipps, L. & Howell, C. 2005. Implementing a holistic approach to e-learning accessibility. In *Proceedings of the 12th International Conference of the Association for Learning Technology*. Manchester, England.
- Kelly, B., Sloan, D., Petrie, H. & Hamilton, F. 2005. Forcing Standardization or Accommodating Diversity ? A Framework for Applying the WCAG in the Real World. In *Proceedings of the 2005 International Cross-Disciplinary Workshop on Web Accessibility (W4A)*. 46–54.
- Kelly, B., Sloan, D., Brown, S., Seale, J., Lauke, P., Ball, S. & Smith, S. 2009. Accessibility 2.0 : Next Steps for Web Accessibility. *Journal of Access Services*. 6(1–2):265–294. DOI: 10.1080/15367960802301028.
- Kettani, D. 2014. *EGovernment Applications in the African Context*.
- Kettani, D., Moulin, B., Gurstein, M. & El Mahdi, A. 2008. E-government and local good governance: a pilot project in Fez, Morocco. *The Electronic Journal of Information Systems in Developing Countries*. 35(1):1–18.

- Kidd, S. 2014. Social exclusion and access to social protection schemes. *Journal of Development Effectiveness*. 9(2):212–244.
- Kidd, S. 2015. *The Political Economy of “Targeting” of Social Security Schemes*. Kent.
- Kim, C.K. 2014. Anti-corruption initiatives and e-government: a cross-national study. *Public Organization Review*. 14(3):385–396.
- King, B.A. & Youngblood, N.E. 2016. E-government in Alabama: An analysis of county voting and election website content, usability, accessibility, and mobile readiness. *Government Information Quarterly*. 33(4):715–726. DOI: 10.1016/j.giq.2016.09.001.
- Kipnis, D., Schmidt, S.M. & Wilkinson, I. 1980. Intraorganizational Influence Tactics : Explorations in Getting One’s Way. *Journal of Applied Psychology*. 65(4):440–452. DOI: 10.1037//0021-9010.65.4.440.
- Kitaw, Y. 2006. *E-Government in Africa, Prospects, challenges and Practices*. Federal Institute of Technology, Lausanne, Switzerland.
- Klein, H.K. & Myers, M.D. 1999. A set of principles for conducting and evaluating interpretive field studies in information systems. *Management Information Systems Quarterly*. 23(1):67–93.
- Koca-Atabey, M. 2013. A personal validation of the social nature of disability : different environments , different experiences. *Disability & Society*. 28(7):1027–1031. DOI: 10.1080/09687599.2013.820535.
- Kothari, C.R. 2004. *Research methodology: Methods and techniques*. Second ed. C.R. Kothari, Ed. New Delhi: New Age International.
- Kotter, J.P. 2003. Power, dependence, and effective management. In *Organizational Influence Processes*. L. Porter, H. Angle, & R. Allen, Eds. New York. 127–141.
- Kotter, P. 1977. Power, Dependence, and Effective Management. *Harvard Business Review*. 55(4):125–136.
- Krippendorff, K. 1980. *Content Analysis: An Introduction to Its Methodology*. Newbury Park: CA:Sage.
- Krippendorff, K. 2004. *Content Analysis: An Introduction to Its Methodology*. Second ed. V. 79. California: Thousands Oak: Sage Publications. DOI: 10.2307/2288384.
- Kumar, R. 2014. *Research Methodology*. third ed. R. Kumar, Ed. London: Sage Publications.

DOI:

<http://196.29.172.66:8080/jspui/bitstream/123456789/2574/1/Research%20Methodology.pdf>.

- Kumar, R. & Best, M.L. 2006. Impact and Sustainability of E-Government Services in Developing Countries : Lessons Learned from Tamil Nadu , India. *The Information Society*. 22(1):1–12. DOI: 10.1080/01972240500388149.
- Kuzel, A. 1992. Sampling in qualitative inquiry. In *Doing Qualitative Research*. B. Crabtree & W. Miller, Eds. Newbury Park: Sage Publications. 31–44.
- Kuzma, J. 2010. Global E-Government Web Accessibility: A Case Study. In *Proceedings of the British Academy of Management Conference*. South Yorkshire 14-16, September 2010: University of Sheffield, UK.
- Kuzma, J., Yen, D. & Oestreicher, K. 2009. Global e-government Web Accessibility : An Empirical Examination of EU , Asian and African Sites. 1–6.
- Larkotey, W.O., Effah, J. & Boateng, R. 2017. Development of E-Passport Application Portal: A Developing Country Case Study. In *Pacific Asia Conference on Information Systems*. 1–13.
- Latif, M.H.A. & Masrek, M.N. 2010. Accessibility Evaluation on Malaysian E-Government Websites. *Journal of e-Government Studies and Best Practice*. 1–11.
- Layne, K. & Lee, J. 2001. Developing fully functional E-government: A four stage model. *Government Information Quarterly*. 18(2):122–136.
- Lazar, J. & Jaeger, P. 2011. Reducing Barriers to Online Access for People with Disabilities. *Issues in Science and Technology*. 7(2):69–83.
- Lazar, J., Dudley-sponaule, A. & Greenidge, K. 2004. Improving web accessibility : a study of webmaster perceptions. *Computers in Human Behavior*. DOI: 10.1016/j.chb.2003.10.018.
- Lee, J. 2010. 10year retrospect on stage models of e-Government: A qualitative meta-synthesis. *Government Information Quarterly*. 27(3):220–230.
- Leist, E. & Smith, D. 2014. Accessibility Issues in E-Government. In *International Conference on Electronic Government and the Information Systems Perspective*. Springer International Publishing.

- Lenoir, R. 1974.
- Letch, N. & Carroll, J. 2008. Excluded again: Implications of integrated e-government systems for those at the margins. *Information Technology & People*. 21(3):283–299. DOI: 10.1017/CBO9781107415324.004.
- Leung, P., Owens, J., Lamb, G., Smith, K., Shaw, J. & Hauff, R. 1999. Meeting the technology needs of students with disabilities in post-secondary education.
- Lin, F., Fofanah, S.S. & Liang, D. 2011. Assessing citizen adoption of e-Government initiatives in Gambia : A validation of the technology acceptance model in information systems success. *Government Information Quarterly*. 28(2):271–279. DOI: 10.1016/j.giq.2010.09.004.
- Loeb, M., Eide, A.H., Jelsma, J., Toni, M.K. & Maart, S. 2008. Poverty and disability in Eastern and Western Cape Provinces, South Africa. *Disability & Society*. 23(4):311–321. DOI: 10.1080/09687590802038803.
- Lucas, K. 2012. Transport and social exclusion: Where are we now? *Transport Policy*. 20:105–113. DOI: 10.1016/j.tranpol.2012.01.013.
- Lyytinen, K.J. & Ngwenyama, O.K. 1992. What does Computer Support for Cooperative Work mean? A Structural Analysis of Computer Supported Cooperative Work. *Accounting, Management and Information Technologies*. 2(I):19–37.
- Madsen, C.Ø., Berger, J.B. & Phythian, M. 2014. The Development in Leading e-Government Articles 2001-2010 : Definitions , Perspectives , Scope , Research Philosophies , Methods and Recommendations : An Update of Heeks and Bailur. In *International Conference on Electronic Government*. 17–34.
- Makoza, F. 2013. The Level of e-Government Implementation : Case of Malawi. *Electronic Journal of E-Government*. 11(2):268–279.
- Makoza, F. & Chigona, W. 2013. Accessibility of e-Government websites: case of Malawi. In *Proceedings of the 15th Annual Conference on World Wide Web Applications*. 4–15.
- Malik, B.H., Shuqin, C., Mastoi, A.G., Gul, N. & Gul, H. 2016. Evaluating Citizen e-Satisfaction from e-Government Services : A Case of Pakistan. *European Scientific Journal*. 12(5):346–370. DOI: 10.19044/esj.2016.v12n5p346.
- Markus, M.L. 1994. Electronic mail as the medium of managerial choice. *Organization science*.

5(4):502–527.

Marshall, M.N. 1996. Sampling for qualitative research. *Family Practice*. 13(6):522–525. DOI: 10.1093/fampra/13.6.522.

Marshall, B., Cardon, P., Poddar, A. & Fontenot, R. 2013. Does Sample Size Matter in Qualitative Research?: a Review of Qualitative Interviews in IS Research. *Journal of Computer Information Systems*. 54(1):11–22. DOI: 10.1111/jan.12163.

Mathieson, J., Popay, J., Enoch, E., Escorel, S. & Hernandez, M. 2008. Social Exclusion Meaning, measurement and experience and links to health inequalities A review of literature. (1).

Matter, R., Harniss, M., Oderud, T., Borg, J. & Eide, A.H. 2016. Assistive technology in resource-limited environments: a scoping review. *Disability and Rehabilitation: Assistive Technology*. 12(2):105–114. DOI: 10.1080/17483107.2016.1188170.

McElroy, J.C. 1982. A Typology of Attribution Leadership Research. *The Academy of Management Review*. 7(3):413–417.

Mensah, O., Williams, J., Atta-Ankomah, R. & Mjomba, M. 2008. Contextual Analysis of the Disability Situation in Ghana. Accra, Ghana.

Mistry, J.J. & Jalal, A. 2012. An Empirical Analysis of the Relationship Between e-government and Corruption. *International Journal of Digital Accounting Research*. 12(3):145–176. DOI: 10.1108/eb018884.

Mitra, S. 2006. The Capability Approach and disability. *Journal of Disability Policy Studies*. 16(4):236–247.

Mitra, S., Posarac, A. & Vick, B. 2011. Disability and poverty in developing countries : a snapshot from the world health survey. Available: 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. & Vick, B. 2013. Disability and poverty in developing countries: a multidimensional study. *World Development*. 41:1–18.

Mittal, P. & Kaur, A. 2013. E-Governance - A challenge for India. *International Journal of*

- Advanced Research in Computer Engineering & Technology (IJARCET). 2(3):1196–1199.
- Moon, M.J. 2002. The Evolution of E-Government : Rhetoric or The Evolution of E-Government among Municipalities : Rhetoric or Reality ? Public Administration Review. 62(4):424–433. DOI: 10.1111/0033-3352.00196.
- Morgeson, F. V., VanAmburg, D. & Mithas, S. 2011. Misplaced Trust ? Exploring the Structure of the E-Government-Citizen Trust Relationship. Journal of Public Administration Research and Theory. 21(2):257–283. DOI: 10.1093/jopart/muq006.
- Mourad, B. Al & Kamoun, F. 2013. Accessibility Evaluation of Dubai e-Government Websites : Findings and Implications. Journal of E-Government Studies and Best Practices. 2013. DOI: 10.5171/2013.
- Mphidi, H. 2008. Digital divide and e-governance in South Africa.
- Mtebe, J.S. & Kondoro, A.W. 2017. Accessibility and Usability of Government Websites in Tanzania. The African Journal of Information Systems. 9(4):261–279.
- Muddiman, D. 2000. Theories of Social Exclusion and The Public Library. In Public Libraries and Resilient Cities. M. Dudley, Ed. 1–15.
- Murawski, L. & Church, R.L. 2009. Socio-Economic Planning Sciences Improving accessibility to rural health services : The maximal covering network improvement problem. Socio-Economic Planning Sciences. 43(2):102–110. DOI: 10.1016/j.seps.2008.02.012.
- Mutula, S. 2013. Ethical Dimension of the Information Society: implications for Africa. In Information Ethics in Africa: Cross-Cutting Themes. Pretoria. 29–42.
- Mutula, S.M. 2008. Comparison of sub-Saharan Africa’s e-government status with developed and transitional nations. Information Management & Computer Security. 16(3):235–250.
- Mutula, S.M. & Mostert, J. 2010. Challenges and opportunities of e-government in South Africa. The Electronic Library. 28(1):38–53.
- Myers, M.D. & Klein, H.K. 2011. A Set of Principles for Conducting Critical Research in Information Systems. Management Information Systems Quarterly. 35(1):17–36.
- Nahuis, I. 2014. The adoption and implementation of accessibility guidelines within Dutch municipalities. University of Twente.
- Nakatumba-Nabende, J., Kanagwa, B., Kivunike, F.. & Tuape, M. 2019. Evaluation of accessibility standards on Ugandan e-government websites. Electronic Government, An

- International Journal. 15(4):355–371.
- Nasri, W. 2014. Citizens' E-Government Services Adoption: An Extension of Unified Theory of Acceptance and Use of Technology Model. *International Journal of Public Administration in the Digital Age*. 1(2):80–96.
- NCA. 2018. National Communications Authority: Voice Statistics. Available: <https://www.nca.org.gh/industry-data-2/market-share-statistics-2/voice-2/>.
- Ndou, V. 2004. E – Government for Developing Countries: Opportunities and Challenges. *The Electronic Journal on Information Systems in Developing Countries*. 18(1):1–24.
- Neuman, W.L. 2014. *Social Research Methods: Qualitative and Quantitative Approaches*. V. 8. Pearson. DOI: 10.2307/3211488.
- Neundorf, K. 2002. *The Content Analysis Guidebook*. California: Thousands Oaks: Sage Publications.
- Ngulube, P. 2007. The nature and accessibility of e-government in sub-Saharan Africa. *International Review of Information Ethics*. 7(9):1–13.
- Ngwenyama, O. 2014. Logical Foundations of Social Science Research. In *Advances in Research Methods for Information Systems Research*. Springer. 7–13.
- Ngwenyama, O. & Nielsen, P.A. 2013. Using organizational influence processes to overcome IS implementation barriers: lessons from a longitudinal case study of SPI implementation. *European Journal of Information Systems*. 23(2):1–18. DOI: 10.1057/ejis.2012.56.
- Ngwenyama, O.K. & Lee, A.S. 1997. Communication richness in electronic mail: Critical social theory and the contextuality of meaning. *Management Information Systems Quarterly*. 145–167.
- Nicotera, A.M., Mahon, M.M. & Zhao, X. 2010. Conceptualization and Measurement of Structural Divergence in the Healthcare Setting. *Journal of Applied Communication Research*. 38(4):362–385. DOI: 10.1080/00909882.2010.514001.
- Niehaves, B. 2007. Innovation Processes in the Public Sector – New Vistas for an Interdisciplinary Perspective on E-Government Research? *Electronic Government: 6th International Conference (EGOV 2007)*. 4656/2007:23–34. DOI: 10.1007/978-3-540-74444-3.
- Nielsen, P.A. & Ngwenyama, O. 2002. Organizational Influence Processes in Software Process

- Improvement. In European Conference on Information Systems. 208–218.
- NITA. 2008. eGovernment network infrastructure. Available: <http://www.nita.gov.gh/eGovernment-Network-Infrastruc> [2016, June 15].
- Nkansah, G.B. & Unwin, T. 2010. Information Technology for Development The contribution of ICTs to the delivery of special educational needs in Ghana : practices and potential. *Information Technology for Development*. 16(3):191–211. DOI: 10.1080/02681102.2010.497273.
- Nkohkwo, Q.N. & Islam, M.S. 2013. Challenges to the Successful Implementation of e-Government Initiatives in Sub-Saharan Africa : A Literature Review. *Electronic Journal of e-Government*. 11(2):253–267.
- Nkwe, N. 2012. E-government: challenges and opportunities in Botswana. *International Journal of Humanities and Social Science*. 2(17):39–48. Available: http://www.ijhssnet.com/journals/Vol_2_No_17_September_2012/5.pdf.
- Noor, K.B. 2008. Case Study: A Strategic Research Methodology. *American Journal of Applied Sciences*. 5(11):1602–1604.
- Norris, D.F. & Reddick, C.G. 2013. Local E-Government in the United States: Transformation or Incremental Change? *Public Administration Review*. 73(1):165–175. DOI: 10.1111/j.1540-6210.2012.02647.x.
- Nowell, L.S., Norris, J.M., White, D.E. & Moules, N.J. 2017. Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*. 16(1):1–13. DOI: 10.1177/1609406917733847.
- Ochara, N.M. 2008. Emergence of the E-Government Artifact in an Environment of Social Exclusion in Kenya. *African Journal of Information Systems*. 1(1):18–43.
- OECD. 2001. Ageing and Transport. Mobility needs and safety issue. Paris, France: OECD Publications.
- Oh, L. & Chen, J. 2015. Determinants of employees ' intention to exert pressure on firms to engage in web accessibility. *Behaviour & Information Technology*. 34(2):108–118.
- Okiy, R.B. 2003. Information for Rural Development: Challenge for Nigerian Rural Public Libraries. *Library Review*. 52(3):126–131.
- Olalere, A. & Lazar, J. 2011. Accessibility of U . S . federal government home pages : Section

- 508 compliance and site accessibility statements. *Government Information Quarterly*. 28(3):303–309. DOI: 10.1016/j.giq.2011.02.002.
- Oliver, M. 1990. The Politics of Disablement—New Social Movements. In *The Politics of Disablement*. 112–131.
- Oni, A., Okunoye, A. & Mbarika, V. 2016. Evaluation of E-Government Implementation : The Case of State Government Websites in Nigeria. *The electronic Journal of e-Government*. 14(1):48–59.
- Oosterlaken, I. 2009. Design for Development : A Capability Approach. *Design Issues*. 25(4):91–102.
- Orlikowski, W.J. & Baroudi, J.J. 1991. Studying information technology in organizations: Research approaches and assumptions. *Information Systems Research*. 2(1):1–28.
- Osei-Kojo, A. 2017. E-government and public service quality in Ghana. *Journal of Public Affairs*. 17(3):1–8. DOI: 10.1002/pa.1620.
- Owusu-Ansah, S. 2014. Human Factor Issues In The Use Of E-Government Services Among Ghanaian Middle Age Population : Improving Usability Of Existing And Future Government Virtual Interactive Systems Design. *Journal of Information Engineering and Applications*. 4(4):85–107.
- Palmer, M. 2011. Disability and Poverty: A Conceptual Review. *Journal of Disability Policy Studies*. 21(4):210–218. DOI: 10.1177/1044207310389333.
- Paris, M. 2006. Website accessibility: A survey of local e-government websites and legislation in Northern Ireland. *Universal Access in the Information Society*. 4(4):292–299. DOI: 10.1007/s10209-003-0081-7.
- Patton, M.Q. 1990. *Qualitative evaluation and research methods*. Second ed. Newbury Park: Sage Publications.
- Patton, M.Q. 2015. What to Observe: Sensitizing Concepts. In *Qualitative Research & Evaluation Methods*. Sage Publications. 358–363.
- Peters, M.A. & Besley, T.A.C. 2014. Social Exclusion/Inclusion: Foucault’s analytics of exclusion, the political ecology of social inclusion and the legitimation of inclusive education. *Open Review of Educational Research*. 1(1):99–115. DOI: 10.1080/23265507.2014.972439.

- Phillips, D. 2008. Social inclusion, social exclusion and social cohesion: tensions in a post-industrial world. *The Hong Kong Journal of Social Work*. 42(1):1–28.
- Picton, A. 2011. Access to Information for Persons with Disabilities. Available: <https://www.humanrightsinitiative.org/publications/ghana/CHRIDISABOOKLET.pdf>.
- Pilling, D. & 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. 35–46.
- Popay, J., Williams, G., Thomas, C. & Gatrell, A. 1998. Theorising inequalities in health : the place of lay knowledge. *Sociology of Health & Illness*. 20(5):619–644.
- Preston, J. & Rajé, F. 2007. Accessibility, mobility and transport-related social exclusion. *Journal of Transport Geography*. 15(3):151–160. DOI: 10.1016/j.jtrangeo.2006.05.002.
- Priandi, M., Fernandez, W. & Sandeep, M.S. 2019. The Role of Context in IS Research: A Review of E-government Research in Developing Economies. In 12th International Conference on Theory and Practice of Electronic Governance (ICEGOV2019). Melbourne. 4.
- Rao, V.R. 2011. Collaborative Government to Employee (G2E): Issues and Challenges to E-Government. *Journal of e-Governance*. 34(4):214–229. DOI: 10.3233/GOV-2011-0279.
- Ratliffe, K.T., Rao, K., Skouge, J.R. & Peter, J. 2012. Navigating the currents of change: technology, inclusion, and access for people with disabilities in the Pacific. *Information Technology for Development*. 18(3):209–225.
- Rawal, N. 2008. Social Inclusion and Exclusion: A Review. *Dhaulguri Journal of Sociology and Anthropolgy*. 2:161–180.
- Roca, B. & Bernal, V.G. 2016. Disability , social movements and radical theory : An anthropological approach. *Anthropological Notebooks*. 22(2):79–92.
- Rorissa, A. & Demissie, D. 2010. An analysis of African e-Government service websites. *Government Information Quarterly journal*. 27(2):161–169. DOI: 10.1016/j.giq.2009.12.003.
- Rose, J. & Hackney, R. 2003. Towards a Structural Theory of Information Systems : a Substantive Case Analysis. In International Conference on System Sciences. 9.

- Rossel, P., Finger, M. & Misuraca, G. 2006. "Mobile" e-Government Options: Between Technology-driven and User-centric. *Electronic Journal of e-Government*. 4(2):79–86. Available: <http://www.ejeg.com/volume-4/vol4-iss2/v4-i2-art5.htm>.
- Rowley, J. 2011. International Journal of Information Management e-Government stakeholders — Who are they and what do they want? *International Journal of Information Management*. 31(1):53–62. DOI: 10.1016/j.ijinfomgt.2010.05.005.
- Rubaii-Barrett, N. & Wise, L.R. 2008. Disability Access and E-Government: An Empirical Analysis of State Practices. *Journal of Disability Policy Studies*. 19(1):52–64. DOI: 10.1177/1044207307311533.
- Ryan, G.W. & Bernard, H.R. 2003. Techniques to Identify Themes. *Field methods*. 15(1):85–109. DOI: 10.1177/1525822X02239569.
- Sagheb-Tehrani, M. 2010. A model of successful factors towards e- government implementation. *Electronic Government, An International Journal*. 7(1):60–74. DOI: 10.1504/EG.2010.029891.
- Sagheb-Tehrani, M. & Ghazarian, A. 2016. A Conceptual Requirements Model for the Domain of Electronic Service Delivery: Success Factors in E-Government Implementation. *Journal of Information Science and Computing Technologies*. 5(2):473–497.
- Saith, R. 2001. Social exclusion: the concept and application to developing countries. Available: <http://magarstudiescenter.org.np/wp-content/uploads/2010/03/Saith-Social-Exclusion-the-Concept-and-Application-to-Devel.pdf>.
- Samman, E. & Rodriguez-Takeuchi, L.K. 2013. Old age, disability and mental health: data issues for a post-2015 framework - ODI Background Notes - Discussion papers. (May):1–10. Available: www.odi.org.uk.
- Saunders, P. 2003. Can Social Exclusion Provide a New Framework for Measuring Poverty? P. Saunders, J. Chalmers, & B. Bradbury, Eds. Sydney: The Social Policy Research Centre, University of New South Wales.
- Saunders, M.N.K. & Townsend, K. 2016. Reporting and Justifying the Number of Interview Participants in Organization and Workplace Research. *British Journal of Management*. 27(4):836–852. DOI: 10.1111/1467-8551.12182.
- Scherer, M.J. 2005. Assessing the benefits of using assistive technologies and other supports

- for thinking, remembering and learning. *Disability and rehabilitation*. 27(13):731–739. DOI: 10.1080/09638280400014816.
- Schuppan, T. 2009. E-Government in developing countries : Experiences from sub-Saharan Africa. *Government Information Quarterly*. 26(1):118–127. DOI: 10.1016/j.giq.2008.01.006.
- Seale, J. 2006. A contextualised model of accessible e-learning practice in higher education institutions. *Australasian Journal of Educational Technology*. 22(2):268–288.
- Sen, A. 1999. *Development as freedom*. Oxford: Oxford University Press.
- Sen, A. 2000. *Social Exclusion: Concept , Application, and Scrutiny*. (1). Manila. DOI: 10.1.1.100.1010.
- Serra, L.C., Carvalho, L.P., Ferreira, L.P., Belimar, J., Vaz, S. & Freire, A.P. 2015. Accessibility Evaluation of E-Government Mobile Applications in Brazil. *Procedia - Procedia Computer Science*. 67:348–357. DOI: 10.1016/j.procs.2015.09.279.
- Shambour, Q. & Lu, J. 2010. A Framework of Hybrid Recommendation System for Government-to-Business Personalized E- Services 2010 Seventh International Conference on Information Technology. In *Information Technology: New Generations (ITNG), 2010 Seventh International Conference*. 592–597. DOI: 10.1109/ITNG.2010.114.
- Shi, Y. 2006. E-Government Web Site Accessibility in Australia and China: A Longitudinal Study. *Social Science Computer Review*. 24(3):378–385. DOI: 10.1177/0894439305283707.
- Shi, Y. 2007. The accessibility of Chinese local government Web sites : An exploratory study. *Government Information Quarterly*. 24(2):377–403. DOI: 10.1016/j.giq.2006.05.004.
- da Silva, P. & Alturas, B. 2015. Web accessibility: Study of maturity level of Portuguese institutions of higher education. In *Information Systems and Technologies (CISTI)*. 1–7.
- Silver, H. 1994. Social exclusion and social solidarity: three paradigms. *International Labour Review*. 133(5–6):531–578.
- Soors, W., Dkhimi, F. & Criel, B. 2013. Lack of access to health care for African indigents: a social exclusion perspective. *International journal for equity in health*. 12(1):1–9.
- Stanforth, C. 2006. Using Actor-Network Theory to Implementation in Developing. *Information Technologies & International Development*. 3(3):35–60.
- Stanley, J. 2007. The Usefulness of Social Exclusion as a Theoretical Concept to Inform Social

- Policy in Transport. Available: thredbo-conference-series.org/downloads/thredbo10_papers/thredbo10-themeD-Stanley.pdf [2015, May 14].
- Stemler, S. 2001. An Overview of Content Analysis. *Practical Assessment, Research & Evaluation*. 7(17):479–498. DOI: 10.1362/146934703771910080.
- Stewart, R., Narendra, V. & Schmetzke, A. 2005. Accessibility and usability of online library databases. *Library Hi Tech*. 23(2):265–286. DOI: 10.1108/07378830510605205.
- Sullivan, K. 2011. The Prevalence of the Medical Model of Disability in Society. Available: http://digitalcommons.olin.edu/ahs_capstone_2011/13 [2015, May 25].
- Takagi, H., Asakawa, C., Fukuda, K. & Maeda, J. 2004. Accessibility designer: visualizing usability for the blind. In *ACM SIGACCESS Accessibility and Computing*. New York, NY: ACM. 177–184.
- Tashtoush, Y.M., Darabseh, A.F. & Al-sarhan, H.N. 2016. The Arabian E-Government Websites Accessibility : A Case study The Arabian E-Government Websites Accessibility : A Case study. In *7th International Conference on Information and Communication Systems (ICICS)*. 276–281. DOI: 10.1109/IACS.2016.7476064.
- Teicher, J., Hughes, O. & Dow, N. 2002. E-government : a new route to public sector quality. *Managing Service Quality: An International Journal*. 12(6):384–393. DOI: 10.1108/09604520210451867.
- Terzi, L. 2005. Beyond the Dilemma of Difference : The Capability Approach to Disability and Special Educational Needs. 39(3).
- Thakur, S. & Singh, S. 2013. Study of Some E-Government Activities in South Africa. *African Journal of Computing & ICT*. 6(2):41–54.
- Thomas, J. & Harden, A. 2008. Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology*. 8(1):45. DOI: 10.1186/1471-2288-8-45.
- Tolbert, C.J. & Mossberger, K. 2006. The Effects of E-Government on Trust and Confidence in Government. *Public administration review*. 66(3):354–369.
- Turner, D.W. 2010. Qualitative interview design: A practical guide for novice investigators. *The Qualitative Report*. 15(3):754–760. DOI: <http://www.nova.edu/ssss/QR/QR15-3/qid.pdf>.

- UN-ASPA. 2001. Benchmarking E-government: A Global Perspective. Available: unpan1.un.org/intradoc/groups/public/documents/un/unpan021547.pdf [2015, May 15].
- UN-DESA. 2018. Gearing E-Government to Support Transformation towards sustainable and resilient societies. New York. Available: [https://repository.unikom.ac.id/63246/1/E-Government Survey 2018_FINAL.pdf](https://repository.unikom.ac.id/63246/1/E-Government%20Survey%202018_FINAL.pdf).
- UNESCO. 2014. Disability Data and Statistics, Monitoring and Evaluation: The Way Forward- a Disability-Inclusive Agenda Towards 2015 and Beyond.
- De Vaus, D.A. 2001. Research design in social research. Thousands Oak: Sage Publications.
- Vehmas, S. & Watson, N. 2014. Moral wrongs , disadvantages , and disability : a critique of critical disability studies. *Disability & Society*. 29(4):638–650. DOI: 10.1080/09687599.2013.831751.
- Venter, S. & Lotriet, H. 2005. Accessibility of South African Web sites to visually disabled users. *SA Journal of Information Management*. 72(2):1–14.
- Verdegem, P. & Verleye, G. 2009. User-centered E-Government in practice: A comprehensive model for measuring user satisfaction. *Government Information Quarterly*. 26(3):487–497. DOI: 10.1016/j.giq.2009.03.005.
- Verkijika, S.F. & 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):52–68.
- Verma, P. & Vats, S.. 2020. ICT and E-Governance : An Indian Perspective. *Studies in Indian Place Names*. 40(50):4512–4518.
- Vincent, J., Dombeu, F. & Rannyai, N. 2014. African E-Government Research Landscape African E-Government Research Landscape. *The African Journal of Information Systems*. 6(3):86–119.
- Visagie, S., Eide, A.H., Mannan, H., Schneider, M., Swartz, L., Mji, G. & MacLachlan, M. 2017. A description of assistive technology sources, services and outcomes of use in a number of African settings. *Disability and Rehabilitation: Assistive Technology*. 12(7):705–712.
- Voida, A., Dombrowski, L., Hayes, G.R. & Mazmanian, M. 2014. Shared values/conflicting logics: working around e-government systems. In *In Proceedings of the 32nd annual ACM*

- conference on Human factors in computing systems. 3583–3592.
- Wahid, S.H.A., Ali, S.J., Ismail, A.H. & Mutalib, A.A. 2015. Usability Principles make Iraqi E-Government portal more accessible. *Jurnal Teknologi*. 77(29):69–76.
- Walsham, G. 1995. Interpretive case studies in IS research: Nature and method. *European Journal of Information Systems*. 4(2):74–81.
- Walsham, G. 2006. Doing interpretive research. *European Journal of Information Systems*. 15(3):320–330. DOI: 10.1057/palgrave.ejis.3000589.
- Watling, S. 2011. Digital exclusion : coming out from behind closed doors. *Disability & Society*. 26(4):491–495. DOI: 10.1080/09687599.2011.567802.
- Waziri, M.D. & Yonah, Z.O. 2014. Towards a Secure Maturity Model for Protecting e-Government Services in Tanzania : A Stakeholders View. *Advances in Computer Science: an International Journal*. 3(6):29–37.
- Welch, E.. 2005. Linking Citizen Satisfaction with E-Government and Trust in Government. *Journal of Public Administration Research and Theory*. 15(3):371–391.
- Welle Donker-Kuijer, M., de Jong, M. & Lentz, L. 2010. Usable guidelines for usable websites? An analysis of five e-government heuristics. *Government Information Quarterly*. 27(3):254–263. DOI: 10.1016/j.giq.2010.02.006.
- West, D.M. 2004. E-government and the transformation of service delivery and citizen attitudes. *Public Administration Review*. 64(1):15–27.
- West, D.M. 2008. Equity and Accessibility in E- Government. *Journal of E-government*. 1(2):31–43. DOI: 10.1300/J399v01n02.
- Whittington, R. 2010. Giddens, structuration theory and strategy as practice. In *Cambridge handbook of strategy as practice*. 109–126. DOI: 10.1017/CCO9781139681032.009.
- WHO. 2011. Understanding Disability. Available: http://www.who.int/disabilities/world_report/2011/chapter1.pdf [2015, November 15].
- WorldBank. 2020. Disability Inclusion. Available: <https://www.worldbank.org/en/topic/disability> [2020, June 25].
- Wyatt, S. 2008. Technological determinism is dead; long live technological determinism. In *The handbook of science and technology studies*. 165–180.
- Yaokumah, W., Brown, S. & 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). 46–50. DOI: 10.1109/GOCICT.2015.18.
- Yesilada, Y., Brajnik, G., Vigo, M. & Harper, S. 2015. Behaviour & Information Technology Exploring perceptions of web accessibility : a survey approach. Behaviour & Information Technology. 34(2):119–134. DOI: 10.1080/0144929X.2013.848238.
- Yildiz, M. 2007. E-government research: Reviewing the literature, limitations, and ways forward. Government Information Quarterly. 24(3):646–665. DOI: 10.1016/j.giq.2007.01.002.
- Yin, R.K. 1994. Case Study Research: Design and Methods. In Applied Social Research Methods Series. Third ed. London: Sage Publications.
- Yukl, G. & Falbe, C.M. 1990. Influence Tactics and Objectives in Upward , Downward , and Lateral Influence Attempts. Journal of Applied Psychology. 75(2):132–140.
- Zheng, Y. & Walsham, G. 2008. Inequality of what? Social exclusion in the e-society as capability deprivation. Information Technology and People. 21(3):222–243.

10. ATTACHMENTS

10.1 Sample of Consent Form

UNIVERSITY OF CAPE TOWN

Department of Information Systems



Leslie Commerce Building
Engineering Mall, Upper Campus
OR Private Bag, Rondebosch 7701
Tel: 650-2261
Fax No: (021) 650-2280

To Whom It May Concern:

E-government has the ability to enhance the quality of government services to citizens through the use of ICTs, particularly internet web-based applications. It allows access to government information and services at convenience. E-government is perceived to have several benefits for persons with disabilities. This study forms part of the requirements for completing a PhD Degree in Information Systems at the University of Cape Town (UCT), Department of Information Systems. It seeks to investigate the accessibility of E-government services for persons with disabilities in Ghana.

We would greatly appreciate your time and effort in responding to the interviews. Your participation in this research is voluntary. All information will be treated in a confidential manner and used exclusively for this study. Your name not will be recorded or published. You will not be requested to supply any identifiable information, ensuring the anonymity of your responses. Your participation in this study would be greatly appreciated but is entirely voluntary.

Sincerely,

Millicent Agangiba

A handwritten signature in blue ink, appearing to read 'Millicent'.

Researcher \ PhD Student, (UCT)
Department of Information Systems
University of Cape Town
Email: agnmil001@myuct.ac.za

Salah Kabanda

A handwritten signature in black ink, appearing to read 'Salah Kabanda'.

Research Supervisor
Department of Information Systems
University of Cape Town
Email: salah.kabanda.uct.ac.za
Telephone: +27-(021)-6504253

10.2 Research Instrument

Section A: Demographics

Gender

Age

Section B: Government Officers

1. What is your position here in the agency?
2. How long have you been working here?

Awareness of accessibility and PWD

3. Are you aware that Persons with disabilities use ICT related services?
4. Are you aware of how the blind access the web?

Policies and implementation issues

5. As an agency how does government policies impact on the way you develop E-government services?
6. Who is involved (which stakeholders) /who were involved in the development of the policies related to the accessibility of services for PWD?
 - Would you say these were the right actors, or an important stakeholder was no consulted during the development of the policy?
 - How was public engagement obtained about the policy, specifically engagement from PWD?
 - What is not working with regards to the policy? What was the intention behind the development of the policy?

Knowledge on assistive technologies

7. Do you know about assistive technologies?
 - Which ones are you familiar with?
 - What government policies or initiatives exist to ensure assistive technologies are available and affordable for PWD?
 - Have you received training on accessibility before?

Drafting requirements E-government services

8. What are some of the factors that influence accessible E-government development?
9. What resources are required to implement a successful accessible E-government services for PWD?
 - What would you need?
 - If you do not know, who would do know?
 - What challenges are they facing in this regard?
 - Who is to provide what resource?
 - When was the first move made to provide the resource(s) and since then what has happened?
 - What is currently available in terms of resources, to ensure that accessible E-government services for PWDs in Ghana?

Perceptions on accessibility

10. What is your opinion with regards to accessibility? Do you consider it a priority?
11. Who should enforce accessibility? Is it you, the government, or PWD, or public institutions such as learning institutions?
12. Which other stakeholders do you think have a role to play in improving E-government accessibility for PWDs, particularly the visually impaired?

Section C: Web Developers

1. Year of Programming experience
2. Have you developed applications for any government agency?
3. Which applications have you developed

Awareness of accessibility and PWD

4. Are you aware that Persons with Disabilities use ICT related services?
5. Are you aware of how the blind accesses the web?
6. Do you know of any way government promotes accessibility of services for PWDs?
 - When did you become aware? Was it during your training? Which year? In which course?
 - Are you aware of the PWD Act and its consequence on design?
 - Would you say you were made thoroughly aware of the consequences of not having accessible websites for PWD by (1) University, and (2) Government?

Awareness of policies

7. How familiar are you with the Persons with Disability Act in Ghana? Does it have any implication on how you design your web?
8. In your opinion, how does government policies impact on E-government accessibility?
 - Do you think the policy/act are effective or ineffective?

Knowledge of assistive technologies

9. What do you know about assistive technologies?
10. Which assistive technologies have you worked with?
 - What were the circumstances that warranted you to work with them during your design and implementation of a website?

Development process

11. Do you evaluate your websites after design?
 - How do you go about this evaluation?
 - Does it include having a PWD assessing the site?
 - What criteria's do you use to assess the accessibility of your sites?
12. What measures do you take to ensure individuals using assistive technologies can access the web?
13. Which guidelines do you follow in developing web applications?
14. Do you know about the W3C guidelines?

Views on accessibility and responsibility towards accessibility

15. What in your opinion is your role with regards to improving E-government accessibility?
 16. Which other stakeholders do you think have a role in improving accessibility of E-government services for PWDs?
 17. What do you think are some of the factors which influence the development of accessible E-government applications?
 18. Have you received training on accessibility before?
 19. What is your opinion with regards to accessibility?
 - Do you consider it a priority?
 20. Who should enforce accessibility?
 - Is it you, the government, or PWD, or public institutions such as learning institutions?
-

Section D: Persons with Disabilities

Understanding the individual's background

1. Where did you school?
2. What work do you do?
3. Job title or position in organization
4. How did you become visually impaired? How what the transition like?
5. How do you get your voice heard when it comes to challenges using government services?
6. How do you use your position to influence government or organization to address your circumstances?

Understanding situation with regards to accessing E-government Information

7. What E-government platforms or online services provided by government do you know of?
8. How do you access E-government services?
 - Why that option?
 - Can you use other alternatives?
9. What do you think are the reasons why you find it difficult accessing or using existing E-government services?

Policies and implementation issues

10. Do the existing policies on disabilities promote accessibility of E-government services for PWD?
11. What policies do you think government should put in place to enhance accessibility of E-government services?

Assistive Technologies and training

12. How does availability and cost of assistive technologies affect your use of the web or online services?
13. Does user experience and training on assistive technologies in any way enhance accessibility?
14. How affordable are assistive technologies you use or require?

Design and implementation issues

15. How easy are you able to navigate the E-government website without difficulty? (checking for accessible design)
16. In your opinion does the E-government portal provide clear and easy to follow procedures, processes and instructions?
17. In your opinion which other stakeholders do you think have a role in improving accessibility of E-government service?

Problems related to the lack of access

18. What challenges do you face or likely to encounter as a result of your inability to access E-government services?
(identify specific challenges PWD have as a result of exclusion)
19. How does your inability to access E-government services affect your livelihood?
 - Are you able to acquire services as fast as others?
 - Are you able to acquire E-government services at same cost as others?
20. How (and what) are you likely to lose out if all government services become accessible only through the internet?

10.3 Consent of Stakeholders

Consent from National Information Technology Agency, (NITA)-Ghana



NATIONAL INFORMATION TECHNOLOGY AGENCY (NITA)
(MINISTRY OF COMMUNICATIONS)



6th Floor, Ghana House, High Street | PMB, Ministries Post Office, Accra, Ghana | Tel: +233-302-661777/661800 Fax: +233-302-661833
www.nita.gov.gh

Our Ref. No.: NITA/ADM/16/01/12

12th January, 2016

RE: INTRODUCTORY LETTER

Millicent Akotam Agangiba
University Of Cape Town
South Africa.

The above mentioned student has indicated that she has been awarded entry into a PhD program in the University of Cape Town, South Africa. She has indicated to us that her PhD research programme topic is on investigating E-Government accessibility for the visually impaired.

The National Information Technology Agency (NITA), Ghana is the Organization responsible to provide leadership in the area of e-Government implementation in Ghana and provides materials on such programmes to researchers upon request.

We are in a position to assist Mrs. Millicent Agangiba in this direction whenever our services are needed to ensure a successful research programme.

Thank you.

A handwritten signature in blue ink, appearing to read 'G. Atta-Boateng', written over a light blue horizontal line.

GEORGE ATTA-BOATENG
AG. DIRECTOR GENERAL





GBU GHANA BLIND UNION

Dignity And Progress

P. O. AC 496, Accra - Ghana
Tel: 233 (0) 302 680102 / 4
Fax: 233 (0) 302 677963

11th January, 2016.

Mrs. Millicent Akotam Agangiba,
University of Cape Town,
South Africa.

Dear Madam,

RE: INTRODUCTORY LETTER

The Ghana Blind Union is pleased to help you in whatever way possible to make your research fruitful.

Thank you.

Yours faithfully,

Dr. Peter Obeng-Asamoah
Executive Director

Ghana Society for the Blind and Ghana Association of the Blind are now Ghana Blind Union

10.4 Profile of Respondents

Demographic data of the Visually Impaired

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

Demographic data of Government Officers

Interviewee	Gender	Agency	Position	Years of working in agency
GOV1	Male	Ministry of Finance	Assistant Programmer	6
GOV2	Male	Ministry of Gender, Child and Social Protection	NCPD Executive	28
GOV3	Male	National Information Technology, NITA	IT Applications Officer	4
GOV4	Male	National Information Technology Agency, NITA	E-government Assist	3
GOV5	Female	National Information Technology, NITA	IT Applications Officer	2
GOV6	Male	National Information Technology, NITA	NITA PRO	4
GOV7	Female	Ghana Education Service	Municipal Director	37
GOV8	Female	Registrar Generals' Department	Senior Programmer	14
GOV9	Male	Ministry of Gender, Child and Social Protection	Manager	7

Demographic data of Developers

Interviewee	Age Range	Years of Programming	E-government applications developer
DEV1	25-30	5	No
DEV2	40-45	24	Yes
DEV3	20-25	7	Yes
DEV4	40-45	14	No
DEV5	35-40	18	Yes
DEV6	35-40	14	Yes
DEV7	25-30	8	Yes
DEV8	20-25	5	Yes
DEV9	25-30	2	Yes
DEV10	25-30	5	Yes

10.5 Sample of Transcript Verified by Respondent

people. So, umm ... if I get the chance to work on any android project, I think I will start from how am how am I going to structure it to fit uhh to be use usable for people who can't do this who can't do that. And if it's ... something that's feasible the technologies are... ahaah then I will... I will gladly do it.

Q: mm ok. so ... what else would you want to add may... I have not asked you but you think is important to this discussion so that I consider it.

R3: uhhmm that umm... how important is erhh making a.. how important is erhh.. education of uhh... how will it be important... how ... is it going to impact on us if we are... right from our our kindergarten we...are taught about the... the disabled people how they do their stuff? because if if we are... if we are to talk about those stuff right from our childhood, then it...becomes our mindset yes so if if e if umm if we get we get to our kindergarten and then we are taught then hey these people this is how they do their stuff, 'blablablablaba' then we can just go with that and then being an engineer, it's just part of you so you do it.

Q: Ok alright so thank you very much.

R3: You are welcome.

I am fine with the transcription as far as our interview is
concern.



10.6 Policy Documents Analysed

Policy Material	Title of policy	Reference
PM1	Data Protection Act	https://www.dataprotection.org.gh/sites/default/files/Data%20Protection%20Act%20%2C%202012%20%28Act%20843%29.pdf
PM2	National Council on Persons with Disability. Guidelines for the disbursement and management the District Assembly Common Fund	https://www.inclusionghana.org/resources/advocacytoolkits/Guidelines%20for%20Disbursement%20of%20District%20Assembly%20Common%20Fund.pdf
PM3	Electronic Transactions Act	https://www.moc.gov.gh/sites/default/files/downloads/Electronic%20Communications%20Act-775.pdf
PM4	Ghana e-Government Interoperability Framework	https://www.ghanahelthservice.org/downloads/Ghana_eGIF_Main.pdf
PM5	Ghana Government Enterprise Architecture Framework	https://nita.gov.gh/wp-content/uploads/2017/12/GGEA-Assessment-Framework.pdf
PM6	National Communications Authority Act	https://www.moc.gov.gh/sites/default/files/downloads/Ghana-National-Communications-Authority-Act-769.pdf
PM7	The Ghana ICT For Accelerated Development (ICT4AD) Policy	https://www.ghanahelthservice.org/downloads/Ghana%20ICT4AD%20Policy.pdf
PM8	National Information Technology Agency Act	https://nita.gov.gh/wp-content/uploads/2017/12/National-Information-Technology-Agency-Act-771.pdf
PM9	Persons with Disability Act	http://www.humanrightsinitiative.org/publications/ghana/disability_rights_in_ghana.pdf
PM10	Convention on the Rights of Persons with Disabilities and Optional Protocol	http://www.un.org/disabilities/documents/convention/convoptprot-e.pdf

10.7 Research Code Book

Name	Description	No. of Sources Coded	Hierarchical Name
1. Accessibility requirements	benefits of accessibility for PWD and the requirements necessary to improve accessibility	33	Nodes\Accessibility requirements
1.1 Accessibility awareness	awareness on accessibility and education on disabilities is needed to improve accessibility	26	Nodes\Accessibility requirements \Accessibility awareness
1.1.1 Creating accessibility awareness	different stakeholders are needed in the creation of accessibility awareness among the Ghanaian populace	18	Nodes\Accessibility requirements \Accessibility awareness\Creating accessibility awareness
1.1.2 Lack of awareness on disabilities and accessibility	lack of awareness on accessibility and disabilities interfere with the judgement of developers and agencies rendering E-government services	21	Nodes\Accessibility requirements \Accessibility awareness\Lack of awareness on disabilities and accessibility
1.2 Accessibility needs and benefits	accessibility views expressed by developers and government officers, accessibility prerequisites and the potential benefits	27	Nodes\Accessibility requirements \Accessibility needs and benefits
1.1.1 Accessibility needs	necessary requirements needed in place to improve accessibility	22	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility needs
1.1.1.1 Accessibility cost	accessibility involves investment of time and resources (e.g. money, human resource)	9	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility needs\Accessibility cost
1.1.1.2 Accessibility requires tools and knowledge	accessibility requires knowledge on available accessibility tools and how to implement them	13	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility needs\Accessibility requires tools and knowledge
1.1.1.3 Accessibility training	training is an essential tool to understand the accessibility needs of PWD and to gain more knowledge	21	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility needs\Accessibility training
1.1.1.4 Exclusive content	there is a need to design exclusive web content for PWD to ensure accessibility	2	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility needs\Exclusive content
1.1.2 Accessibility benefits	incorporating accessibility features in software caters for the needs of a wide range of users making the software more usable and inclusive	17	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility benefits
1.1.2.1 accessibility increases coverage	accessibility of software has greater benefit for a wide range of user which include the aged, illiterate and less educated	11	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility benefits\accessibility increases coverage

Name	Description	No. of Sources Coded	Hierarchical Name
1.1.2.2 accessible design more usable	accessibility of software increases their overall usability	7	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility benefits\accessible design more usable
1.1.3 Accessibility views	opinions of developers and government officers regarding accessibility for PWD	19	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility views
1.1.3.1 A consideration	accessibility is needful and should be considered	4	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility views\A consideration
1.1.3.2 A priority	accessibility should be a top priority	3	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility views\A priority
1.1.3.3 An afterthought	accessibility is not thought of as part of the initial design	4	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility views\An afterthought
1.1.3.4 Not a priority	accessibility is not a topmost priority	14	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility views\Not a priority
1.1.3.5 Social responsibility	accessibility should be seen as a social responsibility	5	Nodes\Accessibility requirements \Accessibility needs and benefits\Accessibility views\Social responsibility
1.3 Education on disabilities and accessibility	education is key to sensitising developers and the society at large on accessibility and disabilities to create awareness and break negative barriers around PWD	23	Nodes\Accessibility requirements \Education on disabilities and accessibility
1.3.1 education on accessibility	educating on accessibility and including accessibility in study curricula for schools	11	Nodes\Accessibility requirements \Education on disabilities and accessibility\education on accessibility
1.3.2 education on disabilities	educating on disabilities and including disability studies in educational syllabus is essential	14	Nodes\Accessibility requirements \Education on disabilities and accessibility\education on disabilities
2. AT acquisition and usage	challenges relating to tools, gadgets and technologies PWD use; how to acquire them, train in them and efficiently use them	37	Nodes\ AT acquisition and usage
2.1 AT policy implementation	implementation of policy to provide subvention and regulate the sale of AT	8	Nodes\ AT acquisition and usage \AT policy implementation

Name	Description	No. of Sources Coded	Hierarchical Name
2.1.1 Policy on AT in progress	efforts are being made to formulate policy regarding assistive technologies	3	Nodes\\ AT acquisition and usage \\AT policy implementation\\ Policy on AT in progress
2.1.2 Policy on AT needed	there is need for a policy on assistive technologies to ensure their availability and reasonable cost	7	Nodes\\ AT acquisition and usage \\AT policy implementation\\Policy on AT needed
2.2 AT required for access	assistive technologies and devices are necessary for accessing E-government services	23	Nodes\\ AT acquisition and usage \\AT required for access
2.2.1 Assistive tools enable access	assistive technologies and tools enable PWD particularly the visually impaired to access electronic gadgets and services	19	Nodes\\ AT acquisition and usage \\AT required for access\\Assistive tools enable access
2.2.2 AT makes working easier	assistive technologies make it easier for PWD to perform daily tasks	9	Nodes\\ AT acquisition and usage \\AT required for access\\AT makes working easier
2.3 Availability and affordability of AT	assistive technologies and devices need to be readily available and affordable to PWD to enhance accessibility	26	Nodes\\ AT acquisition and usage \\Availability and affordability of AT
2.3.1 Availability of AT	assistive technologies are out of reach and not readily accessible for PWD to have access	14	Nodes\\ AT acquisition and usage \\Availability and affordability of AT\\Availability of AT
2.3.2 Cost of AT	assistive technologies and devices for PWD are very expensive in Ghana	23	Nodes\\ AT acquisition and usage \\Availability and affordability of AT\\Cost of AT
2.4 Government needed interventions on AT	provisions government need to make to ensure affordable, readily available assistive technologies and effective training in them	17	Nodes\\ AT acquisition and usage \\Government needed interventions on AT
2.4.1 Free access to AT	the government should make a deliberate effort by supplying assistive technologies to PWD or setting up a centre PWD to have free access to them	8	Nodes\\ AT acquisition and usage \\Government needed interventions on AT\\Free access to AT
2.4.2 Providing or negotiating for grants	the government should provide grants or negotiate with investors to assist with grants towards assistive technologies	2	Nodes\\ AT acquisition and usage \\Government needed interventions on AT\\Providing or negotiating for grants
2.4.3 Resourcing schools and training	the government should resource schools and teaching institutions with assistive technologies to support with training in them for disabled students	6	Nodes\\ AT acquisition and usage \\Government needed interventions on AT\\Resourcing schools and training

Name	Description	No. of Sources Coded	Hierarchical Name
2.4.4 Subsidy on AT	the government should support by way of providing subsidies on AT to reduce their cost	10	Nodes\\ AT acquisition and usage \Government needed interventions on AT\Subsidy on AT
2.5 Limited capabilities of AT	issues regarding unlicensed use of AT which leads to limitations in functioning	13	Nodes\\ AT acquisition and usage \Limited capabilities of AT
2.5.1 Limited functionalities	assistive technologies such as screen readers have limited functionalities; e.g. they not able to describe graphics and read some pdf documents	9	Nodes\\ AT acquisition and usage \Limited capabilities of AT\Limited functionalities
2.5.2 Unlicensed use	use of unlicensed screen readers by cracking them thereby blacklisting users when connected on the internet	8	Nodes\\ AT acquisition and usage \Limited capabilities of AT\Unlicensed use
2.6 Local production of AT	there is a need for research investment in AT to promote local production	8	Nodes\\ AT acquisition and usage \Local production of AT
2.6.1 Importation of AT	most assistive technologies used in Ghana are imported from abroad	6	Nodes\\ AT acquisition and usage \Local production\Importation of AT
2.6.2 Reducing cost through local production	producing AT locally can potentially help to reduce their cost	2	Nodes\\ AT acquisition and usage \Local production\Reducing cost through local production
2.6.3 Researching in AT	there is need to intensively research into assistive technologies to identify gaps and feasibility for their local production	3	Nodes\\ AT acquisition and usage \Local production\Researching in AT
2.7 Stakeholders' knowledge in AT	awareness and knowledge developers and government officers have regarding AT and how they compensate disabilities of PWD	19	Nodes\\ AT acquisition and usage \Stakeholders' knowledge in AT
2.7.1 Familiarity with AT	developers and government officers' awareness on assistive technologies and how they assist PWD	16	Nodes\\ AT acquisition and usage \Stakeholders' knowledge in AT\Familiarity with AT
2.7.2 Knowledge on how AT operate	knowledge developers and government officers have and ought to have regarding assistive technologies	7	Nodes\\ AT acquisition and usage \Stakeholders' knowledge in AT\Knowledge on how AT operate
2.8 Training in AT	issues relating to the significance of training in assistive technologies, cost of training and availability of training facilities	19	Nodes\\ AT acquisition and usage \Training in AT
2.8.1 Importance of training	the significance of training in assistive technologies and the benefits thereof	16	Nodes\\ AT acquisition and usage \Training in AT\Importance of training
2.8.2 Lack of expertise	issues relating to the availability of experts to train PWD in assistive technologies and devices	10	Nodes\\ AT acquisition and usage \Training in AT\Lack of expertise

Name	Description	No. of Sources Coded	Hierarchical Name
2.8.3 Training cost	cost of training in AT is high especially for those PWD not enrolled in educational institutions	7	Nodes\ AT acquisition and usage \Training in AT\Training cost
2.8.4 Training facilities	there are limited facilities providing training in assistive technologies for PWD	7	Nodes\ AT acquisition and usage \Training in AT\Training facilities
9. Effects of inaccessibility	existing challenges PWD face and potential consequences they will encounter due to lack of access to E-government services	24	Nodes\Effects of inaccessibility
3.1 Cost burden	lack of access to E-government services increases the cost of accessing government services for PWD (e.g. making multiple trips to government offices)	12	Nodes\Effects of inaccessibility \Cost burden
3.1.1 Extra cost	accessing E-government services comes at an extra cost for PWD who need to first purchase assistive technologies and train in them	7	Nodes\Effects of inaccessibility \Cost burden\Extra cost
3.1.2 Low financial status	many PWD earn low salaries, and several of them are unemployed making it difficult to cope with the high financial obligations	10	Nodes\Effects of inaccessibility \Cost burden\Low financial status
3.2 Lack of independence and privacy	lack of access makes PWD dependant on others in effect reducing their privacy and confidentiality	14	Nodes\Effects of inaccessibility \Lack of independence and privacy
3.2.1 Lack of independence	lack of access to E-government services makes PWD dependant; always relying on assistance to access information and services	14	Nodes\Effects of inaccessibility \Lack of independence and privacy\Lack of independence
3.2.2 Lack of privacy	lack of access to E-government services reduces privacy for PWD because others get to know their confidential information while assisting them	6	Nodes\Effects of inaccessibility \Lack of independence and privacy\Lack of privacy
3.3 Living deprived life	lack of access to E-government services deprives PWD of essential information and services available for their non-disabled counterparts	9	Nodes\Effects of inaccessibility \Living deprived life
3.3.1 Deprivation	lack of access restricts PWD depriving them of essential information and services	6	Nodes\Effects of inaccessibility \Living deprived life\Deprivation
3.3.2 Stagnation	progress of PWD will be slow and has a tendency of affecting their livelihood	5	Nodes\Effects of inaccessibility \Living deprived life\Stagnation
3.4 Low productivity	lack of access to E-government services makes PWD less productive, limiting their performance and	12	Nodes\Effects of inaccessibility \Low productivity
3.4.1 Creating limitations	PWD are limited in their achievements as they must rely on others for assistance	6	Nodes\Effects of inaccessibility \Low productivity\Creating limitations
3.4.2 Reducing efficiency	PWD are less efficient thereby reducing their productivity	9	Nodes\Effects of inaccessibility \Low productivity\Reducing efficiency
3.5 Risk and emotional effect	lack of excess makes PWD feel a sense of discrimination and exposes them to several other risks	8	Nodes\Effects of inaccessibility \Risk and emotional effect

Name	Description	No. of Sources Coded	Hierarchical Name
3.5.1 Deepening discrimination	lack of access to E-government services amounts to discrimination against PWD from government	4	Nodes\\Effects of inaccessibility \Risk and emotional effect\Deepening discrimination
3.5.2 Negative emotions	lack of access to E-government services leads to anxiety, frustration and emotional pain	3	Nodes\\Effects of inaccessibility \Risk and emotional effect\Negative emotions
3.5.3 Risk-related	lack of access to E-government platforms means PWD may find it difficult to access certain emergency services such as E-medical services	4	Nodes\\Effects of inaccessibility \Risk and emotional effect\Risk-related
4. E-government challenges and benefits	benefits and challenges relating to E-government, such as level of E-government maturity and the need for multi-channel access to E-government services	23	Nodes\\E-government challenges and benefits
4.1 E-government benefits	benefits of E-government services particularly for PWD	13	Nodes\\E-government challenges and benefits\E-government benefits
4.1.1 Cost saving and convenience	E-government services enable citizens to access government services at their convenience and save time and cost	11	Nodes\\E-government challenges and benefits\E-government benefits\Cost saving and convenience
4.1.2 Eliminating discrimination	E-government reduces face to face human interactions which sometimes result in discrimination against PWD	3	Nodes\\E-government challenges and benefits\E-government benefits\Eliminating discrimination
4.2 E-government challenges	challenges facing E-government implementation and access to E-government services in Ghana	16	Nodes\\E-government challenges and benefits\E-government challenges
4.2.1 E-government access options	E-government should have diverse access options to allow citizens to choose	6	Nodes\\E-government challenges and benefits\E-government challenges\E-government access options
4.2.2 E-government awareness and adoption	intensifying E-government awareness creation is to necessary to increase its adoption	7	Nodes\\E-government challenges and benefits\E-government challenges\E-government awareness and adoption
4.2.3 Inaccessible E-government platforms	E-government portals are inaccessible owing to lack of accessibility features	11	Nodes\\E-government challenges and benefits\E-government challenges\Inaccessible E-government platforms
4.3 E-government maturity	level of E-government maturity and the reliability of E-government services	14	Nodes\\E-government challenges and benefits\E-government maturity
4.3.1 E-government at an infant stage	E-government services at an infant stage and many services still require visits to government offices to complete transactions	11	Nodes\\E-government challenges and benefits\E-government maturity\E-government at an infant stage
4.3.2 E-government not reliable	E-government informational portals not frequently updated and lacking relevant information	6	Nodes\\E-government challenges and benefits\E-government maturity\E-government not reliable

Name	Description	No. of Sources Coded	Hierarchical Name
5. Developing E-government	factors that explicitly or implicitly influence the development of E-government applications	33	Nodes\\Developing E-government
5.1 Design considerations	design considerations made for PWD if any in the development of E-government applications and design specifications necessary for accessibility	28	Nodes\\Developing E-government \\Design considerations
5.1.1 Design specifications	specific design considerations are required to ensure E-government applications are accessible to PWD	13	Nodes\\Developing E-government \\Design considerations\\Design specifications
5.1.2 Lack of consideration for PWD	accessibility is hardly considered as most services are designed without having in mind PWD	23	Nodes\\Developing E-government \\Design considerations\\Lack of consideration for PWD
5.2 Determinants of final design	final design of E-government applications determined by stakeholder demands and user test outcomes	19	Nodes\\Developing E-government \\Determinants of final design
5.2.1 Stakeholder engagement	outcomes of stakeholder meetings and consultation are factored into final development of E-government applications	8	Nodes\\Developing E-government \\Determinants of final design\\Stakeholder engagement
5.2.2 User-test outcomes	testing is a necessary component of development, and final development is concluded using user-test outcomes	14	Nodes\\Developing E-government \\Determinants of final design\\User-test outcomes
5.3 Developers' perceptions	underlining assumptions, inner feelings and ideas developers hold that inform their style of	14	Nodes\\Developing E-government \\Developers' perceptions
5.3.1 PWD need assistance to online services	PWD would always need assistance to efficiently access online services	8	Nodes\\Developing E-government \\Developers' perceptions\\PWD need assistance to online services
5.3.2 PWD not technology users	PWD are not regular users of technology	6	Nodes\\Developing E-government \\Developers' perceptions\\PWD not technology users
5.3.4 Training and development assumptions	developer type is determined by the approach adopted in programming	9	Nodes\\Developing E-government \\Developers' perceptions\\training and development assumptions
5.4 Development guidelines	guidelines developers follow and need to know to improve the accessibility of E-government applications	13	Nodes\\Developing E-government \\Development guidelines
5.4.1 Guidelines for developers	developers follow guidelines in the process of development and require contextual guidelines for the development of accessible E-government	12	Nodes\\Developing E-government \\Development guidelines\\Guidelines for developers
5.4.2 W3C guidelines	developers' knowledge on the World Wide Web Consortium guidelines for developing accessible web applications	10	Nodes\\Developing E-government \\Development guidelines\\W3C guidelines
5.5 E-government contracts	development of E-government applications is determined by existing government policies and guidelines outlined in E-government contracts	12	Nodes\\Developing E-government \\E-government contracts

Name	Description	No. of Sources Coded	Hierarchical Name
5.5.1 E-government development guidelines	development of E-government applications follows guidelines outlined by government in E-government contracts	5	Nodes\\Developing E-government \\E-government contracts\\E-government development guidelines
5.5.2 Government policies	development of E-government applications follows existing policies in place by government with regards to developing government applications	7	Nodes\\Developing E-government \\E-government contracts\\Government policies
5.6 Market force drivers	development is affected by the target groups of developers and contract deadlines they must meet	12	Nodes\\Developing E-government \\Market force drivers
5.6.1 Target users	software development is driven by the market size and the target groups developers focus on	12	Nodes\\Developing E-government \\Market force drivers\\Target users
5.6.2 Time constraint	development and software features incorporated in the design is determined by contract time deadlines	3	Nodes\\Developing E-government \\Market force drivers\\Time constraint
6. Institutions, policies and enforcement	existing policies (Act, bills) that protect the interest of PWD and how institutions are enforcing them to improve accessibility	37	Nodes\\Institutions, policies and enforcement
6.1 Enforcing accessibility	requirements needed in place and stakeholders who need to be involved in enforcing accessibility for	35	Nodes\\Institutions, policies and enforcement\\Enforcing accessibility
6.1.1 Accessibility policy	implementation of accessibility policy by the government as a requirement to compel developers to incorporate accessibility features for PWD.	25	Nodes\\Institutions, policies and enforcement\\Enforcing accessibility\\Accessibility policy
6.1.2 Collective responsibility	enforcing accessibility is a collective responsibility of everyone in society	10	Nodes\\Institutions, policies and enforcement\\Enforcing accessibility\\Collective responsibility
6.1.3 Developers	developers need to need clients and set the pace to enforce accessibility	5	Nodes\\Institutions, policies and enforcement\\Enforcing accessibility\\Developers
6.1.4 Government	government is responsible for enforcing accessibility	20	Nodes\\Institutions, policies and enforcement\\Enforcing accessibility\\Government
6.1.5 Government agencies	government agencies offering services to the public should enforce accessibility	10	Nodes\\Institutions, policies and enforcement\\Enforcing accessibility\\Government agencies
6.1.6 Industry and private partners support	support from industry and private partners is needed to enforce accessibility for PWD	22	Nodes\\Institutions, policies and enforcement\\Enforcing accessibility\\Industry and private partners support
6.1.6.1 E-government applications development	E-government applications are mostly developed by the private sector and require their support to enforce accessibility	4	Nodes\\Institutions, policies and enforcement\\Enforcing accessibility\\Industry and private partners support\\E-government applications development

Name	Description	No. of Sources Coded	Hierarchical Name
6.1.6.2 Hardware design considerations	industry and private companies who design or import hardware need to ensure design considerations for PWD	8	Nodes\\Institutions, policies and enforcement\\Enforcing accessibility\\Industry and private partners support\\Hardware design considerations
6.1.6.3 Private partner funding	the private sector needs to provide support for activities such as training, awareness creation to improve accessibility	14	Nodes\\Institutions, policies and enforcement\\Enforcing accessibility\\Industry and private partners support\\Private partner funding
6.2 Inclusive education	inclusive education as a means to promote awareness of disabilities and accessibilities	13	Nodes\\Institutions, policies and enforcement\\Inclusive education
6.2.1 Inclusive education challenges	challenges encountered in the implementation of inclusive education	6	Nodes\\Institutions, policies and enforcement\\Inclusive education\\inclusive education challenges
6.2.2 Inclusive education solution	practising inclusive education is a way to ensure long-term awareness of disabilities and accessibility	7	Nodes\\Institutions, policies and enforcement\\Inclusive education\\inclusive education solution
6.2.3 Inclusive policy enforcement	implementation of inclusive education policy is weak and ineffective	4	Nodes\\Institutions, policies and enforcement\\Inclusive education\\inclusive policy enforcement
6.3 Institutions enforcing laws	the willingness of institutions to firmly implement the existing legislation promoting accessibility	23	Nodes\\Institutions, policies and enforcement\\Institutions enforcing laws
6.3.1 Enforcing the laws	the extent to which laws are being enforced in Ghana	20	Nodes\\Institutions, policies and enforcement\\Institutions enforcing laws\\Enforcing the laws
6.3.2 Lack of political will	lack of political will to implement to latter policies and legislation	3	Nodes\\Institutions, policies and enforcement\\Institutions enforcing laws\\Lack of political will
6.3.3 NITA lacks authority	NITA not mandated with full legal authority to enforce accessibility	2	Nodes\\Institutions, policies and enforcement\\Institutions enforcing laws\\NITA lacks authority
6.3.4 NITA national regulator	NITA is responsible for regulating ICT-related services for Ghana Government	5	Nodes\\Institutions, policies and enforcement\\Institutions enforcing laws\\NITA national regulator
6.4 Persons with Disability Act (PDA)	Persons with Disability Act 715 passed to protect the interest and rights of PWD in Ghana	35	Nodes\\Institutions, policies and enforcement\\Persons with Disability Act (PDA)
6.4.1 Amendment	amendments are needed on PDA to ensure it promotes accessibility to electronic services	7	Nodes\\Institutions, policies and enforcement\\Persons with Disability Act (PDA)\\Amendment

Name	Description	No. of Sources Coded	Hierarchical Name
6.4.2 Awareness of PDA	participants' awareness of Persons with Disability Act	31	Nodes\Institutions, policies and enforcement\Persons with Disability Act (PDA)\awareness of PDA
6.4.3 Lack of enforcement	Ghanaian institutions are not enforcing PDA	26	Nodes\Institutions, policies and enforcement\Persons with Disability Act (PDA)\Lack of enforcement
6.4.4 PDA and digital accessibility	PDA effectiveness in promoting accessibility to E-government services and electronic services in general	11	Nodes\Institutions, policies and enforcement\Persons with Disability Act (PDA)\PDA and digital accessibility
6.4.5 PDA on physical accessibility	PDA relates more to the accessibility of physical infrastructure than electronic services	13	Nodes\Institutions, policies and enforcement\Persons with Disability Act (PDA)\PDA on physical accessibility
7. Making society inclusive	significance of inclusion for PWD and how this could be achieved	23	Nodes\Making society inclusive
7.1 Governmental support	government has the responsibility to promote equality and provide the needed support for PWD	16	Nodes\Making society inclusive\Governmental support
7.1.1 Government's cushioning	the government should provide every support for PWD; ensuring they get all benefits other citizens enjoy	12	Nodes\Making society inclusive\Governmental support\Government's cushioning
7.1.2 Promoting equality	government has a responsibility to promote even playing fields so that PWD can also compete with non-disabled counterparts	7	Nodes\Making society inclusive\Governmental support\Promoting equality
7.2 Societal and family support	PWD need to be supported by family and society at large, so they feel belonged	20	Nodes\Making society inclusive\Societal and family support
7.2.1 Disability is no respecter of persons	everyone is a potentially disabled person hence issues of disabilities should be everyone's concern in the society	6	Nodes\Making society inclusive\Societal and family support\Disability is no respecter of persons
7.2.2 Family support for PWD	immediate family members of PWD ought to render every support to them so others would emulate	6	Nodes\Making society inclusive\Societal and family support\Family support for PWD
7.2.3 Societal support for PWD	PWD should be engaged and involved in every facet of the society such as developing E-government services to ensure they are accessible	15	Nodes\Making society inclusive\Societal and family support\Societal support for PWD
8. PWD lack E-readiness	factors that affect PWD preparedness to take advantage of E-government services	21	Nodes\PWD lack E-readiness
8.1 Access to ICTs and internet	adequate access to ICTs at a reasonable cost and stable internet services play key role in improving	10	Nodes\PWD lack E-readiness\Access to ICTs and internet
8.1.1 Access to ICTs	how available and affordable it is to access ICTs such as computers, mobile phones and other electronic gadgets in Ghana	7	Nodes\PWD lack E-readiness\Access to ICTs and internet\Access to ICTs

Name	Description	No. of Sources Coded	Hierarchical Name
8.1.2 Internet access	penetration, stability and affordability of internet services in Ghana	5	Nodes\PWD lack E-readiness\Access to ICTs and internet\Internet access
8.2 Awareness of their rights	PWD need to know their rights as stipulated in the policies and should demand them accordingly	6	Nodes\PWD lack E-readiness\Awareness on their rights
8.2.1 Advocating for entitlement	PWD ought to advocate for prerogatives due them	2	Nodes\PWD lack E-readiness\Awareness on their rights\Advocating for entitlement
8.2.2 Knowing the law	PWD should know the laws to hold authorities' accountability for their entitlements	2	Nodes\PWD lack E-readiness\Awareness on their rights\Knowing the law
8.2.3 PWD have equal rights	PWD have equal rights like all other citizens	2	Nodes\PWD lack E-readiness\Awareness on their rights\PWD have equal rights
8.3 Education on E-government systems	PWD should show interest and be educated on E-government systems to enable them to use them efficiently	6	Nodes\PWD lack E-readiness\Education on E-government systems
8.3.1 Understanding E-government systems	PWD need to have an understanding of how E-government systems operate, so they easily adapt them	2	Nodes\PWD lack E-readiness\Education on E-government systems\Understanding E-government systems
8.3.2 Willingness and skills to use E-government systems	PWD should demonstrate readiness to use E-government systems and be properly trained on how to use them	5	Nodes\PWD lack E-readiness\Education on E-government systems\Willingness and skills to use E-government systems
8.4 Late ICT adoption and use	ICT adoption in Ghanaian schools is late which makes it even more difficult for PWD to master it	8	Nodes\PWD lack E-readiness\Late ICT adoption and use
8.4.1 Knowledge on ICTs	PWD get to know about ICT late hence the late adoption	4	Nodes\PWD lack E-readiness\Late ICT adoption and use\Knowledge on ICTs
8.4.2 Late adoption of technologies	Intensive use of computers and other ICTs allowed only at tertiary level in Ghana	4	Nodes\PWD lack E-readiness\Late ICT adoption and use\Late adoption of technologies
8.5 Literacy	PWD require reading and ICT literacy to successfully use E-government systems	10	Nodes\PWD lack E-readiness\Literacy
8.5.1 ICT literacy	PWD should have the ability to manipulate and use ICTs well without assistance	4	Nodes\PWD lack E-readiness\Literacy\ICT literacy
8.5.2 Reading literacy	PWD need some formal education to enable them to read and write	7	Nodes\PWD lack E-readiness\Literacy\Reading literacy
9. PWD role in accessibility	importance of PWD making known their challenges and the difficulties they face in voicing out their	29	Nodes\PWD role in accessibility
9.1 PWD lack power to enforce accessibility	PWD lack the power to enforce accessibility because they do not form the majority	6	Nodes\PWD role in accessibility\PWD lack power to enforce accessibility
9.1.1 Lacking power	PWD lack the power to enforce accessibility	3	Nodes\PWD role in accessibility\PWD lack power to enforce accessibility\Lacking power

Name	Description	No. of Sources Coded	Hierarchical Name
9.1.2 Minority group	PWD forms a minority with little bargaining power	3	Nodes\\PWD role in accessibility\\PWD lack power to enforce accessibility\\Minority group
9.2 PWD need to play active role	PWD need to consistently voice out their challenges regarding access to E-government and disability organisations should act as a pressure group on government	16	Nodes\\PWD role in accessibility\\PWD need to play active role
9.2.1 Disability organisations pushing	Disability organisations in Ghana should lobby and mount pressure on the government to facilitate swift response to the needs of PWD	7	Nodes\\PWD role in accessibility\\PWD need to play active role\\Disability organisations pushing
9.2.2 PWD pushing individually	PWD at individual levels need to be actively seen by speaking up and reporting their complaints to the responsible authorities	13	Nodes\\PWD role in accessibility\\PWD need to play active role\\PWD pushing individually
9.3 Voicing out complaints	strategies PWD adopt while voicing out their complaints regarding access to government services	13	Nodes\\PWD role in accessibility\\Voicing out complaints
9.3.1 Organisations and media	PWD voice out their complaints using organised associations such as the association of the disabled and or by seeking attention in the media	7	Nodes\\PWD role in accessibility\\Voicing out complaints\\Organisations and media
9.3.2 Personal efforts	PWD voice out their complaint using personal efforts and links to a higher authority	6	Nodes\\PWD role in accessibility\\Voicing out complaints\\Personal efforts
10. Societal perceptions and beliefs	beliefs and negative perceptions the Ghanaian society hold regarding disabilities	20	Nodes\\Societal perceptions and beliefs
10.1 Contextual conditions	prevailing conditions in Ghana that tend to influence the reasoning and behaviour of E-government stakeholders	10	Nodes\\Societal perceptions and beliefs\\Contextual conditions
10.1.1 Attitude towards PWD	attitude and treatment meted out to PWD in the Ghanaian society	4	Nodes\\Societal perceptions and beliefs\\Contextual conditions\\Attitude towards PWD
10.1.2 Prevailing conditions	prevailing conditions in Ghana that affect the behaviour and conduct of people	8	Nodes\\Societal perceptions and beliefs\\Contextual conditions\\Prevailing conditions
10.2 Social-cultural beliefs	social and cultural beliefs Ghanaians hold about disabilities which determines their attitudes towards PWD	16	Nodes\\Societal perceptions and beliefs\\Social-cultural beliefs
10.2.1 Cultural beliefs	cultural beliefs about disabilities in Ghana informing societal behaviour	3	Nodes\\Societal perceptions and beliefs\\Social-cultural beliefs\\Cultural beliefs
10.2.2 Societal perceptions	perceptions the Ghanaian society hold regarding PWD	16	Nodes\\Societal perceptions and beliefs\\Social-cultural beliefs\\Societal perceptions