Towards effective management and preservation of digital cultural heritage resources: an exploration of contextual factors in Ghana

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By

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Abstract

In today's world of digital technologies, cultural heritage institutions, particularly in developed countries, are seeking ways to create national digital memories for the future of the citizenry. However, rapidly developing technologies and their concomitant technological obsolescence put future memories at risk. The challenge is enormous in developing countries that, when compared to their developed counterparts, lack adequate resources and technologies for effective digital resources management and preservation. As a developing country, Ghana appears ready to face the challenges of effective digital resources management. The country has developed programmes and a national policy on information and communication technologies (ICTs) for accelerated development. However, Ghana does not appear to be effective in managing or preserving digital cultural heritage resources.

An interpretive case research design involving 27 semi-structured interviews with key stakeholders from 23 institutions was used to explore the various contextual factors influencing *the management and preservation of digital cultural heritage resources* (or DPM). Rogers' (2003) "diffusion of innovation" (DOI) theory and Davies' (2000) "policy, strategy and resources" (PSR) troika model provided a basis for a preliminary model of factors to guide the research.

Although the DPM innovation was not fully diffused in Ghana, related activities at the base, middle and higher levels of the Ghanaian social system were unintentionally fostering the adoption process. Four main clusters of contextual factors that were influencing the DPM adoption process in Ghana were identified: attitudinal, resources-related, policy-related, and managerial factors. Key stakeholders perceived the design of appropriate strategies, adequate resource allocation, and proper implementation of policies as key enabling factors for effective adoption of DPM in Ghana. However, a general lack of interest in cultural institutions (libraries, archives and museums) and in information management on the part of decision makers and the Ghanaian stakeholders as a whole was found to hinder DPM adoption.

This study extends Information Systems (IS) research involving DOI theory and the PSR troika model into a developing country context. Attitudinal-based complexities involving misunderstandings among various tribal groups in Ghana, and resources-based complexities surrounding technology access and use, were found from the interview data and were added to the initial model which was expanded to aid in understanding the various contextual factors that influence DPM adoption in Ghana. In addition to the study contributing to theoretical understandings in IS research, it provides Ghanaian policy developers with an empirical base for accelerating adoption of DPM in Ghana. It also provides New Zealand and other digital preservation advanced countries with a deeper understanding from which to provide contextually designed advisory services to other developing countries (particularly in the Pacific Island regions) as it enables the contextual understanding of the factors from Ghana.

Key words: *Digitisation, Digital Preservation, Cultural Heritage, National Digital Memory*

Table of Contents

List of Figures

List of Tables

Statement of Originality

To the best of my knowledge this thesis does not incorporate any material previously accepted by any institution for the award of a degree or diploma. Previously published materials were only used with due acknowledgements.

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Signature

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Wellington, April, 2014

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List of Acronyms

Acronym	*Meaning*
ANZ	Archives New Zealand
DANIDA	Danish International Development Agency
DOI	Diffusion of Innovation Theory
DPC	Digital Preservation Coalition
DPM	Digital Preservation Management or The management and preservation of digital cultural heritage resources
DP-PIG	Digital Preservation Practical Implementers Guild
GIFEC	Ghana Investment Fund for Electronic Communication
GLA	Ghana Library Association
GLB	Ghana Library Board
GMMB	Ghana Museums and Monuments Board
ICA	International Council on Archivists
ICT	Information and Communication Technologies
ICT4AD	Information and Communication Technology for Accelerated Development
IFLA	International Federation of Library Association and Institutions
KNUST	Kwame Nkrumah University of Science and Technology
LIANZA	Library and Information Association of New Zealand Aotearoa
LIS	Library and Information Science
NDCHR	National Digital Cultural Heritage Repository
NDHA	National Digital Heritage Archive
NDM	National Digital Memory
NLA	National Library of Australia
NLNZ	National Library of New Zealand
NZDCS	National Digital Content Strategy
NZDS	New Zealand Digital Strategy
PARBICA	Pacific Regional Branch of ICA
PRAAD	Public Record and Archives Administration Department
PSR Troika	Policy Strategy and Resources Troika
SSNIT	Social Security and National Insurance Trust
UNESCO	United Nations Educational, Scientific and Cultural Organisation

Chapter One: Introduction to the Study

1.1 Introduction

In this chapter, I introduce the study and outline the research context. I describe the background to the research problem and define the specific problem this study investigates. The research questions that guided the exploration of the problem are listed and I define key concepts as they are used in this study. Following the justification for this research, I briefly describe the theoretical considerations and the methodological processes I followed to arrive at an understanding of the research problem. I also describe the delimitation of the scope of the research and conclude this chapter by showing how this thesis is organised.

1.2 Research Context

The history and traditions that a country has had for many years are considered an important part of that country because they uniquely identify the citizens as a distinct group of people (Banks-Wallace, 2002; Belich, 2003; Lentz, 2000; Poll, 2010). Together, the traditions, history, cultural activities and the evidence they provide, form the country's national heritage as well as its memory for the future (Confino, 1993; Mulligan & Schultz, 2002; White, 1999). Hence, there is the need for countries to develop national approaches and co-ordinate actions to manage and preserve such cultural heritage resources effectively (Eden, Bell, Dungworth, & Mathews, 1998). Managing and preserving heritage materials has long been one of the core functions of memory institutions such as libraries, archives and museums (see Cordeiro, 2004, p. 6).

Their passion for their work notwithstanding, information managers in cultural institutions find the responsibilities of providing effective management and preservation of heritage resources very challenging (Harwood, 1994). This, as Harwood identified two decades ago, is a consequence of the new digital technologies. These technologies have not only overwhelmed today's information managers with huge amounts of information, they have also resulted in many new forms of digital cultural heritage materials. As a result, cultural heritage institutions, particularly in developed countries, are seeking ways to use digital technologies to effectively manage and preserve their cultural heritage resources. They also are looking for ways to create national digital memories (NDMs) for the future of their citizenry.

The fast developing digital technologies not only affect the amount of data that information managers need to manage and preserve, their concomitant challenge of technological obsolescence also puts future memories at risk, particularly, those in digital forms (Hockx-Yu, 2006, p. 234). The seriousness of this situation has ignited interest and passion inspiring most cultural institutions to develop and implement actions and plans that translate into national digital policies and strategies for their countries. Such actions, according to Walsham and Waema (1994, p. 151), are critical elements for the establishment of successful information systems in contemporary societies.

I consider the provision of long-term preservation and access to national digital cultural heritage resources as an information system activity. The national library, national archive and national museum of New Zealand provide typical examples with what they are doing to preserve the cultural heritage of New Zealand. Through the efforts of these cultural institutions, New Zealand has now established a National Digital Heritage Archive[1] (NDHA) which I regard as New Zealand's digital memory. The American Memory[2], for the United States of America (USA) and the Australian Digital Collection[3] for Australia are other examples of NDMs. The Europeana[4] project, which brings together NDMs of European countries, represents a supra-national approach to NDMs. There is now discussion of digital cultural heritage 2.0, where cultural institutions are taking advantage of socio-technical systems to interpret the values of their digital cultural heritage resources (Liew, 2013).

Compared to their counterparts in the developed world, developing countries lack adequate resources to effectively implement such information systems (Avgerou, 2008, p. 133). As a developing country, Ghana appears inclined to finding its place in the digital world. The introduction of the Records Management Improvement Programme (1992-1999) as part of the Civil Service Reform Programme led to the conversion of the National Archives of Ghana into the Public Record and Archives Administration Department (PRAAD) through the legislative instrument number 1628 1996 (PRAAD, 2006). The definition of the functions of PRAAD by Act 535 of 1997 also represented a new approach in Ghana to managing recorded heritage of the country (PRAAD, 2006). Furthermore, the development of the Information and Communication Technology for Accelerated Development (Ghana ICT4AD) policy in

[1] See this link for details about NDHA; http://archives.govt.nz/advice/government-digital-archive-programme
[2] Details about the American Memory can also be found here; http://memory.loc.gov/ammem/about/index.html
[3] Iinformation about the Australian Digital Collection is in this link; http://www.nla.gov.au/digicoll/
[4] For details about the Europeana, see http://pro.europeana.eu/about

2004 is an indication of Ghana's vision to be part of nations that have recognised the developmental opportunities and the challenges of the emerging information age which is characterised by information and communication technologies (ICTs) (Ghana ICT4AD, 2003, p. 6).

1.3 About Ghana

Ghana is located in West Africa, covering a total area of 238, 540 square kilometres with a population of about 25 million people (GhanaWeb, 2014). It shares borders with Togo to the east, Ivory Coast to the west, Burkina Faso to the north and the Gulf of Guinea to the south. It is mainly a tropical rainforest belt, broken with heavily forested hills and many streams and rivers with average temperature of about 26 degrees Celsius. The people of Ghana are made up of over 100 different linguistic and cultural groups, making a multicultural country with no single national language. Ghana was colonised by Britain and so the only common language is English, which is used in all formal settings and as the language of instruction in all schools from kindergarten to the university level. The economy is based on cocoa production; bauxite, diamond and gold mining; timber; and since 2007, oil. It has a parliamentary system of governance modelled along the American system (GhanaWeb, 2014).

The culture of Ghana is defined by the unique ways each of the tribal groups live. Apart from the multiplicity of indigenous cultures, there are now additions of various foreign cultures that have been incorporated into the country's social system, making Ghana a very diverse cultural space. The diverse traditional ceremonies, rituals, festivals occupations as well as the people's interactions with those from the outside world has resulted in many evidential artefacts of past activities that now provide important cultural heritage resources for the country (see Figure 7.2 for specific details on Ghanaian cultural heritage resources).

The impact of trade between Ghana and Europe for instance, can still be felt in the many coastal cities where a total of 37 forts and castles were built before the year 1800 (Arthur & Mensah, 2006, p. 300). Evidence of slave trade activities is also commonplace. The ancient slave market in the Kunsu forest at Kintampo and the famous Cape Coast Castle used as a point of departure for slave trading are examples of Ghanaian heritage resources. Many slave trade manuscripts, dispatches and letters for correspondences during the colonial era are also kept at PRAAD, Public Libraries and the National Museum.

1.3.1 Digital Heritage in Ghana

Digitisation of cultural heritage materials has become a common phenomenon worldwide. There are some digitisation initiatives occurring at the institutional level in Ghana, generating digital material. An initiative to digitise the slave trade archives at PRAAD (Azangweo, 2006) and the digitised objects on the website of Ghana Museums and Monuments Board (GMMB, 2011) are just a couple of examples. Other organisations such as the Social Security and National Insurance Trust (SSNIT), Kwame Nkrumah University of Science and Technology (KNUST) library, the University of Ghana Balme library, have also initiated the digitisation of their materials. It is therefore noticeable that the *digital world* is already in Ghana. Many analogue heritage objects have been captured into digital form through digital photo taking and scanning, creating digital heritage resources in Ghana. Therefore, digital heritage materials in Ghana include texts, still and moving pictures, audio, graphics and administrative records in born-digital forms.

But it appears these digital heritage resources are not organised. A search on Google for instance, for "Ghanaian heritage resources" reveals many digital forms of the country's heritage materials scattered across various websites on the World Wide Web (see Appendix 2). Ghanaian digital heritage resources are multiplying in various social media websites, such as Facebook and YouTube, but they are not controlled by any systematic national cultural heritage programme by Ghanaians. There is also no national strategy developed to consciously digitise and put together national digital heritage resources in one place in Ghana. This means the digital versions of Ghanaian heritage resources that are scattered on the internet are mainly being managed by foreign institutions that might not understand the beliefs and values embedded within those resources. This indicates a lack of effective management of digital heritage resources in Ghana which can create a gap in cultural information in the future.

1.3.2 The Digital Preservation Management Process

In this study, I perceive digital preservation as a process that includes the identification, capture, creation, management and preservation of digital materials for the future. I discuss various definitions of digital preservation in section 2.6. The management of the digital preservation and cultural heritage processes, including the technologies used, the policies and strategies employed, the institutions, infrastructure and the type of heritage resources being preserved are all part of what I refer in this study as Digital Preservation Management (DPM).

Thus, the discussions in this study focus not only on the technologies involved in digital preservation, but also on cultural heritage management issues, values, and belief systems involved in applying digital technologies.

Digital activities are going on separately at the individual and institutional levels, which do not appear effective. This raise questions as to why is there still no national approach to capture, create and collate Ghanaian heritage resources for long-term management and preservation? What is influencing the digital activities being undertaking in Ghana? These are some of the questions that come to my mind about DPM in Ghana.

As Zuraidah (2007, p. 48) opines, in such situations where separate institutions are embarking on different digitisation initiatives, there is the tendency that parties involved will interpret the management of the digitisation processes based on their own individual understandings and sensitivities. When exploring digitisation initiatives in Malaysia, Zuraidah observed that such a situation of individual digitisation processes can result in duplication and ineffectiveness in the management and preservation of digital resources (2007). Thus, there appears to be a crucial need for an orderly scholarly investigation to understand the nature and state of the management of digitisation initiatives by cultural heritage institutions in Ghana.

1.4 Background to the Research Problem

While Ghanaians are enthusiastically embracing the new digital technologies, the existing library and information management facilities, which were identified over two decades ago as being substandard (Alemna, 1989, p. 120), are still inadequate to cope with the needs of the country (Akussah, 2005). And although ICT is being used, it is woefully insufficient to project Ghana further into the digital world. For instance, Martey (2004b, p. 16) analysed how ICT is used for distance education in Ghana and identified that it was inadequate. Challenges associated with ICT application in Ghana do not only occur in distance education but also in library and information management. Even though inadequate and improper management practices for ICTs in Ghana were identified over a decade ago (Alemna, 1999, p. 168), the problems were still evident in the country five years later (Martey, 2004b). Current indications do not point to any improvement in management practice, especially in cultural institutions of the country.

A goal of the Ghana ICT4AD policy is to exploit and deploy ICT in all areas of the economy to ensure the effective use of the new digital technologies for the creation and management of digital resources (Ghana ICT4AD, 2003, p. 57). This goal implicitly supports future DPM. Regrettably, none of the 13 specific objectives (p. 8-9, 24), 10 key drivers (p. 10) or the 14 strategies (p. 31) of the ICT policy, focus on the management of recorded information or heritage resources in digital forms.

The position of a national library in designing policies and actions regarding information management for a country, cannot be over emphasised (Alemna, 1989, p. 122). National libraries have been very instrumental in the development of digital strategies for countries, particularly in developed areas, that have progressed in the development and implementation of national digital strategies and NDMs. The National Library of New Zealand, for example, providing leadership, collaborated with relevant Ministries and other organisations including cultural heritage institutions and private organisations to develop New Zealand's national digital strategy (Carnaby, 2009, p. 253) and subsequently the National Digital Heritage Archive (Knight, 2010, p. 85). Similarly, the National Library of Australia and the Library of Congress in America, played leading roles in the development of the Australian digital strategies (NLA, 2009) and the American Memory project respectively. It is therefore a significant deficiency that Ghana has no national library, despite calls for the establishment of such an important institution (Alemna, 1989, p. 12).

Professional associations such as library and information associations can also be very influential in matters relating to information management policies and strategies which concern national economic development (Alemna, 1989, p. 123). The Library and Information Association of New Zealand Aotearoa (LIANZA), for example, initiated the thinking about a national information strategy for New Zealand in 1999 (Carnaby, 2009, p. 252). In this regard, LIANZA serving as an agent of change effectively communicated the benefits of a national digital strategy on information management to the New Zealand stakeholders to adopt. Hence the government and people of New Zealand convinced of the relative advantages of digital innovation, provided funds and appropriate resources and support for the development and implementation of the New Zealand Digital Strategy (NZDS) and subsequently the New Zealand Digital Content Strategy (NZDCS). NZDS and NZDCS have been the driver for digitisation initiatives and digital information management in New

Zealand, contributing to the fast pace at which the country is developing in terms of digitisation and digital preservation initiatives (Dorner, 2009).

Unlike New Zealand, Ghana has not benefited much from professional associations. The Ghana Library Association (GLA) does not appear as an effective change agent to convince the government and people of Ghana of the benefits of establishing a national library in the country (Alemna, 1989, p. 123). There seems to be a lack of interest in the library and information management field by both the government and people of Ghana. Although, as Alemna contends, there is some awareness, especially in the official circles, of a direct correlation between economic development and quick, direct and efficient information management (Alemna, 1989, p. 120). The GLA however, attributes part of the problem to factors such as the scarcity of funds, negative attitudes by stakeholders toward libraries, lack of skilled personnel in the information management field, and inadequate resources (GLA, 2009).

These issues might not only be making the work of the GLA difficult, they might be hindering the development of information management activities in Ghana. I therefore considered it important to explore and understand the factors that are influencing the *management and preservation of digital cultural heritage resources* (which is used in this study to mean the general state of Digital Preservation Management or DPM) which could contribute to the establishment of a National Digital Memory (NDM) for Ghana.

1.5 Statement of the Problem

The background presented above shows that although Ghanaians were fast embracing the new digital technologies, there were no indications of interest, plan and adequate resources to enhance effective DPM. Also, professional bodies in Ghana have not been effective in communicating ideas about information management initiatives to influence appropriate changes. Therefore, the specific problem I investigated in this case study is that Ghana has not been effective in DPM. The contextual factors that are hindering progress or enabling it were unclear. The various contextual elements that were required for a process leading to the development of an NDM for Ghana were also unclear.

1.6 Research Questions

The following questions, arising from the research problem, guided my research:

1. *What is the state of DPM in Ghana?*
2. *What contextual factors are influencing DPM in Ghana?*
3. *How do these contextual factors influence DPM in Ghana?*
4. *What are the key elements necessary for the development of an NDM for Ghana?*

1.7 Research Objective

The purpose of this study has been to explore and understand the various contextual factors influencing the management and preservation of digital cultural heritage resources in Ghana. It also has aimed to identify the shape of heritage resources management and preservation in the country and seeks to elicit from the perspectives of stakeholders, the fundamental elements required for the development of an NDM for Ghana.

1.8 Definitions of Key Concepts

Definitions adopted by researchers are often not uniform, so key and controversial concepts are defined to establish positions taken in research (Perry, 1994, p. 14). The following definitions are adopted for the key concepts in this research:

Culture

The collective programming of the mind that distinguishes one group or category of people from another (Hofstede, 2007, p. 16).

Cultural Heritage Resources

Cultural heritage resources encompass all categories of tradition, including tangible and intangible as well as natural endowment and heritage resulting from armed conflicts. Tangible cultural heritage can be movable (paintings, sculpture, coins, manuscripts, books, and other printed materials), or immovable (monuments and archaeological sites.) or underwater cultural heritage (shipwrecks, underwater ruins and cities) and natural heritage (natural sites with cultural aspects such as cultural landscape, physical, biological or geographical formations). War memorials are some of the heritage resulting from armed conflict (UNESCO, 2008).

Digitisation

The process of creating files by scanning, digital-photographing or otherwise converting analogue materials into digital materials (DPC, 2009).

Digital Material

A broad term encompassing both digital surrogates created as a result of converting analogue materials to digital forms (digitisation), and *born digital* objects for which there has never been and is never intended to be an analogue equivalent (DPC, 2009).

Digital Heritage Materials

In this study the definition for digital heritage is based on UNESCO's (2012) conception, as computer-based materials of enduring value that should be kept for future generations. They emanate from the communities, industries, sectors and regions where they are created and valued. Digital heritage materials are different from other digital materials because they have enduring value and they require active preservation approaches to ensure their continuity. (UNESCO, 2012a).

Digital Preservation

Principles, practices, methods, strategies and managed activities that ensure long term preservation for continued access to digital materials for as long as necessary (DPC, 2009).

Digital Preservation Management (DPM)

In this study DPM is used to refer to all the procedures, technology, information infrastructure and processes involved in the general state of management and preservation of digital cultural heritage resources.

Information Infrastructure

The communication systems, information technologies, information related competencies and the basic education systems which enable the public to understand store and use information in a country (Sugihara, 1994, p. 82). This is seen in the information culture of that country.

Information Culture

For the purpose of this study 'information culture' is used, applying Riyaz and Smith (2012, p. 176) definition as the attitudes, beliefs and behaviour of a community towards information

ownership and information use. It also include a number of contributing elements such as indigenous knowledge, ICT, information literacy, research and development and publishing, libraries and information services, mass media and information policies (p. 178).

Information Management Experts

Experts refer to informed individuals who have adequate knowledge in a subject area or about a phenomenon (McKenna, 1994; Okoli & Pawlowski, 2004; William & Webb, 1994). In the context of this study, informed individuals who have adequate knowledge and practical professional experience in information management, and who have at least first degree in information studies or equivalent experience and are working in the various information management institutions, are considered as information management experts.

National Digital Memory

A repository that provides free and open access to digital copies of national heritage resources through the internet to written and spoken words, sound recordings, still and moving images, prints, and sheet music that document a country's experience, history and creativity for education and lifelong learning (American Memory, 2010).

Stakeholders

The various key players involved in, or affected by digitisation and the management of digital materials in Ghana. They include the people of Ghana, librarians, archivists and other information experts, cultural heritage experts, traditionalists and custodians of the culture, government officials, policy makers, strategy developers and implementers, scholars, funders of DPM initiatives, computer professionals and teachers who teach subjects for which cultural heritage resources in digital forms would support the curriculum.

1.9 Justification for the Research

The importance of information technology to national development has been recognised by many African countries (Alemna, 1999, p. 167). National development includes being effective in digital resources management. This research is a sequel to a previous study in which I investigated Ghanaian information professionals' perception of digital libraries. In that study, I recommended the need to investigate the management and preservation of digital cultural heritage resources that are coming up in Ghana (see Boamah, 2009).

This research which builds on my previous study is likely to prompt decision-makers and all stakeholders to take DPM as a priority area. Although Ghana has also recognised the importance of ICTs, there are no apparent plans in place for their effective management. The identification of various contextual factors relating to DPM in Ghana is important to enable the country to manage its digital resources effectively, particularly those relating to cultural heritage. I consider that effective DPM is a precursor to the establishment of an NDM. Identifying the factors is likely to assist Ghana to understand the importance of establishing an NDM. The outcome of my case study can be useful not only for Ghana as a developing country seeking to understand, learn and improve in DPM, but also to New Zealand. According to the website of the New Zealand Digital Content Strategy (NZDCS), the aim of New Zealand's digital strategy is to "ensure that New Zealand is a world leader in using information and technology to realise the economic, environmental, social and cultural goals and to create a digital future for New Zealanders" (Digital Strategy 2.0, 2008).

Being a world leader in the use of information technology, as indicated in the comment above, may imply New Zealand as a partner or mentor leading other countries, particularly, developing nations, to find their way in using ICT for information management. For New Zealand to really identify what is purely New Zealand in terms of cultural heritage and digital space, it is important for the country to understand what is happening in other areas, particularly in developing countries so that New Zealand can effectively lead other countries. The findings from Ghana can be important for New Zealand to develop contextually relevant advisory services to assist other developing regions, for instance, Pacific Island nations. Further, the study can be useful for the DPM community and academics. While enhancing understanding of the factors that can enable or hinder the DPM adoption process in Ghana, the methodological processes employed to arrive at the findings can have importance for the academic research community.

1.10 Theoretical Considerations

In this study I explored factors that are influencing DPM in Ghana. I considered DPM as an innovation. Therefore, Rogers' (2003) Diffusion of Innovation (DOI) theory provided a guide for exploring and understanding the various factors that were enabling or hindering the decision making for the adoption of the innovation in Ghana. Also, Davies (2000, p. 25) identifies that any effective understanding of strategy development and contextualisation revolves around an understanding of policies and resources in that country. Therefore,

Davies' Policy, Strategy, Resources (PSR) troika model was also used as a guide to explore and understand the various factors affecting policies, strategies and resources in Ghana. I also identified from the literature, factors that influence digital resource management to corroborate the factors from theory. Figure 1.1 illustrates initial thoughts about theoretical considerations.

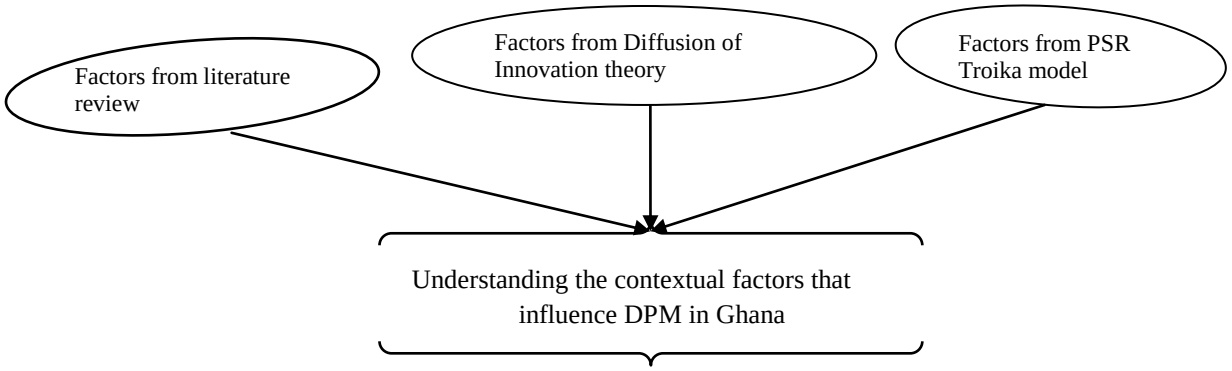

Figure 1.1: Summary of theoretical considerations

A preliminary model of factors was developed based on relevant theory to guide the research (see section 3.6). I revised the model based on the findings of the case study to assist in understanding the various contextual factors that are influencing DPM in Ghana (see section 8.2). A detail discussion of the theories is provided in Chapter three.

1.11 Research Methodology

This research is a single case study within the interpretivist paradigm. I employed the exploratory case research method, bringing into play a qualitative methodology for the research processes and procedures. Qualitative field research enabled me to observe the Ghanaian social system (in relation to the new digital technologies), in its natural setting and in a well-planned, active way, just as qualitative studies are known to do (Babbie, 2001, p. 274). Since meanings of contextual factors are subjective, it was only through a flexible approach that I could get a better understanding of those factors. Qualitative research enhances such flexibility (Miles & Huberman, 1994, p. 10) and strengthens in-depth understanding (Kaplan & Maxwell, 2005, p. 32). My use of exploratory case research stems from my search for understanding of the various factors influencing DPM in Ghana. I relied on human interpretations and meanings, which I gathered from stakeholders in the country. As Walsham (1995, p. 74) indicates, a vehicle for interpretive investigations like this is often

through in-depth case research, where study involves visits to the field site over a period of time.

I employed the single case with a holistic unit of analysis type of case research. This was because I sought to explore and analyse a key component and a relevant aspect of a single entity, the information infrastructure of Ghana. DPM is a key and relevant component of the information infrastructure. The principal data collection technique was semi-structured interviews using open-ended questions. This was aimed to give participants the flexibility of expressing their understanding of the various factors. Information experts from Ghana constituted the main interviewees for my study. Other stakeholders such as government officials or policy-makers were also interviewed. Twenty-seven interviewees selected from 23 institutions were used. The institutions involved were various cultural heritage and information management organisations, private organisations and government institutions such as the ministries and district assembly offices. A snowball sampling technique was used up to the point of saturation.

I employed thematic analysis of the data, which helped me to look for ideas from the transcribed interviews, put them into concepts and then re-grouped the concepts into bigger themes to enhance meaning. Other techniques such as observation and document analysis were triangulated to ensure credibility of the study. A detailed description of the research process is given and justified in chapter four.

1.12 Delimitation of Scope

In this study, I have explored various contextual factors influencing DPM in Ghana. I depended on the views and perspectives of stakeholders for data. The intention of this study was not to show Ghanaians how to develop plans and actions for DPM but to assist in understanding the various influencers of the DPM adoption process in the country. I focused the study on the DPM situation in Ghana because of my familiarity with its social system. Also, as an information professional and indigenous Ghanaian, it was not difficult to explore and understand the intricacies of the various contextual factors. I used the DPM situation of New Zealand as my point of reference because, although field work was conducted in Ghana, this research was primarily planned and undertaken in New Zealand.

1.13 Limitations of the Study

The study was conducted in a limited period of time (from May to October, 2011). The findings are specific to Ghana. Most participants had limited understanding of the DPM innovation. This lack of awareness of DPM had the potential to impact on interviewees' responses to the interview questions and the depth of discussion. The multiple phases of DPM in Ghana made the innovation very complex and difficult to fully understand the nature of the decision making process involved in the adoption of the innovation. I discuss the limitations relating applying DOI theory and PSR troika model in this study in sections 7.2.1 and 7.8 respectively.

1.14 Organisation of this Thesis

This thesis is organised into eight chapters. In the next chapter, I review relevant literature on significant concepts that inform the research. I use Chapter three to expand on the theoretical underpinnings presented briefly in section 1.10. In Chapter four, I elaborate on the brief description of the research methodology presented in section 1.11. In Chapter five, I present the interview data to give an indication of the general state of DPM in Ghana. Chapter five relates to research question 1: *What is the state of DPM in Ghana?*

In Chapter six, I use the DOI theory as a guide to develop an understanding of the various influencers of DPM in Ghana. The chapter relates to research questions 2 and 3: *What contextual factors are influencing DPM in Ghana?* And *how do these contextual factors influence DPM in Ghana?* I discuss the innovation in Ghana and its attributes in Ghana and summarise four major clusters of factors. Attitudinal-related factors, resources-related factors, policy-related factors and management-related factors are outlined in terms of how they enable or hinder DPM in Ghana.

In Chapter seven I use both DOI and PSR troika model as a guide to present discussions of the findings. I also show the various elements that are necessary for a process leading to the development of an NDM. Chapter seven relates to research question 4: *What are the elements necessary for the development of an NDM for Ghana?* I conclude the study in Chapter eight. I summarise how the research questions have been answered and present the refined conceptual model. I offer recommendations arising from the study and suggest areas for further research.

Chapter Two: Literature Review

2.1 Introduction

In this chapter, I review relevant literature on significant concepts that inform the research project. Generally, I discuss what constitutes *digital cultural heritage resources management and preservation* (henceforth, Digital Preservation Management, or DPM) in relation to what is happening in Ghana. In the next sections, I discuss the meaning of culture and cultural heritage in this research. I also discuss indigenous cultural knowledge and outline the various forms of cultural heritage resources to indicate that an understanding of these concepts enhances success in DPM initiatives. The connection between DPM and collective memory motivated me to review literature about National Digital Memories (NDM) to identify the various elements of NDM. Using ideas from the discussions, I assess literature on the state of DPM in Ghana to show the importance of their connection to this study.

I perceive preservation management and technologies as key concepts, providing insight into the research topic. So, I discuss these concepts and show what motivates people to digitise. Following that I examine different studies and reports to clarify the complexities that surround the concept of digital preservation in this research. Then, I outline different DPM initiatives in both developed and developing regions.

Also, as this study explores contextual factors that affect DPM in Ghana, I enumerate the various factors found in literature that can influence the management of digital resources. Then, I summarise the various ideas I gathered from the literature review.

2.2 Culture and Cultural Heritage

I consider that a clear understanding of how people perceive culture and heritage is essential for this research. These concepts have been defined in various ways. Datzira (2006, p. 14) observes, culture relates basically to everything that reflects the ways individuals or a group live, which includes their values, behaviour, knowledge, roles and habits, symbols, traditions, perception patterns and ways of interacting within their society. In a similar way, McDonald (1996, p. 15) views culture as the expressions of observable behavioural regularities, language, and philosophy of a particular society. In their study about Ghana, Arthur and Mensah (2006, p. 299) identify culture as the sum total of ways of living built up by a group of human beings and transmitted from one generation to another. The various definitions of

culture in the literature point to theHofstede (2007, p. 16) idea that culture has a collective rather than individual attribute, which Hofstede (2007, p. 16) explain as manifests in behaviours which are common to some people but not all people. Hofstede's definition for culture, i.e. "the collective programming of the mind that distinguishes one group or category of people from another" (2007, p. 16), is applied in this study.

The aspects of culture that a group of people consciously or unconsciously share with the next generations form the cultural heritage of that group of people. There is no consistently used definition for cultural heritage in the literature (see Blake, 2000; Datzira, 2006; Feather, 2006). Nevertheless, the United Nations Educational Scientific and Cultural Organisation's (UNESCO) centre for culture considers culture, traditions and their artefacts as encompassing four main categories of cultural heritage resources. These cultural heritage groups are tangible and intangible, natural and heritage resulting from human activities which include armed conflicts (UNESCO, 2008). Due to diversity in cultures, UNESCO's categorisation is considered the most authoritative to define cultural heritage in this study. The preservation of these heritage materials is seen in the broader context of managing what has been inherited from the past in a way which will allow their transmission to future generations (Feather, 2006, p. 1).

According to the UNESCO's (2008) classification of cultural heritage, the evidence of cultural activities that can be felt and touched is seen as tangible culture. Tangible culture is mainly related to archaeology and urbanisation as well as objects in museums, archives and libraries. Tangible cultural heritage objects have been classified by UNESCO into:

- Movable, such as paintings, sculpture, coins, manuscripts and specific objects of cultural activities that can be moved from one place to another
- Immovable, such as monuments and archaeological sites
- Underwater cultural heritage, such as shipwrecks and underwater ruins cities
- Natural heritage sites with cultural aspects, such as cultural landscape, physical, biological or geographical formations
- War memorials; heritage resulting from armed conflict (UNESCO, 2008).

From the discussions above, tangible cultural heritage resources in Ghana can be perceived in two forms. The first arises from the various cultural and traditional activities and their physical evidence. Examples of this group include sculptures, paintings, monuments and other natural cultural resources (see Figure 2.1). The second form of Ghanaian heritage resources is the formal records which are held in the main cultural institutions such as PRAAD, GLB and GMMB. The ministries, departments and agencies and other public institutions also keep records of daily transactions. These records are an important part of the country's heritage resources because they serve as evidence of today's business activities for the future. Most of Ghana's heritage resources in digital forms come from the various records for which different institutions are now creating digital surrogates. An example is the conversion of the slave trade archives at PRAAD (see PRAAD, 2006). There are also some digitised photos and videos of some cultural and traditional activities and objects on the websites of GMMB (see GMMB, 2011).

Article 2 of the UNESCO Convention for the Safeguarding of Intangible Cultural Heritage defines intangible cultural heritage as "the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith-that communities, groups and in some case, individuals recognised as part of their cultural heritage" (UNESCO, 2003). These expressions, representations knowledge and other elements of intangible heritage constitute the soul of a society (Datzira, 2006, p. 14). Also, intangible heritage forms are identified with specific oral traditional forms such as poems, myths, riddles, songs, stories, proverbs and legends (Kargbo, 2008, p. 442) which are used in languages, symbols, rituals and ceremonies and performing arts and reflected in cultural values. Intangible heritage forms according to Qereqeretabua (2008) are central to cultural promotion and protection as well as revitalisation of knowledge and cultural systems.

All heritage forms are contextually distinguished. But as Harvey (2007, p. 270) emphasises, intangible heritage is flexible in contrast to tangible heritage forms that are perceived to be fixed. Whether tangible or intangible, heritage forms are transmitted from generation to generation and constantly recreated by communities and groups in response to their environment. Intangible heritage forms also affect a group's interaction with nature and their history and provide that group with a sense of identity and continuity, promoting respect for cultural diversity and human creativities (UNESCO, 2003). Thus, the identity and diversity of

a multicultural nation such as Ghana can be enhanced through the development of intangible heritage forms.

The concept of indigenous knowledge (discussed in the next section), relates to intangible cultural heritage, creating a relationship between a particular community and its ancestral territory (Qereqeretabua, 2008, p. 1). Whether tangible or intangible, cultural heritage provides valuable representations of that group of people. Thus, as Blake (2000, p. 65) suggests, there is the need for heritage materials (whether physical or digital) to be effectively managed, protected and preserved in order to keep a group of people and their society alive in the future. This is a basic idea underlying my research which explores the various contextual factors that influence management and preservation heritage resources in Ghana. Figure 2.1 summarises the various components of cultural heritage discussed above.

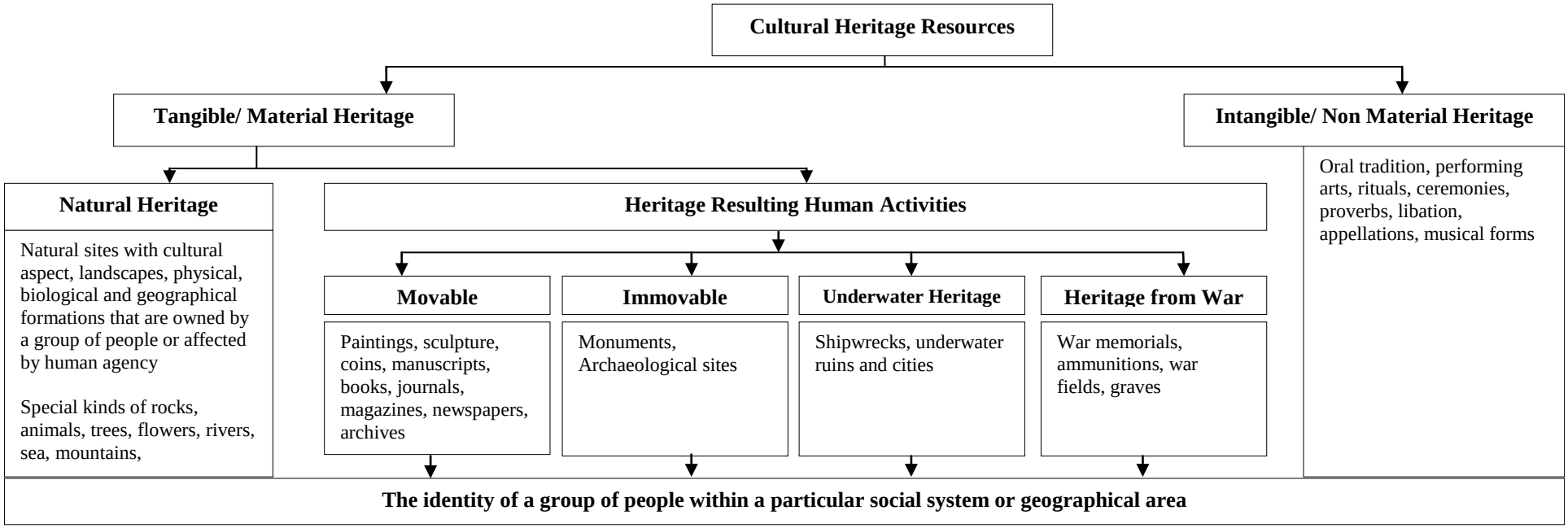

Figure 2.1: Classifications of cultural heritage resources.

Drawing from these main categories of cultural heritage resources, I was able to identify the specific cultural heritage resources in Ghana (see section 7.10, Figure 7.2).

Heritage resources affect individuals as well as groups of a community, with their informative value (Davis, 2007, p. 53). These resources inform about what happened in the past, guide what happens in the present and provide direction for the future. Usually, heritage resources exist in various communities because forbears established laws to protect them. For instance, it has been observed that the Ghanaian indigenous cultural resources existing today, were formed and protected by ancestors of the state prior to colonisation (Dzisi, 2008, p. 255). Traditions and other activities during and after colonial period have added, modified and also altered the original indigenous Ghanaian culture. This has resulted in a new form of Ghanaian culture that is unique to the nation. The management and preservation of the heritage resources resulting from the Ghanaian culture is therefore important to appropriately inform posterity.

In this research I consider heritage resources as valuable sources of cultural information. This idea is strengthened by the literature. Buckland (1991, p. 352) points out that, heritage resources are sometimes considered as documents. This means that cultural heritage resources contain information by their nature. In a subsequent publication, Buckland considers sculptures, museum objects, and even live animals as types of documents (1997, p. 805). This is because these heritage resources inform us about the surroundings of a people and the way those people live in that environment.

Due to the complexities surrounding cultural heritage as information objects, it is essential to strategise their management and preservation. As Eden et al. (1998) identify, effective planning and strategies ensure proper management, preservation and long-term access to cultural heritage resources, particularly the complex intangible ones such as indigenous cultural knowledge.

2.2.1 Indigenous Cultural Knowledge

Various forms of principles, truths and ideas naturally develop as a cultural group interacts with their natural environment. Together, these elements are viewed by many cultural heritage researchers as the indigenous cultural knowledge of that group of people (see Ayiku,

1997; Kargbo, 2008; Moahi, 2012). These heritage forms are engraved in the minds and hearts of the people, particularly the elderly who are sometimes considered living archival repositories of that culture (Kargbo, 2008, p. 442).

I pay attention to indigenous cultural knowledge in this section because it is identified as a system that provides profound challenge to all aspects of human development especially in the 21st century (Hoppers, 2002). Thus, it is an aspect of cultural heritage which raises many concerns when it comes to effective DPM. For instance, issues relating to cultural ownership, privacy and indigenous rights are very critical in DPM programmes. Such issues usually prevent groups from allowing their indigenous cultural knowledge to be captured into national DPM programmes. This collective programming of the minds of that group of people, as highlighted in Hofstede's (2007, p. 16) definition of culture, is the result of the influences from their environment.

The surroundings of the group are very likely to influence what they hear, see, eat and wear. This cultural environment also influences what Arthur and Mensah (2006, p. 299) emphasise as beliefs, knowledge, understanding, values, customs and institutions, which affect the way of life of that particular society. These beliefs, values and understandings constitute the cultural knowledge and *philosophy of the world,* which the group usually tries to protect from other cultural groups. Therefore, preserving cultural knowledge, especially in oral traditions, is very important. This is because, as Kargbo (2008) notes, cultural knowledge "constitutes a critical aspect of a nation's heritage" (p. 442).

Indigenous knowledge is also seen as the cultural reference point for native people, especially in Africa. But this source of cultural identity seems threatened by globalisation and the notion of 'appropriate' cultures from Western societies (Hoppers, 2002). According to Hoppers, "the loss of cultural reference points has culminated in the fundamental breakdown of African societies, with dire consequences for the social and human development project as a whole" (Hoppers, 2002, p. 3). This effect on indigenous cultural knowledge has consequences for DPM projects as well.

An understanding of how indigenous knowledge affects DPM is indispensable to this research. The elements in a definition by the World Bank are useful for the understanding of indigenous knowledge in this research:

- Indigenous Knowledge is local knowledge
- It is unique to every culture or society
- It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural-resources management, and a host of other activities in communities
- It provides problem solving strategies for communities
- It is commonly held by communities rather than individuals
- Indigenous knowledge is tacit and therefore difficult to codify, embedded in community practices, institutions, relationships and rituals (World Bank, 2012).

Thus, people in all cultures try to protect their indigenous knowledge. For instance, protecting indigenous cultural knowledge is a very critical issue for the Maori people of New Zealand. Maori example of protecting their indigenous knowledge is important in this research because it influences New Zealand's response to DPM initiatives. As a frame of reference to this study, all aspects of New Zealand's DPM initiatives are essential to provide insight to this research. To understand how protection of indigenous knowledge can affect the development of DPM in Ghana, I use the next section to discuss cultural ownership and other issues especially relating to intangible cultural heritage in Ghana and New Zealand. Understanding of these issues is important to appreciate the readiness of various tribal groups within a these countries to release their heritage resources (both tangible and intangible) for national DPM programmes.

2.2.2 Issues Surrounding Cultural Ownership, Intellectual Property and Indigenous Rights

Issues surrounding cultural ownership and indigenous rights are huge and complex (Wanda, 2010). Nations are rarely if ever composed of single culture, so there are likely to be issues relating to cultural ownership in the development of national DPM programmes, raising concerns in the literature as to how questions about traditional knowledge and intangible cultural heritage issues may be resolved (Hoffman, 2006; Wanda, 2010).

Ghanaian indigenous cultural knowledge, as identified by Ayiku (1997, p. 1), is seen through the interpretations of key symbolic expressions as found in particular examples of visual, performing and verbal arts. Through visual arts (such as drawings, sculpture and weaving); performing arts (such as dances, drama, festivals, puberty rites, and naming ceremonies); and

verbal arts (such as appellation, libation-pouring, proverbs and storytelling), the significance, social relevance and educational importance of the Ghanaian cultural knowledge are expressed by the various cultural groups (Ayiku, 1997, p. 4).

Major cultural groups in Ghana include the Ewe, Mole-Dagbane, Guan, and Ga-Adangbe (GhanaWeb, 2013b). However, the Akan culture appears to dominate Ghanaian cultures with about 60% of the nation's people (Anquandah, 2006a). The Akan traditional philosophy is enshrined in the *Adinkra traditional symbols*[5] and expressed in language, performances, rituals and traditional arts (Anquandah, 2006b). Although no part of Ghana is ethnically homogeneous, it appears Akan cultural activities are performed in almost every part of the country by both the Akans and sometimes people from the other cultural groups. For instance, the Akan language is used in every part of the country (Anquandah, 2006b; GhanaWeb, 2013a).

Despite the similarities in cultures, Ghana lacks the elements of a collective national cultural identity such as national language (see Anquandah, 2006b; GhanaWeb, 2013a). As a Ghanaian, my observation of the social system supports what the literature shows. Cultural heritage resources are owned individually by individual tribal groups, making Ghanaian heritage resources appear to be scattered.

The cultural situation in Ghana can be viewed in comparison to the New Zealand one. There are two main cultures in New Zealand, but Ghana has over 100 different cultures. In New Zealand, one cultural group (Maori) is significantly protecting access to their indigenous cultural knowledge from the other. This Maori behaviour is not different from what Lor and Britz (2005) observe of African knowledge wealth. According to Lor and Britz, while Africans on one hand are proud to share their cultural knowledge, they on the other keep many aspects hidden, lest it be discovered and stolen or exploited by the North (2005, p. 62). The Maori in New Zealand may be influenced by this attitude as well. In Ghana however, the various cultural groups appear content for their cultures to be accepted by the other tribal groups within the country. Thus, they all take part in national cultural events such as the National Festival on Arts and Culture (NAFAC) to showcase their various tribal heritage

[5] The Adinkra symbolic writing is a traditional system of philosophical writing by the Asante people. See examples from the website of Ghana National Commission on Culture: http://www.ghanaculture.gov.gh/privatecontent/File/Adinkra%20Cultural%20Symbols%20of%20the%20Asante%20People.pdf

resources (see GNCC, 2006). However, the various ethnic groups do not seem ready to accept or assimilate other's culture to create a national identity and that is why plans for national unity through the development of a cultural policy is required (Hagan, 2004). This reason also explains why an exploration of what influence DPM in Ghana is important.

The disagreements among the Ghanaian cultural groups contribute to the lack of a national culture for the country. A full-fledged DPM initiative in Ghana is likely to highlight cultural privacy issues in the country and assist in a deeper understanding of the factors influencing DPM and can lead to the establishment of a collective memory for Ghana.

2.3 Collective Memory

The various heritage materials (see Figure 2.1), represent valuable cultural inheritance to for cultural groups. Taylor (1982, p. 118) argues that the actual heritage value of these historical sites, buildings, artefacts, pictorial arts and other cultural materials, lay not in themselves but the transactions and customs to which they bear witness as "evidence". Thus, he perceives these objects together with the activities for which they bear evidence, the institutions where they are managed and the people who manage them to ensure their continual access, constitute the collective memory of a country.

The existence of memory is necessary for expressing the intangible heritage (UNESCO, 2003). Harvey (2007) points to the importance of preserving memory and emphasises the significant roles played by libraries, archives and museums in the preservation of a *memory of the world* programme launched by UNESCO in 1992 (UNESCO, 2012b). According to UNESCO, growing awareness of threats to access and preservation of documentary heritage in different parts of the world motivated the establishment of the memory of the world programme. This is because UNESCO views the world's documentary heritage as belonging to all people of in the world, and should be preserved and protected for all, with due recognition of protocols and practicalities, and it should be accessible to all without hindrances (UNESCO, 2012b). Like the *memory of the world* programme, preserving national memories is imperative for countries like Ghana where national heritage resources are under threat due to many contextual hindrances.

The main characteristics of a collective memory can be found in the heritage resources to be managed and preserved, the institutions and professionals who manage those materials (see

Taylor, 1982). Nevertheless, the core of these characteristics appears to be embedded in the values and beliefs of the creators and owners of such heritage resources. Thus, the attributes of a true Ghanaian collective memory are with the people of the various ethnic groups who have created the various heritage resources and who ultimately appears to be the only ones who can keep their memory alive (see GNCC, 2010).

The policies, strategies and resources that influence the management of those heritage resources also affect the elements of a memory. The importance of cultural institutions in the development of national memories therefore cannot be over emphasised. Nevertheless, peoples' attitudes towards these institutions sometimes hinder the roles cultural institutions play. For instance, poor recognition of the need for recorded information and memory institutions is affecting the management of library materials, records and heritage resources in libraries, archives and museums in Ghana (Akussah, 2002, 2005; Alemna, 1993, 1998; Azangweo, 2006). This attitude appear common to other African countries such as Mali (Dong, 2012, Ryan, 2010) and Mozambique (Ryan, 2010). The importance of archives to a nation's memory has been emphasised by Ketelaar (2008, p. 12). It is difficult to overlook the relationship between records and heritage. For posterity to appreciate the arrangement of today's memory, Taylor (1982, p. 126) advocates that the connection between records management and heritage must be strengthened. The strength of this connection is to ensure a systematic update of the collective memory to contain not only administrative decisions but also useful response from the community to its administrators.

A society may be oral, yet at the same time literate in terms of the development of its memory. According to Taylor (1982, p. 129), people in such societies are conscious of their limitations and value the written records as preserving the memory of their cultural identity. Taylor cites an instance in Canada where ancient and oral cultural continuity still survives, irrespective of pressure from a genuine multicultural society. This Canadian example is appropriate to comparison with the multicultural situation characterising the memory for Ghana.

Memory institutions have important roles to play in the establishment of a collective memory. However, there is a gap in developing countries, regarding the roles memory institutions play. There is lack of recognition for documentary materials which are in the custody of these institutions as heritage resources. Taylor (1995, p. 11) emphasises that the failure to relate

documentary material culture to other forms of evidences of social activity and function has caused archivists to give undue significance to the concept of the collective memory residing in archives. Nevertheless, a collective memory, according to Taylor, would be sadly deficient without printed materials in libraries, the artefacts in museums, or the findings of archaeology. A collaborative effort by all institutions and key players within a country therefore seems likely to facilitate the development of a country's collective memory. The Open Archival Information System (OAIS) reference model provides a useful frame of reference for long term digital heritage information management and preservation to establish a national digital memory. A summarised version of the OAIS model by Lavoie, Henry, and Dempsey (2006) is illustrated in Figure 2.2.

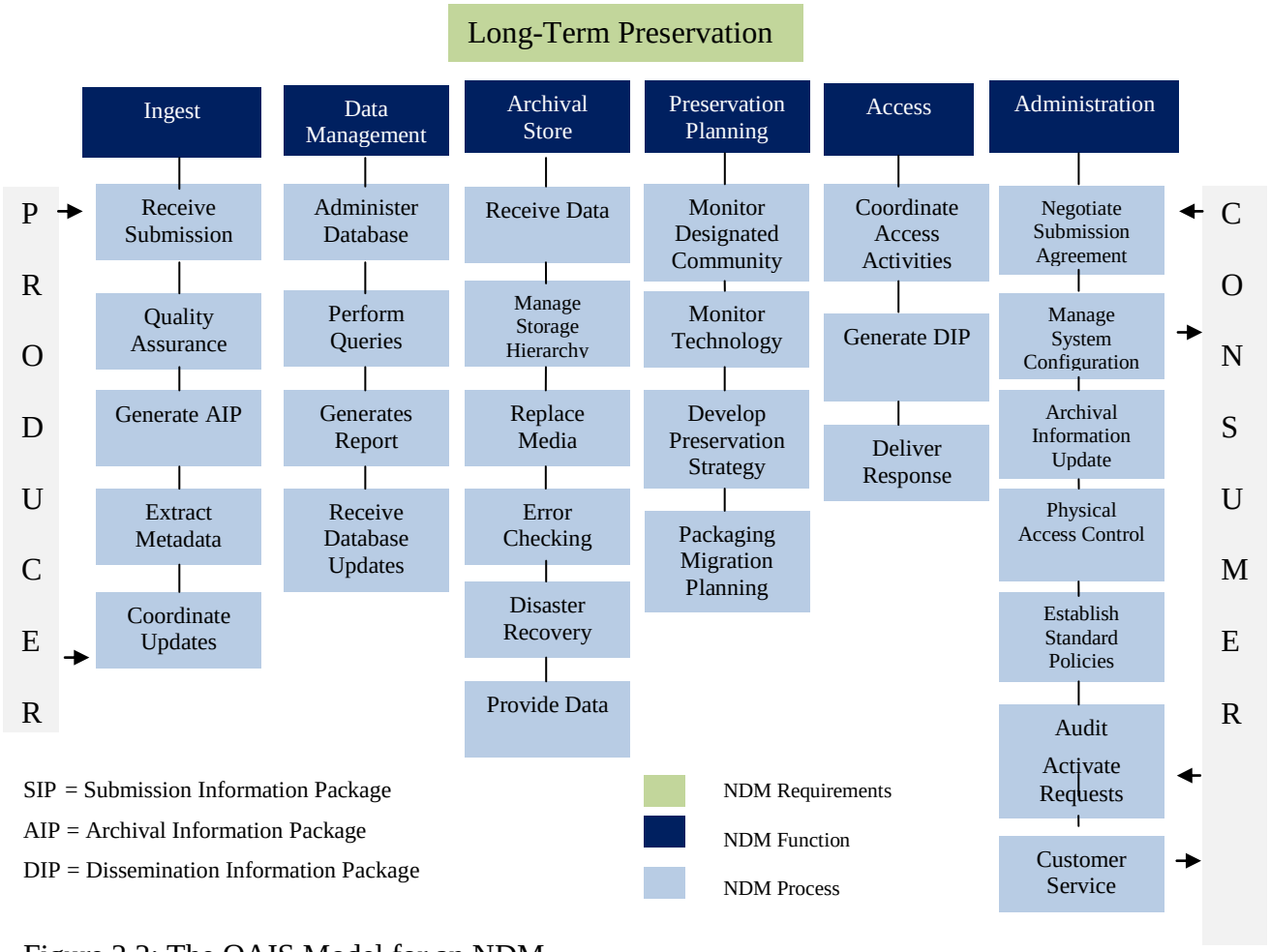

Figure 2.2: The OAIS Model for an NDM
Adopted and modified from a "OAIS Business Logic" (Lavoie et al., 2006).

To preserve the collective memory for the long-term, producers of digital cultural heritage information ingest heritage data into a collective heritage repository. The system appraises the data to enable quality assurance and to render the submitted heritage data to generate the

archival information. Metadata is then extracted from the heritage information package and constantly updated. At the data management stage, the rendered heritage information is sent to a database to be managed. Queries are performed at this stage and reports generated which are updated regularly and managed in an archival store. The heritage data is then preserved using appropriate technology, strategies and planning. When a user/customer requires any heritage information, a negotiation agreement between the user and the system's administration is sent to access control, to generate a response to the request. Other activities performed by administration include heritage information update, establishing standards and control and managing audit submissions (see Lavoie et al., 2006).

When Ghanaian national heritage information is effectively managed in a system, such a system can be perceived as a national digital cultural heritage repository which can be used for the establishment of a national digital memory for the country. At the time of this research, the system described above was complex for the context of Ghana because digital heritage materials were only emerging. Nevertheless, I envisaged that when Ghanaians understand the various contextual factors that influence DPM and become effective in managing its digital heritage resources, the country would likely be able to establish an NDM which is likely to operate in accordance with the OAIS system described above. In this regard, I focused the collective memory aspect of my research on identifying the various elements that could characterise a future NDM for Ghana (see section 7.11).

2.3.1 Attributes of a National Digital Memory

The literature I identified to analyse the features of an NDM focuses on discussing the features of digital repositories at various levels of development. I considered those materials because I related the development of institutional repositories to the development of NDM.

Various institutions in Ghana, particularly the university libraries, are creating institutional repositories where they also consider publications of cultural heritage information. I considered that if the various digital repositories within a country could be combined, it could lead to the development of a national digital heritage repository. When such a repository is managed effectively an NDM can be established. Such initiatives require control and direction from national cultural institutions (such as national libraries, archives or museums) to facilitate, collect, organise, preserve and promote the system for research and discovery

(see Challapandi, Chow, & Tay, 2010 p. 47-48). A look at the American Memory[6] and the New Zealand NDHA[7] shows that NDMs contain national heritage resources in digital forms. Both repositories also imply that an NDM must be online. It is therefore justified to conclude that NDM is developed from a collection of cultural heritage resources through the aggregation of digital repositories by various institutions within a country.

A digital repository is a set of services that an organisation offers to the members of its community for the management and dissemination of digital materials created by the organisation or its members (Gibbons, 2004, p. 6). Gibbons identifies the functions of digital repositories to include access control, preservation, discovery support metadata application and materials submission. She also discusses the various features of institutional repositories to include accessible digital content that is community-driven and focused, have institutional support through collaboration, is durable and permanent (2004). These features can also be identified with NDMs (see American Memory, 2010; NDHA, 2010). In the next section, I discuss the literature that identifies what Ghana is doing in relation to steps that can lead the country towards the establishment of an NDM.

2.4 State of Digital Heritage Resources Management in Ghana

I consider that effective management of heritage resources can lead to the establishment of an NDM. Awareness of the state of heritage resources management assisted me in understanding the factors that influence DPM in Ghana. Ghanaian institutions find it very challenging to manage these digital cultural heritage resources that are proliferating in the country. The GLA reveals some of the challenges they face in their activities (see section 1.4). Noticeable among those challenges is the poor attitudes of the people of Ghana and the lack of interest in information management by stakeholders (GLA, 2009). These challenges appear to affect not only the GLA, but all cultural institutions in their attempt to manage Ghanaian heritage resources effectively. Notwithstanding the challenges Ghanaian institutions are facing, there are some individuals who are concerned and active in DPM initiatives in Ghana. Such individuals serve as agents who promote the situation of Ghana for international organisations to assist the country with ideas about heritage records management and DPM to cause desired changes.

[6] See the American Memory from this link; http://memory.loc.gov/ammem/about/index.html
[7] See this link for details about NDHA; http://archives.govt.nz/advice/government-digital-archive-programme

The International Council on Archives (ICA) is instrumental in aiding Ghana's effort towards effective heritage records management and DPM. For instance, the Pacific Regional Branch of ICA (PARBICA) has succeeded in developing a records management toolkit for good governance. Even though the toolkit was initially intended to support recordkeeping in the Pacific Island nations, PARBICA has now extended the use of the toolkit to other developing areas including Africa, specifically Ghana. In May 2012, officers from PARBICA organised a train-the-trainer workshop to educate local records management trainers on the use of the toolkit in Ghana. During this workshop the importance and relevance of the toolkit for good governance in Ghana was emphasised (see PARBICA, 2012). Adopting the toolkit to the context of Ghana has the potential to enhance effective digital heritage records management and improve governance in the country.

In addition to ICA, other international organisation such as the International Records Management Trust (IRMT), United Nations Educational Scientific and Cultural Organisation (UNESCO) and some foreign missions are also contributing to heritage records management and DPM in Ghana. For instance the Italian Ministry of Foreign Affairs has helped the national museum of Ghana to develop a website where some digital photos of Ghanaian heritage resources are displayed (see GMMB, 2011). IRMT observes that without systematic control records can be easily manipulated, deleted, fragmented or lost. Yet, this situation appears to be what is happening in Ghana. According to a report by IRMT on their records management activities in developing countries (which included Ghana) open government and transparency is a mirage. This lack of openness and transparency in governance is a result of poor records management which hinders proper accountability in governance leading to increased corruption (IRMT, 2012). Thus, since 1989, IRMT have been organising programmes in Ghana to enable effective records management to ensure that necessary information is available and can be trusted for good governance.

The literature shows that there are institutional repositories in Ghana. But it is unclear what contextually determined elements and functions apply to the Ghanaian digital repositories. Asamoah-Hassan (2010) reports three institutional repositories in West Africa. The Kwame Nkrumah University of Science and Technology's (KNUST) institutional repository (KNUSTSpace) was the first to be established. Thus, KNUSTSpace is not only the first in Ghana, but the pace setter in the West African sub-region. It also had the highest number of entries among the three (Asamoah-Hassan, 2010, p. 423 - 424) and includes cultural

information about Ghana in its collections. The KNUSTSpace policy covers areas that are consistent with Gibbons' (2004) identified features and the OAIS model discussed above.

In Ghana today, the new digital technology is infiltrating into the country and fast spreading to all sectors of the economy just like many other countries around the world. Businesses in Ghana are not the only sector passionately embracing digital technologies (see Hinson & Sorensen, 2006), but also education (Martey, 2004b), libraries (Alemna, 1998, 2001; Alemna & Cobblah, 2005), archives and museums (Azangweo, 2006; PRAAD, 2006) and the economy as a whole, through the Ghana ICT for Accelerated Development Policy (Ghana ICT4AD, 2003). The creation, use and preservation of these digital resources in Ghana need to be managed effectively through appropriate contextually designed strategies. As Cummings (2002, p. 2) states, the design and implementation of strategies is a management skill and they are designed to meet contextual strengths and weaknesses. It seems that just like New Zealand, Ghana needs to design, coordinate and implement specific strategies that can combine local Ghanaian traditions and local knowledge with elements from the new digital technologies to provide effective management and long-term preservation and access for Ghanaian digital cultural heritage resources. Through this, Ghana is likely to realise its goals of protecting its information resources and cultural heritage materials.

2.5 Preservation Management and Technologies

In information management, preservation involves the set of activities and processes employed to keep information materials in good condition for the long term (Cloonan, 2001; Gertz, 2000; Lazinger, 2001; Williams & Lunde, 1997). Preservation of heritage information materials can be seen as a way of thinking about the world or it can be a set of actions (Cloonan, 2001, p. 232). A definition Cloonan provides therefore comes in two parts: (a) the basic responsibilities to provide adequate facilities for the protection, care, and maintenance of archives, records and manuscripts; and (b) specific measures – individual and collaborative – undertaken for the repair, maintenance, restoration, or protection of documents (2001, p. 236). In my research therefore, I follow the interpretations above to consider preservation as the plans, actions, procedures, skills and the technologies that are applied to cultural heritage resources to prolong their access.

Preservation management encompasses all the policies, strategies, procedures, and processes that together prevent further deterioration of physical objects, maintain the information they

contain, and increase their functional value (Conway, 1996). The importance of effective management and preservation of cultural heritage information by cultural institutions has been highlighted by McDowell (2007), who states that preservation management has become important due to the nature of recent conflicts and natural disasters around the world. In my study, preservation management refers to activities that concern the application of modern preservation technologies to safeguard heritage information materials.

Preservation technologies are the tools and facilities that are manipulated to bring enhanced value to cultural heritage materials that we need to protect, care for, and maintain for a long period of time. Preservation management is viewed as complex. Yet, the convenience afforded by the new technologies to librarians, archivist and curators in their contemporary preservation roles has also been stressed (see Conway, 1996; Krtalic & Haseney, 2012; McDowell, 2007).

Issues relating to preservation management have been identified to be specific to national contexts (see Krtalic & Haseney, 2012). Contextual factors affecting preservation management require close examination especially in these times of digital technologies. Thus, there is a need to understand factors that are influencing DPM in Ghana as digital technologies are proliferating in the country. In the next two sections I discuss digitisation and digital preservation as techniques in preservation management.

2.5.1 Digitisation

Digitisation, according to the Digital Preservation Coalition (DPC), is the process of creating files by scanning, digital-photographing or otherwise converting analogue materials into digital materials (DPC, 2009). I discuss the concept of digitisation in this section because I consider that it is through the process of digitisation that digital materials are generated. After digitisation, the resulting digital copy, or digital surrogate, is then classed as digital material and then subject to the same broad challenge involved in preserving access to it, just as with *born digital* materials (DPC, 2009). Whether converted from physical materials or born-digital, all digital materials raise concerns about how to preserve on-going access.

For instance, there are concerns about how to access and use digital information in the future when current technology that has been used to create and access the information will no longer be available (Chowdhury, 2010, p. 209) . Such concerns also motivated me to think

about how the digital cultural heritage resources emerging in Ghana can be available in the future. I have limited my research to the exploration of contextual factors that are influencing DPM in Ghana. The importance of DPM becomes clear in Chowdhury's comment that: "The question of preservation was also important in the traditional information management or printed world, but the problem became severe because of the short lifespan of digital information compared to printed information" (2010, p. 209).

People are motivated to digitise for various reasons. A major motivator for organisations to digitise is to salvage, protect and preserve materials from destructive occurrences. McDowell (2007) believes that the cultural heritage conservation community has embraced digitisation as a means to safe-guard cultural heritage materials from occurrences of natural disaster. Conway (2010, p. 61) confirms McDowell's assertion by citing for instance, the flooding of the Arno River in Florence, Italy, on November 4, 1966, which submerged the basements of museums, libraries, and private residences and destroyed centuries old books, manuscripts, and many art works. Ryan (2010, p. 33) also cites the occasional flooding of the Zambezi River destroying materials in Mozambique's principal repository, *Arquivo Historico de Mocambique* (AHM). At the 2012 International Council on Archives congress held in Brisbane, Australia, I had the opportunity to interview the director of AHM, Dr Joel das Neve Tembe who confirmed to me that AHM faces various challenges that are causing the deterioration of materials. But, one of their biggest challenges is the perennial destruction caused by the Zambezi River. They therefore digitise to keep backups. But safeguarding materials from natural disaster is just one of the many reasons why institutions digitise.

The nature of modern conflicts also causes cultural institutions to want to digitise their materials. The destructive effect of conflicts on the cultural richness of the Balkan region (see Tonta, 2009, p. 425) and in Iraq (see Garcia, 2007, p. 354) are examples of how conflicts have destroyed cultural heritage materials, and highlight the value of digitisation for backup. According to a news story by Germany's international broadcaster, Deutsche Welle (DW), culture, tradition and tourism once made Dogon (a town in Mali) a must-see for visitors to Mali. But the recent political conflict in the country has destroyed most of the nation's culture heritage resources and Dogon in particular is struggling to preserve its invaluable culture (DW, 2013). Nevertheless, it is important to note that merely digitising does not protect materials from flood or war or other disastrous event. It provides a backup to fall back on in the event of loss through natural disasters.

Other reasons also motivate organisations' digitisation activities. Dorner, Chawner, and Searle (2002) conducted a survey on digitisation activities in New Zealand and identified various factors that motivated these activities in the country. They clustered the reasons into three main categories, *access*, *storage,* and *availability of funding*. According to Dorner and colleagues, the main motivator for most organisations to digitise was to increase access to their resources, although other motivating factors like user needs or demands, preservation and ease of use were common. These authors identified that organisations digitised to store the historical, cultural or academic values of materials and also to promote the organisations and their resources. When organisations have funding available and they have the ability to exploit their resources in digital formats, they are motivated to digitise (Dorner et al., 2002, p. iv).

A fundamental reason for people to digitise therefore seems to lie somewhere between the two main ideas of access and preservation being discussed in the literature. Nonetheless, once materials are in digital forms, whether converted or born digital, whether initiated by access or preservation concerns, steps need to be taken to ensure that the information they contain will be available for as long as needed. Even though equal emphasis is placed on digitisation as a driver to enhance access and digitisation for preservation my discussion in this study focuses on digitisation for preservation of Ghanaian heritage resources. Conway (2010, p. 65) opines that if digitisation for preservation is an investment in the creation of lasting digital products, then digital preservation can help ensure that this investment is not squandered. What then is digital preservation?

2.6 Digital Preservation

The digital preservation concept is a relatively new one that has developed side by side with concepts like digital libraries (Chowdhury, 2010, p.209) and digital curation (Beagrie, 2006, p. 4). Digital preservation interests different communities, each with a distinct vocabulary and local definitions for key terms. This has led to varied views on what exactly defines digital preservation in the literature (Beagrie, Doerr, Hedstrom, Jones, & Kenney, 2002, p. 3). For instance, a definition provided by Ruusalepp (2003, p. 5), simply refers to digital preservation as the "storage, maintenance and access to *digital resources* over a long term". Jones and Beagrie (2001, p.10) also define digital preservation as the series of managed activities necessary to ensure continued access to digital materials for as long as necessary. In

their definition, Dorner, Liew, and Crookston (2006) include the purposes for which digital resources should be maintained, stating that digital preservation is "the managed activities necessary to ensure the maintenance of, and on-going access to digital material over time, for as long as it is required for legislative or business purposes" (Dorner et al., 2006, p. vi). Despite the diverse views definitions for digital preservation have concentrated on the notion of long-term preservation of digital assets.

The varied views on the concept have led some researchers such as Egan and Thomason (2007) to conclude that there is no universally accepted definition for digital preservation. But, the definition provided by Jones and Beagrie (2001) appears authoritative as it has been employed in works by many authors in the digital preservation community. Chowdhury (2010), Seadle (2004) and Moghaddam (2008) for instance, have used this definition in their studies. The use of *managed activities* also suggests that digital preservation is an information management activity which is very relevant to this study.

How people define digital preservation is often influenced by what motivates them to digitise or create digital surrogates in the first place. In their report to the DPC, Waller and Sharpe (2006, p. 10) used digital preservation to refer to all the actions required to ensure on-going, meaningful access to digital information for as long as it is required and for whatever legitimate purpose. Thus, one can conclude that any decision or activity that works to ensure uninterrupted access to digital materials for the infinite long-term is a digital preservation activity.

A basic aim of every digital preservation venture therefore is to preserve access to the digital information contained in the digital objects and not necessarily the preservation of the hardware or software packages which change with time and can quickly become obsolete. This is the basic idea about digital preservation I used in this study. Yet, the various definitions as shown above suggest that the concept is complex, so I use the next section to discuss some of the complexities surrounding digital preservation.

2.6.1 Complexities Surrounding Digital Preservation

I have identified two aspects of ambiguities about digital preservation: ambiguities surrounding the meaning of the term *digital preservation,* and ambiguities with the appropriate approach to use in the digital preservation process. In this section, I review

literature that discusses various terminologies and approaches that make digital preservation confusing so as to clarify the use of the term in my research.

2.6.1.1 Alternative Terminologies to Digital Preservation

Archives New Zealand, on its Digital Continuity Action Plan website, defines digital continuity as "ensuring digital information is accessible, usable, and reusable by those who need it for as long as it is needed" (Digital Continuity Action Plan, 2012). Comparing the definition for digital continuity to the definitions for digital preservation, one can see that *digital continuity* appears to be another term used for *digital preservation*. Similarly, the DPC observes that *digital archiving* is also used differently within sectors. The library and archival communities often use *digital archiving* and *digital preservation* interchangeably. According to DPC, the process of backing up means digital preservation among computer professionals, because it is the same as the process of ensuring on-going maintenance to digital materials (DPC, 2009). By definition *digital archiving* is also an information management activity which I considered vital to assist in my understanding of the complexities surrounding digital preservation in this study.

Understanding the difference between *digital preservation* and *digital curation* can help to unravel some of the complexities about the meaning of digital preservation. Beagrie (2006, p. 4) defines *digital curation* as "the actions needed to add value to and maintain digital asserts over time for current and future generations of users". From the definitions it can be seen that while *digital preservation* ensures continued access, *digital curation* adds value to digital information. Thus, according to Beagrie, the difference between *digital preservation* and *digital curation* lies in the addition of value by the latter to digital resources through the addition of metadata. His conclusion is very relevant for countries like Ghana that are at the initial stages of generating digital resources:

> Significant efforts need to be put into developing a persistent information infrastructure for digital materials and into developing the digital curation skills of researchers and information professionals. Without this, current investments in digitisation and digital content will only secure short-term rather than lasting benefits. (Beagrie, 2006, p. 13)

Also, the term *digital sustainability* is sometimes used in place of *digital preservation*. Bradley (2007) discusses *digital sustainability* and establishes that the term encompasses a

range of issues and concerns that contribute to the *longevity* of digital information. He contends that *digital preservation* is a significant integral part of *digital sustainability.* But, the focus of *digital sustainability* has been on one technical concern after another as issues and fashions have shifted over the last two decades. Bradley concludes that *digital sustainability* is demonstrated as providing an appropriate context for *digital preservation* because it requires consideration of the overall life cycle, technical, and socio-technical issues associated with the creation and management of digital items (2007, p. 148). Rhodesa and Neacsub (2009, p. 4) agree with Bradley's assertion. They view digital collection management as a sustainability programme which can be safeguarded through enhanced collaboration on a regional or nationwide scale.

The other term that is sometimes used as an alternative to *digital preservation*, is *digital librarianship*. When reviewing the commonalities between research in *digital libraries* and *digital preservation*, Chowdhury (2010, p. 207) highlights that like the *digital library* community, the digital preservation research community is confronted with the challenge of capturing, storing and making use of the information related to users and context. Chowdhury's review also brings out the differences between *digital libraries* and *digital preservation*. Whereas *digital libraries* collect and provide access to digital materials, *digital preservation* aims to ensure that access to digital materials are maintained and preserved for the long-term.

In this study, digital preservation is used as a comprehensive term embracing aspects of digital curation, digital archiving, digital sustainability, and digital libraries.

2.6.1.2 Approaches to Digital Preservation

Digital preservation implies that digital information is actively and continuously managed because digital materials cannot be simply stored and left on the shelf. Actions in digital preservation need to be taken regularly in short time frames, at most, within every five years (Waller & Sharpe, 2006). For this reason, different approaches need to be considered to ensure long-term access to digital information. These approaches are sometimes referred to as *digital preservation strategies* (Beagrie et al., 2002, p. 58). According to Beagrie and colleagues, a digital preservation strategy is a particular technical approach to advance continued access to archived digital materials. They observe that three main approaches are usually used to keep materials within the repository *fresh*. These are *data migration*,

persistent objects transformation and *technology emulation*. Table 2.1, shows these approaches and many others.

Also, Granger (1999, p.25) notes that while some of these approaches are simple others are very complex to apply, suggesting that the simplest strategy is refreshing and the most complex is technological preservation. But, the simplicity or complexity of these approaches is likely to be affected by context dependent factors such as capacity, skills, available funding, and stakeholder's attitudes. In that sense, what may be a simple approach to a people in a specific context may be a complex approach to others in a different context. Figure 2.3 illustrates the simplicity and complexities of Granger's (1999) main strategies for digital preservation.

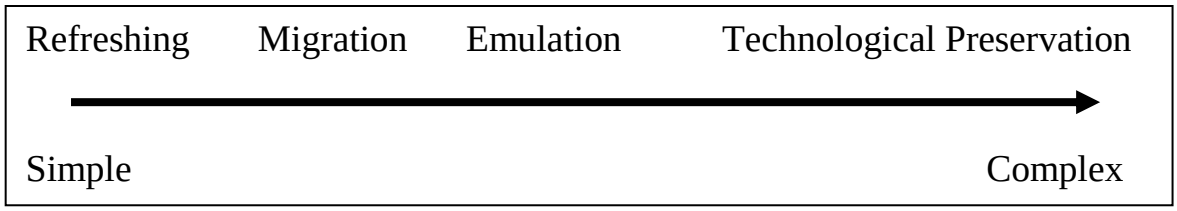

Figure 2.3: Main strategies for digital preservation
(Granger, 1999, p. 25)

Many other digital preservation approaches have been proposed but, as shown on Cornell University Library's website for instance, none of them is appropriate for all data types, situations, or institutions (Cornell University Library, 2007). The uptake of these approaches also differs from country to country, since different factors and conditions may apply in different contexts. In this sense, a digital preservation approach can be seen as a technological strategy. It is different from the more generally social, economic or political *strategy* employed by a country or an organisation in order to develop and implement a DPM programme. I discuss strategy in the later sense in detailed in chapter three under section 3.4.1. In Table 2.1, I describe the different digital preservation approaches.

Digital Preservation Approach	***Description and Source***
Technology Preservation	Operates on the principle that if digital material relies on the technical environment used to create it in other to preserve the functionality and "look and feel" of the product, then the most obvious approach is to preserve the original technology (Beagrie et al., 2002; Cornell University Library, 2007; UKOLN, 2006)
Technology Emulation	This approach combines software and hardware to reproduce in all essential characteristics the performance of another computer of a different design, allowing programs or media designed for a particular environment to operate in a different, usually newer environment (Cornell University Library, 2007; UKOLN, 2006)
Data Migration	The movement of data from one software version to a newer version. The material is maintained in the archive in a currently useable format (Beagrie et al., 2002; Cornell University Library, 2007; UKOLN, 2006)
Bit-stream Copying	This refers to the process of making an exact duplicate of a digital object (Cornell University Library, 2007)
Refreshing	The approach of copying digital information from one long-term storage medium to another of the same type, with no change in the bit stream (Cornell University Library, 2007)
Data Archaeology	This approach includes methods and procedures to rescue content from damaged media or from obsolete or damaged hardware and software environments (Cornell University Library, 2007)
Analogue Backups	Combines the conversion of a digital object into analogue form with the use of durable analogue media (Cornell University Library, 2007)
Encapsulation	The technique of grouping together a digital object and metadata necessary to provide access to that object (Cornell University Library, 2007)
Canonicalization	A technique designed to allow determination of whether essential characteristics of a document have remained intact through a conversion from one format to another (Cornell University Library, 2007)
Durable/ Persistent Media	An example of this technique is 'Gold CDs'. This may reduce the need for refreshing, and help diminish losses from media deterioration, as do careful handling, controlled temperature and humidity, and proper storage.

Table 2.1: Approaches to digital preservation

These technical approaches have their own challenges. A policy or strategy for ensuring the effective planning and implementation of any DPM programme within an organisation or a country therefore seems very important. Effective strategies are likely to enable successful initiatives in DPM programmes in Ghana. I consider that type of strategy or policy as necessary for Ghanaian stakeholders to think about for effective DPM within the country.

Developing strategies to guide the creation, use and preservation of digital heritage resources have worked for some countries like New Zealand (see Carnaby, 2009; Oliver, Crookston, & Dorner, 2010). As digital activities increase in Ghana, an initiative to guide digital heritage resources management is imperative. So, I use the next section to examine DPM initiatives in different regions to ascertain what factors influence the initiative in those regions and relate them to the context of Ghana.

2.7 Initiatives of Digital Preservation Management

In this study, DPM initiatives refer to any decision or actions taken by a country towards the long-term preservation of its national digital cultural heritage resources. Such initiatives include the use of, or intent to use digital technologies for information management, particularly cultural heritage information in a country. Countries are increasingly attaching importance to the preservation of their histories and heritage (Berndt & Carlos, 2000, p. 1). This interest in heritage preservation may explain the widespread DPM initiatives in many regions of the world. In this section, I review various reports, studies and viewpoints on initiatives of DPM programmes. Understanding the DPM situations in various contexts within both developed and developing regions provided me with the background necessary to identify and understand the factors influencing DPM in the context of Ghana.

2.7.1 DPM Initiatives in Developed Areas

Seeking a broader context for DPM initiatives, I considered ICT innovations as part of DPM. The pace and direction of ICT innovation is clearly determined by developed economies of the world (Avgerou, 2008, p. 133). The majority of the studies conducted on digital preservation initiatives in developed areas are concentrated on technological aspects. Also, in developed countries there is progress in DPM at both organisational and national levels.

There is a common impetus for DPM initiatives in developed countries. Beagrie (2003) surveyed the national digital preservation initiatives in Australia, France, the Netherlands and the United Kingdom and made some useful observations that are very relevant to this study. An underlying trend observed in these nations in terms or digital preservation initiatives suggests that in developed countries, where DPM has progress, initiatives were triggered by the recognition that digital materials were proliferating, but digital media are fragile and depend on rapidly evolving software that quickly become obsolete (Beagrie, 2003, p. 3).

Thus, DPM programmes are developed to ensure long-term preservation of digital heritage materials that were multiplying.

Beagrie also observed that the digital preservation initiatives in these developed countries were not just single national initiatives. They were rather many institutional missions that were being extended into the digital domain and also there was a challenge of poor funding for the projects (2003, p. 2). Beagrie's observation provides an understanding for developing counties that hope to initiate DPM. It also shows the need for collaboration and involvement of all institutions (national and private) in such national projects.

Also, the Singapore Memory Project (SMP) which was led by National Library Board of Singapore was driven by the recognition that digital technologies were proliferating in the country and individuals and institutions were accumulating their own digital collections about the country. So the developers of SMP used social media to interact with the citizenry, communities and institutions that have formed memories and content in any format about Singapore and would like to contribute them to build a national collection. Through this means they were able to collect digital resources and digitised physical resources from the people and now SMP has about 212,000 items or 5.3 million digitised pages (see Tang, 2013). The SMP initiative is very relevant for this study as there has been recognition in Ghana that digital technologies are proliferating and at the same time various institutions and individuals are creating digital content through various digital activities in the country, which largely includes the use of social media.

National cultural institutions such as libraries, archives and museums are usually responsible for national DPM initiatives. These cultural institutions are actively creating digital surrogates of their country's heritage collections because those heritage collections represent their national identity (Poll, 2010, p. 122). In a survey of libraries, archives and museums in Europe Poll (2010, p. 129) reported about 19% of analogue collections had been digitised, with no plans for 30% and the remaining 50% of the analogue collections in cultural institutions still waiting to be digitised.

Initiatives in DPM usually begin with the development of digital strategies. This was the situation in New Zealand for instance. DPM initiatives began with in digitisation and information management. According Carnaby (2009, p. 251), progress in digitisation

initiatives in New Zealand stemmed from the country's ability to develop digital strategies. Plan for New Zealand national information strategy began in 1999 through work conducted by the Library and Information Association of New Zealand (LIANZA). The New Zealand Digital Strategy (NZDS) was made up of the following components:

- *Connection*: a broadband connection
- *Content*: a plan about what one can put in the broadband pipes
- *Confidence*: trusted systems and people with the confidence and skill to take an active part in the digital world (Carnaby, 2009, p. 252).

The inclusion of a fourth component (collaboration) to the NZDS extended it to develop into the New Zealand Digital Content Strategy (NZDCS). NZDCS created an awareness in the country about the need for a plan as to what should be put into the broadband (Carnaby, 2009, p. 253). It is important therefore to find out the roles played by cultural institutions in Ghana regarding heritage resources management and preservation.

The progress in New Zealand initiatives in DPM enabled the country to establish a national digital heritage archive (NDHA) which represents New Zealand's collective memory. In a survey to assess early learning from the NDHA, Knight (2010, p. 85) reveals the attitudes of NLNZ's staff towards the NDHA and identifies that key success factors that need to be considered for DPM programmes include, defining strategic drivers; choosing a suitable business model; defining the exact purpose of digital preservation programme; effective deployment and implementation of ideas and ensuring adequate staffing (Knight, 2010, p. 90). Knight stresses that NLNZ's role as a leading organisation in digitisation initiatives and its experiences will be of relevance to many other libraries throughout the world (2010, p. 85). I found these factors to be useful for countries that are developing in term of DPM and very essential to ensuring effective DPM in Ghana.

2.7.2 DPM Initiatives in Developing Areas

Digital cultural heritage management and preservation involves ICT, thus can be considered an information systems (IS) activity. According to Avgerou (2008, p. 133) IS research, which is premised on the potential of ICTs, is concentrated in the developed countries. But the international IS literature includes an increasing number of studies of IS innovation and

initiatives in developing countries. Such studies, according to Avgerou, considerably expand the empirical basis that informs IS research findings (2008). Concerns about digitisation and digital preservation initiatives in developing African countries have concentrated on how to surmount challenges that hinder successful application of the new digital technologies, particularly in the area of cultural heritage resource management and preservation and records management (see Alemna, 1999; Kyobe, 2011; Omeku, 2006; Onyancha, Maluleka, & Ngoepe, 2012).

In the developing world, digital technologies are mainly perceived to be used for communicating (Alemna, 1999; Kraemer, Dedrick, & Sharma, 2009; Omeku, 2006). However, it was identified over a decade ago that a major reason for the existence of computer technologies in developing countries is for creating and storing digital surrogates (Witten, Loots, Trujillo, & Bainbridge, 2002, p. 7). Witten and his colleagues found out that in developing countries, information provided through digital technologies promotes human development in areas such as: disaster relief, dissemination of humanitarian information and enhances locally produced collection of information. Digital information also opens new opportunities for developing countries to enter the global marketplace and creates enabling conditions for the preservation and propagation of indigenous culture (Witten et al., 2002, p. 7-9). But, these opportunities can only be realised when effective strategies are developed for the use of these technologies. Without effective strategies, it will be difficult for developing countries to realise the full potential of the technology and delay the achievement of digital preservation goals.

To ascertain how developing countries have attempted to benefit from ICTs Avgerou (2008, p. 135) reviews IS research different regions. She identifies three discourses on IS implementation and associated organisational and social changes in social science research in developing countries. The first discourse is literature that investigates IS innovation as diffusion of IS knowledge transferred from advanced economies and adapted to the conditions of developing countries. Avgerou's examples of authors involved in this *transfer and diffusion philosophy* include Al-Gahtani (2003) and Rose and Straub (1998). Al Sukkar and Hasan (2005), Heeks (2010), Kalusopa and Zulu (2009) and Navarra (2010) are also good examples of authors in this group of discourse as they provide a rhetoric with the assumption that IS innovation in developing countries is mainly concerned with catching up

with the technologically advanced, rich economies through transferring their technologies and emulating their institutions.

The second group of authors assume that IS innovation in developing countries is about constructing new techno-organisational structures within a given local social context. They place research emphasis on exploring local meanings and working out locally appropriate techno-organisational change. This group thus focuses attention on social embedding of IS innovation in the context of developing countries (Avgerou, 2008, p. 135). Authors involved in this discourse, for example Mengiste (2010), Miscione and Aanestad (2008), Spil, Schuring, Mugisha, Michel-Verkerke, and Lagendijk (2010), view IS innovation as a locally socially constructed course of action (Avgerou, 2008, p. 135). Typical examples of such initiatives include projects such as Aluka[8] in Mali, Mozambique and other parts of Africa (see Dong, 2012; Ryan, 2010).

The third group emphasises the developmental struggle in which IS innovation is implicated. According to Avgerou (2008, p. 136) this discourse of IS research in developing countries take IS innovation to be primarily concerned with creating possibilities for improvement of life conditions in a particular locality amidst global socio-economic change. It therefore considers IS innovation as a transformative socio-economic process. Examples of this group of research include Akpan (2003) and Kanungo (2003). Akpan particularly argues that current processes of globalisation cannot on their own foster economic development for developing countries. So, to stay connected with the global economy, developing countries should pursue development strategies that will meet their basic needs (Akpan, 2003, p. 261). Finally, Avgerou called her readers' attention to the potentially significant theoretical contribution which IS research in developing countries provide to assist in understanding IS innovation in social contexts and in the development of theories and policies (see 2008, p. 140).

My research incorporates relevant elements from the first and second groups of research discourses. It applies knowledge about how technological innovations, particularly relating to digital preservation of cultural heritage resources, is transferred and diffused into all sectors of Ghana especially digital heritage information management. This transfer is mainly from

[8] See the link to the Aluka project http://www.aluka.org/

technologically developed countries and this study employs specific examples from New Zealand as a frame of reference. Also I perceive the DPM innovation in Ghana as a contributor to building strong institutions for the management of heritage resources in digital forms. I see technologically equipped national cultural institutions like a national library, archive and museum as techno-organisational structures mentioned in Avgerou's second group of IS discourse. Even though this study can, in the long-term, lead to a socio-economic change in Ghana, the actual focus does not consciously concern Avgerou's third category of IS discourse. Below are summaries of some of the studies, reports, reviews and research conducted on various DPM initiatives in Africa and their relevance to this research.

Preserving indigenous knowledge is an important part of DPM initiatives. But, it has been observed that libraries and academic institutions in Africa do not integrate indigenous knowledge into their activities well enough (Moahi, 2012). This trend, according to Moahi, is a result of globalisation and an impact of the unifying nature of the world educational system which does not offer opportunities for African institutions to distinguish themselves with what they have to offer (2012, p. 546). Moahi discusses various issues that influence why Africa's indigenous knowledge is not playing a more active and visible role in the knowledge economy. Through his discussion, Moahi explores the roles that African academia and librarians must play to ensure active involvement of indigenous knowledge in Africa's efforts of contributing to knowledge through teaching and research. Focusing his study on universities and libraries, Moahi found that these institutions do not give serious consideration to indigenous knowledge as an important factor to national development.

In my research, the focus is not only on libraries and universities and what they can do to develop indigenous knowledge. My focus is on all cultural and information management institutions including libraries, archives, museums, and university departments where information management is taught as a course, and information professionals and lecturers. Again, the focus of this research is not only on the development of indigenous knowledge and how it can contribute to national development. The central point of my research is about identifying what contextual factors influence the management and preservation of heritage resources (including indigenous knowledge) in digital forms. Moahi's study provided a good precedent to assist me in this exploration of contextual factors in Ghana. It assisted me to understand that although the contextual factors affecting DPM come from various sources, cultural institutions and information professionals are very instrumental to effective DPM

programmes. Where cultural institutions do not include all aspects of heritage, the DPM programme will not be complete. Moahi's comment raised my awareness that where information professionals have lower promotional efforts, it hinders the rate at which decision-makers adopt DPM.

When it comes to DPM initiatives in developing countries, Zuraidah's (2008) study is very significant to my study. She explored professionals' perceptions regarding the establishment of a National Digital Cultural Heritage Repository (NDCHR) in Malaysia. Zuraidah found that four main factors relating to human, governance, content management and technology contribute to the establishment of NDCHR in Malaysia (2008, p. 540).

Reports on specific DPM projects in different parts of Africa provided useful leads to the exploration of the contextual factors in Ghana. For instance, Ryan (2010) reports a case study that describes experiences in a collaborative initiative project to digitise a wide range of scholarly materials from and about Africa. Using two examples of capacity building in Maputo and Timbuktu, Ryan describes the Aluka project highlighting the creation of computer laboratories where cultural heritage materials such as manuscripts were digitised in Mali and oral histories, maps and audio-visual recordings were also digitised in Mozambique (Ryan, 2010). As neighbouring African countries, Mali and Mozambique share some contextual similarities with Ghana. I was able to draw on Ryan's description of the Aluka project to assist in the exploration of the contextual factors in Ghana, as I describe in the next paragraph.

The collaborative nature of the Aluka project revealed to me that DPM initiatives can thrive on collaboration as an enabling factor. Other factors that could be identified to have enabled the Aluka project are adequate funding, equipment, skilled personnel and positive attitudes such as will-power and interest in heritage resources. According to Ryan, Africa faces many challenges which are often unknown to their partners in the developed countries when it comes to collaborative DPM projects. Intermittent and unreliable power supply, lack of access to high-end equipment, complicated customs processes and limited control over the environment are just a few that Ryan identified to mostly hinder the operational efficiency of such technical projects as was seen with the case of Aluka (2010, p. 29). These factors were also identified in Ghana to hinder DPM.

Further, Dong (2012) reports on the economic and political themes she examined, in relation to international collaborative heritage preservation and archives efforts in Mali. In that study, Dong identifies that collaboration involving multiple players is affected by various contextual issues. For instance, collaboration among industrialised nations, international heritage organisations, and postcolonial or economically developing regions are full of social and political issues that affect preservation outcomes and modern cultural development. She revealed four clusters of contextual factors: infrastructure limitations, multiple conceptions of cultural and historical evidence, localisation and globalisation and negotiating collaborations, as the main influencing elements of the Timbuktu manuscripts project in Mali. Drawing on Ryan's (2010) and Dong's (2012) factors, I was able to identify possible factors that influence DPM initiatives in Ghana.

The works discussed above show that African countries face many challenges with DPM initiatives. However, there are cultural heritage resources located in these countries that could be of relevance not only to the countries in Africa, but the world at large. There is the need therefore, to properly manage and preserve these heritage resources for future generations. With the idea of DPM becoming common worldwide, I use this research to explore the factors in Ghana that are influencing the adoption of DPM in the country. I also seek to identify the elements of a national digital repository that can represent the collective memory of Ghana. So in the next two sections, I examine literature that discusses different factors that can influence the management of digital resources and collective memory respectively.

2.8 Factors that Influence the Management of Digital Resources

Ensuring effective management of digital resources can be challenging. In this section, I discuss various factors that influence the digital resources management. I consider the factors that enhance effective digital resources management as enablers of DPM and those that present challenges as hindrances to it. Effective implementation of policies and strategies, proper allocation of resources, investing in ICT, working in cooperation, emulating success stories, and showing full commitment are identified in the literature to enable DPM programmes. Also, inadequate funding, lack of collaboration, lack of ICT infrastructure, lack of communication due to language barriers are major hindrances to effective digital resources management.

2.8.1 Policies and Strategies Implementation

Policies and strategies are significant to guide the creation, use, management and preservation of digital materials. Where there are proper digital policies and strategies, they enable DPM. But inadequate policy or its absence hinders it. The development and implementation of national policies and digital strategies enabled countries that have undertaken DPM initiatives such as New Zealand, to achieve progress (see Carnaby, 2009; Digital Strategy 2.0, 2008; Dorner et al., 2002; Dorner, Liew, & Yeo, 2007; Knight, 2010; NLNZ, 2010a). In their description of the Ghanaian heritage resources, Frimpong, Esselaar, Stork, and Anyimadu (2005) demonstrated that the planning and implementation of strategies to guide initiatives regarding digital heritage resources in Ghana are important considerations. Several authors have also advocated the development of digital strategies for Ghana (see Alemna, 1999; Alemna & Sam, 2006; Frimpong et al., 2005; Mensah & Owusu-Mensah, 2002). Alemna for instance, perceives national information policies and strategies as a set of decisions taken by a government through appropriate laws and regulations. Policy and strategy orient the harmonious development and management of information transfer activities and satisfies a country's information needs. Alemna therefore found it a concern that Ghana did not have a national policy or strategy for digital information management (1999, p. 168).

The need for coherent long-term strategies has long been identified as the first step to tackle the root of the problems relating to Information Systems (IS) that face sub-Saharan African countries (Camara, 1990, p. 55). But, since Camara's suggestion over two decades ago, sub-Saharan countries are still grappling with IS problems because of lack of strategies. Ghana, for instance, has still not developed any appropriate strategies to guide information systems development and digital materials management. It is when such strategies are contextualised in a particular country's situation that the full benefits of embedded strategy to guide DPM can be realised. The time may be appropriate for governments in sub-Saharan African countries such as Ghana to recognise the importance of taking into account the development of effective digital strategies to ensure effective DPM for their countries.

2.8.2 Resource Allocation

Resources for the effective management of digital material are not only the high costs for equipment and its maintenance. The bigger picture includes investment in ICT, encompassing training personnel and encouraging attention in the digitisation and digital preservation field through research. Training people to develop an interest in digital technologies is a good

investment in intellectual capital for ICT. This approach is seen to be difficult for most African countries due to low per capita income and other problems that take a major portion of their resources to 'priority' areas like education , health, agriculture, roads and water (Alemna, 1999, p. 168; Mensah & Owusu-Mensah, 2002). Yet, ICT is applied in all other areas so investments in it can begin with developing people's interest to it. Investing in ICT has enabled countries like New Zealand to achieve progress in DPM (Carnaby, 2009; Dorner et al., 2006; Dorner et al., 2007).

Effective resources allocation and progress in DPM are enabled by the availability of funds. However funding is often not persistent and inadequate in most developing countries (Alemna, 1998, p. 9). According to Alemna, funding is a major hindrance to ICT initiatives not only in Ghana, but in the whole of Africa. In a subsequent publication, Alemna again emphasises that a major barrier for African countries in terms of access and use of ICT, is the cost arising from the acquisition and maintenance of the new information technologies (1999, p. 168). Funding has also been identified as a major hindrance to digital preservation initiatives in other developing regions like India (Nikam, Ganesh, & Tamizhchelvan, 2004, p. 218), Malaysia (Zuraidah, 2007, p. 56), and the Pacific Island countries, such as Fiji (Yee, 2007, p. 2).

Access to ICT also affects effective DPM resource allocation. Lack of ICT infrastructure for instance, is hindering digitisation initiatives in Ghana (Alemna, 1999; Alemna & Sam, 2006; Ayeh, 2008). Cullen notes that the lack of a robust ICT infrastructure with sufficient reliable band-width for internet connection and the necessary equipment as well as the cost to acquire these hardware are the main barriers to physical access to information (Cullen, 2003, p. 249). According to Alemna (1999), the information superhighway comes with the manufacturing of various brands of information technology. The importing of out-dated technologies into African countries seems to make Africa a 'dumping ground' for different brands of unwanted equipment from the west. This is because African countries cannot afford up-to-date hardware. Standardising can facilitate the acquisition of spare parts for maintenance of these facilities (Alemna, 1999, p. 168).

Availability and affordability of ICT in developing countries particularly Ghana, is identified to be inadequate (Alemna & Sam, 2006; Ayeh, 2008). In Ghana, rural communities suffer most in terms of lack of facilities and amenities. Provision of electricity, water, health and

education as well ICT infrastructure is very poor in rural Ghana. With about 69% of Ghanaians living in rural communities, the implication is that the majority of Ghanaians are illiterate and do not have access to facilities including that of ICTs (Alemna & Sam, 2006, p. 238). Notwithstanding, this trend, the use of mobile technologies is becoming common in Ghana even in rural areas.

Lack of physical access to ICT relates to infrastructural limitations to digital initiatives which Dong (2012, p. 271) identifies as a hindrance to international digital heritage preservation projects such as the Timbuktu Manuscript Project in Mali. According to Dong, new media technologies can allow immediate transmission of digital cultural texts across electronic networks. But, access to these technologies is lacking in developing countries like Ghana. This absence provides a barrier to smooth initiatives in digitisation and digital preservation programme.

Resources also include human knowledge, skills and support. The availability of people with knowledge and skill in ICT enables progress in DPM. However, Kyobe (2011) found that lack of skills and knowledge in ICT hinders the management of digital materials not only in developing countries but in some developed areas as well. Cullen (2003) discussing the digital divide in New Zealand, said lack of skills and support prevent groups of users from using the new digital technologies (p. 250). In Ghana, the interaction of factors such as cost, lack of education, culture (tribalism), politicisation and lack of interest prevent people from acquiring knowledge and skills in ICT to support digital resources management. Major ICT projects are undertaken by expatriates who come with their own skilled labour (Alemna, 1999).

2.8.3 Collaboration

Working together in a strategic alliance enables the achievement of results. Over a decade ago, Hoffmann and Schlosser (2001, p. 357) identified that strategic alliances were increasingly gaining favour over go-it-alone strategies for organisations to achieve fast economic growth. Collaboration is likely to be a better option to enable DPM for developing countries because it has been an effective driver for digitisation and digital preservation initiatives in advanced countries. The development of the Europeana digital heritage repository is an example of effective collaboration in DPM. Europeana is an international collaboration to develop a collection of NDMs for European countries (see Europeana, 2013).

Such collaborative engagements assist in demystifying the digital preservation concept to many African countries perceiving DPM as a huge venture which cannot be tackled because of lack of resources. Collaboration is seen as an enabler for initiating developments in digitisation and digital preservation (Alemna, 1999). Buchanan, Gibb, Simmons, and McMenemy (2012, p. 342) identify that collaboration enhances access and improved quality of service, creates awareness and improves relationships among organisations. Collaboration can occur both within and between nations. Developing countries usually seek external support from developed countries and international organisations such as UNESCO, DANIDA, and IFLA for their digitisation initiatives. Effective collaboration can facilitate such external support.

The importance of collaboration in every endeavour cannot be over emphasised. DPM initiatives require long-term planning and sustenance, agreement on formats, standards and use models, interoperability of relevant hardware and software systems. Hence, it is difficult for any institution to do it all alone. As Granger (1999, p. 129) concluded over a decade ago, digital preservation initiatives require partnering among communities and domain specialists, from institutions, diverse group of technologists, users, data centre staff, compliance officers and financial managers. Collaboration is an effective tool for joint decision making and creating competitive advantage (Simatupang, Wright, & Sridharan, 2004, p. 57). It is also perceived as cost-effective and enhancing resource, as well as knowledge sharing (Kock, Hilmer, Standing, & Clark, 2000, p. 1-7). But Dong (2012, p. 281) identifies that memory institutions in developing countries lack this important feature to enhance their engagement in effective initiatives, particularly in digitisation projects. Effective collaboration is also lacking in Ghana (Alemna, 1999, p. 167). The lack of effective collaboration is hindering DPM in Ghana.

Notwithstanding the positive impact team-work can have on DPM projects, issues such as conflict over priorities, power relations, unclear expectations of roles and accountability reflect the negative aspects of collaborative activity. For instance, the effectiveness of collaboration can become minimal where parties do not have balanced power positions. Kahkonen (2014) found that network actors' power relations affect the form of their relationships, because power influences the depth of collaboration. Also, Arazy, Nov, Patterson, and Yeo (2011) identify that task related conflicts can affect a collaborative

process so such issues need to be managed to avoid negative outputs. Thus, to enable effective DPM in Ghana, such negative consequences will need to be recognised and effectively managed.

2.8.4 Emulating Successful DPM Stories

Initiatives in DPM have advanced in the developed world. Researchers in digital resources management believe that it can be rewarding for any country that hopes to achieve progress in managing digital resources to look at what is happening elsewhere in the international environment (Corrales & Westhoff, 2006; Kyobe, 2011). The necessity for developing countries to emulate stories in digital resources management from their successful counterparts may have motivated Alemna (1999, p. 168) to suggest that African countries should violate international conventions on copyright and pirate some of the hardware and software from Western countries in order to develop their own information networks. Nevertheless, pirating may not be necessary in modern times as some technologies are now open-source and can be downloaded free of charge. An example is the greenstone digital library software[9] from New Zealand.

2.8.5 Linguistic Issues

The benefit of emulating success stories of other countries can sometimes be hindered by what has been identified in the literature as the linguistic barrier (Alemna, 1999; De Souza, Laffon, & Leitao, 2008; Ngcobo, 2009). It is challenging for neighbouring countries with different linguistic backgrounds to exchange information technology in spite of how close they may be geographically. Ghana, Togo, Ivory Coast and Burkina Faso for instance, find it quite difficult to exchange ideas and resources on ICT because of their language differences. All of these countries use French as their official language except Ghana which uses English. Ghana relates more to Nigeria which is two countries away, while Togolese scholars prefer to connect with Ivoirians and not their immediate Ghanaian neighbours.

Ghana does not have a single national indigenous language. The different traditional linguistic groups within the country can hinder local understanding of cultural issues. A suggestion to make information available in all official languages (Ngcobo, 2009), may be very useful. New software that automatically translates data into different languages can

[9] The greenstone digital library software can be found through this link; http://www.greenstone.org/download.

enable information sharing and multilinguality in the digital space, enabling international cross-cultural collaboration (Diekema, 2012). A further positive contribution to linguistic diversity has been made by the greenstone digital library software which has played a pivotal role in the preservation and maintenance of international cultures in general and minority languages in particular (Nichols, Witten, Keegan, Dainbridge, & Dewsnip, 2005).

2.8.6 Attitudes of Stakeholders

Positive attitudes of stakeholders enable DPM. But their negative attitudes are hindering it in Ghana (see Akussah, 2005; Alemna, 1989; GLA, 2009). When every stakeholder is fully committed to the course of the digital preservation initiative programme, it works for the success of the initiative. For instance, stakeholders' commitment has been an enabler for New Zealand's digital preservation initiative programme (see Carnaby, 2009; Dorner et al., 2002; Knight, 2010). Negative attitudes towards cultural heritage and the new digital technologies hinder effective DPM. Ghanaians for instance are observed to have poor attitudes towards safeguarding heritage resources (Arthur & Mensah, 2006) .

Peoples' attitudes are also significant to the adoption of the new digital technologies (Kyobe, 2011) and associated initiatives such as DPM projects. Opinions such as "computers are for the young", "difficult to use", "belong to the white culture", "unsafe to put information on" (Cullen, 2003, p. 250) are all negative attitudes that hinder initiatives in digitisation and digital preservation. On the other hand, attitudes such as interest in the new digital technology, desire to learn more about the technology, curiosity to playing with, and willingness to working with the technologies and perceiving the technology as a tool, are positive attitudes that enhance people acceptance of the new technology and its innovations. Such attitudes also enable DPM.

There may be other factors with potential to influence stakeholders' attitudes towards the use of ICT. For instance, Martey (2004b) suggests inadequate ICT infrastructure, lack of equipment, high cost of acquiring and maintaining electronic equipment, will discourage the application of ICT in, for example, distance education. Akussah (2005) also found that poor storage facilities for information management resources, lack of training for staff and lack of government attention also affect information management in Ghana.

2.9 Summary of Factors Identified from the Literature

Effective digital resources management is a result of the interplay of certain contextual factors. While some of these factors enable the successful planning and implementation of DPM initiatives, other factors hinder it. An initial understanding of the factors that influence the general management of digital resources assisted my understanding of the specific contextual factors in Ghana. Table 2.2 summarises the factors identified from the literature review.

Factors that can influence digital resources management
• The development and implementation of national digital policies and strategies • Proper allocation of resources, such as investing in ICT, building capacity, training and education. • Collaboration • Emulating success stories of other countries or partners • Linguistic issues • Stakeholder attitudes, such as commitment and willpower

Table 2.2: Summary of factors that can influence the management of digital resources

Using these factors from the literature and those provided by the underpinning theories I developed a preliminary model of factors (see section 3.6) as a framework to guide my exploration of the contextual factors in Ghana. I revised the model based on the findings (see section 8.2) to aid my understanding of the factors and to see how Ghana can develop a collective memory.

2.10 Chapter Conclusion

Important issues and concepts relating to DPM apparent from the literature include privacy and concerns about ownership of cultural heritage, (see section 2.2.1 and 2.2.2). Cultural heritage resources are very important to identity for any group of people. Four main classes of heritage resources were categorised as tangible, intangible, natural and heritage in the event of armed conflicts. Digital preservation is usually used as a term for the management and preservation of digital heritage resources for the long-term. There are ambiguities surrounding the use of the term *digital preservation* and other related terms such as digital archiving, digital curation, digital continuity, digital libraries and digital sustainability.

Different approaches to digital preservation have also been discussed. The main idea of preservation is to keep information materials (generally) in good condition for the long-term. When it comes to safeguarding cultural heritage resources, traditional preservation involves

both restoration and conservation. The various factors that influence the management and preservation of digital resources have been discussed to show that there are more hindrances to effective digital resources management than enablers.

Also, the discussion highlights that underlying all the challenges to DPM in Africa is a lack of interest in information management. Strategy implementation and policy development are prerequisite for any successful digital preservation project. Digital preservation initiatives are common in developed countries. In recent times, these initiatives are also emerging in developing regions. Heritage resources present the collective memory of a people. When collective memories are well managed, they could contribute to the establishment of an NDM for a country. The state of digital heritage resources management in Ghana is not in good shape. In the next chapter, I discuss the two main theories used: Diffusion of innovation and Policy, Strategy and Resources (PSR) troika.

Chapter Three: Theoretical Considerations

3.1 Introduction

I use this chapter to present the theories that underpin this research. Theories can be used as a lens to provide an initial guide to the design of the study as a part of the iterative process of data collection, or they can come as a final product of interpretive research (Creswell, 2003; Gregor, 2006; Walsham, 1995, 2006). Rogers' (2003) "diffusion of innovations" (DOI) theory and Davies' (2000) "policy, strategy and resources" (PSR) troika model together with ideas from the literature are used to model a framework to underpin this study.

In this chapter I explain my motivation for selecting DOI theory and the PSR model and justify their relevance to this research. A preliminary conceptual model of factors developed to guide the exploration and understanding of the factors in Ghana comes at the end of this chapter.

3.2 Motivation for Considering the Underpinning Theories

The problem that informed this study (see section 1.5) was that Ghana is not effective in managing its digital heritage resources. I used my observations of the DPM situation in New Zealand as a point of reference to explore the DPM situation in Ghana. Thus, I considered theories that could enhance my understanding of factors either hindering progress in DPM in Ghana or enabling it as I observed in New Zealand.

I understood DPM to be a process that enables the management of digital resources and I had observed that this process was not being utilised in Ghana. To investigate the reasons for this situation, I initially considered a number of Information Systems theories. For instance, since DPM involves the use of digital technologies to manage heritage resources, I explored the Technology Acceptance Model (see Venkatesh & Davis, 2000). But I considered that DPM is not only about the technology, it also involves processes and cultural issues. Thus, I needed a theory that could enhance my understanding of both the technological aspects as well as the processes involved in initiating DPM. Rogers explains that "diffusion is a general process not bound by the type of innovation studied, by who the adopters were or by place or culture. The diffusion of innovation was a kind of universal micro-process of social change" (2004, p. 16). In this respect, I considered Rogers' (2003) DOI theory appropriate to guide the exploration and understanding of the various contextual factors in Ghana.

Also, as I observed in New Zealand, effective DPM requires the effective development of policies, strategy implementation and resource allocation (see section 2.8.1). Davies' (2000) PSR troika model was able to assist my understanding of the basic principles of strategy development. Thus, I included the PSR troika model to guide my understanding of the policy, strategy and resource elements influencing DPM in Ghana.

In sections 7.2 and 7.8, I reflect on my use of DOI and PSR troika to justify their application in this qualitative interpretive study. Rogers DOI theory has been used in studies involving qualitative approaches and decision-making relating to innovation adoption (see, section 3.3.2).

3.3 Diffusion of Innovation Theory

The DOI theory was developed by Rogers in 1962 (Rogers, 2003). The model was the result of Rogers' quest to understand a puzzling and frustrating situation where farmers delayed for several years adopting new ideas that could have been profitable for them. This aroused Rogers' interest in agricultural innovation by observing the farmers in and near Carroll, Iowa, his home community (2003, p. xv).

3.3.1 Factors in the DOI theory

Rogers (2003, p. 222-266), summarises the various factors that influence the rate of adoption of an innovation into five main areas: Perceived attributes of the innovation, type of innovation-decision, communication channels, nature of the social system and the extent of change agents' promotional efforts (p. 222). Figure 3.1 illustrates the factors. I explain how these factors influence the adoption of DPM in Ghana in Chapters six and seven.

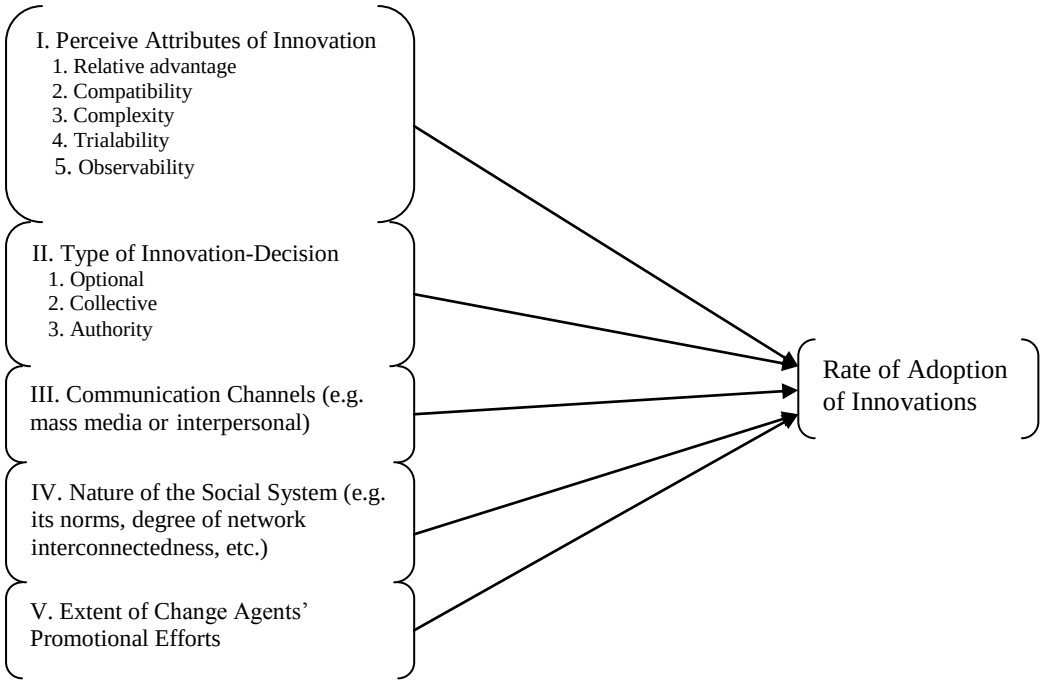

Figure 3.1: Factors affecting the rate of adoption of an innovation

Source: Rogers (2003, p. 222)

3.3.1.1 Perceived Attributes of Innovation

Rogers (2003, p. 222-266) describes five characteristics of an innovation that help to reduce uncertainty about it and influence decisions to adopt or reject it. These attributes affect the rate of an innovation's adoption:

- *Relative Advantage:* The extent to which an innovation is considered to be better than an already existing idea which the new idea will come to replace. Rogers (2003, p. 216) emphasizes that when individuals (or an organisation) pass through the innovation-decision process, they are motivated to seek information to decrease uncertainties about the relative advantage of an innovation. Factors that affect thoughts about relative advantages of an innovation include: Cost effectiveness, ease of use, and delivering better results such as ensuring effective management, preservation and access of cultural heritage resources. I discuss how Ghanaian stakeholders perceived the relative advantages of DPM in the country in section 6.7.

- *Compatibility:* The degree to which an innovation is perceived as consistent with existing values, past experience and needs of potential adopters. For instance, how the idea of DPM is consistent with the social systems and cultural values of Ghana will

affect the rate at which stakeholders adopt the innovation. I discuss the various ways key players saw DPM to be compatible with the Ghanaian system in section 6.3.

- *Complexity:* The degree to which an innovation is perceived as relatively difficult or easy to comprehend, and operate by potential adopters. For instance, if Ghanaian stakeholders perceive DPM as complex, their rate of adoption of the idea will be delayed. However, if they perceive the innovation as simple, the rate of adoption will be faster. In section 6.4, I discuss the specific complexities key players in Ghana perceived of DPM.

- *Trialability:* The degree to which innovation or aspects of it may be tried to ascertain its compatibility, advantages and complexity to a social system. In section 6.5, I explain how aspects of the DPM innovation are being trialled (even if inadvertently) by potential adopters in Ghana.

- *Observability* The degree to which potential adopters are able to perceive results of an innovation after trying it for some time. In section 6.6, I show how key players in Ghana have observed aspects of DPM that have been trialled.

3.3.1.2 Type of Innovation-Decision

According to Rogers (2003), three types of innovation-decision affect the rate of adoption of an innovation:

- *Optional innovation-decisions:* Usually made by individuals who do not depend on the decisions of others to reject or adopt the innovation.
- *Collective innovation-decisions:* Made when members of a system decide to adopt or reject an innovation on consensus.
- *Authority innovation-decisions:* The choice to adopt or reject an innovation made by relatively few powerful individuals in a system. Ghanaian key players perceived that a collective decision on DPM is the best for Ghana (see section 6.12).

Figure 3.2 below shows the innovation decision process. In section 6.12, I reproduce this process and indicate (by shading the appropriate arrows) the stage where Ghanaian

stakeholders are, in terms of their decision regarding the adoption of the innovation in Ghana (see Figure 6.2).

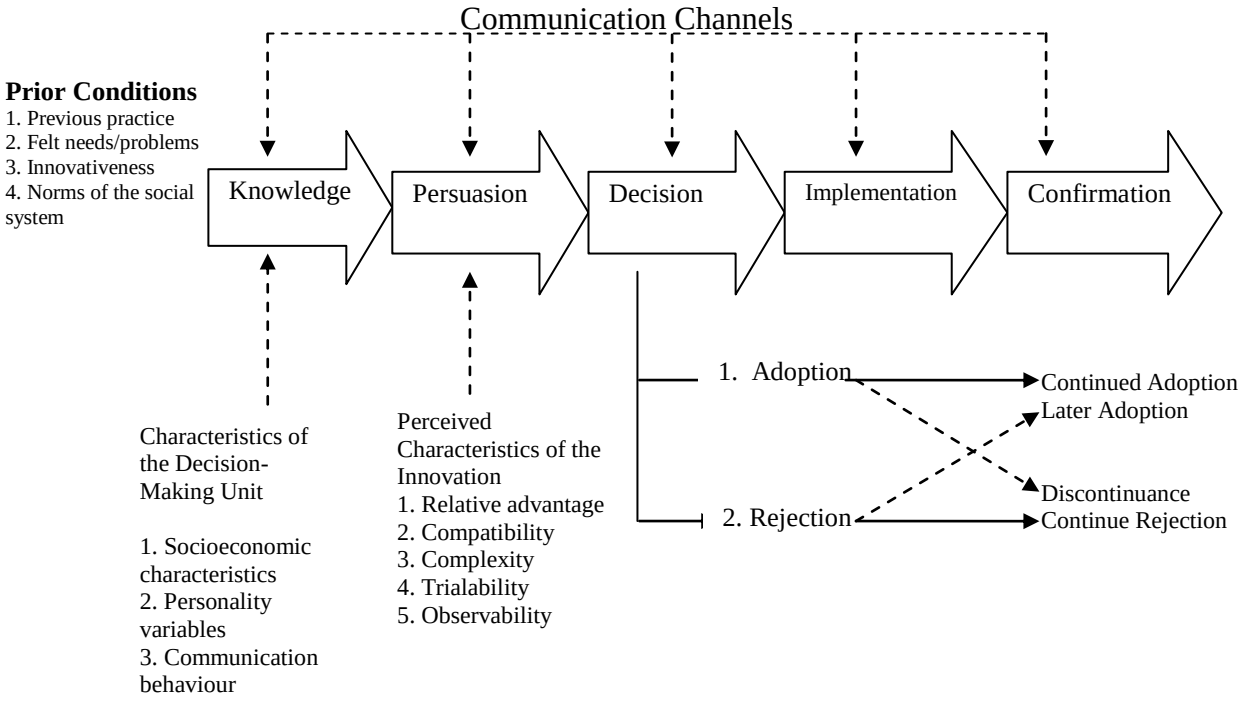

Figure 3.2: The five stages in the innovation-decision process

Source: Rogers (2003, p. 170)

3.3.1.3 Communication Channels

Rogers (2003, p.18) sees communication as a process by which participants create and share information with one another in order to arrive at a mutual understanding. According to Rogers, the means through which information moves from a source to a receiving end is a communication channel. Group meetings, interpersonal discussions, mass media, wikis and blogs are some of the channels agents use to communicate ideas about an innovation. In sections 6.8 and 7.4, I discuss the existing communication channels in Ghana.

3.3.1.4 Social System

Rogers defines a social system as a set of interrelated units that engage in joint problem solving to accomplish a common goal (2003, p. 23). He further identifies that the nature of a social system, such as the norms of the system and the degree to which the communication network structure is highly interconnected, also affects an innovation's rate of adoption (2003, p. 208). The multiple tribes and complex cultural norms in the social system of Ghana, affect the rate at which stakeholders adopt the DPM innovation (see section 6.10).

3.3.1.5 Extent of Change Agents' Promotion Efforts

Rogers (2003, p. 366) sees change agents as individuals who influence a client's innovation decision in a direction deemed desirable by a change agency. According to Rogers, the rate of adoption of an idea depends on the extent of change agents' promotional efforts. Stakeholders in Ghana perceived that certain factors hinder the effects of changes agents in Ghana (see section 6.11).

3.3.2 Applications of the DOI Theory

DOI has provided a theoretical perspective to guide many studies. For example, Greenhalgh et al. (2008) used DOI to explore the introduction of a centrally stored, shared electronic patient record system (the summary care record) in England and drew lessons about the implementation of large scale information technology projects in health care. Their case study revealed eight interacting influences relating to; adopter concerns, interpersonal influences, organisational readiness, the wider environment etc., (Greenhalgh et al., 2008). Greenhalgh and colleagues applied DOI in a different field, but their findings provide insight into areas of innovation adoption. Those were useful to assist me in the understanding of the contextual factors influencing the adoption of DPM in Ghana.

Dorner (2009) also employed DOI to examine public sector readiness for digital preservation in New Zealand. His aim was to examine factors affecting the rate of adoption of the digital preservation innovation in records management practices in New Zealand government agencies (p. 342). Viewing digital preservation as an innovation, Dorner perceives the degree of readiness for digital preservation as the rate of adoption of the innovation across units within public sector organisations. He found that most organisations were knowledgeable about basic aspects of their digital resources but their awareness of digital preservation was generally low, and digital preservation activity was modest overall. Dorner concluded that records managers can become change agents and communicate the advantages of adopting the innovation to assist decision making and planning within the institutions in New Zealand (p. 347).

Also, Tran (2006) used DOI in a mixed methods study, involving interviews and a survey to investigate the adoption of Community Information Networks (CINs) in New Zealand public libraries. Perceiving CINs as an innovation Tran identified the following as some of the

critical success factors of CINs: having relevant vision/aim, serving community needs, promoting broader community relations, building a technological base, providing a relevant content, ensuring public access and collaborating with other networks. In this research, I also perceive DPM as an innovation and use DOI as part of my theoretical framework to explore contextual factors that influence the adoption of the innovation in Ghana.

Using the DOI theory, Brockman and Morgan (1999) assessed the future of Efficient Customer Response (ECR) within the USA by examining "its place in a long line of advances made in distribution over the past century" (p. 397). They suggested that "ECR was the most complex managerial innovation in distribution to be introduced in the USA" (p. 397). Thus despite its potential, diffusion of its specific techniques throughout the USA grocery industry was moderate at best as compared to other managerial innovations such as Electronic Data Interchange (EDI). Brockman and Morgan identified that the delay in adopting ECR and the faster rate at which EDI was adopted was because the former was considerably complex (Brockman & Morgan, 1999). Although, this study was conducted in a different context and discipline, I found Brockman and Morgan's discussion of a complex innovation, ECR, relevant to my consideration of a complex innovation, DPM.

The DOI theory has also been applied in other interpretive studies that appear similar to my research. For instance, Muinde (2009) used DOI to explore contextual factors that influenced ICT-enabled research communication by and for scholars and researchers working in Kenya. She identified a wide range of socio-cultural factors as being relevant.

3.3.3 Relevance of the DOI Theory to this Study

Like the studies discussed above, I also drew on aspects of Rogers' DOI to assist my understanding of the factors in Ghana. My intention to use DOI was not to restrict my exploration in the confines of the elements of the theory. For my research, I perceived the development of national approaches and the implementation of appropriate actions for DPM in Ghana as the new idea which according to Rogers is a type of innovation. I also perceived decision-makers, politicians and key players and the people of Ghana who are in charge of developing national approaches, implementing actions and information professionals who are responsible for DPM in Ghana, as potential adopters of the innovation.

Thus, ideas on the innovation need to be communicated clearly to enhance appropriate change if necessary. Rogers refers to communicators of the new idea as change agents. My observations of New Zealand's DPM showed that the innovation effective there. The country's progress in DPM could be attributed to the effective efforts of change agents. Individual people and key institutions were working together to achieve progress in digital heritage resources management. The Library and Information Association of New Zealand Aotearoa (LIANZA), the National Library of New Zealand (NLNZ) and key players were very instrumental in promoting the innovation in the country. Identify key change agents in Ghana is likely to enable the effective adoption of DPM.

Drawing on Rogers' attributes of an innovation (see Figure 3.1) I describe the factors that influence the decision process for the adoption of DPM in Ghana (see chapter 6). I identified these contextual factors through various iterative approaches of reading through the interview transcripts, to highlight the main ideas (see section 4.7.1) and clustered them into four main areas of factors and related them to the elements in Rogers' theory. The rate at which Ghanaians adopt or reject the innovation depends on how they perceive the development of plans and implementing actions for DPM to be consistent with the values and practices in the social system.

An idea can only be accepted when it is well communicated (Rogers, 2003). As Rogers indicates, the channels through which the idea is communicated can affect the rate of adoption. I perceive the Ghanaian media, research publications and interpersonal communications as channels through which change agents can transmit the new ideas to potential adopters. As Samovar, Porter, and McDaniel (2009) emphasise, an effective future cultural change begins with an effective communication of ideas about the change.

3.3.4 Potential Issues with Applying the DOI Theory in this Study

The DOI theory has been criticised since the 1960s (Stephenson, 2003), even by Everett Rogers himself. Rogers (1995) identified the following biases:

- A pro-innovation bias, which considers the act of innovation as positive and the act of rejecting an innovation as negative.

- Individual-blame bias: This is when, for example, a development agency is perceived as not to blame for its lack of response to the needs of the target group. Rather, the individuals who do not adopt the innovation are to blame for their lack of response
- Bias in favour of larger and more powerful group of potential adopters.

Some critics have questioned the underlying assumption that an idea will inevitably diffuse down to the majority of the people after potential adopters initially adopt an innovation. Goss (1979) for instance analyses the problem he finds in such assumptions and concludes that the application of DOI in developing countries had undesirable consequences. This is because applications of DOI in places like Latin America have shown a widening gap in inequalities among the rich and the poor. This runs counter to the general assumption that the benefits from adopting an innovation spread and become homogenous. Such challenges to the theory suggest that the diffusion of DPM may not be automatically spread among the people of Ghana after its initial adoption by key stakeholders. On the other hand, Black (2000) affirms that there have been well-documented cases of new technologies that have been diffused through the framing population. I reflect on the usefulness and limitations of applying DOI in Chapter 7 where I discuss the findings of this study (see section 7.2).

The literature review shows that an area of factors that affect digital resources management is strategy design, effective policy implementation and adequate resources allocation. In the next section I discuss these concepts.

3.4 Strategy, Policy and Resources

In this study, I consider the development of policies and the implementation of strategies as a key aspect to enable effective DPM. My observation of the DPM situation in New Zealand suggest that understanding key concepts like strategy, policy and resources allocation within the Ghanaian context is vital for a successful DPM programme. When Ghanaian key players fully appreciate the contextual meanings of these key concepts, they are likely to be effective in the implementation of actions to provide long-term preservation and access to Ghanaian digital cultural heritage resources. Thus, I use the next sections to discuss literature on the concepts of strategy, policy and resources.

3.4.1 Strategy

Ghanaians are now challenged by the ways of the new digital technologies. In order not to lose the country's heritage information in digital forms forever, ICT experts, policy developers, decision makers and key players in the country need to design and coordinate contextualised strategies to effectively manage how these technologies are affecting aspects of the Ghanaian economy, particularly digital cultural heritage resources management. Such strategies can be referred to as *national digital strategies*. By this means, Ghana can realise the full potential of the new technologies and still safeguard the country's digital heritage information.

According to Chakravarthy, Mueller-Stewens, Lorange, & Lecher (2003, p. 1), strategy is about creativity and innovation, whereas process smacks of bureaucracy and control. This means that Ghanaians can look at their own circumstances and create strategies to meet their needs. Chakravarthy and colleagues further point out that strategy formulation and implementation has long been seen as an active, goal-oriented process, with a sequence of clearly defined phases and decisions as the relevant objects of analysis. Strategy has always been perceived as an initiative by top management with middle and lower managers only to participate in the process as it goes on by providing the necessary information and serving as facilitators in both the formulation and implementation phases.

Strategy can also be seen as the pattern or plan that integrates the country's major goals, policies and action sequences into a cohesive whole. A well-formulated strategy helps to properly allocate the country's resources into a unique and viable situation based on its relative internal competencies and weaknesses, anticipated changes in environment, and contingent moves by intelligent opponents (Chakravarthy et al., 2003, p. 2). Chakravarthy et al.'s discussion of strategy shows that the concept is inseparably connected with policy and resources and together these concepts make a holistic troika. In the next section I assess the dimensions of strategy implementation before discussing policy and resources. Understanding of the various dimensions has assisted my comprehension of the faults with the strategies in Ghana.

3.4.1.1 Dimensions of Strategy Implementation

Approaches to strategy implementation processes abound in the literature. The one provided by DeWit and Meyer (2004, p. 111) considers both the content and context of strategy. I

considered context and content as essential when considering the implementation of national strategies. According to DeWit and Meyer, the duality of wanting to intentionally design the future, while needing to gradually explore, learn and adapt to an unfolding reality, is the tension central to the topic of strategy implementation. It is the conflicting need to figure things out in advance, versus the need to find things out along the way. So, strategy can in part be planned and in part be emergent.

However, whether planned or emergent, the strategy implementation process is an innovative process which may be influenced by one's innovative creativity and contextual factors. DeWitt and Meyer (2004**)** explain that this is because strategy has to do with the future and arises through a variety of means (p. 111). The two extremes of strategy implementation process (deliberate and emergent) can be brought together as shown in Figure 3.3 below.

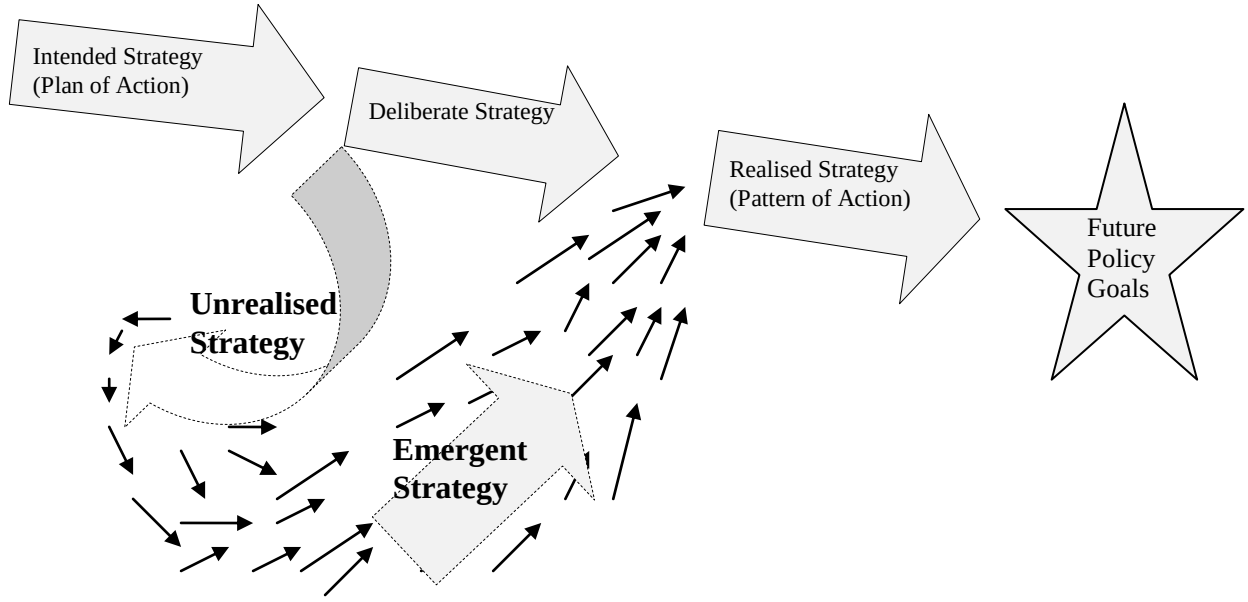

Figure 3.3: Interplay of deliberate and emergent strategy implementation.
Source: Modified from DeWit and Meyer (2004, p. 111)

In the framework of planned and emergent strategies, Ghana can delineate its strategies to meet the country's future needs regarding the management and preservation of digital cultural heritage resources. For instance, the strategy for achieving the goals of the Ghana ICT4AD policy may be planned. But the country needs to consider other strategies that may emerge along the way, even though those emergent strategies may be unplanned. In this regard, the alternative strategic paths as suggested by Davies (2000 p. 28) become very important. For an effective strategic implementation process, DeWit and Meyer suggest the consideration of

three dimensions to consider. These are strategy process, strategy content and strategy context.

In this study, the strategy context is the Ghanaian information infrastructure. Planned policies such as the Ghana ICT4AD and procedures to guide the creation, use and preservation of digital heritage resources are the strategy content. Adequate resources in the form of funds, infrastructure, and materials, as well human resources and training are required to make the strategy content effective to achieve policy goals.

3.4.2 Policy

Policy is the manifestation of considered judgement, plan, role, action, tactics, strategy and sagacity adopted by a government, a party or an organisation (Parsons, 1995, p. 13-14). Sloman (1994, p. 333) identifies the relationship between managers and their targets as an important component which is defined by policy documents. Policy prioritises the planned course of actions adopted and pursued by an organisation or a government. Such a process is undertaken by the decision-makers within an organisation or the state, but it is within the political realm that many of the rules are made that structure and influence activities of the business organisations and their environment (Wilts & Skippari, 2007, p. 129). The businesses and the society in turn influence public policy-making when the organisations develop strategies to fit within the national policy framework. In this respect I conceived strategy and policy as affecting each other. There are strategies to develop policies and there are policies to implement strategies. When the development and implementation of strategies and policies are successfully done, governments are enabled to better meet their economic ends and contribute to the development of the state as a whole (Hadani, 2007, p. 396).

Inadequate access and use of ICT can create pressure within a society. Governments therefore set priorities to enable access to ICT. In this study, I consider societal pressure as not only affecting ICT access and use but also DPM in Ghana. In its attempt to respond to the pressure, the government of Ghana developed the Ghana ICT4AD policy (see Ghana ICT4AD, 2003). I discuss the Ghana ICT4AD policy in section 3.5.4.1.

3.4.3 Resources

The term resources refers to the materials, knowledge, skills and capabilities that can serve as a source of supply, providing the means which can be drawn upon to support aid or facilitate

the execution of a planned action (Zlotin & Zusman, 2005). Thus, depending on the kind of planned action and the context in which the action is to be taken, resources can come in diverse forms and types. The conventional classification of resources has been either natural or other resource forms (Doppelhofer, Miller, & Sala-i-Martin, 2000; Sachs & Warner, 2001).

Initial thoughts of the term resources are usually associated with *natural resources* – water, land, timber, minerals, just to mention a few. Nevertheless, developments such as capitalism, the industrial revolution and the management revolution, brought about other concepts of resources such as *financial resources*, *human resources* and other resources (Zlotin & Zusman, 2005, p. 2). The information revolution inspired discussions about *information resources* (Basch, Thaler, Shi, Yakren, & Schrag, 2004; Hsu, Bouziane, Rattner, & Yee, 2002; Jonscher, 1983; Rosa et al., 2005) and the advent of the contemporary digital technologies in the management of information has also resulted in discussions of digital information resources (Long, 2007; Ma, 2002; Peterson, Rowat, Kreiter, & Mandel, 2004; Pickard, 1998).

According to Davies (2000) resources are needed to make strategies effective in order for strategies to contribute to the achievement of goals set by policy (Davies, 2000). Therefore, for any country to effectively manage its digital cultural heritage resources, other resources such as financial, infrastructure, equipment, human and adequate time are imperative. In Table 3.1, I provide a list of some types of resources and their descriptions which I adopted from Zlotin and Zusman to suit the purpose of this study.

Type of Resource	*Description*
Financial Resources	The ability of a country to provide funds for the undertaking of projects and programmes such as digitisation and digital preservation initiatives.
Human Resources	Refers to the availability of a skilled labour force and knowledgeable personnel to handle the development and implementation of strategies, development of policies for the effective management of activities. They include ICT experts, strategy development experts, librarians, archivists, records managers, policy makers and so on.
Time Resources	Any time, before, after, and between the cycle of a process or procedure within the period allotted for a project such as a digitisation initiative, or a digital preservation programme.
Informational & Communication Technology (ICT) Resources	Any information material or institutions such as libraries, archives and museums and ICT facilities such as broad-band, computers, internet etc. that enable easy access to current and relevant information within the organisational or country levels.

Table 3.1: Types of resources and their descriptions

Adapted from Zlotin and Zusman (2005, p. 30)

The identification of these groups of resources in the literature was useful to guide my understanding of the meanings of the types of resources that are influencing DPM in Ghana. To provide a better understanding of the nature and purpose of policy, strategy and resources, there was the need for a model to guide the exploration of the fundamental qualities and meaning of a strategy for DPM. In this regard, Davies' (2000) PSR Troika model provided a suitable framework of ideas to guide this research.

3.5 The PSR Troika Model

My motivation to use the PSR troika model was to emphasise the relationship between policy, strategy and resources as basic elements that require equal consideration to enable effective DPM. The troika model proposes that the nature and purpose of *strategy* as well as how it is applied in practice is best understood when it is viewed as one element in a troika that also includes *policy* and *resources* (Davies, 2000, p. 25). This reveals the primary characteristic of strategy as having a causal relationship with policy and resources in a troika (Davies, 2000, p. 27). A troika, according to Davies, is an arrangement of three elements. However, what distinguishes a troika from other triumvirates is that in a troika, the three elements are equal in weight and standing, and all three elements act in unison (Davies, 2000, p. 26).

Strategy provides a plan. Then through a process of multiple inputs, options, and outputs, policy goals and objectives of a country can be achieved. Resources also supply the materials and methods needed to make strategy functional and effective. Without resources, strategy can achieve nothing and without strategy, the goals and objectives set by policy cannot be achieved (Davies, 2000, p. 29). Figure 3.4 below illustrates the PSR troika model of understanding strategy.

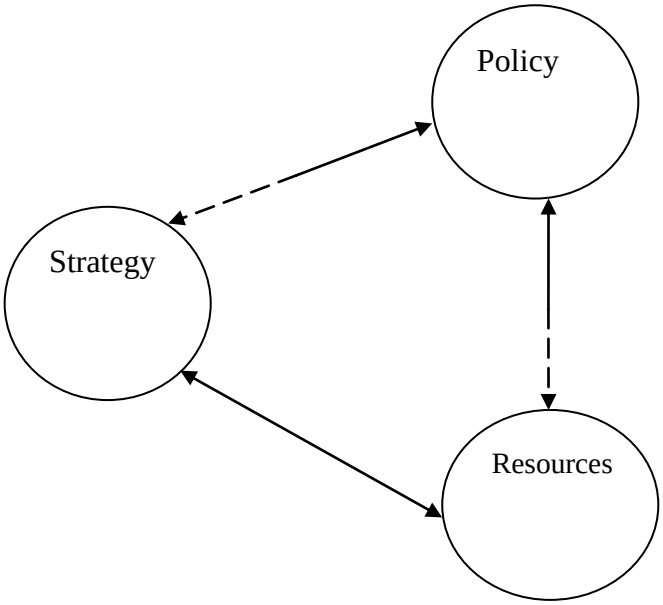

Figure 3.4: The PSR Troika model of understanding strategy
Modified from Davies (2000, p. 27).

As shown in Figure 3.4 policy sets goals and objectives to be achieved at the top level and resources provide what is required at the basic level to achieve the goals (see section 3.4.3). Strategy plays a pivotal role between policy and resources, providing explicit plans to properly allocate resources to achieve policy goals. Thus, while strategy and resources contribute to the achievement of policy goals, policy in turn influences strategy and resources because it expresses clearly what judgements, actions, roles, tactics etc., need to be adopted (see section 3.4.2) as priorities for effective strategy implementation and resources allocation. Hence, all three elements influence the effectiveness of one another. They therefore need to be given equal consideration to achieve success in any project that requires their application.

As Davies explains, policy in government is the product of a legislature that delineates the goals, objectives and priorities of a state (Davies, 2000, p. 27). The literature also shows that strategy is a process that can be conceived as the sum total of purposes, plans and action

sequences by which an organisation entity or state commits human and financial resources, time, and energy to shape its long-term future (Chakravarthy et al., 2003; DeWit & Meyer, 2004; Munive-Hernandez, Dewhurst, Pritchard, & Barber, 2004). The long-term objectives are set by the policies of that country in an environment where there is a contention between factors that can enable and those that hinder the achievement of the policy goals and also to specify strategies.

The idea of the PSR Troika as applied in this study can be related to the traditional approach of cooking on a three-stone-cooking-fire. This approach requires three suitable stones of the same height and similar weight on which a cooking pot can be balanced over a fire. Where one of the stones is damaged or removed, the cooking pot cannot be balanced on the remaining two stones, making cooking impossible.

In the same way, I conceived the three elements of *policy*, *strategy* and *resources* as three stones on which the government of a country can situate its *legislative pot* to *cook* its policy goals and objectives. Where the *resources stone* for example is defective or lacking, the *pot* cannot be balanced on the *strategy* and *policy stones* alone. Similarly, where there are no strategies, a country cannot effectively manipulate its resources to achieve its policy goals; no matter how well-endowed such a country may be in terms of resources. Again, without policies that set the priorities of a country, there cannot be effective strategies to fully harness a country's resources. I perceived this idea of the PSR troika as useful for a country to adequately apply its resources to develop national approaches and implement strategies for the effective DPM.

The troika model further explains that effective strategy implementation is characterised by multiple options, multiple paths, and multiple outcomes (Davies, 2000, p. 28). This approach facilitates the development of a strategy to get around insurmountable obstacles, avoid unacceptable consequences, and be tolerant to changes in conditions. Figure 3.5 illustrates the multiple options and outcomes of strategy implementation:

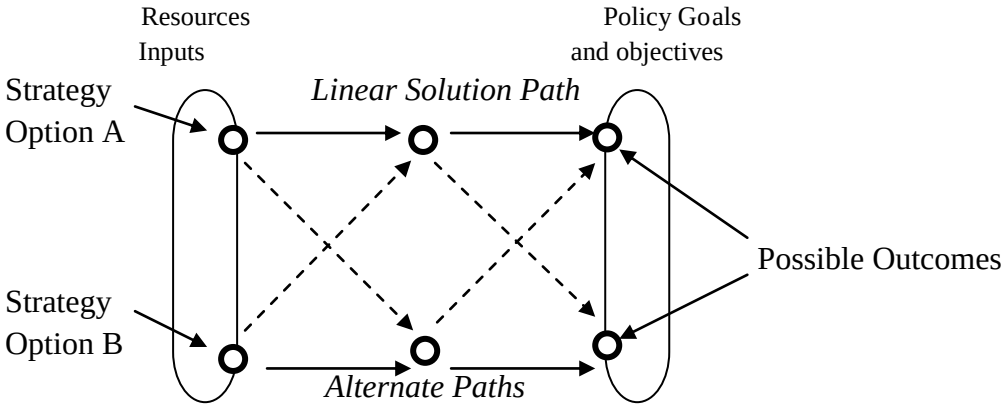

Figure 3.5: Different options and outcomes of strategy formulation
Source: Davies (2000, p. 28)

The purpose of strategy is to achieve policy goals, and since strategy, according to Davies, is driven by its purpose, it must include a plurality of inputs, a multiplicity of options, and an ability to accommodate more than one outcome. But, where policy is ignored or where there is no end-means linkage between policy, strategy and resources, strategy has no object. In such situations, strategy suffers from being a means without an end and it cannot achieve the country's goals and objectives (Davies, 2000, p. 30).

3.5.1 Applications of the PSR Troika Model

Ideas from the PSR troika have been applied in a number of studies. Constantinides (2004) for instance applied ideas from Davies (2000) about corporate policy and strategy to develop a methodological process for identifying, classifying and analysing corporate strategies of two firms: Amazon.com and Etrade.com (Constantinides, 2004, p. 93). The aim of his two case studies approach was to deal with the fast-evolving, uncertain environment, which he describes as strategies for surviving the internet meltdown (Constantinides, 2004, p. 89). Like Constantinides, I also applied ideas from the PSR troika model in my study to understand factors that influence Ghana's efforts to achieve its long-term corporate policies goals on ICT and hence DPM.

The troika model can be applied in a variety of areas. Dordevic (2004) also referred ideas from PSR troika in his exploration of factors that led to the development of a national strategy for Serbia. His study was a strategic response of Serbia to organised crime in the country. He describes the idea of strategy in Davies's troika model as very comprehensive in

the security area (Dordevic, 2009, p. 48). The application of the PSR troika in the security area demonstrates that the model is applicable in a variety of settings.

Using the PSR troika elements, Deenapanray (2005) developed a template for running a business by including a fourth element to extend PSR into the Policy-Strategy-Resources-Tactics (PSRT) model to ensure the ecological sustainability of a business. Deenapanray stated that policies outline the organisation's objectives, prescribing its operational domain. Strategy is the plan articulated by policy, of how the goals will be achieved, and without resources strategy cannot be implemented so it remains a mere intention. But the details of implementing strategy need to be expressed in a plan of action which he refers to as tactics (Deenapanray, 2005).

These applications of the PSR troika model were encouraging for me. But my main motivation to include the model in my theoretical framework stems from the elements it incorporates; an understanding of these elements can enable effective DPM in Ghana.

3.5.2 Potential Issues with Applying the PSR Troika Model in this Study

The PSR troika model was developed in the strategy and management field to assist in the understanding of strategy development for the running of organisations. The model appears relatively new so has not been used much in the literature. It does not appear to have been used in information systems research of studies involving digital preservation and cultural heritage. However, national approaches towards effective DPM include the development of national policies, the implementation of strategies and proper allocation of a nation's resources. These three actions are fundamental components that appear to be given equal consideration to ensure any successful national DPM programme. Thus, I decided to include ideas from the discussion of these elements in the troika model to relate to the contextual understanding of factors affecting policy, strategy and resources that influence DPM in Ghana.

3.5.3 Relevance of the PSR Troika Model in New Zealand

To obtain a thorough familiarity of how the troika model could assist my exploration and understanding of the factors that influence DPM in Ghana, I examined the elements in the model in the New Zealand context since I conducted the research from there. I then used my observations from this experiment as a frame of reference for applying the model in Ghana.

New Zealand has achieved progress in DPM. DPM in New Zealand began with a *policy* around their *digital strategy* and a commitment of *resources*; funds, people, materials and associations such as LIANZA who strongly influence the dimensions of New Zealand's digital environment (Carnaby, 2009, p. 252). Stakeholders in New Zealand realised that digital devices were becoming ubiquitous (Digital Strategy 2.0, 2008). The result of this thinking was the development of the *digital strategy* and subsequently *digital content strategy* to respond to the changes and challenges brought about by the rapidly evolving digital world. The relevance of the PSR troika in the context of New Zealand can be realised by taking a look at how the 'three stones' of policy, strategy and resources, operated there.

3.5.3.1 The policy 'stone' in New Zealand Context

Policy makers identified and defined their priorities, goals and objectives and then planned a definite course of action to adopt in order to realise the digital future for New Zealanders. When these definite courses of action were formalised into a document in 2005 (Carnaby, 2009), it became New Zealand's *policy* on digital resources.

3.5.3.2 The Strategy 'Stone' in New Zealand Context

New Zealanders developed their national digital strategy to ensure that the planned actions in the digital policy were executable and achievable. The troika suggests multiple-option, multiple-path, and multiple-outcome aspects of strategy as an enabler to get around insurmountable obstacles, avoid unacceptable consequences, and be tolerant to changes in conditions (Davies, 2000, p. 28). This was exactly what happened in New Zealand. The first digital strategy was developed in 2005 within the fundamental framework of three elements *connection*, *content* and *confidence*. However, realising the importance of cooperation in digitisation initiatives, a fourth component, *collaboration* was incorporated to make the NZDS more effective to achieve the policy goals. This, according to Carnaby, resulted in the development of *Digital Strategy 2.0* in 2008 (see, 2009, p. 253), bringing to play the idea of multiple-path, multiple-outcome principle described by the troika.

New Zealand policy makers did not only make changes in strategies where necessary, they also employed optional strategies. For instance, the subsequent development of the New Zealand's NZDCS was to provide an additional strategy to cater for what content to be put in

the *connection* (broadband). As Carnaby emphasises, development of NZDS and NZDCS was initiated by LIANZA and led by NLNZ (2009, p. 252) (see also LIANZA, 2012).

The archives community of New Zealand has highlighted the need for awareness of digital preservation concerns. For instance, Archives New Zealand, through the Digital Continuity Action Plan (DCAP) programme, collaborated with the NLNZ and the Department of Internal Affairs to develop the Digital Preservation Strategy (DPS) in June 2011 (see Archives New Zealand, 2012). Archives New Zealand spells out the objectives of this strategy as to:

> Strengthen the on-going security and viability of New Zealand's digital documentary heritage and public archives. Ensure an enduring digital record of government decisions and activities be complemented by policies covering day-to-day digital preservation approaches and processes, while ensuring that the right material is saved in the best way, is identified and useable for the long term. (Archives New Zealand, 2012)

The above discussion demonstrates that New Zealand appeared to be exploring every opportunity to strategise and ensure that their digital cultural heritage resources are well managed and preserved for the future. As stated on the website of NLNZ, digital content was seen as one of the enablers of the New Zealand's digital strategy (NLNZ, 2010b). The development of these strategies is a contributing factor for the astounding increase in the number of digitisation initiatives in New Zealand over the last decade (Dorner et al., 2002; Dorner et al., 2007; NDF, 2013).

Nevertheless, the DPS is not as yet accepted as a national strategy for the whole country. It is a collective initiative of two national institutions (Archives New Zealand and NLNZ) to "affirm both organisations' commitment to ensure that the digital content in their care is managed and preserved in a way that reflect its status as an asset and 'taonga' of New Zealand" (Archives New Zealand, 2014). This implies that not every institution in New Zealand is committed to the DPS. Thus, even though New Zealand is being used as a frame of reference for this study, when it comes to digital preservation initiatives, no one country can claim perfection.

3.5.3.3 The Resources 'Stone' in New Zealand Context

According to Davies, "the purpose of the resources element of the PSR troika is to supply the materials and methods that are the components of corporate and unit strategies"(Davies, 2000, p. 29). After developing the digital strategies, New Zealand provided the resources component. This can be seen in the government's commitment to apportion huge funds for various organisations, particularly the national library, Archives New Zealand and national museum, to undertake digitisation projects (Carnaby, 2009; Dorner et al., 2002; Dorner et al., 2007; NLNZ, 2010b).

Also, the provision of broadband as a channel for digital content is a resource in itself. Another element in New Zealand resources is the creation of platforms such as the National Digital Forum (NDF), where all digital initiatives in the country can be registered. Such avenues enable everybody to see what others are doing and for organisations to publish and advertise their initiatives. The NDF therefore provides a recipe for collaboration which is a useful enabler for initiatives in digitisation and digital preservation of cultural heritage resources (see NDF, 2013).

New Zealand can be observed to have balanced the three stones of *policy*, *strategy* and *resources.* This balance has enabled the country to achieve progress in DPM and the subsequent development of the NDHA which forms the country's NDM. Ghana is likely to make progress in DPM and succeed in creating an NDM by emulating success stories from New Zealand. Emulating success stories has been identified as one of the enablers of DPM (see section 2.8.4). Thus, I applied the PSR troika model in the context of Ghana to facilitate my understanding of, the policy, strategy and resource factors that influence DPM in the country.

3.5.4 Relevance of the PSR Troika Model in Ghana

In this section I use the PSR troika model as a framework to assess the existing policy, strategy and resources situation in Ghana.

3.5.4.1 The Policy 'Stone' in the Ghanaian Context

As in New Zealand, digital technologies are proliferating in Ghana. ICT is being used in education (Martey, 2004b), information management (Akussah, 2002, 2005; Alemna & Cobblah, 2005; Azangweo, 2006), business (Hinson & Sorensen, 2006), and cultural heritage

management (Arthur & Mensah, 2006). The everyday life of the Ghanaian is now being impacted by the new digital technologies (Alemna, 1999). It is therefore important that Ghanaian stakeholders develop a means to effectively manage and preserve the digital resources that are being generated from daily activities.

The development of the Ghana ICT for Accelerated Development (ICT4AD) Policy in 2004 demonstrates Ghana's desire and attempt to achieve progress in ICT use and digital resources management. The existence of ICT4AD shows that the *policy stone* as described in the troika model occurs in Ghana too. As stated in the policy document, the Ghana ICT4AD Policy represents the vision for Ghana in the information age of contemporary digital technologies: "An integrated ICT-led economic Development Policy and Plan Development Framework for Ghana" (Ghana ICT4AD, 2003, p. 6). Thus, Ghana hopes to achieve an ICT-led economic development with a *policy* and *planned framework*. The use of *planned framework* in the vision statement suggests that a strategy was designed for achieving the goals of the ICT4AD.

3.5.4.2 The Strategy 'Stone' in the Ghanaian Context

According to Davies (2000, p. 29), the essence of strategy is "to provide a plan that employs multiple inputs, options, and outputs to achieve policy goals and objectives". As a strategy for ensuring access and effective application of the new digital technology in all areas of the economy of Ghana, the government of Ghana proposes a commitment to:

> Facilitate the rapid development, upgrading, improvement and deployment of the necessary infrastructure in all key areas. As part of this policy commitment, specific measures shall be put in place by the Government to support the development of the nation's physical communications infrastructure. (Ghana ICT4AD, 2003, p. 63)

As stated in the ICT4AD policy document, the following were among the steps proposed to be taken as strategies to achieve the ICT4AD goals for the information sector in Ghana;

- Modernise and expand Ghana's information and communications infrastructure and service
- Expand the physical infrastructure of Ghana, including those of power and transport
- Promote the development, and deployment of basic and broadband and multi-platform communications infrastructure and communications infrastructure
- Develop human resources to support the deployment and rehabilitation of modern and state-of-the-art ICT infrastructure (Ghana ICT4AD, 2003, p. 64).

However, eight years after its development, conditions and circumstances within the country show that the Ghana ICT4AD is unlikely to achieve its long-term goal of *the Ghana Vision 2020 Socio-Economic Development Framework* as set out in the policy document. A short term goal of the policy states that there will be *a Co-ordinated Programme for Economic and Social Development of Ghana (2003-2012)*. As at 2013, no such programme has been achieved. Another goal of the Ghana ICT4AD is *the Ghana Poverty Reduction Strategy (GPRS)* which was slated to be achieved by the year 2004 (Ghana ICT4AD, 2003, p. 6). But, by 2006 many people in Ghana lived on less than USD 1.00 per day (Alemna & Sam, 2006, p.237). As at 2013, almost a decade after the set date for achieving this goal, Ghana is still poverty ridden with the majority of Ghanaians living below the poverty line (U.S. Department of State, 2013). The ICT policy in Ghana does not mention digital preservation or information management.

The situation in Ghana is not like that of New Zealand where their strategies achieved results. Unlike New Zealand, Ghana is sticking to a single strategic option. The original strategies that initially came with the ICT4AD policy have not been reviewed. Alternative strategies have also not been implemented to be consistent with the multiple-option, multiple-path, and multiple-outcome principle described in the PSR troika. Whereas New Zealand took action based strategies towards its policies, the strategies in Ghana were still proposals in the policy document. No clear actions have been taken on them to achieve results. The strategy situation in Ghana raises questions about the state of the resources which are needed to make strategies effective in the country.

3.5.4.3 The Resources 'Stone' in the Ghanaian Context

The condition of Ghana as a developing country enable the country to obtain huge financial support and other forms of assistance through collaborative projects from wealthy nations and international organisations not only for ICT projects, but also for developments in other areas such as health, education and information management. Information management resources in Ghana include available cultural institutions such as PRAAD, GLB, GMMB; training institutions like the Department of Information Studies, University of Ghana and various ICT training centres in other Universities in the country (such as KNUST, University of Cape Coast and University of Education Winneba); the various information management professionals just to mention a few, can all be considered as resources in Ghana.

However, all the resources in Ghana as described above are found to be woefully inadequate (see Akussah, 2002, 2005; Alemna, 2001; Alemna & Cobblah, 2005; Martey, 2004b).

The state of policy, strategy and resource elements operating in Ghana raises questions as to whether these components conform to the tenets described in the PSR Troika. That is, whether these elements are operating on the same 'height and weight' in Ghana. Whether any of the elements is falling short; whether the strategy element in Ghana is effective enough to enable a DPM programme and whether Ghana has enough resources to make the strategy effective. Answers to these questions were difficult to tell from the literature. There was therefore the need to find out what is making it difficult for Ghana to achieve the goals in the ICT4AD policy.

My aim for this study included the identification of the factors that hinder the effectiveness of strategy implementation in Ghana. An understanding of the factors was important to assist Ghana to develop multiple-option, multiple-path strategies around the ICT4AD policy to achieve future goals and to progress in effective DPM which can lead to the establishment of an NDM.

3.6 Preliminary Model of Factors

Section 2.8 of the literature review discusses a number of factors that can enable or hinder the effective management of digital resources. Assessment of the theoretical models also reveals a number of factors that affect DPM. In this section, I use the factors from the literature and theory to develop an initial model of factors to guide the exploration and understanding of the factors that are influencing DPM in Ghana. Since the development of plans and implementation of actions are carried out by humans, I considered the various factors that influence DPM in Ghana to be both internal and external to key stakeholders in the country. Internal factors such as motivation, attitudes, expressions, acceptance and external ones like policy, strategy resources were provided by theory. Figure 3.6 below shows a preliminary conceptual model of how the various theories provide factors to guide the exploration in Ghana. This conceptual model was revised after analysis of the interview data (see section 8.2).

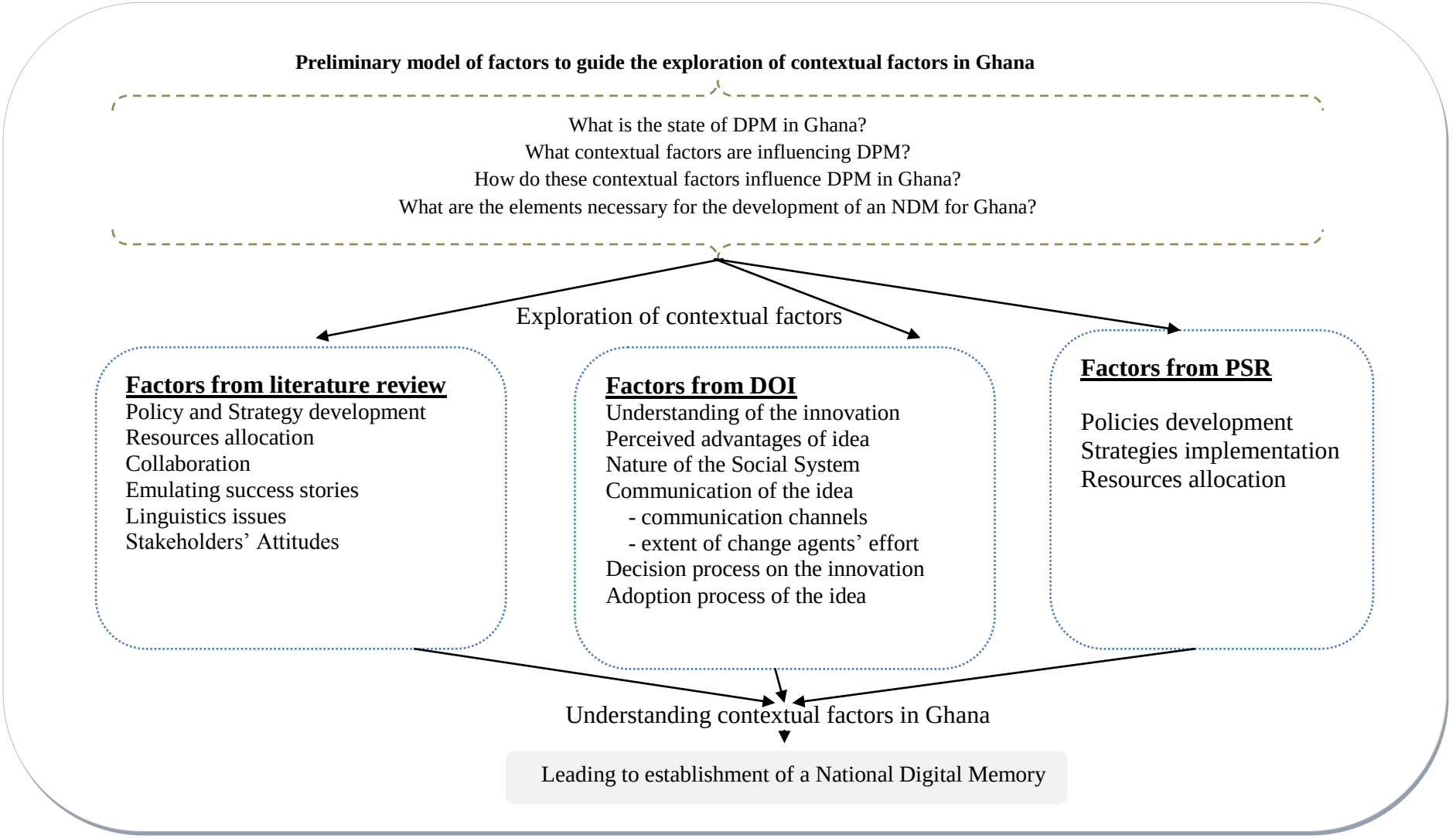

Figure 3.6: Preliminary model of factors that guided the exploration of contextual factors in Ghana

The research questions that directed the course of my research were applied to the initial factors identified from literature and theory to provide a lens for the study. I considered DPM as an innovation in Ghana. The DOI theory guided in the understanding of factors regarding the perceived nature of the innovation, communication of the innovation, what channels to use in communicating the innovation and who should communicate it. These factors also related to stakeholders' attitudes such as interests in the new technologies, motivation in the innovation and willingness to adopt and apply the innovation. The factors from DOI suggested issues relating to telling the right story at the right time and at the right level to the right audience. In the Ghanaian context, the DOI factors also draw attention to the need to sell effective DPM to potential adopters to promote a long-term vision for Ghanaian digital cultural heritage resources. The PSR troika model assists in the understanding of the factors regarding policies, strategies and resources that are needed for the effective implementation of strategy in order to achieve the long-term vision of digital cultural heritage resource management and preservation.

The second category of factors comes from the literature review. Availability of funds, skilled personnel and other material resources, developing strategies, investing in ICT, emulating success stories, collaboration, the development of the right attitude, are among those identified in the literature as enablers for DPM. On the other hand, the literature showed that lack of skilled personnel, poor infrastructure, lack of collaboration, and negative attitudes hinder DPM. I used these initial factors as a guide for the exploration of the contextual factors in Ghana. The next chapter presents the methodology and the research processes I followed.

Chapter Four: Research Methodology

4.1 Introduction

In this chapter, I discuss the methodology used for this research. I undertook an exploratory case research study employing qualitative research methodology in the interpretivist paradigm. As Walsham (2006) argues interpretive methods of research start from the position that our knowledge of reality including the domain of human action is a social construction by human actors. He points out that interpretivist ideas concerning reality are ways of making sense of the world, and shared meanings are a form of intersubjectivity rather than objectivity (Walsham, 2006, p. 320). Because the positivist paradigm views the world as objective and employs statistical methods in its investigations (Fitzgerald & Howcroft, 1998; Myers, 2010) it was unsuitable for my research.

As I explored the contextual factors that are influencing *the management and preservation of digital cultural heritage resources* (henceforth, DPM[10]) in Ghana, the interpretivist paradigm assisted me to achieve meaning and enhance my understanding of the factors. The processes involved in this research followed the inductive, reflexive and iterative approach. The key stages of the research process and the methods I employed for data collection and analysis are described in the sections below.

4.2 Qualitative Research Methodology

Qualitative research methodology was appropriate for my research because its main purpose was to explore and understand the contextual factors influencing the adoption of DP in Ghana. To achieve this purpose, I needed to employ a methodology that would take me into the deeper meanings and understanding of the factors, rather than a methodology that would give me a statistical description and figures about the problem.

Qualitative research allows in-depth studies and interpretations (Walsham, 1995, p. 74) and can assist IS researchers to understand human thoughts and actions in social and organisational contexts (Kaplan & Maxwell, 2005; Klein & Myers, 1999). I considered the development of a national digital memory (the creation, use, management and preservation of digital cultural heritage resources) in Ghana as an information system within the country. To understand how users perceive such a system in the context of Ghana, a qualitative

[10] The management and preservation of digital cultural heritage resources in Ghana is explained as the general state of Digital Preservation Management (DPM) in the country (see sections 1.4 and 1.8).

methodology was appropriate. This research explored factors that influence DPM adoption in Ghana and sought to achieve this understanding through the perspectives of key stakeholders.

The problem relating to Ghana in terms of DPM adoption is unique because of the complex and multi-faceted socio-cultural system of the country. In-depth understanding is vital in such situations. Kaplan and Maxwell (2005, p. 33) indicate that qualitative research is particularly useful for developing and explaining events and processes that lead to specific outcomes. Qualitative methods were therefore suitable to understand and interpret the contextual factors in Ghana. Ghana is at the initial stages of digitisation initiatives where a few organisations have started digitising parts of their records (Alemna & Cobblah, 2005; Asamoah-Hassan, 2010; Martey, 2004b). This implies that Ghana is *new* when it comes to digitisation and digital preservation of cultural heritage activities. Qualitative methodologies have been identified as the best approach for exploring new areas (Miles & Huberman, 1994, p. 10).

4.3 Case Research Method

In line with the qualitative interpretive research as the adopted approach, I selected the case study method of inquiry. As Walsham (1995, p. 74) indicates, the vehicle for such interpretive investigations is often the in-depth case study, where research involves visiting the field site. Other research methods (such as phenomenography, phenomenology, ethnography, grounded theory) could also be associated with qualitative research. The case study method, however, is the most used in information systems (Orlikowski & Baroudi, 1991, p. 4, Figure, 3) and also in information management (Bouthillier & Shearer, 2002). I specify my reasons for choosing the case study method for this research in section 4.3.1.

Case study research can also be positivist depending upon the underlying philosophical assumption of the researcher (Myers, 2010). Yin (2009) defines case study as an empirical inquiry that investigates in-depth, a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident (2009, p. 18). Even though there are different kinds of case studies, they all have the common purpose of investigating a phenomenon in its real-life context (Yin, 2009, p. 16). Creswell (2003) also emphasises that in case studies the researcher explores in-depth a programme, an event, an activity, a process, one or more individuals or elements (p. 15).

4.3.1 Reasons for Selecting Case Research

I selected case research because DPM is about Information Systems (IS). It is a contemporary issue within a social context (Ghana) that required in-depth understanding. Case research method is identified to be particularly suited for IS research, since the object of the IS discipline is the study of information systems either in organisations (Walsham, 1995) or within a country. But interest in IS investigations was identified over two decades ago to have shifted to include socio-technological issues at both organisational and national levels (Benbasat, Goldstein, & Mead, 1987). The DPM concept is a complex modern issue which concerns countries worldwide.

According to Benbasat et al. (1987, p. 369), to effectively deal with any aspect of such issues in a developing country, a research method that can help the researcher to fully understand the situation in its real-life context is required. In case research, the investigator intensely examines a single entity or a particular event for a deeper understanding. Thus, I considered the case study method an appropriate means to help me explore and understand the various contextual factors that are influencing digital cultural heritage resources management and preservation in Ghana.

Furthermore, Benbasat et al., (1987) state that three factors indicate when case research is appropriate to study information systems issues: 1) the researcher can study IS in a natural setting, learn the state of the art, and generate theories from practice; 2) the researcher can answer questions that lead to understanding the nature and complexity of the processes taking place; 3) it is an appropriate way to research an area with few previous studies.

All three reasons informed my choice of a case research method for the problem in Ghana. The study's aim was to explore and understand contextual factors that are influencing the adoption of DPM (*IS*) in Ghana (*its natural setting*). Case research was appropriate to assist me to answer the research question and understand the various factors. And there exist few previous studies in Ghana that relate to physical heritage resources management but none on DPM.

The third of the reasons given by Benbasat et al. (1987) is a reflection on the type of problem underlying this study. The purpose was to develop a model of contextual factors that can assist in the understanding of the situation in Ghana. The initial model was developed based

on the theoretical considerations guiding the study and then reviewed, after analysing the data obtained from fieldwork to enhance the understanding of the factors in the context of Ghana. Case research is noted as particularly appropriate for problems in which research and theory are at their early, formative stages, and close, practice based problems where the experiences of the actors are important and the context of action is critical (Benbasat et al., 1987, p. 369).

Also, Yin (2009, p. 4) points out that case research is most appropriate when: (a) the study seeks to answer *how* and *what* questions; (b) the focus of the research is on contemporary phenomenon within a real-life context; and (c) the investigator has little control over events. This study answers *how* and *what* questions (see section 1.6). DPM is a contemporary issue and I have limited control over the events in Ghana. So, case research is appropriate for this study.

Whereas Yin, in his seminal works appears implicitly to assume a positivist stance in his description of case research, Walsham clarifies that Yin's view that case studies are the preferred research strategy to answer *how* and *what* questions would be accepted by the interpretive school (Walsham, 1995, p. 74). Hence, I considered Yin's criteria as an appropriate guide for selecting case research for this interpretivist study.

4.3.2 Type of Case Research

Yin (2009) describes four major types of case study research. He states that a case research can be single or multiple depending on the unit of analysis. A single case can have a single unit of analysis or embedded multiple units of analysis. A multiple case can also have single units or embedded multiple units of analysis (p. 46). Case studies can be categorised further into exploratory, descriptive, or explanatory (casual). Even though each of these case study methods has its distinctive characteristics, there are large overlaps between them. The main goal of differentiation, according to Yin, is to ensure the appropriate type is selected (2009, p. 8). Figure 4.1 below illustrates the types of case research by indicating the one chosen for this study with broken lines.

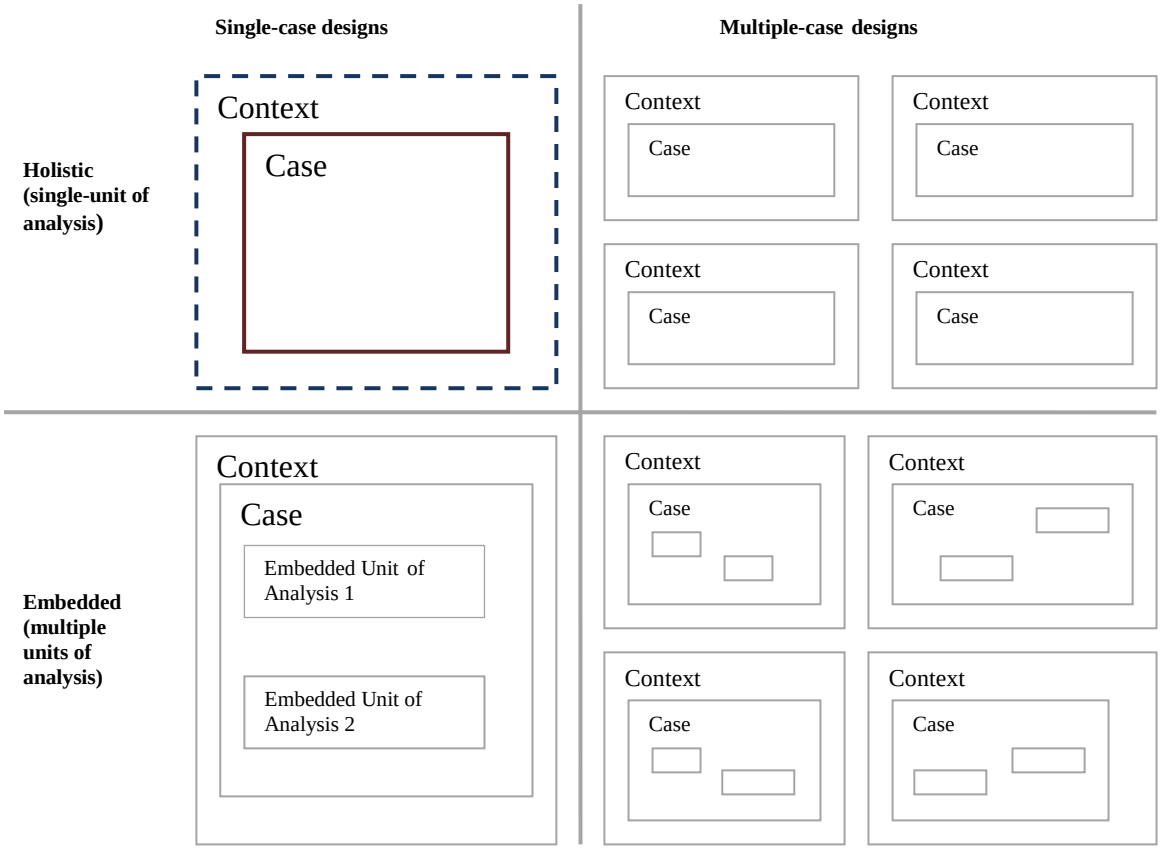

Figure 4.1: Basic Types of Designs for Case Studies
Modified from Yin (2009, p. 46)

This study falls into the single case research with a holistic (single-unit of analysis) type. This is because it explores and seeks to understand factors about a single entity, the information infrastructure of Ghana. The information, communication and the basic education systems which enable Ghanaians to understand, store and use information in the country are considered the information infrastructure of the country (see section 4.4). DPM is regarded as an integral part of the information infrastructure. Hence, I considered the single case research appropriate to study the information infrastructure in the case of Ghana.

Also, single case research has been identified to be appropriate when the case represents a critical case in testing a well-formulated theory or unique case (Yin, 2009, p. 47). The exploration and understanding of contextual factors influencing DPM adoption is unique to the Ghanaian context. Further, this study comes up with an initial model of factors which has been modified based on the data collected from fieldwork. These reasons justify the choice of a single case design for this study. The study also falls within the overlap of exploratory and explanatory case studies because it seeks to answer what and how research questions (see

section 1.6). According to Yin, an exploratory case study should be the most appropriate for *what* questions and explanatory is the best fit for *how* questions (2009, p. 9).

4.4 Unit of Analysis

The unit of analysis is the major 'real thing' that is being analysed in a study (Trochim, 2006). It relates to the fundamental problem that defines what the case is (Yin, 2009). A unit of analysis may be an individual, groups, an event, an entity, a geographical unit or social interactions (Stake, 2005; Trochim, 2006; Yin, 2003, 2009). The unit of analysis for this research is an entity, the information infrastructure of Ghana. Sugihara (1994, p. 82) identifies information infrastructure as the communication systems, information technologies, information related competencies and the basic education systems which enable the public to understand store and use information in a country. This study extends Sugihara's idea to include how contextual factors influence these elements in information management, especially cultural heritage information in digital forms.

4.5 Qualitative Research Processes and Procedures

According to Kaplan and Maxwell (2005, p. 38), qualitative research is inductive, iterative and its design involves considerable flexibility. The research goes through repeated cycles of data collection and analysis to develop models inductively from the data. This qualitative study followed a similar iterative process. It employed qualitative techniques to collect data that were used to modify a preliminary model of factors based on theory to provide a framework that guided the study. The model was eventually refined based on the findings to assist in the understanding of the various contextual factors that are influencing DPM adoption in Ghana.

4.5.1 Data Collection Procedures

There are varying qualitative data collection techniques, including observations, interviews and document analysis to understand and explain social phenomena (Byrne, 2001b; Kaplan & Maxwell, 2005; Myers, 1997; Yin, 2009). In this study I employed semi-structured interviews as the principal data collection method to generate the data for analysis. This technique allowed participants to provide rich, contextual descriptions of events that enhanced understanding of the factors in Ghana. I also used participant and environmental observations and document analysis to triangulate and verify data.

4.5.2 The Interview Process

I used open-ended questions to extract major themes, issues and ideas that could assist in the understanding of the factors. The interview questions (see Appendix 2) were indicative of the areas the study sought to cover and they were influenced by the research questions and factors that emanated from literature and theory. Having identified the initial participants, as described in section 4.6, I started the interview process by calling each of the identified participants by phone from New Zealand and talked to them informally to explain the research project. After they agreed informally to participate, I sent each of them an information sheet and consent form. This step was followed by face-to-face contact with each of them soon upon arriving in Ghana. I again explained the aims and purpose of the study to get their formal agreement. I then discussed the appropriate date, venue and time for the interviews. Most of the interviews took place in the offices of the respective interviewees. Some of the interviews were also conducted during the 2nd National Policy and Cultural Fair organised at the Centre for National Culture in Kumasi, Ashanti region.

4.5.3 Timing Consideration

I used a period of six months (1st May, 2011 – 1st November, 2011) for data collection. Although this period was my original plan, it was made easy because I was able to make further contacts at the National Policy and Cultural Fair. The plan was to interview all participants in their institutions so that I could observe their contexts. The cultural institutions and other organisations from which interviewees were selected are concentrated in Ghana's capital, Accra and the second largest city, Kumasi and I was based in a different city. Scheduling meetings with informants and travelling to their offices was very difficult in Ghanaian conditions, which delayed the process. The Fair, which was not in my original plan, helped me to meet top decision makers who later formed part of my participants (I discuss my study participants in section 4.6), saving me a lot of time.

4.5.4 The Interview Session

Three main stages in the actual interview session are the introduction, middle and final stages (Byrne, 2001a, p. 234). I used the introductory stage to provide an overview of the whole process and build trust in the interviewees. The middle stage, which took most of the time, was used to ask specific questions relating to the factors that enable or hinder DPM adoption in Ghana. At this stage, I paid particular attention to the interviewees, listening very carefully to whatever they said.

I made sure that interviewees stayed on topic with their comments by guiding the flow and directions of their responses with the interview questions. I used the final stage of the interview session to present a summary of the interviewees' comments and allow for confirmation and additional information. An interview session took 45 minutes to 1 hour. I used my familiarity with the environment and the nature of the people to observe non-verbal cues while still taking notes and recording the conversation with a digital voice recorder. The non-verbal cues, the notes and the recordings enabled me to properly interpret interview data at the data analysis stage. I transcribed each interview as soon as possible; this gave me more familiarity with the interview data.

4.5.5 Observation

An important principle of qualitative data collection is that everything is potential data. The researcher does not rigidly restrict the scope of data collection in advance, or use formal rules to decide that some data are inadmissible or irrelevant (Kaplan & Maxwell, 2005, p. 39). For this reason I supported the interview data with other techniques to help me capture as much data as possible. I employed passive mode observation of both the participants in their environment and the facilities they employ in their work, to identify non-verbal cues and impressions that supplemented their verbal expressions. Using a digital camera and other devices, I documented my observations by recording visual images. For instance, I observed the way some of the institutions were undertaking digitisation activities (see Appendix 3A of one such project). Similarly, Appendix 3B shows evidence of records management problems.

4.5.6 Site Visit

As I was planning my research, I visited leading New Zealand cultural heritage institutions (Archives New Zealand, National Library of New Zealand, National Museum of New Zealand and Radio New Zealand) to see how New Zealand cultural heritage resources (both digital and physical) were being managed and preserved using digital technologies. With this background, I visited Ghanaian cultural heritage institutions to analyse some of the contents and the contexts within which they are managed. These visits gave me a broader sense of the issues such as the condition, procedures, strategies and policies that surround the DPM concept. Figure 4.2 below summarises the data collection procedures for this study.

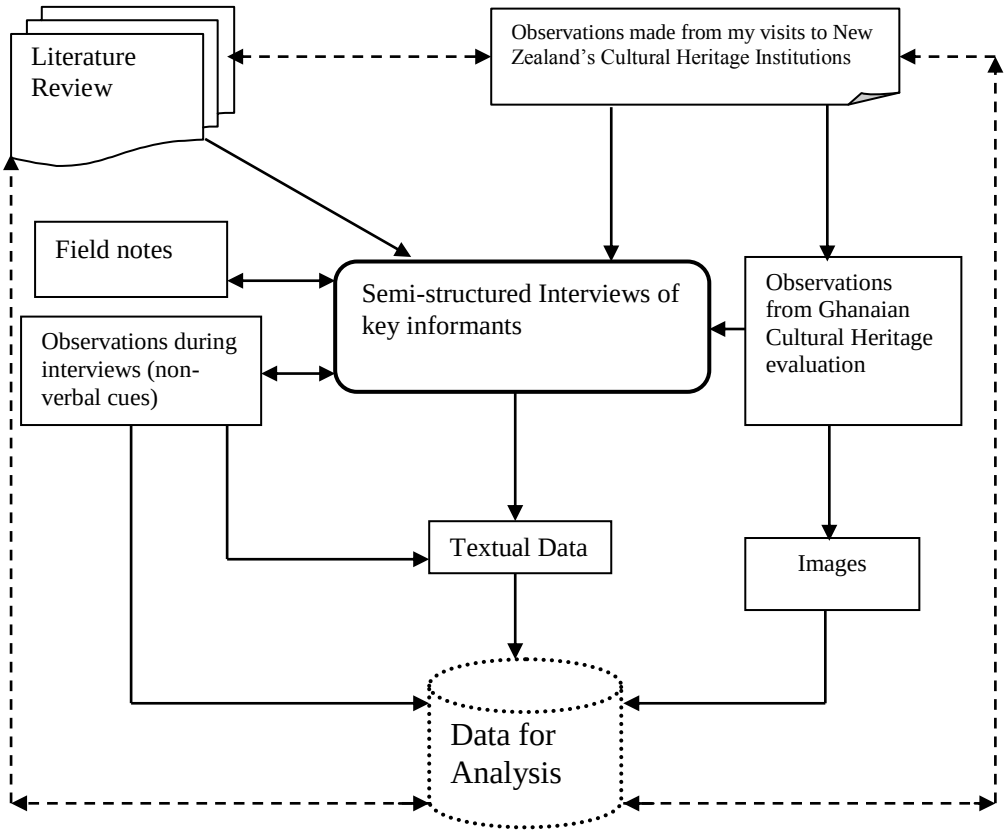

Figure 4.2: Data Collection Procedures

I started the whole process with a literature review. Ideas from the literature helped me to ask relevant questions during my visits to New Zealand cultural institutions. Ideas from these visits and discussions with the New Zealand staff were fed back into the literature review. This initial step helped me to look at specific areas in the literature that needed attention. The literature review also provided me with ideas about which questions to ask the interviewees in Ghana. I took field notes and pictures of some of the cultural heritage resources. Together, all these sources provided data that were analysed to understand the factors in Ghana. During data analysis, I referred back to the literature review to identify similarities or conflicting views to the interview data. While this iterative process enabled thorough familiarity with the interview data, it also ensured credibility of the findings from the case study.

4.6 Study Participants

Participants for this study involved key stakeholders of DPM in Ghana. To get a better understanding of the factors influencing DPM in Ghana, I deemed the views of people who can influence DPM in any way and those who have informed knowledge in the subject area as very relevant. People from the information management field (libraries and archives), cultural heritage field (museums and other cultural institutions), ICT management, and the

area of government strategic policy making in Ghana were considered. Mammo (2007, p. 149) describes information professionals as people with rich experiences working in the information management field and who have at least a first degree. However, there were other individuals who were not information experts per se but who had knowledge relevant to this research, making them qualify to participate in this study. Government officials, policy makers, strategy developers and implementers, scholars, funders, and high school teachers (teaching ICT and other subjects for which cultural heritage resources in digital forms would support the curriculum), were also part of the research. Details about interviewees in this study are provided in sections 5.2 and 5.3.

4.6.1 Selection of Key Participants

I used the snowball sampling strategy to identify subsequent interviewees up to saturation. Initial participants were primary contacts from key information management institutions there were initially identified. Through the initial contacts I easily got access to other interviewees in other organisations. Saturation was achieved after 27 interviewees.

4.6.2 Issues Relating to the Participants

I went to Ghana to gather the data for the study. I anticipated that access to participants and cultural heritage institutions such as libraries, archives, museums, galleries, and the library school was not going to be very problematic. I expected that an introductory letter from the School of Information Management, Victoria University of Wellington, would facilitate cooperation from the Ghanaian institutions and participants. However, even though informal contact was made with some of the initial participants, getting access to them was very challenging. This was because participants had busy schedules, and meetings were difficult to arrange.

Also, the period for data collection coincided with a time when the Ghanaian media were headlining Wikileaks[11] reports that affected the country. The reports implicated many public officials and prominent politicians in certain corrupt dealings and allegedly compromising security information affecting Ghana with United States officials. The Wikileaks phenomenon that occurred worldwide provided a fascinating twist to this study. Any unauthorised access to information can lead to mistrust, fear and apprehension. It was

[11] The news item in the link below is just one example of the Wikileaks stories at the time of my data collection (May – October, 2011) http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=217888

therefore not surprising that the incident in Ghana resulted in concerns which were still so uppermost in the minds of interviewees that they felt nervous about taking part in the study.

Furthermore, Anas Aremeyaw Anas[12] is an investigative journalist who is very well known for his undercover investigations to expose corrupt officials in Ghana. His reports, which are usually shown by national and international televisions stations, have led to the banning, arrest and conviction of many public officials and private businessmen in the country. Around the same time the Ghanaian media was discussing Wikileaks reports, Anas also released a video report that showed some security personnel and public officials taking bribes and dealing in illegal cocoa trading and mining.

These reports impacted on this study. I was met with some suspicion in most of the offices I visited. Some potential interviewees were direct in asking if I was not one of "these secret agents who have come to take information for possible devious purposes". Thus, some potential participants who had earlier agreed to grant interviews either cancelled or kept rescheduling until it was no longer necessary to interview them.

4.6.3 Pilot Study

According to Morse, Barrett, Mayan, Olson and Spiers (2002, p. 20), the purpose of pilot studies, if used in qualitative inquiry, is to refine data collection strategies rather than to formulate an analytic scheme or develop theory. I tested the interview questions with three pilot participants in New Zealand.

The first pilot participant was a PhD student at Victoria University of Wellington, member of the Ewe tribe. His responses to the interview questions assisted me to understand how to follow protocols and approach discussions with the people from his tribe and traditional area. The second pilot interviewee was a New Zealand government employee. He was an older man from the Akan tribe and his responses helped me to understand ways to interview traditionalists such as chiefs, clan heads and tribal leaders. The third participant was a fellow PhD student from Peru. His responses helped me to see how the questions would be understood by someone who was not familiar with digital preservation concerns. This assisted me to clarify all ambiguities in the interview questions. The pilot also gave me an

[12] Some of Anas Aremeyao Anas' undercover stories can be seen here http://www.youtube.com/user/anasglobal

idea of how interviewees would conduct themselves and helped me to manage the actual interview process.

4.7 Data Analysis Procedures

If the main goal of qualitative research is to gain an in-depth understanding of the lived experience of a group about a phenomenon (Aronson, 1994; Byrne, 2001a; Kaplan & Maxwell, 2005; Priest, Roberts, & Woods, 2002a, 2002b), then qualitative data analysis can be said to be the platform to achieve such an understanding. Qualitative data analysis refers to a range of non-lineal, iterative processes and procedures that involve different rounds of questioning, reflecting, paraphrasing, interpreting and verifying (Aronson, 1994; Byrne, 2001a; Priest et al., 2002a). This process allows the researcher to create explanations, interpretations and understanding from the data collected. Kaplan and Maxwell state that "the purpose of qualitative data analysis is to develop an interpretation that answers the basic question of what is going on here" (2005, p. 41). Miles and Huberman (1994, p. 10) identify the components of qualitative data as; data reduction, data display and conclusion drawing or verification. These procedures follow data collection. Figure 4.3 below illustrates these components.

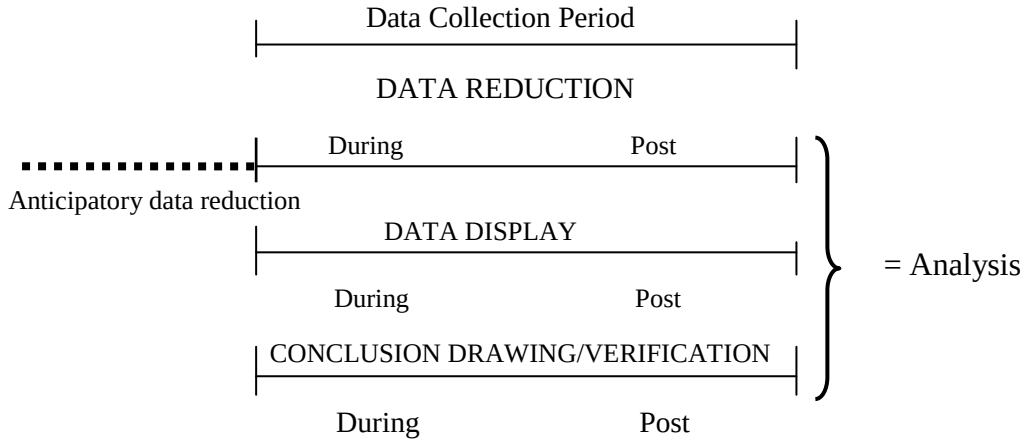

Figure 4.3: Components of data Analysis: Flow Model
Adapted from Miles and Huberman (1994, p. 10)

4.7.1 Data Reduction

Data reduction refers to the process of selecting, focusing, simplifying, abstracting, and transforming the data that appear in written-up field notes and transcription. I followed the approach recommended by Miles and Huberman (1994) in the analysis of the data for this study. I paid particular attention to the coding process. Coding in qualitative data analysis, according to Kaplan and Maxwell (2005, p. 42) involves selecting particular segments of the

data and sorting these into categories that facilitates insight, comparison, and the development of theory. Coding helps qualitative researchers to gain a new perspective on their material and to focus further data collection as well as leading to unforeseen directions (Charmaz, 2000, p. 515).

I used Microsoft Word to manage the data for this study. At the initial stages of data collection, I used open coding to break down the data and to identify first level concepts and categories. I did this by transcribing every interview right after each interview day or sometimes, after interview sessions. Later when all interviews were done, I took time to carefully read through all 27 transcripts several times, marking key concepts with different colour fonts. Using the most frequently employed colours to stand for groups of ideas, I created tables for each group and put them in separate files and folders. I regrouped similar sets of ideas into categories. From the tables, I clustered the group of ideas marked red as stakeholder attitudes and identified them as attitudinal factors that are influencing DPM in Ghana. I categorised the group of ideas marked purple as resource factors. I grouped those marked blue as factors relating to policy issues and I classified the ideas marked green as management-related factors. Thus, I ended up with four separate files containing various quotations from the interviews about the main themes and clusters of factors influencing DPM. Using interviewee codes (see section 5.2), it was easy for me to uniquely identify each extract of interviewees' comments, which I regrouped to form the clusters of contextual factors.

4.7.2 Drawing Conclusion

From the findings, I modified the conceptual model of factors and related them to the literature (see section 8.2). Aronson (1994) indicates that referring back to the literature to interweave it with the findings, makes the researcher's story robust. The conclusions for this study are presented in chapter eight.

4.8 Quality of the Research

Proponents of quantitative and experimental approaches frequently criticise the absence of "standard" means of ensuring quality of qualitative research (Denzin & Lincoln, 2005; Maxwell, 2002). Such criticisms have inspired suggestions on how qualitative researchers should implement verifying strategies that can ensure the attainment of rigour using approaches inherent within each qualitative design, and moves the responsibility for

incorporating and maintaining reliability and validity from external reviewers' judgement to the investigators themselves (Morse et al., 2002, p. 13). I have considered these assumptions to ensure the credibility, transferability, dependability and confirmability of this research.

4.8.1 Credibility of the Research

Lincoln and Guba assert that credibility asks about how one can establish confidence in the *truth* of the findings of a particular inquiry from the participants and the context in which the study was carried out (Lincoln & Guba, 1985, p. 290). Whereas the credibility of quantitative research depends on instrument construction (Hoehle, 2009), the credibility of qualitative research depends on the ability and effort of the researcher, making the researcher the instrument (Golafshani, 2003, p. 600).

4.8.1.1The Researcher

I was born and bred in Ghana. I had all my education up to the university level in Ghana, which means I am very familiar with the socio-cultural, educational and political system of the country. Although Ghana is multi-cultural and inter-tribal marriages are very common, my parents are both from the Asante tribe, limiting my traditional and cultural beliefs and background to the Asante customary practices. I also lived all my life in the Ashanti region until the time for my university education when I first moved to live in Accra and have since lived in almost every part of the country. This means, although I had little experience with other Ghanaian cultures as a child, I have now learnt about Ghanaian cultural heritage through working in various regions and living with different people across the cultural groups of the country. My experience with different cultures in various countries outside Ghana (e.g. in Europe and New Zealand) has also broadened my worldview on cultural heritage management issues.

My educational path has focused on information management, making the application of modern digital technologies to the management and preservation of cultural heritage resources my passion. Thus, when I observed and experienced first-hand, how DPM is taking place in advanced countries, I decided to use my observation of the DPM situation in New Zealand as a point of reference to explore what is influencing DPM in Ghana.

I acknowledge the potential for my background and experiences to influence my interaction with participants. This can happen in diverse ways. For instance, in Ghana some of the tribes

sometimes look down on the way other groups live their lives, creating unhealthy comparisons, competitions and sometimes conflicts. The most common of such comparisons is between the Asante tribe and most of the other tribes. The Asantes, resident in the middle of Ghana, appear to perceive their cultural heritage as superior to the others, a view which is vehemently refuted by the other tribes. One of my interviewees (Naaba) was from a tribe in the northern part of Ghana. Naaba described how people of his tribe cook their vegetables better than the Asantes, because the Asantes overcook their foods, particularly vegetables, a way of cooking that drains all the nutrients from the vegetables. When Naaba said this, he gave me a friendly laugh to indicate that he knows I am an Asante and he is saying something against Asantes. This tells me that knowledge about our backgrounds as interviewee and researcher could influence the data. But the most important thing was to be aware of these influences and I encouraged him to continue talking.

With the permission of participants I took photographs of all the places I visited including some of the heritage resources I found (see Appendix 3). I used these pictures to assist my interpretation of interviewees' narratives. As Morse et al. (2002, p. 17) emphasise, verification processes such as checking, confirming, making sure, and being certain helps to identify and correct errors and enhance the credibility of a study. I therefore compared my observations of the evidence with the accounts from the various interviewees and other documentary evidence (such as the Ghana ICT4AD Policy and the New Zealand Digital Strategies) to check for consistencies across the various sources. Creswell suggests that when verification mechanisms are woven into every step of the inquiry, the research will be a solid product (Creswell, 2003, p. 196).

I triangulated different data sources of information, such as the literature, other respondents, observation and documents analysis, by examining evidence from these sources and using it to build a coherent justification for the themes and clusters of factors. For instance, from the literature I understood that cultural heritage objects by themselves can be seen as documents (Buckland, 1991; 1997). I therefore noted the information the "documents" (heritage resources) I found in Ghana provided me, and compared to the information interviewees gave me about the heritage resources. I also analysed documents in the form of reports, policies and guidelines to verify the accuracy of interview comments. For instance, when I looked carefully at the Ghana ICT policy I found that no part of the policy discusses DPM, digitisation, or information management. This confirmed what interviewees told me about

decision makers not seeing DPM or information management as a priority area. I also used interviewees' quotations, tables and figures to interpret the data to convey rich meanings in the findings. Such diverse ways of interpreting data can take readers to the setting of Ghana and give the discussion an element of shared experiences. I spent six months in Ghana (from May to October, 2011) to gather the interview data. This enabled me to develop an in-depth understanding of the factors that influence the DPM in the country.

4.9 Ethical Considerations

This study involves cultural heritage resources management and preservation and human subjects. Cultural issues are sensitive involving many of privacy issues and so require strict adherence to ethical principles. I obtained clearance from the School of Information Management Human Ethics Committee (HEC) before commencing data collection. I:

- Sought informed consent from participants by providing information sheets and requiring them to sign consent forms
- Respected the rights of privacy and confidentiality of participants by using the interview data only for the purposes of this study
- Ensured the limitation of deception and avoidance of conflict of interest by being transparent and honest with participants about how the data has been used
- Ensured social and cultural sensitivity according to the Ghanaian context; for instance when I visited chiefs' palaces for interviews I observed the necessary traditional rights such as presenting gin
- Respected property rights. For instance, in one of the visits an interviewee talked about a family hall mark and I asked to see it, I was told I am not allowed to see because I am not part of the family and obliged

I sought consent from cultural institutions and other organisations and observed all cultural protocols in Ghana.

4.10 Chapter Conclusion

The purpose of this study is to explore the various contextual factors influencing DPM in Ghana. This chapter has been used to present the research approach that was followed to arrive at the study findings. The various sections have discussed that this is an interpretive qualitative study the employed a single case study method. Semi-structured interviews were used to gather the perspectives of stakeholders who were mostly information professionals, government officials and ICT managers. Media issues relating to Wikileaks and local

investigative journalism made some key players nervous to take part in the study, presenting a challenge during data collection. A thematic approach was followed to analyse the data and the findings are discussed in subsequent chapters. The next chapter presents the data, which provides a general overview of the state of digital heritage management and preservation in Ghana.

Chapter Five: Ghanaian Voices

5.1 Introduction

In this chapter, I present the interviewees' voices to give an indication of the general state of Digital Preservation Management (DPM)[13] in Ghana. The chapter relates to the first research question: *What is the state of DPM in Ghana?* I consider stakeholders' perceptions of elements of a future National Digital Memory (NDM) for Ghana as part of the various influencers of the current state of DPM in the country. Thus, although in chapter seven I present the elements of an NDM for Ghana, as perceived by key players, I use the later part of this chapter to present some of the key comments interviewees made about an NDM for Ghana. I begin this chapter with a description of the participants, and their institutions and also show how I assigned codes to my interviewees.

5.2 Description of the Data Collection

The overarching aim of this research was to explore and understand the various contextual factors influencing DPM. The study is based on the views and perspectives of a cross section of key players in Ghana. A semi-structured interview technique using the snowball sampling strategy was employed, as explained in sections 4.5.1 and 4.6.1. Interviewees included information and cultural heritage experts, scholars, funders of information management and cultural heritage initiatives, school teachers who handle subjects for which ICT and cultural heritage resources in digital forms support the curriculum, and government officials involved in policy and decision making in Ghana.

Participants were drawn from various cultural institutions, ministries, departments, agencies and district offices, traditional areas, chiefs' palaces, institutions involved with ICT education and those that dealt with digital information management. They cut across the various ethnic groups as mentioned in the introductory chapter (section 1.3), giving a balanced view to the discussion of Ghanaian cultural heritage resources in this study. In all, I conducted 27 interviews. Twenty-five of the 27 interviewees had had formal education up to the university level, so their interviews were conducted in English. Interviews with two traditionalists were conducted in the Akan language, which I translated and transcribed for analysis. This was because one of these traditionalist interviewees had never had any formal education, but was the most knowledgeable in the history and traditions of the traditional area. The other

[13] The general state of Digital Preservation Management (DPM) is used in this study to refer to the management and preservation of digital cultural heritage resources in Ghana (see sections 1.4 and 1.8).

traditionalist had had some formal education up to the elementary level. This interviewee felt more comfortable with the interview in the Akan language. To facilitate coding, I grouped the interviewees into five categories based on their institutions. Table 5.1 shows the institutional categories of interviewees and their codes.

Interviewees	**Code**	**Number**
Information Management Academics	UL	4
People from Cultural Institutions (Libraries, Archives, Museums, Chiefs' Palaces)	CI	8
ICT Teachers/ Managers	IT	4
People from Ministries and District Offices	MD	7
Private Institutions	PI	4
Total Number of Interviewees		**27**

Table 5.1: Interviewee Codes

The Department of Information Studies (DIS), University of Ghana, is the main institution that educates information professionals in Ghana. From DIS, I interviewed four lecturers who I labelled 'UL'. There were eight participants from the different cultural institutions, whom I labelled CI1 through to CI8. I labelled participants from various institutions where ICT education and/or its management take place as 'IT'. They included ICT teachers and managers. I grouped participants from public institutions such as the ministries, departments, agencies and district assemblies together and labelled them 'MD'. I used the label 'PI' for participants from private institutions and Non-Governmental Organisations.

5.3 Institutions

There are two main categories of institutions represented by interviewees. One group was from areas where access to information and facilities was relatively easy. Access to electricity and modern technology was easily found in the urban areas of Ghana. The other group of institutions was from areas where access to these facilities was relatively difficult. This situation was typical of rural areas of the country. Therefore, I categorised participants' institutions as being either urban or rural.

I considered an institution to be rural if it lacked basic infrastructural facilities, and it was based in a province serving a particular interest of the people of that province and not necessarily the whole of Ghana. Examples of rural institutions in this study include: a Health Research Institution (HRI) which was based in a particular municipality and conducting

research on the health of the local people; a Community Information Centre (CIC) that was based in a particular district to provide ICT education and training to the local people and a rural radio station that linked the local people to news items from major broadcasting companies in the big cities.

I considered urban institutions to be those that have easy access to standard infrastructural facilities and are usually located in the cities to serve the general interest of all the people of Ghana. The ministries, head offices of departments and agencies, universities and their libraries were examples of urban institutions in this study.

For the purposes of readability and confidentiality, I assigned pseudonyms to interviewees. These pseudonyms are traditional names that I picked arbitrarily to replace the real names of the interviewees. Table 5.2 below shows interviewees codes and their assigned pseudonyms.

Interviewee code	**Pseudonym**	**Interviewee code**	**Pseudonym**
CI1	Abronoma	UL3	Odomankoma
CI2	Komfoanokye	UL4	Osagyefo
CI3	Agya	MD1	Togbwe
CI4	Diawuo	MD2	Sunkwa
CI5	Funtun	MD3	Adoa
CI6	Ntim	MD4	Kwakubonsam
CI7	Okyerema	MD5	Ayibontey
CI8	Asantewaa	MD6	Osono
IT1	Okokroko	MD7	Atuguba
IT2	Adieyepena	PI1	Kuntane
IT3	Moaninko	PI2	Akokyem
IT4	Opambuo	PI3	Otadie
UL1	Bosomuru	PI4	Naaba
UL2	Asempayatia		

Table 5.2: Pseudonyms for interviewees

Interviewees' comments are presented under the following thematic areas identified from the data: Digital Resources; DPM institutions; Digital Divide; National Digital Activities; National Digital Policy; Ghanaian Cultural Heritage Resources and National Digital Memory (NDM) for Ghana.

5.3.1 Digital Resources

Eleven individuals from 11 rural institutions and 16 individuals from 12 urban institutions participated in the interviews. Interviewees' comments showed that the majority of institutions from both sides of the rural-urban divide either dealt with digital materials of some sort or were in various stages of converting their records into digital forms. The interview comments showed that many rural institutions, in spite of their lack of adequate resources, were generating digital records in Ghana. Interviewees from rural institutions expressed in various comments how their institutions created digital materials. Otadie for instance, said any time they conduct interviews on their radio programmes, their technician records the interviews using a computer program. After that the technician burns the recorded interviews on CDs and keeps them in the radio station's library.

Also, Akokyem stressed that being in a rural area did not prevent their institution from dealing with digital materials, explaining that they use computer technologies and software such as Sound Forge and Nero Wave Editor to edit their programmes. He showed that everything in his institution was about computers and that one cannot work there without having knowledge of computers. Expanding on the tools some rural institutions used and the criteria they were following to digitise heritage materials, Komfoanokye said:

> Talking about digital, we have started. We have special cameras and software that have room for each object, a column for its accession number, the status, whether it was donated to the museum or purchased. (CI2)

These explanations from the interviewees indicate that digital materials were, at the time of this study, appearing even in underdeveloped communities of Ghana. The interview comments further show that rural institutions that did not have digital materials were planning to digitise in the future. For example, Naaba indicated that his institution did not actually do digitisation. But because of the difficulty of where to store their forms, they were thinking by 2012 they should buy a scanner so that they will just convert the analogue forms, extract the information they need and archive them in digital form. Naaba's comments confirmed an impression from the literature review that storage and lack of modern equipment were some of the issues that made information management difficult in Ghana and negatively impacted the state of DPM (Akussah, 2002, 2005; Alemna & Sam, 2006).

Interviewees showed that the new digital technology was being used by many people in Ghana including those in rural areas and can have a positive influence on the state of DPM in the country. This could explain the sense of duty by some rural institutions to generate digital materials even in their underdeveloped conditions. Otadie for instance, emphasised how digital technologies were being used by rural people in Ghana and he showed how this use could provide useful information to enhance the understanding of DPM:

> People are using digital technologies in the form of digital recorders, digital cameras and even mobile phones in the rural areas, but we take it as if that place is rural so we don't go there. I am advising you, go to the grassroots. It is there that the hardships that people go through in terms of ICT use can be found. If you go to Accra, they are already advanced you will not get any necessary information. (PI3)

Some institutions in the urban areas of Ghana were however at different stages of managing digital materials. Interviewees' accounts showed that more urban institutions in the country were not only creating digital materials, but also had attained appreciable levels of ICT use and digital resources management. Some of these urban institutions were managing their own institutional repositories. Agya for instance, revealed:

> We created this digital repository in 2009, and it is the only University in Ghana with an institutional repository which is live online. Currently our institutional repository has been mandated to be the national institutional repository. We keep digital forms of thesis of post graduate students, reports of graduate students, conference papers, research papers by lecturers and faculty. We also have some of our collection representing our heritage, for example, the *Adinkra* traditional signs and symbols like 'Gye Nyame', 'Asempa', all of them are represented in our database. (CI3)

In addition to what Agya said, I observed that other institutions have also reached various levels of developing their institutional repositories in Ghana. But, unlike the repository Agya was talking about, none of the other institutional repositories was yet live online. The University of Ghana library for instance had acquired scanners and other equipment and was busily digitising various aspects of their collections to create their digital repository. Diawuo was part of this project and made this observation:

> The Royal Institute of Netherlands is interested in our collection. They are providing support in terms of funding and equipment to help us digitise and preserve our Africana collections, and create a repository. We have started as you can see, but we are not online yet. (CI4)

Although, I could not verify the existence of "The Royal Institute of Netherlands", Diawuo's comment shows there is collaboration going on to assist his institution in establishing an institutional repository.

The dichotomy between the *haves* and the *have-nots* was not always apparent in the rural-urban differences among the institutions. From the interviewees' comments, it can be seen that there were some public institutions in the urban areas that lacked the facilities to even manage the analogue materials in their care. Some of these urban institutions did not have the capacity to create or manage digital resources. They not only lacked the resources to convert their materials into digital form, they also had no skilled personnel to handle digital resources management and preservation. Interviewees from some national cultural institutions in the urban areas expressed concern about why their institutions were still in a state that could not support the creation and management of digital materials. Funtun and Ayibontey for example commented:

> The benefits of digitisation would be immense to us. But we have not started. This is a government institution but the government is not doing everything for us. We have to look elsewhere for funding. They say it is capital intensive. These decision makers don't put value on records. (CI5)

> We do not have any digital materials. Of course we are in the information age and we need to have digital materials where you can sit in the comfort of your home and have access to our materials here but we don't have that yet and we still trace it to the lack of funds. We need funding not only to acquire the required equipment, but also to train people to do it. I do not see anybody capable of doing it here now. (MD5)

Just as it could be observed in some of the rural institutions, the comments by interviewees also suggested that some of the urban institutions (despite the belief that Ghanaian urban institutions were relatively well to do) were only beginning to initiate the digitisation of their materials. Abronoma for instance, revealed that their institution was at the time of this study, trying to digitise some of the items they had. Also, Atuguba explained how their institution was planning to go digital:

> We don't have any digital materials now. We are in the international highway of digitisation and if you don't have it then it means you are lagging behind. But we are developing the facility. You can see the computer room with computers and other equipment downstairs; we are now trying to develop the digital facility which we will incorporate in our information development, acquisition and distribution. (MD7)

Interviewees from both rural and urban areas revealed that individual institutions were getting involved in various levels of digital materials creation and management in Ghana. Funtun previously expressed concern about his institution's inability to digitise. But he commented again that they had some financial assistance to enable them to digitise the slave trade archives for example. Even though local circumstances hindered their efforts, they were able to digitise through collaboration.

There were many challenges. Yet, institutions in Ghana were exploring all possibilities to have their materials digitised. As to their motivation to digitise, most of the rural institutions were apparently digitising to preserve their recorded information. Akokyem made their motivation clear when she said that sometimes they save the recording on the computers and then burn them on compact discs as well as on mini diskettes and then keep these materials in their library for future reference.

Further, the need to keep information over time was a motivating factor for institutions in Ghana to attempt to digitise, particularly those in the rural areas. An example of this was indicated in Kuntane's account. He said that when he takes pictures of the heritage resources in Kintampo, he transfers them unto his computer and then burns the digital pictures onto compact discs which he keeps as backups. Otadie also said:

> We keep these things for future reference. Sometimes there are some controversies in some of the interviews. You interview somebody today and the next time he will say no 'I didn't say that'. So we play it back to serve as evidence. (PI3)

In other instances, interviewees commented that their institutions were motivated to digitise to create or enhance access to their materials. Mostly, remarks from interviewees in urban institutions reflected that their institutions were inspired to digitise to enable access to their materials. For example, Agya said:

> There is the need for people to have access to the intellectual output of this University. How will they know? They have to come here which is always difficult. So we have created this digital repository to make access easy. (CI3)

Abronoma also said her institution was trying to digitise some of their items so that people will not necessarily need to come to their premises all the time to have a look at what they have. But people can also go to their website and see the digital version of their objects. This

according to her was because "each digital object will have the dating and information with it" (CI1).

Kwakubonsam believed that the stories of their people have been told by outsiders from questionable perspectives. Thus his institution is trying to digitise the heritage resources they have, to provide the right access to the materials through pictures, videos, to project their true sense of identity.

Interviewees' comments also showed that there were institutions in Ghana that were trying to digitise with the dual motives of preserving as well as creating access to the materials. A comment by Komfoanokye was one of the examples that gave this impression:

> We are motivated to digitise to preserve and also for easy reading of the objects. For instance, if somebody cannot physically come here we can have something online for them to access, we call it virtual museum. If somebody doesn't want to visit, he can go to the net and have a look at it, so it is also for access (CI2).

From the various comments it can be identified that institutions both in urban and rural Ghana were generating digital materials and providing management of some sorts to the different levels of digital materials creation. Nevertheless, some of the approaches that were being used by some of the institutions to manage their digital materials raised questions about the state of DPM in Ghana. Kuntane for instance, explained how he managed and preserved digital records of his institution:

> I have a refrigerator, which has never been used to keep food. So I keep the CDs in CD bags and place them well in the air tight fridge, so the materials are well preserved. I use the fridge as a cabinet. (PI)

People and institutions were trying to manage and preserve digital materials in any way that suited their circumstance in Ghana. This point raised the issue of whether there were any guidelines for these digital activities that were springing up among Ghanaian institutions and whether the various institutions had any guiding policies. In the next section I present interviewees' perspectives on what guided digital activities in various institutions.

5.3.2 DPM Institutions

Since digital materials were mainly being created and managed by institutions in Ghana it was important to look at the state of these institutions in terms of policies and issues affecting digital resources management in the country.

5.3.2.1 Institutional Policies

When asked whether their organisations had policies regarding their digital activities, interviewees' remarks revealed different actions being taken by both rural and urban institutions in the country. According to the interviewees, most urban institutions had some form of policies to guide their activities. For example, Agya said the institutional repository, where he was a manager, had a policy which mandates every staff member of their university to deposit research outputs into the database. Also, in this comment, Abronoma described the policy in her institution:

> We do not have specific policies here. We deal with standard policy, there are standard policies that run through every country in the world and there is a UNESCO policy too, particularly for the shrines, castles and forts. They are all UNESCO heritage sites. What we do here is guided by the UNESCO standard policy. (CI1)

The situation presented in Abronoma's comment shows that although certain institutions in Ghana had not designed their own policies, they sometimes drew from policies by international organisations to guide their activities. On the other hand, interviewees' comments also showed that although most of the rural institutions generated some digital materials, they neither had any policies designed by themselves nor drew from a general one to guide their activities. Komfoanokye for instance indicated his institution did not have a policy, but he was confident by the time they finish their digitisation, the policy will also be ready. Otadie also said:

> I am not aware of any policy here. But I think if there should be any policy regarding ICT it will help us. We have rules and regulations for staff. But I do not know of any policy. (PI3)

It was likely that the rules and regulations existing in Otadie's institution may have been geared towards the goals and objectives of policies. But, such rules and objectives were not definitively indicated as policies by staff of the institution.

In addition to the policy issues discussed above, comments revealed that the Ghanaian institutions faced specific challenges in creating, managing and preserving digital materials. In the section that follows I present what interviewees articulated as some of those issues that affected heritage resources management.

5.3.2.2 Issues Affecting Digital Materials Management

The challenges identified from interviewees' narratives as affecting the various institutions in terms of digital heritage resource management were common to both sides of the rural-urban divide. Interviewees perceived financial constraints as underlining all the challenges that afflicted the various institutions in Ghana. All of them cited lack of funds as a basic challenge. Moaninko for instance, revealed that because his institution had no form of funding, it was forced to levy students for ICT fees each year. Funtun lamented that his institution had no antidote to the financial problems:

> We are constrained by the lack of funds. Decision makers don't value archives. I was compelled once to confront our director and accountant whether they don't present our case when they go for budget hearings but they said they do more than their personal capacity, but those who will give approval do not see why archives should be given that much, as I speak with you now we have not been able to put our finding aids on computers. (CI5)

However, comments by interviewees from urban institutions showed that although they agreed that there was a lack of funds, they did not believe that the fundamental challenge to general information management was insufficient funding per se. These interviewees explained that lack of interest and commitment by stakeholders, especially decision makers, was the main challenge. Stakeholders did not show positive attitudes towards effective management and preservation of (digital) information resources in Ghana. There were many instances where interviewees commented on the lack of stakeholders' commitment and interest in information management. Osagyefo for instance believed that stakeholders generally did not see the importance of heritage resources management. But he thought that the major factor was the lack of interest by government authorities. Agya again indicated that institutions in the country were not committed because leaders had other priorities:

> If the institutions are committed, we wouldn't have these problems with scanners. The leaders buy heavy, heavy cars; we buy $80,000 cars and all that. How much is a scanner? The institutional commitment is not there. It is not because we don't have the money, the money is there but they are used for other things (CI3)

Funtun also believed that if Ghanaian stakeholders valued information and records management, financing projects in these areas would not be a problem. He added, however, the following comment:

> The Ghanaian perception of the value for records is very poor. If somebody in an institution or department is troublesome or not doing well in his area that person is thrown into the records office as a punishment and where are the record offices? They are usually under staircases where junks, old tyres, old furniture and obsolete things are kept. (CI5)

Interviewees further revealed that the lack of value accorded to information and records management was sometimes exacerbated by professionals in the field. Ntim agreed with Funtun's claim. He however, believed the attitudes of records managers to their work sometimes resulted in other stakeholders disrespecting records management. He said:

> Almost all the offices do not have their records on computers. Even the conventional, paper records are not properly managed, because professionals are not doing their work well. In most repositories, lots of records are not being processed and they are fast deteriorating. There are no air-conditioners, our repositories are handicapped in resources. Of course some of these things need money to do, but there are certain things that could be done without needing money. Getting records, bringing them to the repositories, arranging and listing them do not require money to do. I think key figures, our leaders do not have passion and our records are fast deteriorating because professionals are themselves not committed to the work. (CI5)

To Bosomuru, decision makers and policy developers only showed seriousness in areas that interest them; and that is where they liked to provide financial support. But their interests are definitely not in information management. He wondered:

> Whether decision makers in Ghana are even aware of what you are talking about and whether they are interested is another matter. They will always be talking about one issue, finance. They say there is no money yet they have money for other things. (UL1)

Another challenge identified from interviewees' comments as affecting Ghanaian institutions was the lack of infrastructural resources: buildings, equipment, as well as human capacity. Interviewees believed that the situation was worse in rural institutions. All interviewees commented on the lack of resources. Those who emphasised the lack of infrastructural resources in urban institutions included Togbwe. He was worried that his institution lacked equipment and the few computers and accessories they had were not adequate for them to

manage ICT related issues. Togbwe rationalised that if these are the challenges they face at the head offices, then one can imagine what goes in the rural areas.

Diawuo also stressed that the main challenge his institution faced was staffing. They did not have enough, and most of their staff needed training. All interviewees, including Bosomuru, underscored that Ghana as a country lacked a key DPM resource in the form of a national library:

> We lack a regulatory or controlling body. National Library is needed as a controlling body for the success of all these. It is needed to coordinate other institutions due to inherent issues and to avoid rivalry. But we don't have it. (UL1)

Togbwe's disclosure on the challenges urban institutions face at the head offices and what might be going on at the districts showed that rural Ghana was under-developed and institutions there were facing even more challenges. Accounts from interviewees coming from rural institutions confirmed Togbwe's assertion and illustrated that there was a wide gap between rural and urban Ghana. Sunkwa, who had close association with rural communities for instance, confirmed in a statement that most of the rural areas do not have access to electricity at all and where they do, it is not constant.

Also, commenting on human resources, knowledge and skills, Naaba told me about the lack of skilled personnel in the area where their institution was located:

> You will not find people with that level of computer knowledge and skill in Kintampo. Here people with that level of skill prefer to live in Accra or Kumasi not here. When our machines break down we had to call people from Accra or Kumasi. (PI4)

Furthermore, Adieyepena expressed concern that ICT lessons were conducted abstractly because the school where she taught ICT did not have computers, equipment and a computer laboratory for practical lessons. Then again, Osono described the conditions of his district as having few learning centres and libraries with no computers, no museums, except the chief's palace which was used as the repository for some cultural heritage materials in the district.

The rural-urban divide in Ghana, as illustrated by the comments above, not only affected infrastructure, it also affected education, knowledge levels and usage of the new digital technologies in the country. This raises the issue of the digital divide and how the situation

was being handled in the country. In the section that follows I present the perspectives of stakeholders about the digital divide in Ghana.

5.3.3 Digital Divide

Interviewees showed that there was a digital divide in Ghana. They believed this divide was caused by the difference between the availability and unavailability of network infrastructure in various parts of the country. Additionally, interviewees rationalised that the divide was also a result of the disparities in the general literacy levels in the country. The issue of illiteracy relating to the digital divide in Ghana was stressed by 24 of the 27 interviewees. Interviewees from both urban and rural institutions described how illiteracy levels influenced the distribution of knowledge in digital technologies and the technologies themselves. Kuntane for instance, said:

> Majority of the people are illiterate so they don't know the values of some of these things [DPM]. Personally it was not until I got to the University that I laid hands on the computer for the first time. (PI1)

Togbwe was influential in a department responsible for the dissemination of information on government projects and policies. His comment that about 40% - 60% of Ghanaians were illiterate and lacking formal education was therefore important. Also, Oson pointed out that the high level of illiteracy makes ICT use difficult and Asempayetia said, due to high illiteracy levels, Ghanaians only focus on oral culture and performances rather than documentary aspects of the country's heritage.

It was clear from interviewees' explanations that most illiterate Ghanaians lived in rural communities. Togbwe clarified this point in this comment:

> In most rural areas of Ghana there are no facilities. People there have never seen a television before, never seen the computer. There are school children up to the secondary level who have never touched even a computer mouse before. Most Ghanaians don't have access to the internet. (MD1)

Interviewees also believed that illiteracy per se did not prevent people in rural communities from getting access to and using the new digital technologies. As Otadie expressed (see section 5.3.1), many people in Ghanaian rural communities were using the digital technologies in the form of digital recorders, digital cameras, mobile phones, computers and their accessories. But, interviewees further revealed that access to knowledge on ICTs was

less in the rural than the urban areas of Ghana. Thus, although people were using the technology in rural areas, use was restricted to certain purposes or specific people.

By interviewee accounts, access to, and education about the new digital technologies in Ghana was imperative but interviewees believed certain factors made it challenging. Adieyepena, for instance, said ICT education was woefully inadequate in the village where the school in which she taught ICT was located. She blamed this inadequacy on the lack of ICT resources. Also Moaninko, commenting on how he goes about teaching ICT in a rural institution, said that most of the assignments he gave to his students required them to go on the Internet. But there was no other place in the town for students to access the internet after they finish school. He therefore wondered how students could effectively learn ICT in this setting.

Internet connections in Ghana are provided by telecommunication companies. But Sunkwa explained that there was poor access to telecommunications facilities in Ghanaian rural communities because most of the telecommunication operators do not want to go to the rural areas as operations in these areas were not cost effective. Opambuo described internet access in an ICT centre within a rural community in this way:

> It is normal, it is not very slow and it is not fast. When we started there were having problems, you know the internet it is coming from Accra and they know it is coming to a rural area so, you know Ghana, your people, black man. They gave us a small bandwidth and they were always slowing it, maybe they were thinking we will take it like that but not me. I kept calling and went there, and then they made it a bit better for us. But it is very bad in other villages. (IT4)

Nevertheless, interviewees' comments showed that there were attempts to bridge the digital divide by enhancing people's knowledge of ICT. This was being done by extending ICT to all areas in Ghana especially to rural communities. According to the narratives, the government of Ghana, working through key ministries and agencies, was making attempts to extend ICT to rural communities. The Ghana Investments Fund for Electronic Communications (GIFEC), under the Ministry of Communication, was mentioned by 25 of the 27 interviewees as instrumental in extending ICT to the rural areas. With expert knowledge from GIFEC, Sunkwa described some of the activities of the agency regarding extending ICT to rural communities:

> The main vision of GIFEC is basically to provide electronic communication in the unserved and underserved communities of Ghana. We do this through a number of projects, among such projects are the School Connectivity project, Mobile Library Connectivity project, Community Information Centre project just to mention a few. (MD2)

Sunkwa continued to explain that:

> Under the School Connectivity project, GIFEC in partnership with the Ministry of Education has provided all NVTIs and the 38 teacher training colleges in Ghana with modern ICT equipment; computers, scanners, printers and connected them to the Internet. The aim is for teachers to come out equipped with ICT skills to teach children in the rural communities. Under the Mobile Library Connectivity project, GIFEC in collaboration with the Ghana Library Board provides modern ICT equipments in the board's mobile library vans so that when the Ghana Library Board embarks on their usual mobile library activities, where vans are filled with books for rural children to read, GIFEC trained personnel will join to also set up a mobile ICT centre, where the rural folks can use computers and access the Internet for that period. (MD2)

He went on:

> Under the Community Information Centre (CIC) project, GIFEC collaborates with the district assemblies to build a CIC and furnish it with computers and all its modern technologies including Internet connectivity, to provide access to ICT in the rural communities. (MD2)

To confirm from stakeholders how institutions were benefiting from GIFEC's activities, I asked both rural and urban interviewees to indicate the effectiveness of these projects in their areas and illustrate how the projects were contributing to bridge the digital divide. Moaninko who was an ICT instructor, explained GIFEC's activities in a school which was under GIFEC's School Connectivity Programme:

> We had the idea to set an ICT laboratory for the students, but it was not easy due to lack of funding, GIFEC came in and said they wanted to enhance our teaching by the use of computers. They brought twenty computers, a printer, a scanner, a UPS and they connected us to the Internet. They will repair broken down computers for one year as a warranty, after that we will have to find our own way of repairing broken down ones. (IT3)

Ayibontey explained a collaborative venture between GIFEC and the GLB to show how GLB was benefiting from the Mobile Library project as follows:

> Fortunately we are in collaboration with GIFEC; they are helping us a lot. We have started in phases, the first phase they were able to equip our regional libraries with

> Internet cafes and our mobile libraries with computers and internet. So with the mobile libraries they provide services to areas where there are no static libraries and when we go we don't only provide reading books, we also go along with the computers and Internet facilities so that the users will also browse or seek information through the computers. (MD5)

Again, Opambuo confirmed GIFEC's activities in a Community Information Centre (CIC) and explained how the CIC project worked in their district as a whole and the town where the CIC was located:

> As the name connotes, CIC is about information, may be about the district. It is supposed to be for the constituency. The government of Ghana through GIFEC and with funding support from UNDP established these centres in all the 230 constituencies in Ghana. So far 170 structures have been put up and 120 have been furnished with computers, scanners, printers, UPS and Internet connectivity.

After he had given a general background to the CIC project, Opambuo explained how the project is operating specifically in their district:

> In this district we have two constituencies. So we have two CICs, this one is here [in this town] and another one is located in [another town in the other constituency]. The aim of this CIC is to bridge the digital divide between the urban and the rural, the served and the underserved, the fortunate and the unfortunate. So we don't have CICs in the urban centres like Kumasi, Sunyani, Takoradi and the capital towns. We have projects and programs to encourage or promote ICT for the community here. We basically do ICT training, secretarial and internet services for people in the community. We provide ICT practical studies for school kids in the district who do not have ICT laboratories in their schools (IT4).

From the foregoing explanation, it can be seen that ICT and digital activities were gradually gaining ground at the grassroots in Ghana through the various institutions and district assemblies of the country. Interviewees' comments indicated that this result was an outcome of an impact of certain national digital initiatives. I therefore present interviewees' perspectives of national ICT initiatives in Ghana.

5.3.4 National Digital Activities

Interviewees explained that Ghana as a nation was trying to make its impact felt in the global digital infrastructure. The projects being undertaken by the government through GIFEC, at the various institutions and districts, as discussed above, were examples. The participants from key Ministries indicated that ICT and digital activities were becoming an integral component of the day to day functions of these higher government institutions. From the

perspectives of the interviewees, the impact of these ICT activities in the key Ministries was being felt at the institutional and district levels. Togbwe for instance, described the activities of Information Services Department (ISD) and their relation to digital initiatives in Ghana:

> ISD disseminates information on policies, programs, projects and activities of government, regardless of which government is in place. We use cinema vans and go to every nooks and crannies of this country where traditional media such as television, radio, and newspaper cannot reach. In 2003, Government established the Government of Ghana Portal, which is the official website of the Republic of Ghana. Now in addition to the traditional media ISD is using modern media or modern technologies to give information about Ghana to people everywhere in the world online. (MD1)

Togbwe revealed that the Ghana portal was an indication that all ministries, departments and agencies can create and submit digital information which would be made available on the official website of the country. For instance, Adoa from the Ministry of Defence indicated in the following comment that ICT knowledge was being applied to enhance activities of the military in Ghana:

> ICT is part of us. We have professionals who even teach it in the Ghana Armed Forces. You need to be ICT knowledgeable to be able to operate modern weapons. We document everything in every mission that we have participated. We do filming and take pictures on the battle grounds using modern technologies. We make documentaries. Every battalion make documentation, filming and still pictures. We use them for training and preserve them for future usage. We do these because it tells our story, where we have come from and where we are going. (MD3)

These increasing digital activities, both at the local and national levels in Ghana indicated that the country's dependency on modern digital technologies is rapidly expanding. This, according to interviewees, suggested that significant national strategies and plans to control and regulate digital or ICT endeavours in Ghana were timely. The interviewees commented that proper plans and strategies could ensure effective use and or appropriate harnessing of the full potential of ICT to benefit the country. Odomankoma had expert knowledge in heritage resources management and preservation and Asempayetia was also an expert in records management. They both emphasised the need for effective policies and strategies around the use of ICT for information management. Odomankoma said:

> The key word is strategy and the outlook of management. Alternative strategies are needed. I am sure you know what it means to keep your materials in digital formats. they are machine dependent, their life span, their vulnerability and what not. So you need a very comprehensive policy which will take care of the content, the metadata,

> the access restrictions and controls in relation to the laws. We need all these captured in a policy and a strategy and then the programme flows out of that. (UL3)

Also, commenting on what should be the way forward towards DPM, Asempayetia pointed out the need for Ghanaians to establish a forum of institutions with similar interests to look at the possibility of coming out with a policy and strategies that will support the policy. These comments prompted my interest to look into what Ghana was currently doing regarding national digital policies and strategies. The section that follows presents how interviewees commented on that state of digital policies and strategies in Ghana.

5.3.5 National Digital Policy

Interviewees confirmed that Ghana has developed an ICT policy and was ensuring its implementation at different levels of the country's economy. Togbwe described the ICT policy in Ghana and how it was developed:

> Formulation of the ICT4AD policy actually started in 1998. I was the secretary to the national planning committee that organised that conference to discuss the development of the policy. We finished formulating and it had to go to parliament for an act to be passed before it could become a policy. But it delayed due to bureaucracy, then the 2000 elections came and the NDC[14] lost power and the NPP[15] came and took the national document and to another conference again to review it in 2001. The new government started reviewing the document in 2001, 2002, 2003, and 2004, before the document was finally passed by government. (MD1)

Togbwe went further to explain some of the strategies in the policy and how the government is trying to implement them:

> The policy has strategies. So what the government plans to do is to provide all the 230 electoral constituencies with Community Information Centres (CICs). Now about 170 districts have been provided with CICs but since they started till now that we are speaking there are challenges and we still having a long way to go. (MD1)

From the explanations above, Ghana appears to have a rationally rendered ICT policy, but it is questionable whether stakeholders are aware of it. According to developers of the policy, the focus of ICT4AD was to benefit especially those in the rural areas. But concerns were whether the policy had been fully understood by these stakeholders. The interviewees revealed that most of the so called educated people were neither aware of the existence of the

[14] NDC stands for National Democratic Congress, the name of a major political party in Ghana
[15] NPP stands for New Patriotic Party, the name of another major political party in Ghana

ICT policy nor did they fully understand it. For instance, when asked about their awareness of the ICT policy, interviewees gave varying responses. Some claimed awareness of the policy, but their comments showed they had limited view of what it was. Komfoanokye for example talked about his knowledge of the policy as follows:

> But I have not read about that policy, I will not be surprised if Ghana should have that policy. It is good because we need a policy to guide and to guard against fraud you know. Ahaa, so it is good. (CI2)

Otadie also responded in these words: "At the moment I am not aware of any policy like that. I think if there should be any policy regarding ICT it will help the ICT system" (PI3). These interviewee comments illustrate that even though some key stakeholders were unaware of the existence of an ICT policy, they believed that the development of an effective policy to guide the management of digital resources is a good idea. Other interviewees from both urban and rural areas who had heard about the policy were either not sure of its content or could not say what exactly the policy's specific objectives were. Further, interviewees who knew about the ICT policy did not believe in the effectiveness of the policy to achieve its purpose. They believed there were insufficient resources and proper management to make the policy effective. Adieyepena for example commented:

> We have this ICT policy which says something like, every child in Ghana by the year 2012 should study ICT and it is accelerated. Even though we have this policy, the government is not making the policy effective because, we don't have computers, we don't have the means to learn the subject. They proposed that each child will get a laptop, huh! I don't see that materialising. So I don't see it being possible. (IT2)

Osono was the head of IT section in a corporate office. He also revealed that he did not know much about the ICT policy although he was aware of a national policy. He said: "Before the coming of any national policy, our District Chief Executive had ICT as his major priority so this one coming in will augment the idea" (MD5), indicating that his interest was in district rather than national ICT issues. Interviewees who demonstrated understanding of the ICT policy noted that the policy was not in any way guiding the digital activities they were undertaking in their various institutions. For example, Diawuo's institution was far advanced in a massive digitisation project. Yet, he said he did not see how the ICT policy had had any influence because his institution was not getting any support from government.

The interviewees felt that the Ghana ICT4AD policy is beset with weaknesses. They pointed out that the shortcomings were hindering the ICT4AD from performing as a fully-fledged national digital strategy like similar strategies in countries such as New Zealand. Even Togbwe, who had been part of the development of the ICT4AD policy, said it has problems as a national digital strategy:

> I can tell you that we have defects in all the three elements that you mentioned [policy, strategy and resources]. In terms of human resources we still have a long way to go, because until every Ghanaian citizen can read and write we have deficiency in the human resource, the material resources itself we have problems, the technology, the machines, the materials, equipment, software, all the infrastructure and the internet facility are all problematic. (MD1)

Interviewees' comment further showed that the Ghana ICT4AD policy had not been effective in achieving the goals specified. Okokroko was an ICT instructor from an urban school:

> The policy is not being effectively managed. It comes from the policy makers. You see when the policy is made; it is supposed to come to the grassroots. The people who are supposed to implement the policy are not doing their work well, probably that is how come the gap. So it might be either the government or the policy implementers or those who are supposed to digest the policy and work with it. (IT1)

Nevertheless, Togbwe gave the assurance that there were some strategies underway to transform the ICT4AD into a vibrant national digital policy. He said:

> One thing the Ghana government is doing as part of the policy is the E-Ghana project. Government wants to have an internet backbone. We are going to have fibre optic cables so that the internet will be fast. There is an agency called National Information Technology Agency (NITA) under the Ministry of Communication. They are going to implement that policy and that fast internet project. Right now as we are sitting down here we are preparing a policy for content for Ghana Portal. We are looking for consultants to actually help develop that policy. So we are in the process of doing that. (MD1)

Attempts by the Ghanaian government to prepare a policy for digital content, show that the timing of my research was appropriate. Ghanaian decision makers were only just beginning to consider what content should go into a national digital cultural heritage infrastructure. The next section sets out stakeholders' perceptions of Ghanaian heritage resources.

5.3.6 Ghanaian Cultural Heritage Resources

Interviewees considered that Ghana has varied forms of cultural heritage resources (see Figure 7.2). These heritage forms, according to stakeholders, can be pulled together into a repository and managed to form a memory for the country. The heritage forms discussed here are physical cultural heritage. I deemed it important to discuss them because it is these heritage forms that will digitised and converted to create digital content for a DPM programme for Ghana.

The majority of the heritage resources were in the rural areas. They were mostly of the ancient and immovable type. Kuntane for instance, described some of the cultural heritage resources in the Kintampo traditional area as follows:

> Apart from the waterfalls and mountains, archaeological evidence has shown that as far back as 2500BC commercial farming was being practiced here in Kintampo. It is through the preservation of these archaeological histories of Kintampo that these facts are known to us. The cowpea seeds that were preserved by the people at the time as well as some farming implements and improvised farm tools were discovered by archaeologists as proof. There is also evidence that Kintampo area was used as a slave market during the Trans Saharan Slave Trade. There are trees that have shackles still tacked into them, rocky enclosures and caves to show that slaves were kept there for market. They are still there I can show you if you want to see. (PI1)

Osono also talked about the cultural heritage resources in the Afigya Kwabere district:

> The artefacts are in the custody of the chiefs and queens. But the heritage resources here are mostly natural ones. We have a natural lake at Keykyewere which can be developed into a tourist attraction. We also have very high hills and stones that need to been seen before you can understand what I am talking about. (MD6)

As I analysed the transcript, I noticed that each heritage resource had its own special story coming with it. Traditional leaders recounting the history of how their people came to settle in their present locations told fascinating stories about the heritage resources in their traditional areas. For instance, Asantewaa was very knowledgeable about the history of the Damoama royal family; she explained how their people came to occupy the Kintampo traditional area:

> We came from Amakom in Kumasi. There were wars at that time. Our grandfather was a hunter. Carrying only his gun, he took all of us in the direction of Nkruansah. He left us in the care of the then Nkruansah chief and came here alone. He didn't have any specific destination but he came to a grove of 'enkuntanepo' [enkuntane trees].

> The forest was full of games, streams and rivers. The biggest of the rivers is the 'pompon' river which has the falls. He then came back to Nkruansah for us and we came to settle here. People heard about the 'enkuntanepo' and started moving here too. The White men didn't know how to pronounce 'enkuntanepo' so they called the forest 'Kintampo' and now the whole area is called 'kintampo' after the forest which is now known as the sacred grove at 'Kunsu'. (CI8)

Also, Okyerema described how their people came to settle in the area they currently occupy:

> That lake is called *bosom twee* [god antelope]. It was a small well-spring. One day a hunter was chasing an antelope [otwee]. When the antelope got to the well, it jumped into it and vanished. The hunter was so surprised that the shallow little wellspring could swallow up the antelope. He reasoned that it must be a god [bosom]. So he settled by the wellspring. Its water started expanding and now it has turn into this large lake. It is still expanding because every year it unsettles communities surrounding it. (CI7)

Further, interviewees from urban institutions that managed some of the heritage resources also talked about their materials to indicate the kinds of heritage resources there are in Ghana. For example, Abronoma, who was aware of the activities of the Ghana Museums and Management Board, said the board has many of forts and castles to manage along the coasts. They also have statues and manikins depicting important cultural people like chiefs and traditional priests and shrines, most of which are UNESCO heritage sites.

Kwakubonsam not only described the Ghanaian cultural heritage his institution was managing and preserving, but also described their significance to the lives of both the past and present people:

> Ghanaian heritage is enshrined in our traditional music and its various forms. If you take the Asantes alone we have Kete, Adowa. The Gas also have Kpalongo, the Ewes have Adwagya. All these forms have their special occasions during which they are performed, the dress code during performance, dance, and instruments. It's a whole lot. The Akans also have the Adinkra traditional symbols and let me tell you, that alone captures the aspirations of the people and their philosophy of life. It formed their way of writing, how they understood nature, their relationship with God, their way of expressing knowledge are all captured in the Adinkra symbols. (MD4)

Interviewees made it clear that most Ghanaian heritage resources were not documented and this posed the threat of losing important heritage resources. Osagyefo, an expert in cultural knowledge, for example, explained why Ghanaian heritage lacks documentation and the dangers the country faces in that regard:

> We are an oral culture. We need to document our culture. The little that has even been done it is foreigners or let me say outsiders who do not understand the culture who have documented our culture. Basic knowledge about our culture and other things will be missing to generations to come because they have not been documented for them to read. (UL4)

In the view of interviewees, regular performances and celebrations of cultural practices can keep the oral heritage resources alive. For instance Kwakubonsam noted that the lack of cultural documentation could cause the loss of important heritage resources. He told how some near extinct heritage performances were salvaged:

> Last year we had the privilege of the 10th anniversary of Otumfuo [title of Asante kings] where through his own request we brought onto the Apatakesie [the biggest auditorium] stage about, 15 of these almost dying traditional musical forms. We went searching for them and performed to the delight of His Majesty and His entourage. It was a rewarding experience but until then most of the groups were almost dead. (MD4)

With the advent of the new digital technologies, documentation of cultural heritage in Ghana is becoming important and appreciated more by many institutions in the country. Interviewees explained why they perceived that documenting heritage resources was important. Kwakubonsam for example said now they record some of the cultural performances in audio and video and also in pictures because his institution believes that the heritage resources can best be preserved for the future through such documentation.

To Funtun, documenting the culture is the best way forward, especially in today's environment of rapid technological changes. He said:

> We should document, because the oral tradition our elders used are failing us. Things are changing, from text we move to microforms and now the latest form of storing information [digitisation]. So I think we should move with the time. (CI5)

Interviewees reported that some institutions are already keeping digital versions of cultural heritage materials. For example, Agya said:

> We have some cultural heritage materials in our digital repository. For example the Adinkra signs and symbols. There are Ghanaian cultural heritage that we are also preserving and at the same time letting people outside the country have access to our culture. (CI3)

Abronoma also said her institution had some digitised items on a website, and indicated that their institution had some digital materials that they manage; although she explained that the

website was being managed by a different body because of the lack of skilled staff from her institution.

Interviewees' comments showed that digital versions of heritage resources also exist in Ghana and that different levels of digitisation activities were being undertaken by institutions. These digital heritage resources were scattered throughout the country. Concerns were about whether there were any standards being followed or what standards were being applied by the various institutions in the digitisation processes and whether the various digital heritage resources could be pulled together to form a national digital memory for Ghana.

5.3.7 National Digital Memory for Ghana

According to interviewees, the essence of cultural heritage preservation is to keep alive a national memory for a country. The interviews revealed that a national institution responsible for heritage resources management and the technology to apply in the preservation of those resources were very important. Bosomuru was also an expert in heritage recordkeeping. In the comments below, Bosomuru expressed an urgent need for a national memory institution, which could make use of ideas from success stories elsewhere:

> At the end of the day the objective of preservation will be to ensure that the national memory is available and can be tapped into at any point by anybody who needs it. Because of this a formidable institutions is needed to review what is happening somewhere and come out with priorities. (UL1)

For Ghana to be able to build a digital cultural heritage repository, interviewees believed certain elements need to be taken into careful consideration. Some of the interviewees thought that careful selection of repository content was essential. Komfoanokye for instance said this about content of a national digital memory for Ghana:

> Ghana should have a national institution where you can go and have access to cultures of different aspects of our people with our different tribes, the Asante culture, Dagombas, all the cultures and history at one point. So that it becomes a national thing. But for now everybody has their own separate culture. (CI2)

Kwakubonsam also described what should be the distinguishing elements of the content of a national digital memory for Ghana:

> Some of us are not even concern about whether there is a national institution or not. If we should have, what should be there? That is the most important because if we should have such an institution and when you go there it is only foreign materials you will see there then we must not have it. What we are doing is to encourage our people to put these knowledge and information into book so that when we eventually have that national institution it will be filled with books and materials documented by our people about us, making us understand who we are, what our people have gone through, where we are now and where we are going. (MD4)

Another element that robustly appeared in interviewees' comments as affecting the establishment of a national memory for Ghana was the attitudes of stakeholders and the Ghanaian people as a whole. Interviewees felt that the attitudes of some key stakeholders make both DPM and NDM difficult to achieve in Ghana. For instance, some decision makers believe that digitising and making cultural knowledge public would expose heritage resources to theft by outsiders. Kwakubonsam, a decision maker at the centre for national culture, demonstrated this belief in these words:

> We need to protect our creative and intellectual materials. We need to be always conscious so that we don't get people stealing them from us. I think the idea of digitising is laudable but I am sceptical because we do not have adequate protective measures for them when we put them online. What I know is that those people out there are good at stealing and if we don't take care they will steal everything from us and come back later to sell to us at very expensive prices (MD4).

Other attitudes that were found in the interviews to affect the establishment of a national digital memory concerned the interest and commitment of stakeholders. Interviewees showed that there is low commitment and less interest in institutions that manage and preserve information resources in Ghana. There was also bitterness among the different tribes. This animosity resulted from historical tribal wars and it was hindering the pulling together of the various aspects of the Ghanaian culture from the different tribes to form a collective national cultural identity. Komfoanokye was a manager of a traditional live museum. In the comment that follows, he explained how bitterness was preventing people from submitting their various tribal cultures to form part of a national culture:

> It is not easy to do that. You see, some people have been trampled upon in the past and so to heal those wounds is not easy. Ghana was more or less Asante before the British came. After independence the expectation was that the constitution would recognise certain Asante cultures as a national one. But because of bitterness from historical wars the other tribes did not agree, so now I don't think anybody can tell Asante to bring the Golden Stool [for example] for national keeps or making Akwasidae an national thing. Even when it comes to choosing a national language, let's face fact, everywhere you go here in Ghana everybody in every tribe is speaking

> the Akan language but they don't want to accept it as a national language because of the existing bitterness. So this national memory we will try but it is not going to work (CI2).

According to interviewees' comments, a collective national memory for Ghana is difficult to achieve because of issues emanating from tribal differences. These differences prevent the collaboration that is an important element for the establishment of an NDM. Adieyepena for example expressed the importance of collaboration as enhancing resources sharing. But, interviewees noted how the lack of collaboration was affecting Ghanaian heritage management and hindering the establishment of an NDM. Abronoma gave an example where the absence of cooperation is affecting Ghanaian heritage resources management in these words:

> There is no unity, every tribe looks at its culture individually and everybody makes sure that the government does not take over. So there are aspects of cultures that they will never release you see (CI1).

From the foregoing it is clear that digitising Ghanaian heritage resources and establishing an NDM for the country is challenging. Abronoma, for example commented that:

> Most people in Ghana don't pay much attention to heritage and posterity, many are not thinking of the future people to come. They are thinking of themselves and now. So it is very difficult to get people to donate the cultural heritage they have. Even though some willingly donate to the national museum, others are not ready to donate because they are thinking about only themselves and their tribe. (CI1)

Apart from the content, behavioural and collaboration issues, many other issues relating to infrastructure and management capacity also surfaced in the interviews. However, in spite of all these challenges, interviewees perceived that establishment of an NDM could benefit Ghana. They believed that conditions in Ghana could enable the establishment of an NDM in the country, despite Komfoanokye's views about a national digital memory for Ghana being impossible because of animosity among some tribal groups, He also acknowledged the importance of such an innovation for the country in these words:

> A time has come for us to come together as a nation and have a [digital preservation and National Memory] it is a reconciliatory something for us you know, if at the end of the day we see aspects of all the cultures in Ghana there, Asante history, Ewes, Gas, Dagombas, and all the rest over there, it will be fine. (CI2)

Kwakubonsam also perceived DPM and NDM as very important because to him, digitisation will keep heritage resources safe in one place. In the view of Kuntane, Ghana will not just benefit from a national digital memory, but the people could take pride from it. This was how he put it:

> There is national pride in heritage resources this is what should motivate us to well manage and preserve our cultural heritage. The best way to keep them for future generation is to digitise them and collectively protect them. (PI1)

Interviewees felt that DPM and subsequently establishing an NDM as important for Ghana. But neither DPM nor NDM were developing, even though there were now some digital heritage resources in the country.

5.4 Chapter Conclusion

The general state of digital cultural heritage resources management in Ghana is beset with various challenges. Participants for this study were selected from various institutions that deal with cultural heritage resources and ICT management as well as ministries and departments. The interviewees' comments revealed various issues affecting heritage resources management and preservation. Digital heritage materials are rapidly proliferating in Ghana and Ghanaian institutions are providing management of some sort to these digital resources.

Although various institutions were undertaking digital activities, they were not with DPM intentions. The majority of the institutions do not have any policies to guide their digital activities in Ghana. Many issues affect digital materials management at institutional levels. There are insufficient resources: infrastructure, equipment, and skilled personnel.

There is a digital divide in Ghana. Illiteracy levels are high and this contributes to the digital divide in the country. Ghana has a national ICT policy, but the policy has problems that hinder the achievement of the policy goals. Many Ghanaian cultural heritage resources exist would provide the content for an NDM for the country. But Ghana does not have an NDM.

The next chapter applies Rogers' DOI theory to explore the various contextual factors that are influencing DPM in Ghana. It elaborates on the some of the issues raised by interviewees and presented in this chapter. The discussion in chapter six focuses on examining a uniquely complex social system of Ghana, a multifaceted innovation and its attributes as a frame to explore the various influencers of DPM adoption in Ghana.

Chapter Six: Influencers of DPM Adoption in Ghana

6.1 Introduction

In this chapter, I explore the various contextual factors influencing the adoption of Digital Preservation Management (DPM)[16] in Ghana. The chapter relates to research questions 2 and 3: *What contextual factors are influencing DPM in Ghana? And how do these contextual factors influence DPM in Ghana?* This chapter is the result of an iterative process of sorting, comparing, going through the interview data several times and clustering, to identify initial factors and then mapping the factors with DOI's attributes of an innovation to identify the various influencers of DPM adoption in Ghana. The main factors are summarised at the end of the chapter.

Using Rogers' DOI as a guide, I observed that the DPM innovation in Ghana is highly multifaceted and the social system is complex with different sets of patterned arrangements of various units within it. Rogers believes such patterns and units form a structure that gives stability and regularity to individual behaviour and different actors within the system (2003, p. 24). My analysis of the interview data shows that the Ghanaian social system is complex and has a structure composed of three main levels defining different organisations, groups, members, patterns of behaviour and activities at various the levels.

Thus, in this chapter, I examine the multidimensional nature of the DPM innovation and its attributes in Ghana. I look closely at, the channels used in communicating ideas about the innovation, the timing of the innovation and at the multifaceted social system of Ghana in relation to how the dynamics of these factors are influencing the rate of adoption of the innovation in the country. While examining the interview data, I found that although DPM is a new idea to be diffused in Ghana, the adoption of the innovation as a whole is not occurring uniformly in the country. Nonetheless, even though a comprehensive DPM innovation is yet to be diffused into Ghana, potential adopters within each of the three of the social system were already unconsciously adopting various aspects of the innovation. Therefore, in this chapter, I examine the various attributes of DPM in Ghana in relation to the country's social system rather than focusing on the innovation as a uni-dimensional concept.

[16] I have explained DPM earlier. See for example sections 1.4, 1.8, 4.1 and 5.1.

6.2 The Innovation

In section 3.3, I followed Rogers' (2003) definition of an innovation to explain that the innovation in this research involves the development of national approaches and the implementation of appropriate actions for DPM in Ghana. Going through the data, I discovered that there were different stages of DPM related activities occurring among groups across the various levels of Ghanaian society. I identified some of these activities as being foundational to the DPM innovation by fostering the adoption process.

Through my analysis of the interview data, I found that the Ghanaian social system consists of interrelated units of varied traditional and cultural systems. There are also formal components such as public and private institutions, professional groups and different levels of activities, making the Ghanaian social system highly complex. I discuss the social system of Ghana in section 6.10. During the data analysis I also observed a relationship between the multidimensional nature of the Ghanaian social system and the various DPM related activities. These activities were occurring in layers that reflect the structure in the social system and involve all DPM stakeholders, from those at the base levels up to high national level decision makers and institutions. Although some of these activities were planned, they were not consciously geared towards achieving DPM per se. Thus, the innovation being examined in this research is a complex idea rather than one of the simple technological products, systems or services which are common in many other applications of DOI.

For instance, people in both the rural and urban areas, school children and teachers were all involved in activities relevant to very early aspects of DPM adoption. Tribal leaders and cultural custodians such as chiefs, queen mothers and traditional priests were also participating in foundational activities that were relevant to early aspects of DPM. And formal institutions and professional groups such as PRAAD, GLB, GLA, GMMB and GIFEC were also involved in DPM related activities. In Figure 6.1 below I illustrate the different levels in the Ghana social system, and of the approaches and activities related to DPM and the groups participating at those levels.

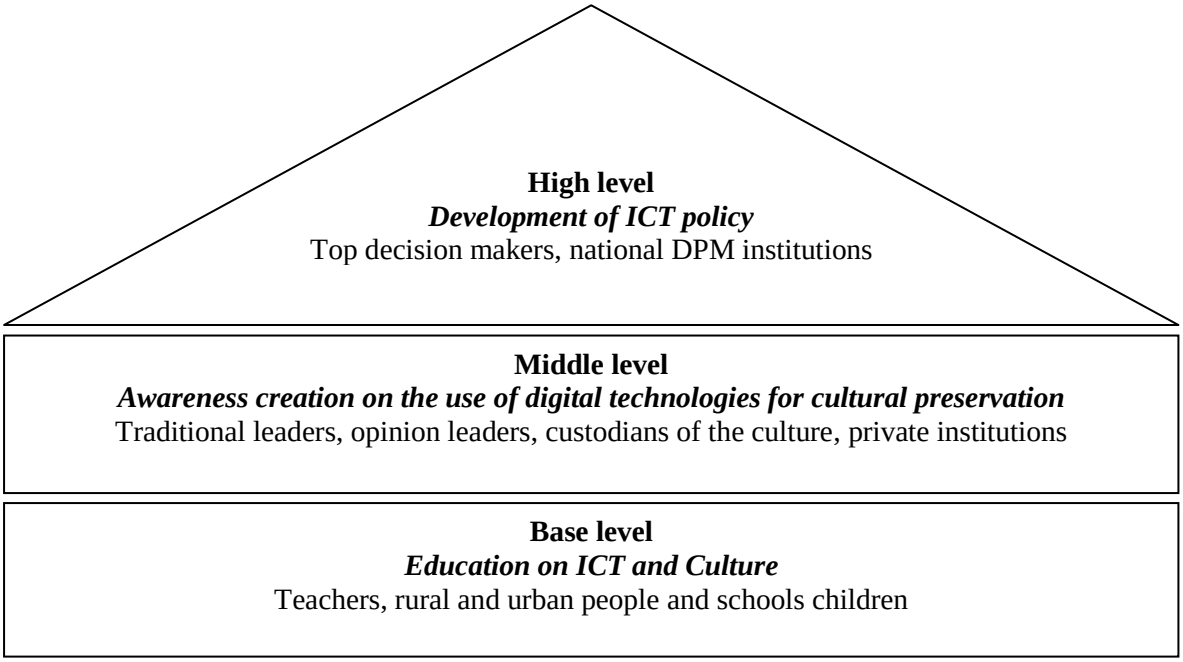

Figure 6.1: Levels of activities relating to DPM in the Ghanaian social system

The context of Ghana presents complex challenges relating to infrastructure and DPM related activities (see section 5.3). In this chapter, I discuss different examples of activities and national approaches that were going on in Ghana by relating them to the levels in Figure 6.1. As seen in Chapter five, Ghana is still at an early stage of digital resources management and so appropriate actions were very basic. At the base level for instance, ICT instructors and teachers who handle courses which have relevance for DPM were inculcating knowledge about the new digital technology and about the Ghanaian cultural heritage to people in both rural and urban communities and to children in schools. Such activities were generating interest in various aspects of DPM such as using digital technologies to document aspects of the culture (see section 5.3). These base level activities were fostering the innovation adoption process from the bottom up.

Also, as the interview data show, some custodians of the Ghanaian culture feared losing control of heritage resources permanently through DPM (see sections 5.3.7 and 6.3.4.1). This fear affected some of the activities that were going on at the middle level of the Ghanaian social system. At the middle level, activities involved some institutions, such as regional and district level government departments and private institutions that learn about initiatives from national ones. Middle level activities also involved events where information professionals informed traditional leaders and opinion leaders on the usefulness of applying the new digital

technologies to the management and preservation of cultural heritage information. These activities were unconsciously sensitising custodians of the culture and traditional leaders to think positively about releasing their culture for future DPM programmes (see interviewees' comments in section 5.3.). For instance, Kwakubonsam's explanation that his institution was encouraging traditional people to document their traditional knowledge to enhance a future national heritage repository was an indication that some of the activities at the middle level were sensitising cultural custodians about DPM.

Decisions on national approaches and appropriate actions, which had an impact on DPM in Ghana, were also occurring at the high level. Higher level activities involved big national institutions, major committees and leaders engaging in the development of policies. At the centre of the activities at all the levels were the change agents. I discuss change agents in Ghana in section 6.11.

Using the various levels of activities in my analysis of the interview data, I was able to understand the specific innovation that needs to be adopted in Ghana. Interviewees noted that DPM was not fully occurring in Ghana because the county lacks *planned* actions to ensure on-going access to the country's national digital heritage resources that were proliferating in the country. Asempayetia, for instance, regretted that regardless of the digital activities going on at both middle and high levels in Ghana, the country still has no plans for a national DPM programme. He asked:

> If you set up a team to look at a national ICT policy, are you also not going to look at the records created by the systems, both paper and digital? Won't you put measures in place to ensure that these things are effectively taken care of? So why is it that over this period of time there is neither a plan nor basic infrastructure available for the management of digital information? (UL2)

Asempayetia's questions imply that the specific innovation which needs to be adopted in Ghana is a plan for DPM. As illustrated by Figure 6.1, some lower level activities were fostering the adoption of DPM. However, as identified in section 5.3.1, even though some DPM related activities have been going on in Ghana they were without DPM intentions or were not being directed towards the achievement of DPM objectives.

In this study 15 of the 27 interviewees did not show full understanding of the DPM concept. Although 11 of these 15 interviewees demonstrated some awareness of DPM at the institutional level and attempted to explain how their institutions undertake DPM related activities, their explanations showed they did not fully understand the components of a national DPM programme. For instance, in answer to the question: "*Do you have any digital materials that you manage?"* Otadie said his institution uses computers to record radio programmes and then burn these recordings on CDs and keep them. However, when asked how the digital materials are preserved, Otadie explained:

> As a matter of fact I do not know the process and I cannot tell you whether the [radio] station has future plans for that [preserving the CDs] or not. But as time goes on if the technology changes, I think we will also change how we do our production and recording and other things. (PI3)

Like Otadie, most stakeholders, especially those involved in middle level activities were aware of digital materials and how they are created (see also section 5.3.1). But their understanding of how to handle digital materials was limited. Most of the interviewees did not demonstrate a full understanding of the processes involved in DPM.

The remaining four of the 15 *DPM-uninformed* interviewees, Okyerema, Asantewaa, Sunkwa and Osono during their interviews, were hearing about the DPM concept for the first time. This is not surprising given their backgrounds. For instance, Okyerema and Asantewaa are traditionalists who have had no formal education and although their in-depth knowledge of the Ghanaian culture and heritage is potentially an important component of DPM, they had never been part of any digitisation project. Also, although Sunkwa and Osono play technical roles in their respective department and district assembly, they had never applied their technical knowledge to managing cultural heritage. For instance, during an interview session, Sunkwa with this comment interrupted a question I was asking:

> Hold on, are we going to talk about the activities of GIFEC or cultural heritage? I have already told you I have no idea about this cultural heritage stuff and their management or whatever. (MD2)

Thus, the DPM idea was new to most of the stakeholders across the various levels and their lack of knowledge of DPM impacted on some interviewees' responses to the interview questions.

Although DPM has been undertaken in countries like New Zealand, Ghana is yet to consciously undertake the initiative. It was therefore not surprising that Bosomuru, an expert in information management, said that "the technology does not come from here [Ghana]. It comes from there [developed countries]. So we need to adopt and adapt to suit our context". Bosomuru's comment is consistent with Alemna's (1999) assertion that African countries should emulate some of the technologies from Western countries in order to build their own information networks (see section 2.8.4).

The comments by both Bosomuru and Alemna suggest a common notion that the innovation involves only technology. But, Rogers further points out that an innovation can consist of information and ideas such as religion, policy, or even strategy or culture (2003, p. 12). Thus, the innovation in this study comprises not only of the technologies involved in DPM, but also all other aspects such as digital strategies and policies, traditional and cultural heritage issues, political and other social issues that come with DPM. Therefore, going by Rogers' (2003) definition (see section 3.3), and from interviewees' comments, the innovation discussed in this research is a complex *idea* of DPM, which interviewee believe, will supersede traditional preservation techniques at all levels when it is fully adopted.

The DOI theory identifies five attributes of an innovation that influence its rate of adoption: *compatibility*, *complexity*, *trialability*, *observability* and *relative advantage*. The interview data shows that these factors impacted the rate Ghanaian stakeholders were adopting DPM. Using these attributes as a framework, the various contextual influencers of the DPM innovation in Ghana are explored below.

6.3 Compatibility of DPM with the Ghanaian System

According to Rogers (2003) compatibility is the degree to which an innovation is perceived as consistent with existing values, past experience and needs of potential adopters. From my analysis of the interview data, I found that aspects of compatibility factors that were enhancing the rate of adoption of the DPM innovation revolved mainly around stakeholders' attitudes towards the innovation. I discuss the specific attitudes in section 6.3.4, but first I present the existing values, past experience and needs of potential adopters in Ghana.

6.3.1 Existing Socio-cultural Values

My observation through analysis of the interview data revealed that commonly held standards of what is acceptable or unacceptable, important or unimportant, right or wrong, workable or unworkable regarding the adoption of DPM into the Ghanaian social system were evident in stakeholders' attitudes, especially those of cultural custodians. An important cultural value common to all the tribes in Ghana is what interviewees described as cultural communalism. According to interviewees, although the people live in separate communities there is a social bond that makes everyone responsible for one another. In this system of communal living, almost everything is done in groups. For instance Asantewaa, narrated how communal system works in the areas as follows:

> We are all together, we are one people so why one's concern not be my concern. If Kofi see my child going wayward, he has the right to chastise her. In the same way if my child is hungry and I am not at home why will Maame Afia not give her some of their food? She knows I will do same to her children. This is the way we live as Ghanaians we eat together from the same bowl, sleep together in the same hut. It does not matter where you come from we are one. (CI 8)

Although this system of communal living is usually within tribal groups, it is a very important feature which is compatible with the development of a national DPM. It enables the tribal groups that are close to relate well and share cultures, which can lead to effective DPM.

For effective DPM innovation to be realised in Ghana, interviewees suggested that both tangible and intangible cultural heritage resources need to be conserved and protected to form content for the DPM programme. However, interviewees expressed concern that certain human activities, especially by members at the base level in the Ghanaian social system, sometimes lead to the loss of or alteration of heritage resources. All my interviewees expressed worry that certain negative activities were destroying important cultural heritage resources. Interviewees who were knowledgeable about DPM noted that the destruction of key heritage resources can affect the content for a future DPM programme. For instance, Kuntane's description of how local chainsaw operators were destroying the reserved Kunsu forest is an example of how human activities can affect the content of a future DPM programme in Ghana. The Kunsu forest contains an ancient slave market and other important cultural heritage resources at Kintampo. Digital images of these heritage resources could

contribute to a DPM programme for Ghana. Thus the destruction of these important heritage resources could create a gap in Ghana's history and memory.

Nonetheless, some interviewees especially those from traditional institutions, expressed the view that digitising the culture and making it available online through DPM can lead to over exposure of certain important cultural knowledge. They were concerned that DPM might lead to a loss or alteration of some heritage resources. Thus, there were mistrusts about DPM among many Ghanaian stakeholders, particularly custodians of the culture, making it incompatible for those people.

In section 5.3.6, I presented interviewees' comments on how Ghanaians perceive their cultural heritage resources as important for their national identity. For instance, comments by Kuntane, Osono, Kwakubosam, Asantewaa and Okyerema (see section 5.3.6), showed how Ghanaian stakeholders value the preservation of heritage resources. From my analysis of the interviewees' comments, I observed that many stakeholders, particularly at the base and high levels, believed that it is important to bring various tribal heritage resources together for effective management and preservation at the national level. This belief in itself is an enabler for the adoption of DPM and demonstrates that this aspect of the innovation is compatible with the Ghanaian social system.

Again, interviewees' statements indicated that socio-cultural values such as traditional laws, practices and taboos not only forbid people from tampering with heritage resources, they also ensure the conservation of culture and heritage materials in Ghana. Thus, these practices reveal values within the Ghanaian society that enable the adoption of DPM and make the innovation compatible to the Ghanaian system. For example, as revealed in a comment by Kuntane, the ancient slave market in the sacred Kunsu forest has existed until now because traditional leaders in the area rendered the forest sacred. It is taboo for people to go there. Only traditional priests are allowed to go there for prayers to the gods. People adhere to these customs that protect heritage resources in the forest. He said:

> There is an ancient dug out *oware* [traditional game] in the rocks inside the Kunsu forest. Pots the slaves used, the shackles use to chain them are still tacked into the trees, they are all still there. People's activities in the forest can easily result in the loss of these important heritage resources. So the chief and elders in Kunsu have

> rendered the forest evil and it is taboo for anyone to enter the forest for any activity. The people also listen, so the forest and the heritage in it are being protected. (PI1)

Ghanaian stakeholders were conscious of their culture. From my analysis of the interview transcripts, I observed that this consciousness, which mainly showed in the middle level activities, is a significant value factor that was fostering some stakeholders' acceptance of the DPM innovation. Being conscious of the culture and adhering to practices that ensure the protection of cultural heritage were attitudes that are compatible with DPM adoption. The importance of cultural consciousness as an enabler for effective DPM was mentioned by various interviewees (see also section 5.3.6). For example, Osagyefo said:

> As for the culture we are conscious of it as Ghanaians and Africans, and that is very important. It enables us to think about our history and make us want to preserve our traditional norms and practices and behaviours, otherwise there are a lot of things our children will lose in the future. (UL4)

Cultural consciousness was enhancing DPM related activities particularly at the middle level as shown in Figure 6.1. As interviewees indicated, being conscious of the culture creates awareness for the need to manage and preserve the heritage resources for future generations. Such awareness enables the adoption of DPM. The Ghana Museums and Monuments Board (GMMB) is one of the institutions responsible for the management and preservation of Ghanaian cultural heritage. Talking about the activities of GMMB, Abronoma indicated that a factor that has enabled GMMB to succeed in their responsibilities is that the Ghanaian people love their culture and history. These positive traditional attitudes, beliefs and customs, awareness and fondness for culture and history by stakeholders at all levels in the social system in Ghana enable DPM adoption in the country. While positives human attitudes protect the heritage resources from being destroyed, such attitudes help to maintain the preserved content to form components of future DPM programmes in the country. DPM therefore forms an important component of the existing values of the social system of Ghana. While some aspects of the innovation are acceptable at all levels of the social system, some members at the middle level found some aspects unworkable, making these people to mistrust the innovation and to hold onto their existing attitudes.

6.3.2 Past Experience

According to interviewees, the application of modern technology to heritage resources management is a recent phenomenon in Ghana which has become imperative due to the

proliferation of digital technologies in the country. Interviewees noted that the Ghanaian culture is largely oral, indicating that stakeholders had limited previous experience with the documentation of cultural heritage information and the use of digital technologies.

My analysis of the interview data indicates that some valuable knowledge and ideas in the culture are in the custody of traditional leaders such as chiefs, queen mothers, traditional priests, clan and family heads. Cultural knowledge is mostly transferred orally and through performances for the young generation to observe and learn. The culture is also preserved through this oral transfer of cultural knowledge and stakeholders, especially traditionalists, acknowledged that this system has worked well for them.

However, interviewees felt that certain cultural behaviours restrict traditional leaders from maximum interaction with young people. According to interviewees, the young learn about their traditions and cultural values through interactions with the custodians. Kuntane, a manager of a private environmental preservation organisation, for instance, commented that:

> The leaders, chiefs, queen mothers and custodians of the culture, don't see the essence of preservation in modern times. Just consider how the traditional home operates, when children ask questions they are shouted at to keep quite because we think children are not supposed to ask elders too many questions. So it is not unusual to find kids being insulted by elders for even coming close to ask a question. Chiefs and queen-mothers don't interact with the youth. Children see them as a cult. They are not approachable. So if we do not find a way of documenting these cultures, all these heritage resources at their disposal will not be available to the youth in the future because there is a barrier. (PI1)

This practice is typical of many indigenous cultures. But that does not necessarily mean there is no transfer of knowledge and traditions. It could mean that the guided approach and a channel of transfer is taken, and only selected recipients (usually from the tribes) are involved, which does not fit well with the typical Western notion of knowledge.

Still such interactions are an important bridge between the base level and middle levels of DPM activities (see Figure 6.1). Links between the various levels of DPM activities are likely to enhance better understanding of the innovation and foster a faster rate of adoption. Yet, as a cultural practice, elders do not involve the youth in most activities, causing the young generation in modern Ghana to lose interest in their culture and go after foreign ones. This behaviour does not encourage the transfer and preservation of cultural knowledge.

Stakeholders therefore believed that documenting the culture through innovations such as DPM is the best way to remove this barrier to avoid loss of various aspects of cultural knowledge in Ghana.

Osagyefo was an academic and expert in cultural preservation. His comment below is just an example from the interview data that expressed regret that the lack of reading and writing in Ghana, especially about cultural heritage issues, is causing the loss of important cultural information in the country:

> We don't take cultural heritage management and preservation as an area of priority. People neither read nor want to write about our culture. They are interested in other areas. Although we are an oral society we need to write to enhance knowledge transfer. But we allow foreigners to write on our culture. So the major factor is lack of interest. They don't have the interest and desire to write about the culture. (UL4)

For stakeholders to see culture as a priority area, the culture needs to be appreciated. But whether Ghanaians appreciate their culture is questionable.

6.3.3 Needs of Potential Adopters

In section 7.6, I discuss potential adopters of the DPM innovation and the adoption process in Ghana. Interviewees' comments show that potential adopters need clear policies, effective strategies, adequate resources and workable management practices to be able to adopt the DPM innovation. But, interviewees believed that one cannot effectively preserve what is not appreciated. Stakeholders require positive attitudes towards the Ghanaian culture to enable effective adoption of DPM. All interviewees commented that key players need to value the culture and develop confidence in the use of the new digital technologies for preserving the culture. In section 5.3.7, I presented interviewees' views that there is national pride and cultural consciousness. According to my analysis of the interview data these values can enable the adoption of DPM and make the innovation compatible to the Ghanaian social system. The interviewees reflected that while these values are required, some stakeholders in Ghana do not appreciate the Ghanaian culture. Some interviewees believed that almost every aspect of the Ghanaian culture has been adulterated by influences from foreign cultures, particularly the English culture. People no longer appreciate the Ghanaian ways of life. Kwakubonsam for instance, bemoaned the fact that Ghanaian food, music, dance, clothing, religion and even education have been replaced with the English versions. He used my appearance to make his point in this comment:

> If I ask to take you for lunch right now, I know you will mention a foreign food. Look at how you are dressed [referring to my white office shirt tucked into a black pair of office pants with black pair of shoes] it doesn't show that you are a Ghanaian. So as for the negative influence on our culture, it is so visible for you to refuse to see. (MD4).

Kuntane also showed how appreciating culture is very important to the adoption process:

> Our clothing, for instance the batik [traditional cloth], throughout the week, it is only on Fridays that people wear traditional clothing. The rest of the days go in favour of the Whiteman's cloth. This is bad for our culture. We are creating jobs for foreigners and promoting their culture. The drawings and paintings, the adinkra traditional symbols in our clothing are special. If we wear them we promote our culture. If we take photos with them we preserve many things about our culture, the wear, the design, the stitch all these are part of our heritage but we don't appreciate, how then can we preserve them? The appreciation is the first step, and then comes commitment before we take bold steps to preserving them. (PI1)

Thus, in this instance, the awareness of the lack of appreciation for the Ghanaian culture by stakeholders provided a reason for the adoption of DPM, demonstrating that the innovation is consistent with the needs of potential adopters and with the Ghanaian social system. Ghanaians need to understand what they own in terms of culture before they can appreciate it and desire to preserve it.

As revealed by interviewees, the potential adopters of DPM, such as traditionalists and custodians of the various tribal cultures in Ghana, have a crucial need for lasting protection and preservation of their heritage resources. But, as mentioned earlier, custodians of the culture feared that they might lose some important aspects of their culture through the processes in DPM. Notwithstanding this fear, interviewees identified that there were varied cultural elements across all levels of the Ghanaian social system that were fostering the adoption process. For instance, there were various cultural aspects from the different tribes and linguistic groups to enrich a collective national cultural heritage with a unique diversity for Ghana. Each of the over 100 different tribal groups has their unique cultures. Stakeholders perceived that when elements from these diverse cultures are pulled together, the resultant national cultural heritage is unique indeed. Nonetheless, interviewees saw that fear of permanent loss of cultural information on the part of the different cultural groups makes the DPM innovation in Ghana challenging. The fear that they might lose their heritage resources

forever is preventing the various tribes from bringing their heritage resources to build a national cultural heritage repository.

Interviewees traced the reason for this behaviour to the coming of the Europeans to Ghana and the animosities created among the tribes. I discuss these reasons in section 7.5.1. See also Komfoanokye's comment in section 5.3.7 about how the Asantes thought their culture would be accepted as the national one after independence. Komfoanokye further explained that there are many observances his tribe does want to make public especially in the celebration of festivals because other tribes, out of bitterness, did not agree for those customs to be made national.

> People don't want to accept it [Asante] as a national language because they feel bitter. So we will also keep our [culture] because it is for the Asantes alone. (CI2)

It is very likely that other tribes will also think the same way as Komfoanokye and keep their cultures to themselves, hindering the development of a national DPM.

As mentioned in section 6.2, the majority of the interviewees demonstrated little understanding of DPM. Nevertheless, a careful analysis of interviewees' comments about the innovation show that stakeholders, including members at both the middle and high levels, perceive that any successful heritage resources management will lead to a collective national cultural heritage repository. This perception by stakeholders also indicates that the essence of effective DPM is to establish an NDM. Thus, Komfoanokye's comment above reveals that the fear of losing ownership of cultural information does not just affect the DPM innovation in Ghana; it also affects the development of an NDM for the country.

Interviewees' comments show a feeling of bitterness existing among the tribes in Ghana. This feeling was causing the tribes to keep their various heritage resources separate from a collective national heritage. It was clear that one reason why some tribes were unwilling to share their heritage resources was because most of these heritage resources contain precious minerals. There is concern that those who might handle the national heritage materials may be interested in the precious minerals involved. Komfoanokye again provided clarification:

> People have their own cultural objects of historical significance hidden under their bedrooms, because they fear that once they give them out who is going to take care of those objects, who is going to preserve them. Their forefathers of so many years ago gave those items which are mainly gold. You see, everything is gold. Look, this key

> contains gold [holding up a key]. You see? But modern people, the moment you give this item to them they will go and sell it. But if people can be assured of a place, a secured central point to keep the item, they will donate. So in the future his grandson will visit the place and say oh my grandfather donated this or that and he will feel proud and the next time he will also do something to help. (CI2)

Thus, the fear of loss by stakeholders demonstrates that there were aspects of the DPM innovation that were not fully compatible with the values and concerns of some members of the middle and top levels of the Ghanaian social system. In contrast, a positive attitude identified by interviewees that is consistent with the adoption of the DPM innovation in Ghana is the stakeholders' interest in the new technologies.

6.3.4 Specific Stakeholder Attitudes that influence Compatibility

From the data analysis, I found that the attitudes of Ghanaian stakeholders towards DPM were key determinant of the compatibility of the innovation with the Ghanaian social system. The stakeholders' interest in the innovation, their ideas about the innovation, their respect for information management laws, their political attitudes and their information culture were some of the specific attitudes that were influencing the compatibility of DPM in Ghana.

6.3.4.1 Interest in Digital Technologies

Among the interviewees, I found an interest in the new digital technologies. This interest was particularly high among young people at the base level of the Ghanaian social system, even though some members at the middle and high levels also demonstrated some interest. This interest enabled people to develop a passion for projects that come with the technology such as that related to the DPM innovation. As a result of this interest, more people were using the technology in their daily lives. Interviewees identified that mobile technologies, digital cameras and computers, were being used by Ghanaians particularly among the youth in all parts of the country, including rural and urban areas. The people used the technologies not only to enhance education and communication, but also to record cultural events such as festivals, ceremonies, rituals, as well as physical heritage resources (see section 5.3.1). Thus, the adoption process of the DPM innovation was compatible with the use of the technology in the Ghanaian society. Interviewees also thought that the interest in digital technologies inspires the desire and commitment to preserve the digitally documented heritage resources. For instance, Asempayetia commented that there is a desire by stakeholders to do digital preservation because of the proliferation of the technology in Ghana. Such desires and commitments are also consistent with the adoption of the DPM innovation. Twenty-five of

the interviewees were certain that when interests in these DPM activities develop and get to the national level, this occurrence is likely to enable the establishment of a National Digital Memory (NDM) for the country.

The interviewees also mentioned that as a result of the people's interest in the technology, institutions in all areas of the economy, and particularly those at the middle level of the social system were applying the technology in their work. They also sought to employ people who had skills in the technology to enhance their work. These made people, especially those at the base level, endeavour to seek knowledge and skills in the new technologies to enhance their opportunities for work. For instance, Akokyem, a journalist in a rural radio station, said this about his institution:

> We use computer software for our programme because ICT is of interest to us. If you don't have the technical know-how, if you don't know something about computers, you cannot work here. When you want a job here the first thing they will ask you even before they ask other questions is 'do you have knowledge in computers'? (PI2)

Also, Agya, an institutional repository manager, said:

> Now everybody knows that everything is about IT, everything is on the Internet, so if you are not good in IT you struggle. People who don't know anything about IT always fall behind. If you are looking for any document these days you have to use ICT. Even libraries are reducing the rate at which we use books. We buy more digital aspects than the physical book. (CI3)

The comments above show that not only the cultural institutions were interested in using the new digital technologies to manage the cultural heritage resources in their care. Radio stations and institutions in other fields and at all the levels across the social system in Ghana were all showing interest in, and were using the technology. Even though as shown in section 5.3.3, Ghanaian institutions face many challenges, the interest in technology use within the various institutions at the various levels was fostering the DPM adoption process and demonstrated that the innovation is compatible with the Ghanaian social system.

The interest in technology notwithstanding, all interviewees, with the exception of Sunkwa, further identified that there is a lack of interest in information management and in DPM institutions by various stakeholders across all levels in the social system. As DPM is an information management activity, this lack of interest is a sign that this innovation which is also information management process is incompatible with the interests of some members of

the Ghanaian society. Some interviewees attributed this lack of interest to ignorance. For instance, Bosomuru, an academic and expert in heritage information management, believed that many people, especially members at the base and middle levels of the social system were unaware of the need to manage and preserve information and as a result, were not simply interested. And at the top levels where awareness of the need for information management was high, members had little interest in the technology and decision makers were interested in other priority areas (see interviewees' comment in section 5.3.2.2). Agya, an institutional repository manager at a KNUST library, provided another example of this lack of interest:

> Populating the institutional repository is our big challenge because people are not interested. They are not technologically inclined so they do not understand, especially the old professors, they are not interested at all. They will tell you, 'I should go and do my research and you should come and have access to it'. So we ask the librarians in their various faculties to go round and talk to them about the benefits of the repository. (CI3)

The lack of interest underlined all areas of information management in Ghana, and as the interview data indicated, it cuts across all stakeholders including key decision makers in the country. Thus, sometimes top managers and decision makers had conflicting views of important information management issues because of their interests in areas other than information management.

6.3.4.2 Conflicting Views on Information Management

Interviewees felt high level decision makers in the Ghanaian system had conflicting ideas about some important information management issues in Ghana. My analysis of the interview data indicates that the lack of a national library in Ghana is a serious hindrance to information management and DPM, confirming assertions made in the literature that lack of a national library was affecting the general economic development in Ghana (see Alemna, 1989, p. 122). Interviewees' explanations show that for a national library to be established in Ghana, the government has required top information management professionals to submit a proposal for consideration. But, these professionals expressed conflicting views about a Ghanaian national library, causing the government to hold back on providing the needed resources for the development of a national library for Ghana.

The DPM situation is complicated by the rivalry between these two organisations. The Ghana Library Board (GLB) executes national library responsibilities in Ghana and the Ghana

Library Association (GLA) is the leading professional association for library and information professionals in the country. Top decision makers in these two institutions did not agree in ideas about the establishment of a national library. Their views on the nature and purpose of a national library for Ghana were conflicting, creating tension between them. My observation of the Ghanaian society and my analysis of the interview data identified that the tension is not only delaying the establishment of a national library, it is also delaying the process for adoption of DPM and subsequent development of an NDM in Ghana. For example, Atukuba, a decision maker at the GLB revealed his thoughts about the establishment of a national library in Ghana:

> We want a national library as a national library in a building, period! But the library association also wants it in another form and we are saying no. I don't care about the name, it is the role it will play and how it is structured that matters. We came out with a document and submitted it to government, and then later another document appeared [from GLA]. So the library board said 'no this is the document we have submitted'. But they also said no 'this is what we want it to be done'. So that is the problem now. (MD7)

Also, Ayibontey, a decision maker in GLA, viewed the establishment of a national library for Ghana this way:

> What they can do is to start it somewhere. They should have a big building to start the project. If you want to have a national library that will coordinate the activities of all other libraries or information centres, you need not collapse the public library system. The way they are going about it creates the suspicion that somebody wants his own agenda. So we received it with stiff opposition. We are not interested. (MD5)

A situation like this, in which ideas and interests were conflicting among members at higher levels, created tensions and distrust among key stakeholders across all the other levels. It also created an environment in which programmes were difficult to implement. This tension at the high levels thus created a context in which DPM adoption as a process became incompatible within the Ghanaian society. The situation was not only preventing the establishment of a national library as an important information management institution in Ghana, it was also hindering the adoption of DPM in the country.

6.3.4.3 Political Behaviour

Decision makers at the higher level of the Ghanaian social system include politicians. Eighteen (i.e., two-thirds), of the interviewees indicated that certain attitudes by politicians created a context that made the adoption of the DPM innovation incompatible with the

Ghanaian social system. These interviewees felt that deception, unfulfilled promises and unnecessary interference in DPM projects are some of the behaviours politicians in Ghana displayed at the higher level which was making the adoption of DPM difficult at the base and middle levels. The interviewees pointed out that, incumbent governments have not shown interest in projects initiated by their opponents in previous governments. Whenever an incumbent government has taken office, it either has dragged out the implementation of policies developed by past governments or has put aside all their initiatives. Togbwe, a decision maker at the Department of Information Services who was also part of the committee that developed the Ghana ICT4AD policy, related how such political interference dragged out the development of the policy from 1998 to 2004. Togbwe said:

> We started formulating the policy in 1998 and even submitted a document to parliament for an act to be passed. But when the NDC [National Democratic Congress] government lost the 2000 elections and the NPP [New Patriotic Party] government come to power, the bill was dragged until 2004. (MD1)

Asempayetia, also a policy expert, explained how political attitudes interfered with attempts by key players to initiate DPM related plans:

> You may want to talk to Dr. Paa Kwesi Ndum. Yes, I mean the presidential candidate. During the NPP government, he was the minister for Public Sector Reforms (PSR) and he initiated a lot of reform plans on the management of recorded information and their preservation. You could find out from him, what were the initiatives over the course of time when he was a minister? There is not such ministry today because the new NDC government dissolved the PSR. (UL2)

The initiative as described in Asempayetia's comment created a context within high level activities which enabled the DPM adoption process to be consistent with the Ghanaian society. But he regretted that the ministry together with all the plans by the minister were rejected by the new government. In addition, Bosomuru revealed an instance where a DPM project was stopped because of political interference:

> The Social Security and National Insurance Trust [SSNIT] is one institution that initiated a nice digitisation project, but when the NPP came into power, they subjected SSNIT in an investigation on how their machines were acquired and how they finance the project. Because of this SSNIT was never able to continue with the digitising. (UL1)

While investigating projects may be a necessary step to reduce corruption in activities across the levels in the system of Ghana, interviewees expressed the view that these high level

investigations are sometimes used by governments to frustrate institutions that do not sympathise with them. The abrogation of projects, programs and policies initiated by previous governments has been typical of governments in Ghana over the years hindering national development in general.

Interviewees noted that in addition to these interferences governments usually deceive and fail in their promises to members at the base level. Comments by Okokroko, Adieyepena, Moaninko and Kuntane, for instance, focused specifically on a government promise to give one laptop computer to every school going child in Ghana. When asked about their views on this high level decision, interviewees revealed the sentiments of members at the base level in the following comments:

> They say one laptop per child but you go to a school of 2000 pupils and you see only two laptops for the whole school (IT2).
>
> How can a government give every school child a laptop when school teachers do not have one and are not even trained in ICT themselves? (IT1)
>
> How can the government give computers to every school child when most of these places do not even have electricity, how are they going to use it? (IT3)

Political interference and unfulfilled promises are not only hindering activities and general development in Ghana, they are also creating an environment that make aspects of the DPM adoption process incompatible across all levels of the Ghanaian social system. Interviewees believed that some members at the base and middle levels react to this attitude by politicians and other high level members by disregarding certain laws in Ghana, especially information management laws.

6.3.4.4 Attitudes towards Information and Cultural Heritage Management Laws

In the view of interviewees, a consequence of unfulfilled political promise at the high level is the difficulty in enforcing laws at the base and middle levels of the social system of Ghana. Ghana lacks proper law enforcement systems in all areas including information management. The lack of proper law enforcement at the various levels is hindering effective implementation of projects, including DPM projects. Kwakubonsam for instance, observed:

> Ghana has a propensity for signing laws and conventions but is bad at their enforcement. These laws and conventions ensure the adequate protection of heritage

> resources but they are not well enforced. People just have bad attitudes of disregarding the laws that they know are protecting Ghanaian heritage resources; not that they are ignorant of the laws, they know, they are aware, they just chose to ignore and nothing is being done to them. (MD4)

There are legal deposit laws that require book publishers at middle levels and other members in the book industry at the base level to submit copies of published materials to cultural institutions. But, interviewees noticed that people flout these laws and get away with it. There are no proper enforcement procedures. Atuguba for example explained the disregard for laws as follows:

> There are book and newspaper laws which entreat every published material including the newspapers to be deposited with the Ghana Library Board, University Libraries and the Register General's Department. But publishers are not depositing. We have to chase them. But when we go they don't even mind us. Enforcing the laws is the problem. (MD7)

Interviewees explained that even high level laws setting up the responsibilities for national cultural institutions are also overlooked. For instance, Ayibontey explained that Act 327 mandates the Ghana Library Board (GLB) to perform the responsibilities of a national library. Funtun also talked about Act 535 defining the functions of PRAAD to include keeping every public document including proceedings in parliament. However, Asempayetia complained that because stakeholders at all levels pay no proper attention to the laws that set responsibilities for these institutions, the institutions fail in their responsibilities to lead initiatives in information management such as DPM in Ghana. As can be deduced from the comments, stakeholders are aware the laws exist. People just disregard the laws and there are no proper enforcement measures. Interviewees explained that when decision-makers and politicians at the high level fail in their promises, it becomes morally difficult for the government to enforce the laws and at the base and middle levels. It also becomes difficult to properly allocate resources to enhance developments in information management initiatives such as DPM, leading to poor information culture.

6.3.4.5 Information Culture

In this study, information culture is viewed as the attitudes, beliefs and behaviour of a community towards information ownership and information use, applying the definition of Riyaz and Smith (2012, p. 176) for information culture. Riyaz and Smith also identified that in a developing country context there are a number of contributing elements to information

culture, including indigenous knowledge, ICT, information literacy, research and development and publishing, libraries and information services, mass media and information policies (2012, p. 178). My use of information culture in this study also includes all these interrelated elements that contribute to effective information management initiatives such as DPM.

Thus, all the factors discussed earlier in this section are contributing elements to the information culture in Ghana. My analysis of the interview data shows that information culture among members in all the levels of the social system was poor. Funtun, a senior records manager at PRAAD, described the information culture in some middle level institutions in Ghana in the following comment:

> When staff of an institution misbehaves or not doing well or there is any troublesome staff, the person is thrown into the records department or office. And where are the records offices, under stair cases, where junk, old furniture, used tires and obsolete items are kept. So they are put there as punishment. So this should give you an idea of how Ghanaians treat records and information in general. (CI5)

The culture of using information management as punishment for staff from other fields gave a poor impression of the information management field and its associated activities. Thus, this poor perception was contributing to an environment that in essence is making the adoption process of the DPM innovation very difficult. Asempayetia therefore suggested:

> We have to renew interest in our governance and one way of doing it is to develop a good culture for our information. Information culture must have to improve, otherwise all these about [DPM] will come to nothing. Governments will come and go if the commitment to the digital preservation strategy is not there, they may squeeze it totally out through lack of funding, and if that happens, the common citizen, the citizen on the street who has that information culture, can challenge the president. 'What is your commitment to this'? This is our heritage, what are you doing about it? But if that culture is not there and is not promoted, how do we get this done? So the information culture is important but we have been taken it for granted. In New Zealand what will happen if the government reneges on its promises and commitments what will happen? People will take the government on! But look at here. (UL2)

Poor information culture by stakeholders was only deepening the already existing *lack of* interest on the part of government. Asempayetia's comment also suggests that corrupt governments at the high level intentionally stifled efforts towards effective information culture so that people at the base level had less power to challenge the government when it

reneged on its promises. Poor information culture also shows how Ghanaian stakeholders appeared not to appreciate progress for the institutions that manage and preserve the country's records and cultural resources. In the perspectives of interviewees Ghanaian treat records anyhow. Odomankoma for instance, explained that people treat corporate records as their personal property. He noted that transactions are kept in personal email accounts and when staff leave the organisation their emails go with them no accountability, nothing is done to properly manage recorded information. Keeping corporate records in personal emails and treating them as personal records was resulting in the loss of important corporate records.

The poor information culture was attributed to a lack of respect for documentary resources in Ghana. Interviewees also noted that there is a general antipathy for reading and writing by Ghanaians. Funtun for example observed that:

> The Ghanaian by nature does not like reading. There is this saying that 'if you want to hide anything from the African or Ghanaian, just put it on paper'. So when it comes to defence you just say I put it in writing you did not read it. (CI5)

Stakeholders perceived that this antipathy for reading and writing is a cause of lack of interest in libraries and archives as information management institutions. People neither go to the library to read nor write anything to be put there for others to go and read. Interviewees indicated that there are some scholars who have written on a range of issues in Ghana. But the priorities of Ghanaians who can write are not on cultural heritage. Osagyefo remarked on cultural documentation as follows:

> I think one of the various factors hindering the management of the cultural heritage is that we don't normally take them as an area of priority. People don't want to write about our culture. They are interested in other areas. They don't have the interest and desire to write about the culture. Although we are an oral society we need to write. But we rather allow foreigners to write on our culture. So the major factor is lack of interest. (UL4)

Interviewees reasoned that the lack of documentation about the culture explains why people at all levels in the country's social system attach little value to heritage resources and the cultural institutions that manage and preserve them. People therefore do not perceive the library, archives and museum professions as important. Odomankoma observed the record and heritage management profession are perceived poorly:

> People within the profession are not projecting it properly. They are not proud to be identified as heritage management professionals. They don't talk about the profession. They don't write for people outside to be aware of what is going on, you see. If you are not motivated, people will not perceive you as important in the chain of things in the nation. We occupy an important position but we don't carry ourselves well. (UL3)

As seen in Odomankoma's observation, due to their status in the Ghanaian society, librarians and archivists are demotivated and demoralised, which reduces their enthusiasm for projecting and promoting their sector. Professionals themselves may be to blame for this perception as can be seen from the comment above. However, the interview data indicates this information culture, and influences on the Ghanaian culture itself, may be the result of certain Ghanaian political behaviours towards information management. As DPM is an information management activity, poor information culture by potential adopters made the innovation adoption process inconsistent with stakeholders' values and interests.

6.3.5 Summary of Factors influencing Compatible of DPM in Ghana

I have used this section to examine the degree to which DPM is conceived to be compatible as an innovation in Ghana. Table 6.1 below summarises the main compatibility factors.

DPM Compatibility Factors

• Existing Socio-cultural Values
• Past Experience
• Needs of Potential Adopters
• Specific Stakeholder Attitudes
  o Interest in digital technologies
  o Different Information Management Philosophies
  o Political Behaviour
  o Attitudes towards Information and Cultural Heritage Management Laws
  o Information Culture

Table 6.1: Summary of factors influencing compatibility of DPM in Ghana

The compatibility factors are mainly related to the attitudes, values and beliefs systems of the people regarding the new digital technologies and the cultural system of Ghana. Where these factors are positive, it enhances that adoption of DPM, while adoption is delayed where these factors are negative, making the innovation complex.

6.4 Complexity of the DPM Innovation

Complexity is defined by Rogers (2003, p. 257) as the degree to which an innovation is perceived as relatively difficult or easy to comprehend and operate by potential adopters. Thus, according to DOI, the rate at which stakeholders in Ghana adopt the DPM innovation also depends on how complex they perceive the idea to be. According to Rogers, the complexity of an innovation, as perceived by members of a social system, is negatively related to its rate of adoption (2003, p. 257).

Stakeholders across all levels of the Ghanaian social system found DPM to be somewhat complex, making the adoption process of the innovation difficult in Ghana. This complexity, as interviewees indicated, was associated with the acquisition and application of the new digital technologies and their infrastructure (see section 5.3). Interviewees noted that existing technological infrastructure in Ghana was enabling the adoption of DPM. However, there are certain challenges to these technologies that was making the adoption of DPM complicated in the country. Interviewees perceived the complexity to be in the access to the technology at the base level, its application to the management of heritage information at the middle level and the high level policies affecting the use of these technologies at the lower levels.

6.4.1 Accessing Digital Technology

Although as discussed in section 6.3.4.1, people are showing interest in, and using the new digital technology particularly at the base level in Ghana, the interviewees believed nonetheless that access to the technology is very challenging both at the base and middle levels in the country. My analysis of the interview data indicates that acquiring funding for DPM related projects was part of innovation process. Interviewees mentioned that cost of acquiring technological equipment and funding for DPM related projects is the main challenge because people do not know how to do that part of the process. The high costs were hindering access to the technology and were making adoption of DPM complex. Interviewees, especially those from government funded institutions at the high level, also expressed regret about the lack of technology due to inadequate funding. For instance, Funtun described the technological and funding status of PRAAD:

> As we sit here now, we have not been able to put our finding aids onto computers. Being a government institution we look up to the government for funding, but it seems they are not interested. The other time I was compelled to confront our director and the accountant on whether they do not present our case when they go for budget

> hearing, but they said they do their best. But no funding is coming. The only two computers we have were donated by the MAMOTH Ghana when they came to digitise parts of our collection. (CI5)

Funtun revealed further that a government directive that institutions should find means of generating their own funds, may explain why the government is being parsimonious with its funding. Thus lack of funding is preventing PRAAD from accessing the needed technology for DPM related projects.

Also, from the GLB, Atuguba talked about a similar situation of lack of funding and computer equipment. However, he acknowledged that GIFEC has been assisting GLB with some computers, even though he thought it is insufficient to support a DPM project. Interviewees observed that universities in Ghana are self-funded institutions with limited support from government. Yet, advanced digitisation projects in Ghana could be found in the universities. The Balme Library, University of Ghana and the KNUST Library were the two most technologically resourced institutions in Ghana. As was mentioned earlier, the KNUST Library has already created the KNUSTSpace institutional repository. However, despite being the first institution to develop an institutional repository in West Africa, Agya revealed that they struggled with funding to acquire up-to-date digital equipment:

> Our major problem is funding and access to equipment. We need proper scanners currently the one we are using is the normal paper scanners. But we are looking for the book drive pro scanner, very powerful, you can scan a whole book without removing the pages. It is about $25000. The university says it hasn't got the funds to acquire it. (CI3)

Lack of access to modern technology affects the rate of adoption of the DPM innovation by stakeholders in Ghana. Interviewees indicated that although some institutions may have some funding, getting access to modern digital technologies was very challenging. Togbwe for example, explained the state of digital technologies in his organisation as follows:

> The computers we are using are those that have been used for about 20-30 years and Europeans don't need them anymore. They are outmoded, you understand, the technology is changing very fast but the new ones are very expensive. The software also changes and new software are in. But we are still relying on very old versions. So the technology is leaving us behind, transmission of information through the website becomes a challenge. (MD1)

The new digital technology is an inseparable component of DPM. So the lack of access to modern technology particularly at the base level in Ghana makes the innovation complex and hinders the adoption process for stakeholders.

6.4.2 Using Digital Technology

Aside from the difficulties in getting access to technologies, interviewees noted that there are problems with using the acquired equipment by members across all levels in the social system. Lack of adequate knowledge and skills in ICT at the base level, inadequate training, high cost of maintenance and lack of power to operate digital machines at the middle levels are some of the factors that complicate technology use and creating digital divide in Ghana (see for instance comments by Funtun, Naaba, Adieyepena, Togbwe and Kuntane in sections 5.3.2.2 and 5.3.2.3).

Interviewees commonly thought that the majority of Ghanaians are ICT illiterate. When people have limited knowledge about an innovation it becomes complicated for them to adopt it because it takes a long time for them to learn about it. The rate at which some Ghanaian stakeholders are adopting this aspect of the DPM innovation is therefore low across the base and middle levels. For instance, Togbwe further explained that some of the people have never seen a computer before. There are some school children up to the secondary level who have never touched a computer mouse before. According Togbwe, people need education to understand what is going on about DPM.

Kuntane, who completed his first degree in 2009 and now, is a manager of an NGO, revealed that he personally laid hands on the computer for the first time when he entered the University.

Interviewees, especially IT professionals, felt that training in ICT was very poor across the levels in Ghana because of inadequate funding, ICT equipment and infrastructure. IT teachers observed that while the schools lack ICT laboratories and computers, some of the students do not take the training seriously because they have the idea that everything about ICT is difficult. Okokroko for instance, commented about training in his school as follows:

> People are thinking of other things rather than concentrating on ICT. The problem is very complex, because probably we are not telling them the need to study ICT because if students in school do not see the need of being serious in studying ICT, how much will the parent who has no idea at all about it desire to learn about it. (IT1)

My analysis of the interview data indicates that when people, especially members at the base level lose the desire to train in ICT, because of challenges they face with accessing the technology, their level of knowledge and skills in the use of the technology become low. Limited knowledge and skills in the technology makes it difficult for people to understand aspects of DPM, which was complicating the adoption process at all levels in Ghana.

Other problems such as lack of access to electricity were also making use of digital technologies difficult in Ghana. Interviewees regretted that many areas in Ghana lacked access to electricity. Togbwe for instance, said some people in some rural areas of the country have not even had the chance to watch television before because of lack of electricity. Where there was power, frequent power cuts made use of electricity inconsistent. Funtun described how fluctuating power affects their work:

> For 15 years now we have not had free flow of electricity, no power in our stack area and you know with archives the materials needs constant temperature and humidity to keep the records. So for these 15 years we have not had the right temperature. This means deterioration is very fast and the saddest part is we do not have any backups anywhere. So you can imagine the problem. (CI5)

Without digital technology DPM will be impossible. The challenges in access and use of the digital technology at the base and middle levels, was making DPM complex to adopt in Ghana. There was also a lack of qualified staff and institutional capacity to handle DPM projects at the middle and higher levels. These challenges were all as a result of the complexity involved with the access and use of digital technologies in Ghana.

6.4.3 Policy for Digital Technology

High level DPM activities involve the development of policies and implementation of strategies to guide the activities at the base and middle levels (see Figure 6.1). The literature showed that policy development and strategy implementation enable DPM (see, Dong, 2012; Frimpong et al., 2005; Kyobe, 2011). The situation where the development of national digital strategies has enabled New Zealand to achieve progress in DPM was discussed earlier (see section 3.5.3.2 and 7.11.1). The PSR troika model (see section 3.5) also provides that to achieve policy goals it is necessary to give equal considerations to the implementation of strategies and the allocation of resources. Interviewees confirmed that policies and digital strategies enable the DPM adoption process in Ghana. The existence of a national policy on

ICT in Ghana has been mentioned in various sections of this thesis (e.g., section 1.2 and 3.5.4.1). Interviewees confirmed the existence of the ICT4AD Policy (see section 5.3.5). Stakeholders' believed that because of the policy around digital technologies in Ghana, they are conscious of the potential of the new technology and were looking for the best way to harness it. The policy on access and use of ICT in Ghana should, theoretically, help Ghanaians understand DPM and increase its rate of adoption. Interviewees noted that policy and strategy are meant to clarify the DPM adoption process and that since these are failing in Ghana, people have found it difficult to comprehend how the innovation can be implemented in the country.

The policy situation in Ghana has been discussed in various sections of this thesis. Although interviewees identified the existence of the Ghana ICT4AD at the high level as enabling the adoption of DPM at the base and middle levels in Ghana, the same interviewees regretted that many deficiencies in the policy make it incapable of guiding the adoption of DPM, making the innovation adoption process complex. From various comments by interviewees and discussions in different sections of this thesis, I identify the following deficiencies about the ICT policy:

- It lacks achievable goals and targets because all the miles-stones set in the policy were not achieved (see sections 3.5.4.1).
- There are no strategies for DPM accompanying the policy. None of the strategies that come with the policy focus on information management (see section 3.5.1.2).
- The policy lacks adequate resources to enhance its effective implementation
- There is no complementary policy (see e.g., section 5.3.5) to provide multipath actions and outcomes which the PSR troika model suggests as the effective way of achieving policy goals (see section 3.5, Figure 3.5).
- As a result of political influences, the ICT policy in Ghana was not collaboratively developed (see 5.3.5). So it lacks the input of all stakeholders and largely contains the interest of some key players.
- Incumbent governments are not willing to continue with other policies initiated by previous governments (see e.g., section 5.3.5)
- Stakeholders are not aware of the policy (see e.g. various comments in section 5.3.5)

- It is not reviewed on an on-going basis to meet current needs (see e.g., Togbwe's comment in section 5.3.5)
- It is not effectively promoted (see e.g., Okokroko's comment, in section 5.3.5)

These deficiencies are as a result of poor policy planning, over-ambitious policy content, improper policy implementation and ineffective policy management. They also arise because the policies lack adequate resources to enable implementation to enhance ICT access and use in programmes such as DPM, making the innovation complex for potential adopters to try in Ghana.

6.4.4 Summary of Factors Influencing Complexity of DPM in Ghana

The main factors making the adoption of the DPM innovation complex in Ghana revolve around access to and using technology. Table 6.2 below summarises the various complexity factors.

DPM Complexity Factors

• Accessing Digital Technology
  ○ Access relating to lack of funds
  ○ Access relating to lack of modern technology
• Using Digital Technology
  ○ Lack of knowledge and skills in using ICT
  ○ Inadequate training in ICT
  ○ Lack of power to operate electronic equipment
• Policy for Digital Technology
  ○ Policy goals
  ○ Strategies
  ○ Complementary policies etc.

Table 6.2: Summary of factors influencing complexity of DPM in Ghana

These factors suggest that resources especially relating to technology, digital policy and strategy have great influence on the rate of adoption of the DPM innovation in Ghana.

6.5 Trialability of DPM in Ghana

Rogers (2003) defines trialability as the degree to which an innovation or aspects of it may be tried to determine its compatibility, advantages and complexity. As has already been explained in section 6.2, the DPM idea is not occurring in Ghana as a discrete unit of innovation. But from my analysis of the interview data, I observed that stakeholders are

unconsciously applying various aspects of the innovation at different levels of the Ghanaian social system (see Figure 6.1 for some of the examples of activities). Potential adopters were trying components of DPM even without their knowledge of the innovation. According to Rogers (2003), the rate of adoption of an innovation is affected by how trialable the innovation is by potential adopters. In the views of DPM informed interviewees, both the processes and technological aspects of DPM were being tried in in Ghana in various institutions across the different levels. The KNUSTSpace repository described by Agya for instance was perceived as an aspect of DPM that was being tried at the middle level in Ghana.

Other digitisation projects that were going on in various institutions could be viewed in the same way as the KNUSTSpace, for instance, Bosomuru's revelation of SSNIT's attempt to digitise and preserve their records; Komfoanokye's narrative about the digitisation and preservation of the cultural heritage resources at the Manhyia Palace Museum; Otadie and Akokyem's accounts of how their radio station digitally records and preserve their programmes. These are all examples of DPM related activities being tried at the base and middle levels in the country. The various aspects of DPM that were able to be investigated in Ghana were fostering the adoption process of the innovation in the country's social system.

6.6 Observability of DPM in Ghana

Observability is defined by Rogers (2003) as the degree to which potential adopters are able to perceive results of an innovation after trying it for some time. According to Rogers (2003), how observable an innovation is can influence the rate of adoption of that innovation. As described in Chapter five, interviewees reported that some institutions in Ghana have tried initiatives in digitisation that are leading to the proliferation of digital heritage materials in the country. Interviewees' comments also show that there were efforts to extend ICT to all areas to bridge the digital divide (see section 5.3.3). This spread of ICT, according to my analysis of the interview data, is enhancing the DPM activities that are going on in Ghana.

Key stakeholders involved in these DPM related projects across the various levels were observing the results of the activities. For example, interviewees (comments from MD4, MD6, MD7, CI2, IT3 and IT4), who were mainly involved in some middle level digitisation activities, indicated that their observations of the use of the technologies and DPM related activities in their respective institutions were positive. For instance, Komfoanokye said:

> The technology works, it is a good thing, I think a time has come for us as Ghanaians to come together as a nation and have a national [digital] memory where in the end we can see aspects of all the cultures from all the tribes. (CI2)

Such comments by the interviewees show that stakeholders who were able to observe various aspects of the innovation were favourable towards it, which was fostering the DPM adoption process.

Komfoanokye's institution had started digitising aspects of their collections and was beginning to manage some digital forms of the cultural heritage materials in their care. Komfoanokye and Kwakubonsam were both directors of some middle level institutions that manage and preserve cultural heritage resources. Kwakubonsam's institution was not directly involved in digitisation. But he expressed the view that, based on what he has observed from other institutions in the country, the whole idea of digitising is laudable. There were many other managers and directors like Kwakubonsam and Komfoanokye whose institutions were in various stages of initiatives in the DPM innovation. Many high and middle level Ghanaian stakeholders have tried aspects of the DPM innovation, albeit mostly unconsciously, and they have observed some results. Thus, they are able to understand the advantages of the innovation. In the next section, I discuss how interviewees perceive the advantages of the DPM innovation in Ghana.

6.7 Relative Advantages of DPM Adoption in Ghana

Economic profitability, social prestige and needs of the potential adopter are some of the factors that Rogers (2003, p. 229) says are used by potential adopters to determine the relative advantages of an innovation. Rogers defines the relative advantage of an innovation as the degree to which the innovation is perceived as better than the idea it supersedes. Keeping the factors identified by Rogers' in mind, I clustered the interviewees' perspectives of the relative advantages of the DPM innovation in Ghana into five major areas as follows:

- Managing Ghanaian Cultural Heritage Resources Effectively
- Enhancing Stakeholders' Attitudes towards Ghanaian Culture
- Contributing to Building Strong Institutions
- Preserving Value of Ghanaian Cultural Identity for the Long Term
- Enhancing Wider Access to Ghanaian Cultural Heritage

6.7.1 Managing Ghanaian Cultural Heritage Resources Effectively

Comments from 25 of the interviewees indicated that the DPM innovation in Ghana is an effective way for Ghana to manage its cultural heritage resources in digital forms. This effective way of management, in interviewees' views, can be seen in the innovation assisting in effective selecting, organising, controlling, ordering and monitoring Ghanaian cultural heritage resources; strengthening law enforcement, policy and strategy development; facilitating the information management roles in general; and enhancing capacity building. Each of these is examined below.

6.7.1.1 Contextualising Cultural Information

Interviewees indicated that through DPM related initiatives, organisations involved in digitisation activities at the various levels in the Ghanaian social system were being systematic in undertaking different information management functions, such as selecting and organising materials, in order to monitor and control the digitisation processes effectively. This way, interviewees believed, the innovation was enhancing the contextualisation of cultural information and was leading to effective management of not only digital heritage resources, but also of the analogue ones that are being prepared for digitisation. Komfoanokye for instance, who was a leading member in a middle level institution, was delighted that his organisation through a DPM related project, was able to properly organise its materials before digitisation:

> Before we digitise, we prepare all necessary information about the object so that if you take 'tweredua' [pen] for instance, it tells you the name, the accession number, the status whether it was donated or purchased. We also have the condition, whether it is stable or not and whether we have parts attached. We also keep backups. So the digitisation comprises all those. We examine all the objects and write conditional reports, history of the object, who gave it, when was it used, how was it used why is it being preserved for the future. (CI2)

Also, Ntim, an archivist in a high level institution said:

> What I am working on here as a principal archivist, is conventional records. There are plans to digitise, but you know before you can digitise some of these things they have to be organised then you see those you can digitise. (CI6)

Ntim and Komfoanokye's comments suggest that organising materials helps to contextualise information to make proper digitisation decisions and DPM more effective.

Based on the interviewees' perspectives, the effective management of cultural heritage resources also means adequate control over these resources. My analysis of the interview data shows that adequate control enhances proper and centralised supervision of the cultural heritage resources within the country. These factors provide a standard to tribal leadership who were also having control over individual tribal heritage resources management. Interviewees noted that distributed controlling of heritage resources, especially at the base and middle levels in Ghana is a problem. Ayibontey, for instance, indicated that people in his institution felt that Ghanaian heritage information was scattered and so they were trying to use the policies they were designing to bring the heritage resources together under one control. Ntim also expressed that there is a need for a national control of heritage resources in Ghana:

> As a cultural country like Ghana we have problems with heritage control. Asantes are doing their own thing in their region, Ewes also doing their own thing, Dagombas, and so do all the other tribes. Heritage resources are just scattered all over the place without any strong centralised control. It is only through a national heritage project like you are talking about that can bring these materials together. (CI6)

Interviewees pointed out that the issue with scattered cultural heritage resources and their control in Ghana can be tackled through the DPM innovation. Atuguba for instance, perceived the innovation as beneficial for controlling cultural heritage resources in Ghana. However, he was of the opinion that centralised control begins with the cultural institutions in the various regions collecting their local heritage resources together, then later the regional repositories can be joined together to form a national repository. He said:

> If we have been able to collect all these, then all the materials should be grouped at one place. This will force somebody somewhere to do something. It will entice somebody to say "ok now let's create a repository for all these things" and that will be the genesis of our national digital library. (MD7)

Thus, stakeholders believed that it is through an innovation like DPM that a national digital heritage repository can be effectively realised, providing the country with the social benefit of a prestigious stance, rather than the previous way of physical heritage resources management and preservation.

6.7.1.2 Strengthening Policy, Strategy Development and Law Enforcement

The interviewees believed that adequate selecting, controlling and monitoring of cultural heritage resources strengthen the development and implementation of information management laws, policies and strategies. Interviewees believed that various aspects of DPM

related activities stimulate a coherent and mutually agreed set of actions which include the development of policies and strategies. Effective policies give strength to enforcing laws regarding information management across the various levels of the Ghanaian social system. A look at countries such as New Zealand, Australia and the United States of America, where DPM initiatives have been undertaken, shows that the innovation thrives on policy development and strategy implementation. In view of this, interviewees perceived that the successful implementation of aspects of the innovation in Ghana will assist in strengthening policy development, strategy implementation as well as effective resources allocation. Thus, interviewees perceived that DPM in Ghana has the potential advantage of economic profitability because the development of policy, strategy and resources will affect not only DPM but other areas of the economy.

When asked what they would do to ensure successful implementation of the DPM innovation in Ghana, interviewees specified policies and laws as the fundamental elements. Diawuo for instance said:

> The first thing I will do is to make sure policies and laws are developed to serve as a blueprint for information management and all activities. Also resources are scattered in Ghana, so I would ensure that there are strong networks to pull resources together. I would develop training and education programmes. I would look at budgetary allocation very well. Then I would look at copyright issue that will encourage people to deposit materials. (CI4)

Also, even though Agya's institution has successfully established a digital repository, he explained that it is only through enforcing laws and strengthening policies from the base to the high levels that the DPM innovation can thrive in the Ghanaian social system:

> I will enforce laws, the laws should work. If the law doesn't work DPM cannot work through. I will bring out policies that will make the laws work, manage intellectual output which forms part of our heritage. I will manage information content of the country very well and make it accessible to everybody. (CI3)

Thus, interviewees believed that strengthening policies, strategies and laws are the basic information management success factors which are enhanced through the development of the DPM innovation. Interviewees indicated that initiatives in DPM are compelling institutions in Ghana to rethink policy development in order to succeed in the adoption of the innovation. For instance, because Komfoanokye's institution was undertaking a digitisation project, the

institution was also planning the development of a policy to assist in the effective running of the project and the management of the digitised materials once the project was completed. Even though such a policy was non-existent before, they started thinking about it because of the digitisation project.

6.7.1.3 Facilitating Cultural Information Management

Interviewees noted that the DPM innovation makes management of cultural heritage information easier. Through the innovation, different information management processes are brought together at one point with little effort. Interviewees reasoned that the innovation in Ghana will provide economic benefits for member across all the levels in the social system. It creates job opportunities, attracts more ICT skilled personnel into the information management field and through improved efficiency reduces relative cost. These factors mentioned by interviewees are consistent with economic profitability, which Rogers' (2003) identifies as a factor related to the relative advantage of an innovation.

Although Ntim's institution was at a high level, it had not yet started working with any digital materials. This is how Ntim perceived that aspects of DPM were of advantageous to his institution:

> When I was coming to manage this archive, I said I will have to liaise with the academic registrar and the university librarian to have some of these documents digitised because that will make their preservation easier. University graduates do not want to work here. They want to work in places that are 'modern' and use modern tools. Using modern technologies to digitise and preserve our materials will not only attract the graduates as manpower, we will also need fewer people to work on the computers and save costs. (CI6)

Agya's institution was also at the high level in the social system, had digitised some of their materials using less sophisticated technologies. He perceived that with the full adoption of DPM and the use of more sophisticated digital technologies, their work will be easier:

> With the book scanner, we just slot the book in and within a second the book will be scanned, within a minute we have the whole content in the book, where we also preserve the physical book because it does not break the paper and all that. (CI3)

Further, Atuguba's institution, which was also at a high level, was beginning initiatives in digitisation and the DPM innovation. He also perceived that full adoption of DPM enables the planning and development of digital facilities for the digitisation of heritage materials.

According to Atuguba, DPM will make it easier to incorporate acquisition, distribution and preservation in their information management.

6.7.1.4 Encouraging Capacity Building

Interviewees' believed that the DPM innovation requires knowledge and skills in the new digital technologies, as mentioned earlier (see sections 5.3.1 and 6.4.2.). According to interviewees the innovation in Ghanaian institutions will need staff who are capable of handling operations with the technologies in order to effectively manage digital cultural heritage resources at all levels of the social system. Talking about the innovation in Ghana, Odomankoma for instance, said:

> You know, it [DPM] is something huge. It cannot be left with PRAAD alone. It involves capacity, infrastructure. I don't think they have the needed capacity to even handle things at where we are now. There is no way anybody can handle this. So the staff capacity must be built, human capacity, if we are thinking of a dedicated digital repository. (UL3)

It can be observed from Odomankoma's comment that both institutional and human capacities across all the levels in the Ghanaian social system are inadequate to support initiatives in DPM in Ghana. However, part of Odomankoma's comment suggests that if there should be any success with DPM in the country, then there must be human capacity building. This part of Odomankoma's comment explains that capacity building is a requirement to enhance the rate of adoption of aspects of the innovation. As different institutions take advantage of the DPM innovation human capacity is built. The knowledge and skills acquired will in turn become beneficial to developing the innovation in Ghana.

As can be seen from the data, the interviewees believed that the DPM innovation in Ghana will encourage ICT training and support for members at the base and middle levels of the Ghana social system. Some of the participants in this study believed that staff, particularly within middle level institutions where initiatives in DPM are being undertaken, take advantage of the innovation to acquire ICT training and skill support from experts involved in the initiative. According to Diawuo, the Balme Library, which is the main library in University of Ghana, was embarking on a digitisation project, where most of their collections were being converted with the aim creating an institutional repository for the University. Diawuo revealed that through the digitisation project ICT support was being provided to staff and students in terms of hardware, software and training. Thus, both staff and students in the

University had the advantage of learning about the new digital technologies through the DPM related activity that was going on in the Balme Library. My analysis of what the interviewees felt is that the perceived advantages were fostering the DPM adoption process.

6.7.2 Enhancing Stakeholders' Attitudes towards Ghanaian Culture

Twenty-one of the interviewees discussed aspects of the DPM innovation in Ghana that demonstrated positive perceptions which counter some of the negative attitudes stakeholders show towards the Ghanaian culture and the new digital technology. Interviewees believed that talks, discussions and initiatives on DPM related activities in Ghana have led stakeholders to appreciate the need to manage and preserve the country's cultural heritage resources. As interviewees such as Kuntane, Komfoanokye, Kwakubonsam and Osagyefo commented, valuing the culture is the starting point for its effective management and preservation. The interviewees perceived that a group of people value their culture only when they are aware of its significance. The interviewees commented that Ghanaian stakeholders, who are able to try and observe aspects of the innovation at various levels in the social system, are in the position to understand the importance of applying the technology to managing cultural heritage.

This awareness was fostering stakeholders' acceptance of DPM as a better idea to supersede the traditional approach of managing and preserving heritage resources. Thus, through the innovation, stakeholders were developing positive attitudes towards the culture and technology. These positive attitudes are consistent with the needs, which according to Rogers (2003) are used as a factor by potential adopters to determine the relative advantages of an innovation. Kuntane for instance explained that effective DPM occurs only when stakeholders at all levels appreciate the meaning and value of the heritage resources to be digitised, and they are committed to preserving them.

In addition to enhancing cultural appreciation, interviewees mentioned that the innovation was encouraging Ghanaian stakeholders to effectively connect culture with the new technology. Opambuo pointed out that significant traditional leaders like traditional priests and custodians of the culture, who would typically have done certain traditional practices in secret, now do not even mind their performances being captured on the new digital media. Opambuo narrated how he observed acceptance of the new technologies by the chief and traditional priest of his area:

> The chief and the traditional priest of this town are the custodians of the culture of this area. They both have their children in this centre to learn about ICT. When I miss a class with their children, they get angry with me for not giving their children more time to teach them the computer, showing that even the custodians are striving to learn something about the computer. They have realised how the world is changing to digital. When these custodians die they leave the culture to their children. So they want the children to learn about the technology so that they can use it to manage and preserve the culture. (IT4)

As can be seen in the above quote, interest in the use of digital technologies is contributing to the development of a positive influence in stakeholders (especially traditional leaders) on how to apply the technology to preserving the culture. The technology aspect of the DPM innovation has aroused some stakeholders' interest in working with it and has made them willing to undertake initiatives with it. Ayibontey, for example, observed that institutions that were not using the new technologies were losing staff to places that offer opportunities to work with the new technologies. Ayibontey revealed that his library has lost many staff to the university libraries. These staff were attracted by the fact that university libraries are the most resourced in terms of the new technology for information management and DPM projects were also going on there. The data show that initiatives involving the DPM innovation not only were arousing the interest of stakeholders in the culture and the technologies for managing it, they were also encouraging institutions and individuals to work together to achieve goal oriented results. Thus, these initiatives were enhancing collaboration.

6.7.2.1 Enhancing Collaborations and Resource Sharing

My analysis of the interview data shows that the DPM innovation requires resources that cannot be drawn from a single source. Interviewees observed that resources such as funds, equipment, infrastructure, human capacity, skills and knowledge are very scarce in Ghana. According to interviewees, a single institution or individual cannot single-handedly gather all the needed resources to undertake DPM initiative. They noted that even countries sometimes need the support of other countries and international organisations. Such support, interviewees perceived, comes through collaboration. One of the essential requirements for embarking on successful initiatives in the DPM innovation, mentioned by almost all interviewees, is the need for different individuals, institutions, professional associations and all stakeholders to work together. While this partnership must happen to ensure success in DPM, the same teamwork, interviewees noted, is enhanced by the DPM innovation. Interviewees perceived that people at the base and middle levels support governments,

decision makers, and institutions at the higher level by coming together to collaboratively undertake initiatives in the innovation.

Interviewees described some of the forms of collaboration already going on in Ghana. For instance, Ayibontey explained how his institution was working together with GIFEC to enhance information management through the application of computers and its related technologies and through the use of internet facilities in the various libraries his institution managed. Diawuo also described collaboration in his institution (see comment in section 5.3.1).

Thus, there were different forms of collaborations occurring among institutions in the Ghanaian social system. Through these forms of collaboration, resources were being pooled to enhance the capacity of partner institutions, making initiatives successful and stronger at all levels in Ghana. These collaborations were made possible through perceptions that the DPM innovation not only provided the relative advantage related to economic benefits but also the advantage of serving the needs of the people through effective heritage resources management and preservation.

6.7.3 Contributing to Building Strong Institutions

Twenty-six of the interviewees, including the traditionalists, commented that while enhancing collaborations and resources sharing among institutions, DPM related initiatives were also contributing to building strong institutions. National cultural institutions, such as libraries, archives and museums, were being developed and strengthened through DPM related initiatives that were going on at the base and middle levels. In countries like New Zealand that have achieved progress in DPM, not only have cultural institutions such as national libraries, national archives and museums played key roles, but also professional associations such as library associations and archival groups have all collaborated to enhance the innovation there (Carnaby, 2009; Dorner et al., 2007; Knight, 2010). The strength of these institutions and associations has been enhanced through successful DPM initiatives in New Zealand (Oliver et al., 2010).

Interviewees commented that the DPM innovation in Ghana has already contributed to the strengthening of existing institutions such as PRAAD, GLB and GMMB. It also has been facilitating the establishment of non-existing ones like the national library. According to

interviewees, even though aspects of the innovation were only beginning to be adopted in Ghana, higher level institutions were responsible for leadership roles in implementing the initiative at the base and middle levels. PRAAD and GLB are higher level institutions that play the roles of a national archive and national library respectively. However, according to interviewees, these institutions have been very under resourced and ineffective. Interviewees believed that aspects of the DPM innovation in Ghana will compel decision makers to make heritage information management a priority area. This, according to interviewees, is because digital technology is in vogue in Ghana, giving social prestige to any innovation it is attached to. Thus, the innovation has the relative advantage of enhancing the information management field. Some interviewees commented that when DPM and information management become priority areas, cultural institutions will be resourced appropriately. Atuguba, for instance, was interested in how DPM can contribute to discussion of issues relevant to the development of a national library for Ghana:

> You will agree with me that the number one facility for a national library is the infrastructure, the building. We don't have any building in place. I don't think this building is suitable for a national library. You have been outside Ghana and you have entered the National Library of New Zealand, so you will agree with me that this building cannot house a national library. You see that is why I think the [DPM] thing is very good. It will bring out certain issues that are working against the establishment of such an important institution in Ghana. (MD7)

Although the current condition of cultural institutions such as PRAAD, GLB and GMMB is inadequate, stakeholders believed that through DPM initiatives they can be made strong to take up leadership roles, giving the innovation the relative advantage of contributing to building and strengthening cultural institutions.

6.7.3.1 Leading to the Establishment of a National Digital Memory

The interviewees' perspectives on the idea of an NDM for Ghana were discussed in section 5.3.8. In the next chapter, I also discuss the various elements that are necessary for a process to develop an NDM for Ghana (see sections 7.10 and 7.11). In this section I explore interviewees' assertions that while DPM contributes to the building of strong institutions, there is an added advantage that it leads to the establishment of a national digital memory. Interviewees explained that through DPM initiatives at the various levels, different institutions are able to build their individual digital or institutional repositories which can be merged to build a national digital repository that can form a part of a future digital memory for Ghana.

The KNUSTSpace institutional repository, for instance, was established at the middle level with the basic idea of developing it to form part of a high level national digital repository. As the first of only three institutional repositories in the West Africa sub-region, KNUSTSpace had the highest numbers of entries as at February 1, 2010 (Asamoah-Hassan, 2010, p. 422). Agya, a manager at KNUSTSpace, expanded on some of the activities of the repository and explained the plans to develop KNUSTSpace repository to form a component of a full-fledged Ghanaian National Digital Heritage Repository in the future while keeping the values of the culture and allaying the fears of traditional leaders.

6.7.4 Preserving Value of Ghanaian Cultural Identity for the Long Term

As already discussed in section 6.2, DPM in Ghana is a new idea which, if and when fully adopted, will supersede traditional preservation techniques at all levels. The objective of DPM, as revealed in the literature, is to preserve digital heritage resources for as long as needed or necessary (Dorner et al., 2006; DPC, 2009; Jones & Beagrie, 2001). There are also concerns in the literature about the need to maintain the value of heritage resources while they are being preserved for the long term. Cloonan (2001, p. 235) for instance, argues that even with the most perfect traditional techniques, we would still not be able to present the same form of an object in preservation after some years. In a subsequent publication, Cloonan explained that this is because to preserve is to alter and even normal wear and tear will change the value and form of materials (Cloonan, 2007). Interviewees who were DPM informed believed that the DPM innovation will not just supersede the traditional approach, it also has the relative advantage of helping to preserve the value of heritage resources as they are being preserved.

Although some interviewees did not fully understand DPM, comments by 26 of the interviewees suggest that they believe aspects of the innovation will prolong the life span of the artefacts better than the previous traditional preservation methods applied by cultural heritage institutions. Those interviewees who understood the innovation explained why they believe cultural identity can be well preserved with maintained valued through the innovation. For instance, Kuntane said:

> Digital preservation is very necessary because the way things are going if we do not preserve heritage materials digitally, then it is not preservation at all. Photos on papers

> easily fade out, when water pours on them they spoil, the quality and everything get spoil. We can get the paintings of foreign artists on the internet. However, paintings of certain great but unknown African artist cannot be found because efforts were not made to preserve them either physically or move a step further to preserve them digitally. (PI1)

Also, Adieyepena perceived that through the DPM innovation, the Ghanaian culture can be preserved holistically:

> I think every aspect of our culture can be preserved through [DPM].When you talk about traditional rites like *Bragro* [Puberty rights] for instance; we are gradually losing its true value with the changing times. But if we can take digital videos of those people and preserve them, we can show to next generations as a record of the exact way these ceremonies are performed. Because as the years go by things change and how it is performed now might not be the same some time to come. (IT2)

My analysis of the interview data indicates that the Ghanaian culture is mostly oral and ways of preserving aspects of the traditions has always been by word of mouth and through performances. But interviewees noted that the performances are not the same all the time and oral nations keep changing from time to time. In the views of Atuguba, Opambuo, Togbwe, Abronoma, Ntim, Agya, and Funtun the only way to preserve certain aspects of the Ghana culture for the long term and still maintain their value, is through the DPM innovation. Atuguba for instance, explained that a fully adopted DPM in Ghana will help link people to their culture because he saw the innovation as the best means of preserving non-materials cultural aspects such as traditional ceremonies, language and rituals:

> Our traditional ceremonies like weddings, funerals, festivals and rituals, can be captured on digital videos and preserved. How to welcome a guest traditionally, our language itself, because language is our number one culture, if you would be identified with a group it is your language. If you can collect all these cultures now, digitise them and preserve them for future generations, then posterity will see exactly how these traditions were performed. But we are not doing that, and these things keep changing. So the digital preservation innovation is a great advantage to our sons in the future since it can help us do some of these things. (MD7)

Abronoma also observed that the adoption of DPM has the relative advantage of preserving the value in rare cultural objects. She explained:

> If we can do things today, it means we have picked on other things from somewhere in the past and have built on it. If we can use the blender today, it means our people in

> the past used *apotoyewa ne ta* [grinding pot] and we have built on that to develop the blender. So when DPM enables the preservation of videos and pictures of the way things are done today, future generations can see the exact objects and build on them.

Funtun was also confident that with the DPM innovation the value of documentary heritage will be enhanced:

> You know in this archive we only hold physical materials. Poor storage conditions are causing them to deteriorate very fast, humidity, temperature and a lot of things are very bad. Things would be different if the materials were to be on the computer. It is time we migrate or digitise our documents. It will even help us to have backup copies for the records. (CI5)

The Ghanaian cultural identity can be seen in various forms. The adoption of the DPM innovation comes with the relative advantage of ensuring continual access to these cultural forms in Ghana and enables lasting value for the identity of Ghanaians. Interviewees further indicated that while adoption of the innovation is helping to preserve culture, it adds value and refines the culture.

According to the interviewees, the innovation can add value to the Ghanaian cultural identity by:

- Enhancing the Perception of Value of Cultural Heritage Field
- Enhancing National Unity and Reconciliation
- Providing Evidential References to Assist in Disputes and Conflicts Resolution
- Enabling Cultural Awareness in Stakeholders

6.7.4.1 Enhancing the Perception of Value of Cultural Heritage Field

There appeared to be a negative perception among stakeholders of the heritage and the information management field (see for instance, discussions in sections 5.3.2.2; 5.3.4; 6.3.4.3; 6.3.4.4 and 6.3.4.5). However, interviewees believed that DPM activities in Ghana, especially those at the base level and those involving the use of digital technologies are building in stakeholders a realisation of the importance of Ghanaian cultural heritage and particularly the importance of heritage resources being preserved and made accessible in digital forms.

According to the interviewees, the roles of the information professional and the records manager were beginning to be recognised as important and valuable in the social system as a

result of the application of digital preservation technologies to their work. Funtun for example, said:

> The Ghanaian perception of records and the records manager is affecting our work. They [Ghanaians] have poor perception for records management. But they attached high value to the new digital technologies. So digitising our materials and preserving them digitally can add value not only to the records but also to our work and or status. (CI5)

The comment above demonstrates Ghanaian stakeholders' believe that digital technologies add value to culture when these technologies are applied to the management and preservation of heritage resources. Interviewees believed that the knowledge and skills in ICT that are gained, even if unintentionally, through initiatives associated with the DPM innovation help stakeholders preserve and even improve on, traditional cultural practices. For instance, *kentey* is a traditional cloth woven with different colourful threads into very complicated patterns. Interviewees noted that computers have been used to facilitate the designing of *kentey* patterns. Adieyepena, an ICT teacher talked about application of digital technologies in traditional activities she said:

> It [digital technology] is very good for our culture, it will not only help us preserve our culture, it can add [value] to it. When it comes to designs of the kentey the computer can give lots more designs that what the people can. I have some Arts students at KNUST, they've been designing cloths with the computer and when you see some of their designs, you can see that it takes only the computer to do something like that. (IT2)

As demonstrated by the above comment, the DPM related activities are appreciated because they are helping Ghanaians to preserve and add value to their culture. Abronoma rationalised that through research on aspects of DPM like this study, various ways by which digital technologies can improve both tangible and intangible cultures will be identified. As the DPM innovation is perceived to add value and improve the Ghanaian culture, interviewees commented that through the improved culture, the innovation can enhance national unity and reconciliation.

6.7.4.2 Enhancing National Unity and Reconciliation

The cultural diversity of Ghana has been discussed earlier (see sections 1.3 and 2.2.2). Interviewees considered that a successful national DPM initiative in Ghana requires that various characteristics of the different tribal cultures have to be pooled at a central point to be

managed and preserved. Various participants pointed out that successful DPM in Ghana might lead to the different tribes appreciating the cultures of one another, which would help create unity among Ghanaians. Abronoma commented that:

> Tribal issues from the past have caused most of the tribes in Ghana to become individualistic. Most of the people from the tribes do not want to let go of what [cultural heritage] they have. This [new] idea involving the new digital technologies might interest their youth to submit some of the heritage and through that may be later, help to heal wounds. (CI1)

Komfoanokye also suggested that various aspects of the DPM related activities at the base and high levels have the potential to reconcile the tribal differences that were affecting the middle level innovation activities:

> If it [DPM] can be successful in Ghana it can serve as a reconciliation thing. I am telling you because the Asantes will see the Ewes, Gas, Dagombas, all the rest, as one because they will have a common culture belonging to all different unique cultures coming together to form a bigger culture for everybody. At the end of the day you see aspects of every culture, Asante history, Ewe's, Dagombas', Ga's, Bono's, Fante's and the rest, all together. (CI2)

Thus, as demonstrated above, DPM was perceived as a means to bring the cultures together and to help reconcile differences.

6.7.4.3 Providing Evidential References to Assist in Disputes and Conflicts Resolution

Ghana has experienced both internal and external conflicts and this study's participants identified DPM as a means of resolution by preserving and providing access to vital evidence. Many tribal conflicts in Ghana have been attributed to the differences in cultures and lack of understanding among tribal members in the country. The interview data show that these conflicts were rampant in the past, either over lands and other cultural heritage resources or for supremacy and power. Family disputes over inheritance such as chieftaincy titles also occur within individual tribes. A consequence of these disputes is long standing litigation both in the court of law and in traditional courts in the chiefs' palaces. Interviewees believed that the only solution to these disputes is for various factions to provide recorded evidence to back up their stories. But since the Ghanaian culture is mostly oral, the evidence provided by disputing parties is always oral narratives which are difficult for arbitrators to use to make conclusions. Interviewees believed that through DPM, digital records are made available as evidence that can easily be referred to.

According to interviewees, the DPM adoption process is useful in such situations not only because it enhances cultural documentation, but also because it enhances the preservation of recorded evidence. They pointed out that through digital recordkeeping, readily retrievable records can provide evidence quickly, helping to solve disputes and conflicts and bringing unity among the people. Interviewees commented that such evidence should be easily accessed online. Funtun for example, observed that records can help to resolve disputes and how he perceived the DPM adoption to provide a better reference to help solve disputes:

> I am sure as a Ghanaian you are aware that we practice the extended family system and that is all about our cultural heritage which needs to be documented and made easily accessible. All the chieftaincy problems we are having now is because most of us [tribes] our elders did not bother to document whatever there was during their period. They relied on oral tradition which is now failing us, because even with modern technologies people have found ways of changing information into other forms to favour their interest. So if we should document heritage information, when there is a dispute then the evidence can be retrieved and referred for the truth. Then we can avoid all these conflicts. If the evidence is made into electronic form and put online then it can be accessed everywhere at any time, making conflict resolution even easier. (CI5)

External conflicts were also mentioned by Funtun. He explained that after Ghana discovered oil in 2007, there was an issue between Ghana and Ivory Coast over ownership of the territorial waters where some of the oil fields are located. According to Funtun, since the fields are located close to the Ivorian border, there were claims that some parts of the oil fields belong to Ivory Coast. But, in the international court at The Hague, Ghana was able to produce a 1770 map that proved that the present demarcation has been altered to favour Ivory Coast and the issue was settles in Ghana's favour. There are many instances where recorded information has served as evidence to settle issues. However, Funtun pointed out that these documents were fast deteriorating because of poor conditions where they are kept and that digitising them, will not only save the physical versions as backups, but will also enable on-going access to serve as evidence for future reference, therefore avoiding disputes.

As seen in Funtun's observations, enabling the preservation of and access to records that are evidence to support conflict resolution is very important for Ghana. Another advantage of DPM identified by participants is that it is creating awareness among stakeholders of the various aspects of Ghanaian culture.

6.7.4.4 Enabling Cultural Awareness in Stakeholders

As discussed in section 6.3.3, some interviewees claimed that Ghanaians, particularly the youth, appreciate Western cultures more than the Ghanaian one. Also, as mentioned in various sections of this thesis, custodians of the culture expressed fear of permanent loss of heritage resources (see for example, sections 5.3.7, 6.2 and 6.3.4.1). The interview data suggest that one reason this fear exists is because of the lack of awareness among Ghanaians of the value of their culture, especially among members at the middle level of the social system. Osagyefo for instance emphasised the lack of this awareness by stressing the need to create in people knowledge about the culture and the necessity to preserve it. Abronoma agreed with Osagyefo:

> Most people are not aware of the importance of history and these heritage resources and why we need to preserve them. They need to know that for one to build the future they must know the past. How will they know, it is through studies such as you are doing, and practicing it to bring out the importance and the need for cultural preservation. (CI1)

Thus, DPM is perceived as enabling awareness of the various aspects of the culture. Interviewees noted that many aspects of the Ghanaian culture were overlooked with respect to their management and preservation; it is through the DPM innovation that important aspects can be brought together and managed. The study participants also commented that when experts in DPM explain the functionalities and usability of the digitised resources to users and to the general public to promote awareness, they highlight the importance of cultural records and information management in general.

6.7.5 Enhancing Wider Access to Ghanaian Cultural Heritage

Even though some of the 27 interviewees did not fully understand DPM, all of them commented about various issues of relevance to it. My analysis of their different comments demonstrates that participants believed that through the DPM adoption process, Ghanaian cultural heritage would be readily accessed by the wider global community. Togbwe for instance, referred to e-government to explain how people can access cultural heritage resources without necessarily travel to where these resources are located:

> It [DPM] affects our whole lives from birth to death. Now we have e-government, e-business, health and all that. Now doctors can be operating in Tamale [a city in northern Ghana] and communicating with other experts in Korlebu [a teaching hospital in the capital].When there is a festival here somebody can take a video and

> instantly send it to another person in Japan. So ICT is helping us to do all that. Cultural information can be accessed easier and faster now. (MD1)

Interviewees, including those whose institutions have not yet started any DPM activity, expressed how they perceived the innovation as advantageous because it enhances access to their materials. Funtun for instance, said:

> The benefits of digitisation are immense. People can go online and access whatever we are doing here and pay fees and we can use the money we generate to run affairs here. Digitisation is very important, but we have not started yet. (CI5)

It was interesting that Funtun saw access as a fee generating service. Another interesting example was provided by Komfoanokye who disclosed that many people are scared to visit the Asante palace. He said the tribe's historic tradition of human sacrifice, with the victims being mostly outsiders is still fresh in the minds of visitors. Komfoanokye therefore found the innovation to be advantageous to his institution this way:

> If we create this digital versions and it is on the Internet, those who are scared to come here can go online to read about some of our collections. That way, Manhyia Palace Museum goes closer to them, so that they will appreciate that Asante has a lot of good things to tell the world. (CI2)

Thus, in addition to pointing out that DPM innovation creates access to heritage resources, the interviewees believed that it encourages people to appreciate the culture and eschew fears regarding certain aspects of the culture.

6.7.5.1 Enabling Research Studies

Another important feature of the DPM innovation identified by interviewee is that is facilitates research and advancement in cultural knowledge. Funtun for instance, described the importance of research using Ghanaian cultural heritage information, which he believed is facilitated through DPM:

> People use their background to say things and go scot free because stakeholders find it difficult to research for the truth. If we digitise and everything is easily available online, when anybody says something people can easily check. That is why somebody will come and tell us that only one person founded Ghana and you have no means of finding out or checking whether that information is correct or not. But if all these things are digitised and made available online and everybody can access it easily from anywhere some of these lies will stop. (CI5)

The importance of the type of research identified in Funtun's reflection can also be related to elimination or reduction of political deception (which was discussed in section 6.3.4.3). As Funtun explained, DPM makes it possible for Ghanaians to access and reference information online in order to ascertain the truth. By making it possible for people to conduct research to verify or disprove statements made by political leaders, DPM helps stop deceptive politicians from providing false information to the public. As demonstrated above, DPM makes cultural information accessible and therefore promotes research into the Ghanaian culture.

6.7.5.2 Projecting Ghana into the Digital World

An aim for developing the ICT4AD policy was for Ghana to be part of nations worldwide that have recognised the developmental opportunities and challenges of the emerging information age characterised by ICTs (Ghana ICT4AD, 2003, p. 6). Thus, there have been attempts at the national level to project Ghana into the digital world. Even though the policy does not focus on DPM per se, the interviewees perceived that in addition to its other benefits, DPM has the potential to project Ghana into the world. For instance, Osono said:

> We can use the digital innovation to develop our culture and project it to the world and preserve it at the same time. So we can develop this in the continent with Ghana may be, as the major point. So we can start from somewhere, maybe we start from the national level and infuse some digital aspect in the national museum and then take it from there. (MD6)

Atuguba also reasoned:

> Now we are on the international highway of digitisation and so if you do not have the innovation in your country then you are lagging behind. Developing such an innovation in the country will therefore put Ghana into the digital world. (MD7)

Also, Togbwe, who had been part of the initial planning of the Ghana ICT4AD policy, said that in addition to the traditional media, the government was using ICT, which he considered to be as part of DPM, to disseminate information about Ghanaian heritage to people all over the world through the Internet.

6.7.6 Summary of Relative Advantages

Although DPM was not fully occurring in Ghana and some of the related activities were being undertaken without DPM intentions, interviewees perceived many advantages that demonstrate the innovation's suitability for adoption into Ghana. The relative advantages of

the DPM innovation in Ghana perceived by stakeholders as discussed above are summarised in Table 6.3 below.

Relative Advantages of DPM Adoption in Ghana
Managing Ghanaian Cultural Heritage Resources Effectively • Contextualising Cultural Information • Strengthening policy, strategy development and law enforcement • Facilitating cultural information management • Encouraging capacity building
Enhancing Stakeholders' Attitudes towards Ghanaian Culture • Enhancing collaborations and resource sharing
Contributing to Building Strong Institutions • Leading to the establishment of a national digital memory
Preserving Value of Ghanaian Cultural Identity for the Long Term • Enhancing the perception of value of cultural heritage field • Enhancing national unity and reconciliation • Providing evidential references to assist in disputes and conflict resolution • Enabling cultural awareness in stakeholders
Enhancing Wider Access to Ghanaian Cultural Heritage • Enabling research studies • Projecting Ghana into the digital world

Table 6.3: Summary of Relative Advantages of the DPM adoption in Ghana

6.8 Channels of Communications about DPM in Ghana

Rogers (2003, p.18) describes communication as a process by which participants create and share information with one another in order to arrive at a mutual understanding. According to Rogers, group meetings, interpersonal discussions, mass media, wikis, and blogs, are some of the channels agents can use to communicate ideas about an innovation. Although various forms of these channels were being used in diverse ways at the various levels in the social system of Ghana, and their existence was fostering the DPM adoption process, they were not consciously used for communicating ideas on DPM per se.

My analysis of the interview data indicates that in the communication process itself, the message content touched on issues such as policies and strategies, attitudes and resources relating to ICT use and heritage information management. Agents such as ICT professionals were introducing ideas about the technology to people in both rural and urban areas of the base level within the Ghanaian society. Heritage experts were also using some of these channels at the middle level to engage with cultural custodians to sensitise them on modern ways of managing and preserving cultural heritage. At the high level these experts were using similar channels to engage with decision makers (see section 6.2, Figure 6.1). The use of these channels by members across the levels and the content of the discussions were fostering stakeholders' understanding of the relative advantages of the innovation and people's appreciation of the need to adopt the innovation. The use of these channels was influencing potential adopters' decisions on the DPM adoption process in Ghana. The individuals who were mediating the communication through those channels are referred to by Rogers (2003) as change agents. I discuss change agents in Ghana in section 6.11.

In areas like New Zealand where technology is developed and DPM initiatives have also reached advanced stages, the use of wikis, blog, conferences and digital forums are common (see for example, NDF, 2013). In this study, interviewees talked about interpersonal and group discussions, mass communication media such as radio and television discussions, newspaper publications and outreach programmes frequently used channels in Ghana. When Togbwe for instance, described how the Information Services Department disseminates information about the government's activities in Ghana, he indicated that they are moving from the traditional channels of communication to the new digital technologies:

> In 2003 we developed the Ghana government portal and since then we have been using the new Information Technologies to also disseminate government information online in addition to the traditional media. (MD1)

As demonstrated in the comment above, although new digital channels for communication such as the Ghana Portal are being developed, they are not consciously being used for communications on DPM. They are rather used to communicate information about government projects, which at the time of my study, did not involve DPM even though some DPM related activities were being undertaken at the various levels. The existence of these channels however, has the potential to enable DPM in Ghana.

Despite the existence of the channels mentioned above, interviewees, particularly those from cultural institutions (e.g., Abronoma, Komfoanokye, Diawuo, Funtun and Ntim), indicated that stakeholders were ineffective in using the channels to enable information management activities. Ntim for instance explained that channels such as research, outreach programmes, exhibitions, seminars and professional group meetings, are very effective but they were not being used properly by stakeholders in Ghana. Nevertheless, a comment by Agya, a librarian and an IT manager, showed a different situation. According to Agya these channels were working for his institution. He said that faculty members in particularly were not aware of the benefits of the KNUSTSpace innovation so they were not interested in submitting their works to be deposited in the repository. In view of that, he together with agents at KNUSTSpace used channels such a workshops, research, seminars, book marks and flyers, in addition to mass communication media, to create awareness about their institutional repository. Agya said when they have advocacy programmes on the radios and televisions about the KNUSTSpace, many people phone in to ask questions and give suggestions, indicating that knowledge about the innovation was being shared.

Having a clear understanding of the DPM concept was important for stakeholders to be effective in their choice and use of communication channels. As discussed earlier, stakeholders in Ghana perceived the DPM innovation and its attributes in various ways. Through the interview data, I observed that the institutional backgrounds of interviewees were influencing their views and their appropriation of the communication channels to use. Interviewees from well-resourced DPM institutions (e.g., Agya and Diawuo) showed a clear understanding of DPM and they gave positive comments about the concept. Those from deprived DPM institutions (e.g., Abronoma, Komfoanokye, Funtun and Ntim) showed limited awareness and understanding of DPM. Though some of the interviewees from poorly resourced institutions demonstrated some understanding of DPM, their lack of opportunity to exercise DPM related activities deprived them of a practical understanding of the innovation and therefore their limited ability to explain it.

For instance, Ntim's institution had not started any digitisation projects. A look at the surroundings of the office where the interview with him took place revealed that his institution lacked resources and was beset with many challenges (see pictures in Appendix 3B). The communication channels he suggested (research, exhibitions, friends of DPM) were appropriate for spreading information about the innovation in Ghana. His institution, however,

was not using these channels even to communicate ideas about the analogue preservation they were undertaking. Ntim's lack of practical understanding of these communication channels was obvious. On the other hand, Agya's institution was already using those channels. It had already established an institutional repository and was using the same channels to communicate ideas about the repository to stakeholders. His understanding of the DPM innovation and how best to communicate ideas about it, was very clear.

From my observation of some interviewees' mannerisms and my analysis of their transcripts, it was also evident that those individuals with special interest in the DPM concept had an appreciable understanding of the innovation despite the state of their institutions. However, Kuntane, one of the interviewees from a private organisation, erroneously believed that the communication channel his institution was using provided a form of DPM. When asked how his organisation was communicating information about its DPM related activity to people, he explained that it used a blog in the following way:

> On the blog are photos and videos on our activities. So we are also using the blog to preserve our materials. Personally I believe that if I keep these photos in printed forms and in the future I am not there, my family can restrict access to the public, but the internet is an unrestricted platform that people can [use to] access our materials. (PI1)

Although the use of blogs is a good communication channel suggested by Rogers, (2003, p. 18), use as explained in Kuntane's comment appears to be for purposes other than informing ideas about DPM. Otadie, who worked at a different institution, acknowledged he was hearing the DPM concept for the first time. He explained, however, that his radio station was using some of its programmes to promote cultural education:

> We have now started educating people about our culture. We have programmes like *Tete wo bi ka* [the past has something to tell]. It is purely about Ghanaian culture. We invite traditional people like chiefs, queen-mothers traditional priests who know the Ghanaian culture to talk about it. Sometimes Akans come and talk about their culture. Other times northerners, then Ewes and other tribes will also come. (PI3)

Otadie's explanation demonstrates that his organisation was using the radio station as a channel for cultural education purposes including the communication of ideas about DPM - even though the organisation's understanding of DPM was not clearly envisaged. Otadie revealed earlier that the radio station digitally recorded all their programmes (see section 5.3.1) which shows that the *Tete wo bi ka* cultural programme was recorded digitally and

being preserved. Such programmes therefore were enabling DPM and the radio station was acting as a channel to communicate and foster discussion of ideas about the DPM innovation in Ghana.

6.9 Time of the DPM Innovation in Ghana

Rogers (2003) identifies time as a key factor in the innovation diffusion process. According to Rogers, time provides that affects:

- The innovation's rate of adoption in a system which is usually measured as the number of potential adopters of the system who adopt the innovation in a given period
- The innovation decision process by which an individual passes from first knowledge of an innovation through its adoption or rejection (2003, p. 20).

As discussed in section 6.2 and 6.10, in Ghana the DPM innovation is multifaceted, having groups and members at various levels as potential adopters at different times. My analysis of the interview data indicates that the measure of time related to the innovation's adoption was different for the groups of potential adopters. From the interview data, I observed that some stakeholders appeared to have identified advantages of the DPM innovation and were in the early stages of adopting the innovation. Other stakeholders appeared unaware of the innovation but had the potential of adopting it at a later stage. Therefore this measure of time aspect depended on the potential adopters' first knowledge of DPM. The stakeholders who had first knowledge of DPM and have tried its related activities can be seen as early adopters in Ghana.

Claims in the literature that the new digital technologies are now proliferating in Ghana and fast spreading through all sectors of the economy (Akussah, 2002, 2005; Alemna, 1999; Alemna & Cobblah, 2005; Arthur & Mensah, 2006; Martey, 2004b) were confirmed by interviewees (see section 5.3). Also, all interviewees, including the traditionalists, indicated in different ways that now is the time for Ghanaians to adopt the DPM innovation and establish a collective national memory in the country. Komfoanokye, who was involved in a DPM related activity at the middle level, for instance, opined that the time has come for Ghanaians to reconcile their differences by coming together to digitise and preserve their heritage resources.

Another example of time indication for the innovation was shown by Kwakubonsam. Kwakubonsam previously expressed his strong scepticism about the safety of heritage materials being put online and called for the need to adequately protect heritage resources from being stolen (see section 5.3.7). However, in the comment below he demonstrated his belief that it is now time for DPM in Ghana:

> All these times our stories have been told by outsiders from very questionable perspectives. Now is the time to tell our story in the right perspective. So we are doing this kind of work [digitising] and publicise it, to inform people about our heritage and ensure that indigenous materials in the bosom of our people are protected in these new times of digital technologies. (MD4)

Despite the fast spread of technology in Ghana, there were limited indications of stakeholders' readiness for adopting a digital innovation. The interview data show that stakeholders' interests and priorities were not on the DPM innovation. Interviewees therefore suggested that creating more awareness was likely to generate interest among stakeholders and decision-makers to make them ready for any initiative in digital innovations. This was because, similar to Dorner's (2009) findings as discussed in sections 3.3.2 and 7.2.1, Ghanaian stakeholders were unaware of the DPM innovation. Bosomuru for instance, described the situation:

> Your headache will be whether people are even aware of what you are talking about and whether the interest is even there. They always talk about major issues that are pressing to them. Finance and basic needs in life, are major issues [that are more important] than digitising culture. (UL1)

Osagyefo was also of the opinion that it was easy to bring some members in the social system to the awareness of the innovation. But for some others, it was very difficult because the priority areas of such people were different to DPM. Osagyefo said:

> For us in the academics you can get us to understand. But the ministries will fund it. But they are not ready for these things. They have other priorities. But let's not blame them too much. In areas where basic needs such as food, clothing and shelter are difficult to provide. People are interest in these thing and politicians are more interested in power, so they will provide things that will make them win votes. So how do you bring people to the awareness of it. If they set it [DPM] up, the common man will not see it. Their priorities are things that the common man will see and say 'yes during your time this is what you did for us'. (UL4)

Thus, interviewees pointed out that some stakeholders, particularly at the high level of the Ghanaian social system, did not see a need for DPM in Ghana for now, because they saw other needs being more pressing.

6.10 Nature of the Ghanaian Social System

A social system is defined by Rogers (2003, p. 23) as a set of interrelated units that engage in joint problem solving to accomplish a common goal. According Rogers, a social system consists of members or units which include individuals, informal groups, organisations and or subsystems. A social system also has structure and Rogers (2003, p. 37) defines the structure of the system as the set of patterned arrangements of the units in the system which give stability and regularity to individual behaviour in the system. From Rogers' definition, a social system can be multifaceted.

Based on my analysis of the interview data, I identified a complex social system in Ghana which is structured to reflect three main levels involving different organisations, groups, members, patterns of behaviour and activities. Interviewees' comments portray that these units in the Ghanaian social system are interrelated. In section 6.2, I described briefly some of the aspects of the Ghanaian social system. There are cultural, traditional and educational systems (including ICT teachers and instructors) involved in activities relating to DPM at the base and middle levels. There are also public and private institutions at the middle level and professional groups such as library associations and ICT professionals associations and national institutions at the high level, which collaborate in joint problem solving towards the achievement goals relating to DPM in Ghana.

Nevertheless, interviewees' comments revealed that there is misunderstanding among members in the Ghanaian social system. This disagreement resulting from tribal differences was affecting the joint efforts needed by members of the social system, not only for solving national developmental issues, but it also affected all activities relating to DPM at all levels. Thus in Ghana, tribalism complicates DPM. For instance, talks about a national language for Ghana have been hindered by tribal sentiments. Interviewees regretted that this influence has repercussions on heritage resources management in the country.

For example, participants in my study came from different tribes and different regions of Ghana. It could be observed in their demeanour during interviews that some of their

comments were influenced by tribal sentiments. Komfoanokye, Asantewaa, Kwakubosam, Bosomuru and Adieyepena came from the Akan tribe. Comments from these interviewees revealed a sense of Asante's supremacy over the other tribes in terms of possession and control of cultural heritage in Ghana. For instance, Komfoanokye commented that Asante was more or less Ghana and so the Asante people had thought that Asante heritage was going to be recognised as national heritage. He further stated that the Akan language is spoken everywhere in Ghana but has been not accepted by other tribes to be a national language because the others do not want Asante to appear superior. A sense of bitterness could be seen in Komfoanokye's comments over the challenge to the *Asante supremacy*.

Also, Naaba is a Kussaasi, a tribe in the extreme northern part of Ghana. He described an interesting relationship between health information and cultural heritage. However, he revealed tribal sentiments when he used a scenario of how people from different tribes cook their vegetables to eat. Naaba's assertion that Northerners cook their vegetables better than southerners was likely to be influenced by the fact that he comes from the north. Such tribal sentiments not only prevent national development, they are also hinder DPM in Ghana. New Zealand for instance has a similar social system with its bi-cultural situation. But, the country has made progress in DPM. While New Zealand may have its own peculiar challenges, it is likely that referring to experiences that worked for the country may be helpful for Ghana to understand its contextual factors. Such understanding is likely to enhance the rate at which key players adopt a contextualised digital continuity plan for Ghana. According to Rogers (2003, p. 222), the rate of adoption of an innovation also depends on the extent of change agent efforts. The rate at which stakeholders in Ghana adopt the DPM innovation and will be interested to channel the country's resources to develop a DPM, depends on the effectiveness of change agents.

6.11 Change Agents in Ghana

Based on Rogers' idea of a change agent, I delineate change agents in this study to include both institution and individuals (see section 3.3.1.5). Rogers defines a change agent as, "an individual who influences clients' innovation-decisions in a direction deemed desirable by a change agency" (2003, p. 366). As Rogers explains, many different occupations fit his definition of a change agent, for example teachers, consultants, public health workers, agricultural extension agent and sales people. According Rogers, for the efforts of the change agent to be effective the agent needs to develop a need for change, establish an information

exchange relationship, diagnose problems, create an intent to change in the client, translate the intent into action, stabilise adoption and prevent discontinuance and achieve a terminal relationship (2003, p. 369).

My analysis of the interview data revealed many different groups, individuals, and institutions that in one way or the other were influencing potential adopters' decisions towards desirable change regarding the DPM adoption process. When asked who are responsible for communicating ideas about DPM to effect the necessary change, interviewees identified information professionals, teachers, journalists and professional groups such as library associations, archivist associations, ICT professionals associations, the museum's board, and politicians. These agents were using various channels such as forums, conferences, workshops and seminars to discuss and communicate DPM related ideas to influence potential adopters' decisions on the innovation adoption process at the various levels in the Ghana society.

Interviewees noted that efforts by some change agents in Ghana were not leading to desirable change towards DPM adoption. According to interviewees, efforts by individual agents were scattered and did not have national impact. My analysis of the interview data indicates that efforts by individual change agents were mostly ineffective. Interviewees noted that although these agents may be effective in diagnosing a problem, their efforts usually were stifled as a result of lack of resources. This according to the interviewees was because top decision makers who are in charge of resource allocation do not show interest in information management activities which included those relating to DPM (see section 5.3.2.2 and 6.3.4.1).

Several interviewees, however, indicated that some institutional efforts for change were having a national impact that was influencing potential adopters' decisions on DPM adoption in Ghana. For instance, Agya and Diawuao's comments about their institutions' efforts to create digital repositories had national impact (even though these were middle level institutions). But my analysis of the interview data indicates that only a few institutions were engaging in DPM related activities at the base and middle levels to influence potential adopters' decisions at these levels.

Interviewees' comments show that at the higher level, professional associations were powerful change agents that were bringing together different professionals under one

umbrella with a common voice. Agya, who is also a member of the Ghana Library Association (GLA), stated that the GLA was collaborating with stakeholders and other institutions to discuss ways in which they can bring about appropriate change in information management. Atukuba also revealed that about 12 years ago a committee made up of members from both GLB and the GLA met to deliberate on a proposal to be submitted to the government on the establishment of a national library indicating collaboration among professionals and institution to bring appropriate change towards heritage information management. Ayibontey confirmed the comments by Atukuba and Agya when he revealed that there were efforts by various organisations and all the libraries, led by the Ghana Library Association to have a national library. The comments by Ayibontey and Atukuba for instance show that the GLB and the GLA are the key institutions through which higher level information management change agents advise government regarding strategic information management issues such as the establishment of a national library. Establishment of a national library is an important action and a giant step towards DPM. But the comments show that efforts by agents have not been effective enough to influence government and decision makers' decision in a desirable way such as establishing a national library.

Some interviewees commented that there were certain individuals such as records managers, librarians, university lecturers, researchers, ICT teachers, traditionalists and cultural heritage resource managers who have been effective in communicating DPM related ideas. The role played by those agents was changing the minds of various people within the Ghanaian society to a direction which interviewees deemed desirable for the adoption of the DPM innovation. These agents used meetings and interpersonal discussions, either by face-to-face, and sometimes through phone or through wikis, blogs and other media forms. For instance, Komfoanokye commented that a former curator of his museum used to take part in a weekly radio programme to educate people about the history of Asante. This way people learn about the culture and traditional knowledge is preserved, showing the curator to be a very effective agent to communicate ideas about an important aspect of DPM.

In the discussions under communication channels above (see section 6.8), Agya commented on how various faculty librarians were used as change agents. These librarians communicate ideas about the KNUSTSpace institutional repository to various faculty members in the university. By influencing the university's academic staff to accept the repository, these librarians were change agents influencing the adoption of one aspect of the DPM innovation

in Ghana among a set of clients. Agya further commented that the repository is not only keeping digital versions of the research outputs of the University, it is also keeping some Ghanaian cultural heritage information in digital form. The KNUSTSpace institutional repository is thus an important component of the DPM innovation in Ghana. As Agya explained, the main agent whose effective promotional efforts resulted in the adoption of the institutional repository was the university librarian of the KNUST. This is what Agya said:

> The digital repository was created in 2009. It is the only university in Ghana with an institutional repository which is live online. The idea was introduced to this country by our university librarian, she realised that there was the need for people to have access to the intellectual output of this university. People always had to travel here before they can get access to what we have. So she pushed and this digital repository was developed so that people can access our database from everywhere. (CI3)

From Agya's comment above, the KNUST university librarian can be seen as an individual change agent. Information management in Ghana includes DPM, so any effort by any agent to promote ideas on the innovation can be seen as an individual promotional effort influencing the adoption of DPM in a positive direction. Ayibontey again said:

> We are doing our best as individuals, trying to get the government involved. We lure politicians to get them involved some are really interested in libraries. You should know how to look for people. We get the Minister of Education and the Minister of Communications to support the library because they are interested in the library. So we should be able to get all these people together and lobby to get the government and the general public together. (MD5)

Ghanaian journalists were also significant agents of change at the middle level of the social system. They include radio broadcasters, television presenters and newspaper editors. These agents were using the media to project the Ghanaian culture. Individual agents as well as their association, the Ghana Journalists Association (GJA), were communicating ideas on cultural heritage and the importance of its preservation to stakeholders, thus influencing the adoption of this aspect of the innovation. Regrettably, interviewees did not see these agents as effective in their efforts to communication ideas on information management. Togbwe, who is a journalist himself, indicated that journalists need training to make them more effective as change agents in their promotional efforts:

> Change agents should be aware of what information they are communicating and how they pass it on. So I myself I need orientation. The Ghanaian or African Journalist needs orientation on how to report what. What type of information are journalists disseminating about African and how we live? When foreign journalists come here

> they look for war, starvation and disaster to put on the Internet. Now see we are having this cultural policy fair. People are discussing beautiful ideas about our culture and students are listening. These are some of the things our journalists should be sending to the rest of the world. Our agents need training to be effective in communicating ideas. (MD1)

Thus, the DPM innovation is yet to be fully diffused and adopted in Ghana. There were agents who were communicating ideas about the innovation to potential adopters at different levels in the Ghanaian society. Although some of the efforts by the change agents were unintentional and some of their activities were unplanned or partially planned, these activities were positively changing clients' behaviour. Their efforts were also influencing the decisions by potential adopters towards in a direction desirable for the DPM adoption process.

6.12 Innovation-decision Process in Ghana

For the DPM innovation to be fully adopted by Ghanaian stakeholders, decision making was vital. Rogers (2003) states that:

> The innovation-decision process is the process through which an individual (or other decision making unit) passes from gaining initial knowledge of an innovation, to forming an attitude towards the innovation, to making a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision. (p. 168)

In this study, the stakeholders had not come to a conclusive decision on the DPM innovation. This was because most of them did not fully understand the innovation and, as was seen in the interview data, those stakeholders who had knowledge on DPM were not fully undertaking activities that involved all aspects of the innovation. However, my analysis of the various interviewee comments indicates that some potential adopters of the DPM innovation in Ghana were already at an initial stage in the innovation-decision process as described in Rogers' defining above.

As further stated by Rogers (2003, p. 168) the innovation-decision process consists of a series of choices and actions over time through which an individual or a system (or organisation) evaluates a new idea and decides whether or not to incorporate the innovation into an on-going practice. As discussed earlier, Ghanaian stakeholders were making choices and were taking part in a variety of activities related to the DPM innovation. Although these choices may have been unconscious and the activities may have been unplanned they were inherently preparing potential adopters towards a conclusive decision and subsequent confirmation when the knowledge about the innovation was fully communicated to them.

My analysis of the interview data indicates that in Ghana, decisions on which aspects of the DPM innovation to be adopted are complex and a major determinant of the innovation adoption process. This is because of the multidimensional nature of both the innovation and the social system. Rogers (2003, p. 222) states that "the rate of adoption of an innovation depends on the type of innovation-decision made". As already mentioned in section 3.3.1.2, Rogers identifies optional, collective and authoritative innovation-decision types.

According to Rogers, an innovation requiring an individual optional decision is generally adopted more rapidly; however, I found the adoption process for DPM in Ghana to be highly complex and it involved many stakeholders. Thus, based on my analysis of the interview data, the DPM innovation-process in Ghana required a collective decision involving stakeholders at all levels of the social system. Interviewees perceived that collective decisions were not happening in Ghana because top decision makers usually made high level national decisions without input from members at the base and middle levels of the social system. The interviewees believed that the decision makers involved only members and sympathisers of their government in decision-making, irrespective of whether those selected were competent or otherwise (see section 6.3.4.3). Thus, there was an authoritative type of innovation-decision making occurring at the high level of the social system that was hindering development in general and DPM in particular. This situation, as interviewees noted, resulted from the negative attitudes held by some stakeholders (see 6.3.4). According to interviewees, Ghanaian politicians and decision-makers were controlling decisions on projects for every initiative in the country. This attitude slowed the rate of adoption of the DPM innovation in Ghana.

Ghana's position in the innovation-decision process can be illustrated by revisiting Rogers' (2003, p. 170) five stage innovation-decision process, which was presented in Chapter three (see section 3.3.1.2, Figure 3.2). In Figure 6.2 below the shaded arrows indicate the stage at which Ghanaian stakeholders were in the DPM innovation-decision process.

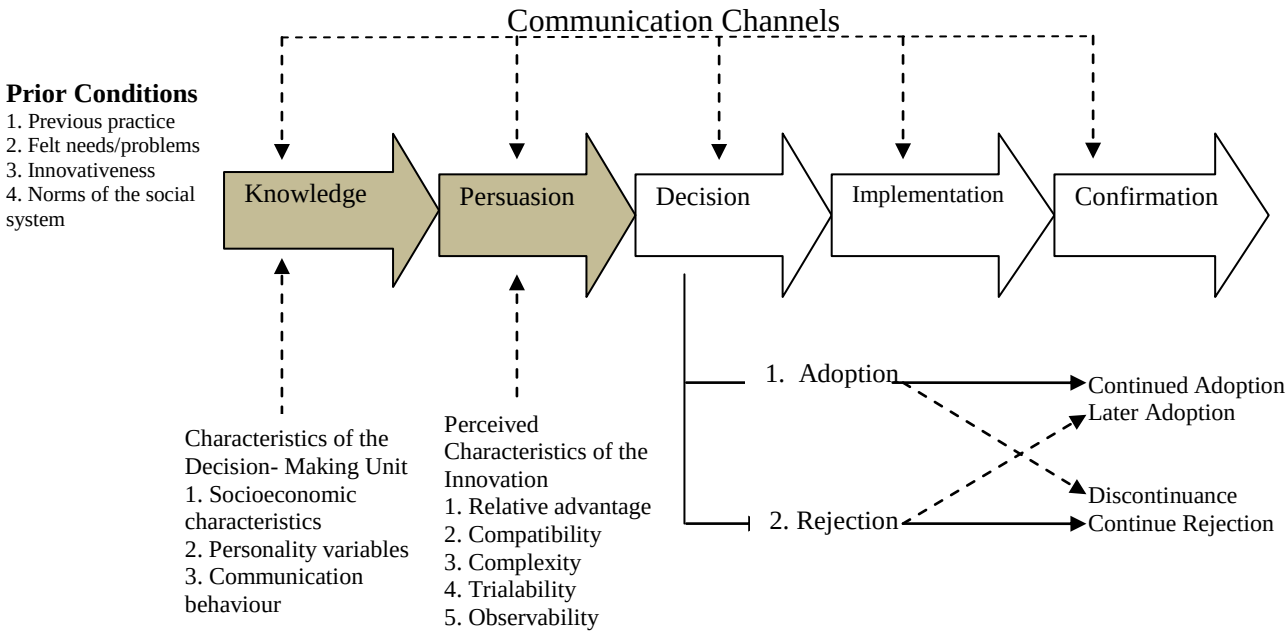

Figure 6.2: The stage of Ghanaian stakeholders in the innovation-decision process
Sources: Modified from Rogers (2003, p. 170)

In my data, I found that the majority of Ghanaian stakeholders, especially members at the base and middle levels of the social system, had limited knowledge of DPM. Some at the base level were still learning, but others, especially traditionalists at both the base and middle levels did not have any knowledge about the innovation at all. There was evidence of efforts by change agents to persuade high level decision makers and other stakeholders to positively influence their innovation-decision. From interviewees' perspectives on the relative advantages of DPM, I observed that some of the stakeholders were persuaded about the benefits of adopting the innovation. Agya's description of promotional efforts that he and his colleagues were doing about the KNUSTSpace is a good example of persuasion. At the time of my research, there was no decision on DPM in Ghana yet. Although there were some digitisation activities going on in Ghana, DPM had not been fully adopted, implemented or confirmed in the country. Thus, in the five stage innovation-decision process, Ghanaian stakeholders were, overall at the knowledge and persuasion stages.

6.13 Summary of Contextual Factors Influencing DPM in Ghana

Based on my analysis in this chapter using Rogers' DOI as a lens, and in the previous one in which I drew upon the Ghanaian voices of the interviewees, I now summarise the factors that are influencing the rate of adoption of DPM in Ghana into four major areas: Attitudinal

factors, Policy-related factors, Resource-related factors and Management factors. Within these major clusters I identify the sub-factors that are enablers of DPM adoption (i.e., they are influencing the rate of adoption positively) and those that are hindrances of it (i.e., they are influencing that rate of adoption negatively).

6.13.1 Attitudinal Factors

Positive attitudinal factors found in this study show in stakeholders' commitments and willingness to ensure that Ghanaian heritage resources are preserved for the future (see for instance sections 5.3.7 and 5.3.8); the special interest people are showing in the use of ICT and the new digital technologies and their readiness to apply digital technologies to managing heritage resources (see sections 5.3.1, 5.3.2, 5.3.4 and 6.2). This interest is a necessary enabler for an effective DPM programme. The discussion, especially in section 6.5, shows how stakeholders are motivated by their experiences with trialling ICT in various aspects of the Ghanaian social system and how they are inspired by the advantages they perceived from DPM. Positive attitudes are apparent in existing socio-cultural values (see section 6.3). However there are others that are hindering it. Table 6.4 below summarises all the attitudinal factors.

Attitudinal-related factors
Attitudinal enablers • Commitment and willingness to preserve heritage resources • Interest in ICT and digital technologies • Motivation and inspiration from perceived advantages of DPM • Cultural communalism • Cultural awareness and consciousness
Attitudinal hindrances • In adequate awareness of DPM • Poor information culture • Conflicting views on Information Management • Attitudes towards Information and Cultural Heritage Management Laws • Lack of respect for documentary resources • Fear of permanent loss of heritage resources • Appreciation of foreign culture • Animosities among cultural groups • Political deception and failed promises

Table 6.4: Summary of attitudinal factors influencing the rate of DPM adoption in Ghana

Attitudinal factors found to be influencing the rate of DPM adoption negatively include: lack of respect for documentary resources; conflicting views on information management, poor information culture (see section 6.3.4.2). The fear by some traditional heritage owners of permanent loss of heritage resources through DPM may be genuinely founded. Awareness of both positive and negative attitudes is necessary to ensure successful DPM programmes in Ghana.

6.13.2 Resource-related Factors

For a successful DPM to be realised, adequate resources and proper allocation of these resources is fundamental (see section 3.4 and 3.5). Table 6.5 below summarises the resource related factors that emerged from the data, showing those that enhancing the rate of DPM adoption and those that are hindering it.

Resource-related factors

Enabling resource factors
• Available communication systems
• ICT infrastructural facilities
• Available institutions
  o Cultural institutions
  o ICT institutions
• Available professional associations
  o Ghana Library Association
• Collaborative processes
• Availability of funds
• Education and train opportunities
• Power to operate electronic equipment

Hindrances relating to resources • In adequate awareness for DPM • Inadequate ICT training • Inadequate and outmoded equipment • Inadequate funding sources • Inadequate number professionals

Table 6.5: Summary of resource-related factors influencing the rate of DPM adoption in Ghana

6.13.3 Policy-related Factors

Interviewees perceived that although the development of Ghana's ICT policy was a good initiative that could enable developments in projects involving ICT such as DPM, there were many deficiencies with the Ghana ICT policy that was hindering DPM. Table 6.6 below summarises the various policy-related factors influencing the rate of DPM adoption in Ghana.

Policy-related factors
Enabler • Available policy (Ghana ICT 4AD)
Hindrances • Inadequate policy makers • Incomprehensive policy content • Over ambitious policy goals • Improper policy planning • Inappropriate strategies • Inappropriate policy implementation • Lack of alternative strategies • Inappropriate policy management

Table 6.6: Summary of policy-related factors influencing the rate of DPM adoption in Ghana

The policy and strategy situation in Ghana has been discussed in section 3.5.4.1 and 3.5.4.2. Interviewees believed that policy making processes in Ghana are inadequate. They argued that the problem is not because there are too few policy making experts in Ghana, however, the problem is because those involved in developing national policies are greatly influenced by government machineries and the corrupt political behaviour in Ghana (see sections 5.3.5 and 6.3.4.3). According to the interviewees, the content of the Ghana ICT policy is not comprehensive. The policy does not mention information management or DPM or digitisation activities (see section 6.4.3).

6.13.4 Management-related Factors

Management issues are central to this research because the study seeks to understand what is influencing effective management of heritage resources. Many management factors were identified in the literature. Management issues appear to relate to almost all the identified factors. For instance, when Zuraidah (2008) explored the factors that were influencing the establishment of the national digital heritage repository in Malaysia, all four major factors she identified related to management issues. *Human factors* related to staff ability to perform roles in digitisation; governance factors concerned the relationship between people and

institutional structures; *content management factors* bordered on management functions such as organising, categorising and structuring information resources; and technological factors focused on selection of hardware, a process which is also related to management. The need for relevant skills was also stressed (see Knight, 2010 and Carnaby, 2009).

In this study I identified similar management factors. Prominent among these factors is leadership. The interviewees' comments show that in addition to the management factors discussed above, there is a kind traditional leadership that wields absolute control of tribal heritage resources. Every tribal leader controls their cultural heritage. They have the power to allow external access and they ensure the management and survival of the heritage. Kwakubonsam's comment that the Asantehene ordered a search for performers of a particular Asante traditional dance that had almost gone extinct (see section 5.3.6), was an indication of how some traditional leaders apply traditional management skills to ensure the administration and preservation of their heritage resources. Agya also explained that the Asante king sits in a traditional court on Thursdays to settle disputes and litigations relating to traditional matters within the Ashanti region. There are formal courts of law and yet the king also has power to arbitrate matter among his people. These examples show that these traditional leadership roles can greatly influence the development of national DPM programmes. Table 6.7 below shows the management-related factors discussed by interviewees.

Management-related factors

Enablers
• Available leadership
  o Traditional leadership
  o Non-traditional / Corporate leadership
• Available human resources
  o Professional staff

Hindrances • Lack of institutional capacity to handle DPM projects • Inadequate supervision • Inadequate human resource   o Inadequate skilled staff • Ineffective administration

Table 6.7: Summary of management-related factors influencing the rate of DPM adoption in Ghana

All interviewees commented on management problems in Ghana. Although interviewees supported the idea of traditional leadership and control of heritage resources, they believed

that a more formal leadership and control is required for an effective national DPM programme. Yet the comments show that the current state of management in Ghana was inadequate to support a national DPM programme because of inertia in corporate DPM related institutions (see section 5.3.2). Human resources were inadequate; there was poor supervision; institutional capacity to handle DPM related activities was lacking (see Appendix 2b); and government support for the information management field was insufficient. Thus, management support for DPM in Ghana was inadequate.

6.14 Chapter Conclusion

In this chapter, I used Rogers (2003) DOI theory to explore the various contextual factors influencing the adoption of DPM in Ghana. As demonstrated through this chapter, various DPM related activities have been going on in Ghana, though not all have been undertaken with DPM in mind. Based on the analysis of these data, I observed that there were three levels in the Ghanaian social system involved in DPM-related activities - base, middle and high levels (see Figure 6.1).

Through my analysis of the data I also showed that some of the Ghanaian stakeholders perceived that DPM is an important innovation from which the country will benefit by its adoption (see section 6.7). I also revealed that interviewees believed the adoption of the DPM innovation starts with an appreciation of the culture and a desire to manage and preserve it. They believed that this awareness, coupled with an interest in the new digital technologies, has the potential to influence the development of policies and strategies to guide DPM. According to interviewees, activities that help make members of the society become conscious of the value of their culture can influence decision makers at the high level to identify DPM as a priority area for which resources should be available in the form of funding, equipment, infrastructure, education, skilled personnel and capable institutions. The interviewees also believed that activities that raise cultural awareness can influence the rate of DPM adoption positively at the base and middle levels as well. Some factors, however, were perceived as influencing the rate of adoption negatively (for example fear of loss of tribal heritage).

Chapter Seven: Fundamental Elements Shaping the Development of a Ghanaian National Digital Memory

7.1 Introduction

In the preceding chapter, I discussed the main influencers of the adoption of Digital Preservation Management, (DPM)[17] in Ghana and highlighted the main clusters of factors: attitudinal-related, resource-related, policy-related and management-related. Based on my observation of the DPM situation in New Zealand, I considered that when Ghanaian stakeholders fully adopt DPM and the innovation becomes effectively diffused into the Ghanaian social system, it is very likely to lead to the development of a National Digital Memory (NDM) for the country. The findings of my study indicate that the contextual factors are multivariate; making the DPM innovation in Ghana is multi-faceted.

In this chapter, I discuss the findings of this study (as presented in Chapters 5 and 6), highlighting the various contextual elements that are necessary for the development of an NDM for Ghana. The chapter relates to the fourth research question: *What are the key elements necessary for the development of an NDM for Ghana?* In this discussion, I reflect on the usefulness and limitations of applying the DOI theory (see section 7.2) and the PSR troika model (see section 7.8) and discuss a process that can lead to the development of an NDM for Ghana.

7.2 Reflection on the Application of DOI

In the preceding chapter, I explained DPM as an innovation in Ghana (see section 6.2) and that its adoption can be examined using DOI theory. Since different interpretive qualitative studies have applied various aspects of the DOI theory to suit their purposes (see sections 3.3.2) I was convinced that including the theory in my theoretical framework would be effective. However, I also encountered certain limitations with applying the theory.

7.2.1 How DOI worked for this study

My analysis of the interview data showed that potential adopters are already undertaking DPM related activities at three different levels of the social system of Ghana (see Figure 6.1). Some stakeholders, particularly at the base and middle levels, were talking about converting their analogue materials into digital forms (digitisation). Other stakeholders at the middle

[17] See previous section, 1.4, 1.8, 4.1, 5.1 and 6.1 for explanations on DPM.

level were talking about the measures to take to preserve the digitised materials they already have (DPM). However, other key players at the high level were concerned about having a collective national memory developed from a national digital cultural heritage repository (NDM) for Ghana.

The findings from my study are consistent with findings from other studies that have applied aspects of DOI to explore the adoption of various innovations in their respective fields. For instance, when Dorner (2009) used DOI to explore public sector readiness for digital preservation in New Zealand (see section 3.3.2), he found that awareness of the concept was generally low among public sector institutions (Dorner 2009, p. 347). Similarly, I considered the Ghanaian stakeholders' readiness for DPM as an indication of the level of adoption of the innovation. I found that Ghanaians, particularly those at the base and middle levels within the social system were mostly unaware of the innovation although those who were undertaking digitisation activities were knowledgeable about the basic elements of their digital activities. Using similar factors from DOI, Dorner (2009, p. 345) found that awareness of the need for policies, corporate control of digital materials, knowledge of financial and staffing resources requirements and awareness of threats to digital materials were vital to the adoption of the digital preservation innovation in New Zealand. Specific elements in the four clusters of factors identified in my study corroborate the factors Dorner discussed (see section 6.13).

The findings are also similar to the eight interrelated influences that Greenhalgh et al. (2008) identified using DOI theory in their investigation of the adoption of a centrally stored, shared electronic patient records system (the summary care record, i.e. SCR) in the United Kingdom. Greenhalgh et al. found material properties of SCR (especially technical immaturity and lack of interoperability) (see section 3.3.2) to be important. In this study I also found the lack of ICT equipment, computers and other material resources is an area of complexity associated with resource allocation that is hindering the rate of DPM adoption in Ghana.

Ghanaian stakeholders' interest in the new digital technologies is influencing the rate of adoption in a positive direction. This finding is consistent with the discovery by Greenhalgh et al. (2008) of the attributes of SCR, especially the extent to which potential adopters believe the benefits of adopting SCR outweigh the risks. In addition, I found that issues related to the stakeholders' perceptions of the complexity of DPM were hindering the innovation's rate of adoption in Ghana while Greenhalgh et al. discovered that the concern shown by SCR

adopters were an impediment to that innovation's adoption. The issue of DPM as a complex innovation in my study is also consistent with Efficient Customer Response (ECR) as a complex managerial innovation in Brockman and Morgan's (1999) study. They found that adoption of ECR was delayed because of its complexity which was in contrast to the fast adoption of other managerial innovations such as Electronic Data Interchange (EDI). This finding suggests that adoption of DPM may be faster when it is diffused in simple components to potential adopters rather than presented as the complex multifaceted holistic concept.

Since this is an interpretive study I first explored other means of making sense of the interview data, in particular to provide insight into the significance of the values and social life of Ghanaians (see sections 4.7.1 and 4.8). The DOI theory was then applied as an additional means to assist me in presenting the contextual influencers of the adoption of the DPM innovation at various levels of the Ghana social system. Therefore the first step was to identify the factors after iterative processes of reading, sorting, comparing and clustering the ideas in the interview data. The second step was to map the main ideas with the elements of DOI as shown in Figure 7.1:

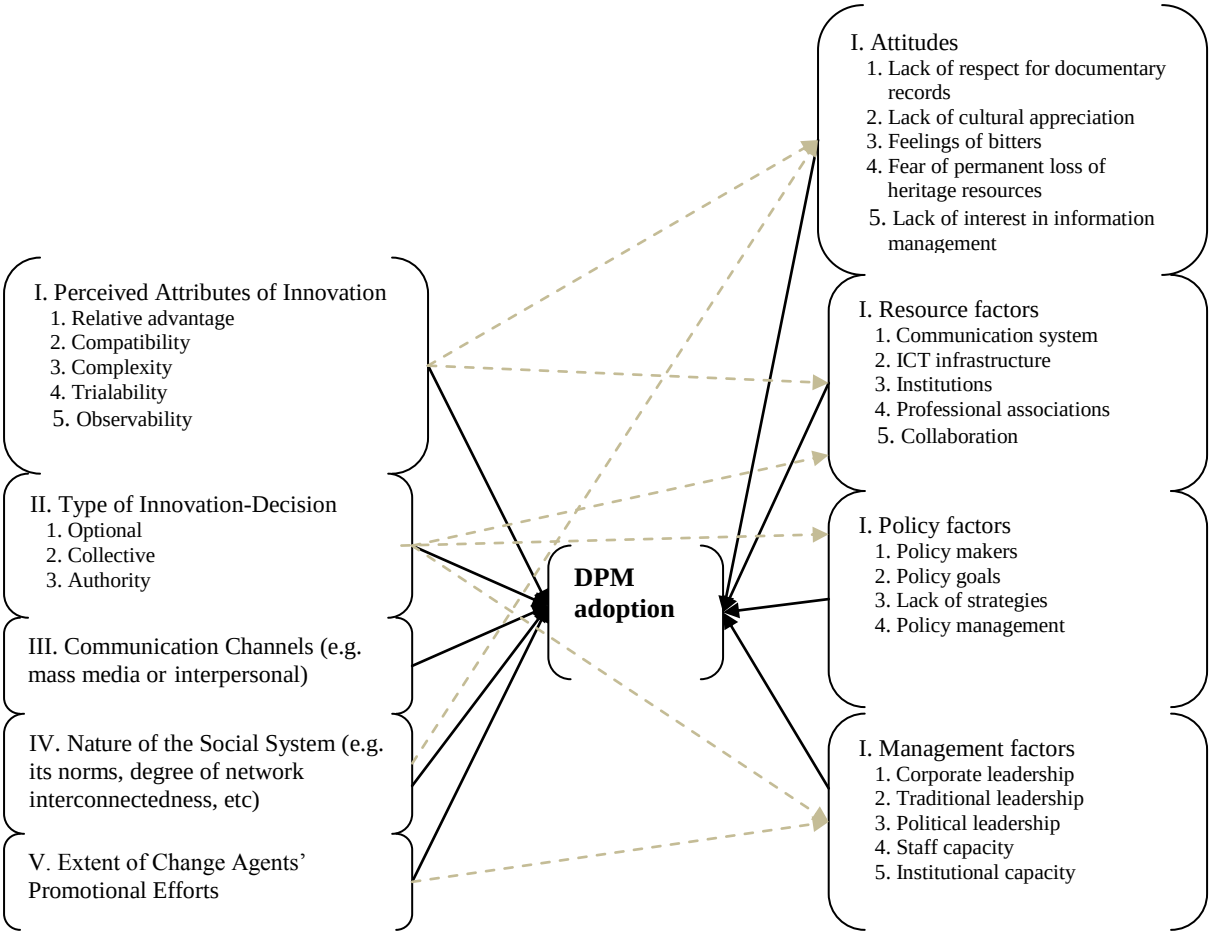

Figure 7.1: Mapping DOI elements to initial findings

My intention of mapping DOI to the findings was not to restrict my ways of making sense of the data but to bring a theoretical perspective to the data analysis and presentation. DOI was therefore neither "a status symbol nor an optional extra" (Silverman, 2001, p. 110) in this research but was used as a guide. Silverman further indicates that "without theory research is impossibly narrow and without research theory is a mere armchair contemplation" (2001, p. 110). But it also seems that without theory research can be overwhelmingly wide.

7.2.2 Limitations of DOI in this Study

In section 3.3.4, I discuss the various criticisms of the DOI theory. Some of the biases discussed by Rogers (1995) were inevitably brought to the study. For instance, my observation of DPM as a positive innovation in New Zealand may be perceived differently by Ghanaian stakeholders when a contextually unique DPM is fully adopted in Ghana. Thus, the

fact that some of the discussions focus on how factors hindering DPM are undesirable and those that can enable it are strategic, show a pro-innovation bias. Also, some of the attitudinal factors for instance, those relating to lack of interest in DPM, lack of appreciation of culture and fear of losing cultural heritage resources on the part of custodians of the culture, have connotations of individual blame bias.

Also, I have observed that the types of innovations discussed in the vast majority of other studies that have applied DOI (see section 3.3.2) were concerned with simple technological process adoption, in contrast to the DPM innovation, which is very complex and multifaceted. As already mentioned in section 3.3.1, DOI identifies four main factors that influence the adoption of an innovation. Employing the theory in this study has helped me to understand that applying these elements to study the diffusion and adoption of ideas does not readily operate in the same way for every innovation.

I perceive the DOI theory as having two main aspects. One aspect is structured and predefined with specific elements that guide the diffusion and adoption of ideas in a seemingly tunnelling way. This aspect appears suitable to analyse the adoption of relatively straightforward simple innovations such as those described in Tran (2006), Dorner (2009) and Muinde (2009). Other innovations are complex and multifaceted. The ECR innovation described in Brockman and Morgan (1999) and DPM in this study are very complex. The diffusion and adoption processes of such complex innovations can also be studied using DOI. This is because of Rogers' (2004, p. 16) explanation that diffusion is a general, universal micro-process of social changes that is not bound by the type of innovation studied, by who the adopters are or by place or culture. But I realise that the structured aspect of the DOI theory does not strongly support the study of complex innovations.

Thus, it is apparent that there is also the more malleable and process oriented aspect of DOI that makes the theory flexible and applicable to more complex innovations such as DPM in this study. My application of DOI was influenced by this second aspect of the innovation. Nevertheless, it is difficult to apply aspects of the theory without considering the elements in the first main aspect. This can make the application of the theory complicated, especially, in the context of a whole nation with a complex social structure and in which the adoption of the innovation was occurring across that society at different rates for different components of the innovation. However, since DOI is not the sole theory for this study, I employed other

iterative data analysis methodologies (see 4.7.1) to make sense of my data. With the support of the elements from the PSR troika model and ideas from the literature, I clustered the factors as shown in section 7.1 above. Below I discuss other areas where the influencers of DPM adoption could be found.

7.3 Reflection on the Factors

Elements in the main clusters of factor were mainly in accordance with findings from the literature and the components of the initial model of factors (see section 3.5, Figure 3.6). However, there were aspects of the management-related factors in particular which emerged as new insights to the various influencers of DPM.

Previous studies that have discussed various factors affecting DPM identified some management-related factors. For instance, Zuraidah (2008) mentions availability or inadequately skilled staff, Knight (2010) discusses the importance of relevant skilled staff; and Rogers' point about change agents and opinion leaders relates to leadership. However, the interview data showed these factors to be just one aspect of management-related issues.

These factors can be viewed as formal or corporate forms of management factors that mainly occur within corporate bodies. The data in this study also reveal a new category of management factors that can have great impact on DPM in Ghana, relating to traditional governance.

Institutions such as the National House of Chiefs [18] in Ghana empowers traditional governance and leadership; Chiefs have absolute control over their respective heritage resources in whatever institution or place they may be in Ghana. Each king or traditional leader therefore has his own mode of managing his people and their heritage resources. For instance, Komfoanokye explained how the Asante King sits in his own court to arbitrate matters on every Thursday. This form of traditional governance can have a significant impact on DPM in Ghana, especially as traditional leaders are seeking ways to incorporate the new digital technologies in their activities. For example, Opambuo commented that the traditional priest in his community has enrolled his son in the ICT classes at the Community Information Centre so that when the son eventually take his inheritance as the next priest, he can apply modern technologies to the management of affairs at the shrine. Another example was

[18] Now there is a website to put the activities of traditional leaders online http://www.chieftaincy.org/

provided by the chieftaincy association developing a website to make their activities visible online. These instances are a reminder of the importance of traditional governance, and highlight the fact that this unique category of management-related factors must also be taken into consideration.

7.4 Communication Channels

Channels such as mass media, wikis, blogs, forums, workshops and conferences are described by Rogers (2003, p. 18) as effective for change agents to use to transmit and share ideas about an innovation. These channels were less used by stakeholders especially at the base and middle level in Ghana not because the channels do not exist, but because people were unfamiliar with them. In addition, the interviewees who used these channels discussed their use in relation to ideas about issues other than DPM. Despite the proliferation of digital technologies in Ghana and with people fast embracing the use of these technologies, Ghanaian stakeholders both at the base and high levels barely discussed technology related issues, including how to apply ICT to manage and preserve heritage resources. Thus, most custodians of the culture were more comfortable with physical access than with digital access.

7.5 Nature of the Social System of Ghana

The social system of Ghana comprises different aspects that provide explanations for the factors influencing DPM in the country. I discussed the social system and the perspectives of interviewees pertaining to DPM related activities in earlier parts of this thesis (see for example sections 6.2 and 6.10). In this section, I discuss the nature of the cultural and traditional system, influences from foreign cultures, the economic and political situation, the digital divide, and the state of DPM institutions that relate to the rate of adoption of DPM in the country.

7.5.1 The Cultural and Traditional System

Given the multicultural nature of Ghana (see 5.3.6 and 5.3.7 and 6.3) and the people's interest in the use of the new digital technologies (6.3.4.1), it was apparent that Ghana has the basic elements compatible with the adoption of DPM and moving on to the establishment of an NDM. However, there was little documentary culture. The oral nature of the Ghanaian cultural system does not encourage reading and writing among the people. Cultural knowledge has for many years been transferred from generation to generations by word of mouth. There are many tribal and ethnic disagreements and conflicts arising from the reliance

on oral culture and the lack of evidential records to support claims by various factions during arbitrations.

The traditional methods of preserving heritage resources were still fresh in the minds of the many Ghanaian stakeholders. The people's acceptance of the oral and traditional ways of preserving Ghanaian heritage resources was evident in interviewees' expressions and mannerisms. Some Ghanaians stakeholders felt that the traditional way of heritage preservation was sufficient for their needs. This contentment did not encourage the formal documentation of cultural activities and the preservation of documentary heritage in formal institutions such as libraries, archives and museums. Thus, even though people were interested in using the new digital technologies, this use did not extend to documenting cultural heritage for preservation. The interest in technology use was more about access to ICT for communicational and recreational purposes which was not enhancing the rate of DPM adoption per se.

In this regard, therefore, I observed the rate of adoption of the DPM innovation in Ghana from two angles. On one hand, increased interest in technology use was likely to enhance the people's consciousness of potential applications of the technology, such as for preserving digital heritage records, and thus, it should be raising greater awareness of DPM and increasing the rate of its adoption. On the other hand, the lack of interest in information management and cultural institutions, coupled with current trends of high regard for foreign cultures, might diminish the interest in using the new technology to manage and preserve the Ghanaian culture.

Like other cultural groups, Ghanaians were also protective of their culture. An excessive protection of culture in Ghana would slow the rate of adoption of the DPM innovation there. An understanding gleaned from the literature and the interviews was that protection of cultural knowledge and heritage resources results from the fear of losing ownership of important aspects of one's culture to other people. The Ghanaian tribes were guarding against the cultural influences from one another. Individual cultural groups in Ghana wanted their own culture to be learned and practiced by the other traditional groups. The extent to which other cultures know and practice a particular culture in the traditional system in Ghana is the basis upon which cultural superiority is determined. But, as seen in my study, the Ghanaian

tribes feel bitter about one another, so they reject the cultures of one another. These feelings of bitterness and animosity have historical explanations.

Historic tribal and ethnic conflicts generated antagonisms among the people (see Komfoanokye's comment 5.3.7). This rivalry, which has been carried to modern times, erased the spirit and interest of cooperation among the tribes in Ghana. The people lack interest in a common Ghanaian national culture because that will mean accepting the culture of an enemy, which most of the tribes appear to have resolved never to do. For instance, the country has no national language. The people's lack of interest in a common national culture influenced the lack of interest in innovations such as DPM. This lack of willingness by tribal groups to bring cultures together was not just to protect their cultures, it was also due to the antipathies they have for one another. There were indications that the hatred among the people was deepened by foreign influences.

7.5.2 Influences from Foreign Culture

Interviewees' accounts show that before the coming of Europeans to the area now called Ghana, tribal groups fought among themselves for space, wealth and power. With the arrival of Europeans, the British supported weaker tribes to overcome the more powerful ones. The British intervention brought an end to the tribal wars, but it also led to them colonising the people. However, colonisation could neither unify the tribes and their cultures as one people of a country, nor resolve the disputes. Colonisation rather imposed the English culture on the Ghanaian one. This influence of the English culture on the Ghanaian culture was very clear during my study (see for example Komfoanokye's comment in section 5.3.7).

Although there are some similarities among the local cultures in Ghana, the only cultural factors that are common to all the tribes in Ghana come from the English culture. For instance, apart from the English language, which is the only official language of the country, there is no local language common to all Ghanaians. English dress, English dance, music, food and traditions, are commonplace in Ghana.

The English culture as a conjoint element is a uniting cultural factor which could enable the decision process for the adoption of DPM in Ghana. But the danger it poses to the indigenous cultures is also apparent. All interviewees conveyed that the influence of the foreign culture was deepening the animosity among the Ghanaian tribes; remarks from Kwakubonsam,

Komfoanakye, Kuntane and Naaba, were good examples (see section 5.3.7). Ghanaian tribes do not agree with one another in traditional terms. Whenever issues turn away from the English cultural codes, there is disagreement. The existing animosity among the tribes causes Ghanaians to use the English culture as an arbitrary unifier just for the sake of peace. As a result, there is a gradual takeover of English culture which was a concern for many stakeholders (for example, see Kuntane and Kwakubonsam's comment in section 6.3.3).

It is now difficult to see anyone speak a Ghanaian language without switching or mixing it at some point with the English language. Even chiefs, queen mothers, traditional priests and clan heads, who are custodians of the Ghanaian cultures find it difficult to speak a typical Ghanaian language completely without the use of English words. Thus, the question most stakeholders asked was whether the innovation is about DPM of Ghanaian heritage or DPM of British heritage. This was because in addition to the language all other aspects of the Ghanaian culture are being replaced with foreign ways of life. The Ghanaian traditional ways of life and even names are all dying out and being replaced with English ones. Almost every Ghanaian has a 'Christian name' which has almost completely eliminated traditional names in the country. It is now difficult to see children gathered by the fire side in the evenings to listen to traditional stories from elders. The modern Ghanaian child and even some of the elders are more interested in watching foreign programmes on the television. Thus, stakeholders were concerned about what the content of a true NDM for Ghana will be.

The situation is even more complicated as stakeholders perceived that the new digital technologies were speeding the adulteration of the indigenous cultures. While some stakeholders found the proliferation of use of digital technologies as an enabler for DPM adoption in Ghana, others believed that the infiltration of the technologies was a threat to the indigenous cultures of Ghana. According to the stakeholders digital technologies are not Ghanaian culture. They feared that since the predominant technology language is English, most of the original aspects of the Ghanaian indigenous cultures might not be properly captured into digital forms, which might lead to the loss of the originality of those aspects of the culture. These ambiguities suggested to Ghanaian stakeholders that digitising aspects of the culture and putting it *out there* on the internet will mean giving the remaining unadulterated heritage away. While enhanced access to the culture was lauded, there was also the fear that DPM may facilitate too much access resulting in the stealing of some aspects of the culture by foreigners or a complete loss of Ghanaian heritage (see section 5.3.7). This fear

is consistent with an observation in the literature that African's like to hide aspects of their cultural knowledge for fear that heritage resources may be stolen or exploited by the North (see Lor and Britz, 2005, p. 62). This fear was slowing the rate of adoption of the DPM innovation in Ghana.

Nonetheless, other stakeholders believed that regardless of whether Ghana has a completely original culture or an English-influenced culture, the nation currently has remnants of the past activities. These heritage resources therefore need to be preserved using the technology of the specific time for posterity to understand the country's roots. Such perceptions are compatible not only with the adoption of DPM and subsequent establishment of an NDM for the country, they also enhance national development.

7.5.3 Economic and Political Situation

Economically, Ghana is a developing country and still struggling with commercial, industrial and monetary problems. The majority of the people are poor (see U. S. Department of State, 2012). People are therefore more concerned about how to acquire basic needs. Some stakeholders, especially traditionalists and custodians of the culture did not see the need to spend time participating in this study because other priorities were occupying their thoughts. Some of the traditional people I contacted and requested for their participation in my study told me that they have more pressing issues than to think of DPM for now. Some interviewees explained that the DPM venture involves huge costs upon which it will be unwise for the country to spend money before resolving other pressing needs. Bosomuru for instance, agreed with such people by asking why people should be thinking of spending on the preservation of culture heritage when their concerns are about how to get food and shelter. Such a perception indicates that DPM is likely to be irrelevant in the economic priorities of most Ghanaian stakeholders. The economic influences on the decision for the adoption of DPM in Ghana also had relationship to political factors.

Most governments in Ghana have come to power with promises to provide the basic needs of the people as well as to improve the infrastructure such as access roads, public toilets and social amenities. Thus, to obtain or sustain power or win the support of the people, politicians want the people to see that they are applying the country's resources on providing the things that interest the citizenry. DPM does not fit into that category. Therefore it was not on the priority lists of governments in Ghana. Even prioritised items were largely not fulfilled,

which raised questions as to how political leaders in Ghana managed the state's resources to meet the needs of the people.

Ghana is a democratic state with a parliamentary system. The constitution allows the president and his government all the power and the prerogative of appointing or relieving public officials of their posts at will. This system results in a lack of trust in governments by the people when it comes to the management of national projects. The general perception among interviewees was that leaders appoint people from their tribes and sympathisers of the government to key positions. This means experts and professionals who are not favourites of the government are not called to the discussion table during the planning and implementation of national issues such as policy and strategy development. Thus, most strategic issues are decided by non-experts who are part of a government and national projects are managed by government favourites who may not be experts in the area.

Incumbent governments, because of lack of trust in previous governments, do not only come to power with their own set of public officials, they also discontinue all projects and policies initiated by the previous governments. On top of that almost all incumbent governments conduct series of investigations into projects initiated by previous governments. While some of these investigations are good to check financial misappropriations, the majority of the probes are unwarranted and only instituted to get back at political opponents. Such investigations are usually not essentially conducted to ensure continuity of national projects. Once a government leaves power, almost all the projects it has initiated end just where they are. New governments always want to start their own initiatives instead of continuing the previous government's projects lest they give credit to their political opponents in the minds of the people. The implication of the political situation in Ghana was that some of the projects that incumbent governments abandon include initiatives that may contribute to the adoption of DPM.

The delay in the development of the ICT4AD policy as described by Togbwe (see section 5.3.5), was one example. Another example was what Bosumuru said about an investigation conducted by the NPP government into a digitisation project which was initiated by SSNIT (see section 6.3.4.3). Due to such political reasons, many institutions, in order not to attract any politically motivated investigations, were uninterested in initiating projects perceived by the state as large ones. Projects like digitisation and DPM which require the acquisition of

new technologies and sometimes sophisticated technology were therefore avoided. Thus, such situations were hindering people and institutions from adopting the DPM innovation.

Nevertheless, in as much as government investigations into how some of the institutions acquire resources to undertake projects may be hindering the DPM innovation, such inquiries were also providing checks on corrupt public officials. Some public officials overestimated the costs for projects in order to siphon some of the funds into their own pockets. Usually, their exorbitant pricing makes some of the projects impossible to accomplish. Through government investigations into such illicit deals regarding financing of projects, corruption could be exposed and dealt with. Consequently, the investigations assist in eliminating the perception that DPM projects are too expensive to undertake. In this regard, such government scrutiny of the activities of various institutions enables the adoption of the DPM innovation. Regardless of such investigations, Ghanaian governments do not take DPM projects as a priority. The inquiries are not done with DPM intentions. The general interest of the people is not in DPM. The economic and political situations of Ghana deprive the majority of the people access to the new digital technology.

7.5.4 Digital Divide

As mentioned in section 5.3.4, the most deprived areas in Ghana were rural, and many typical traditional activities took place in these areas. Despite the lack of infrastructural resources, there was evidence of people using the new digital technologies in much of rural Ghana. Some of the interviewees pointed out that some rural Ghanaians are using the new digital technology in the form of laptops, digital cameras, iPods and mobile phones. This is an indication that the cause of the digital divide in the country is not geographical or cultural; rather it is related more to the people's interest and willingness to use the technology. Nonetheless, rural users of digital devices were interested to see how they work rather than formally using them to solve practical issues, particularly in information management. The interviewees also commented that where broadband is available, many people are incapable of using digital technology due to illiteracy (see section 5.3). There were also people in the urban areas who did not use the new technology because of low interest.

From my analysis of the data, I found the digital divide in Ghana to be one of the influencers of DPM adoption in the country. The lack of access to new technology in many areas of the country was therefore having a negative impact on the rate of DPM adoption in those areas.

However, I also found that some people and some institutions that were using the technology in both urban and rural areas were having a positive impact on the rate of adoption of DPM in Ghana. Nonetheless, I was surprised to see many people and institutions in the urban areas of Ghana who did not have access or did not use the new technology. This was because of my initial thought that the urban areas were more developed than the rural areas and so people there should have easy access to the technology. But, that was not always the case. It depended on who was interested in using, and could afford, the technology. It did not matter whether the person was rural or urban dweller, interested people could somehow get access to the technology if they had the money.

There were also different stages of access to the technology. While some people were just starting to use the technology, it was obvious that others had only started using it and were perfecting its use. Yet, there were people and institutions that were using the new digital technologies at advanced stages. Thus, the digital divide also impacted on who was among the group of adopters and how they were adopting aspects of the innovation.

7.5.5 Awareness of DPM Innovation in Ghana

Although some DPM activities were going on in various institutions, awareness of the innovation in Ghana was also very low. For instance, many institutions were converting their analogue materials into digital forms and were at various stages of managing the digital versions of their materials. Other institutions had also established institutional repositories that were operational. Thus, it was clear that various institutions were at different stages of undertaking DPM activities, indicating that the adoption of DPM was compatible with the social system of Ghana. Yet, stakeholders were undertaking these activities without relating them to DPM. The majority of Ghanaian stakeholders did not understand the DPM innovation. Although digitisation activities were commonplace, the main reason for the institutions to digitise aspects of their collection was simply because it was in line with current trends.

It is fashionable in Ghana to be seen to have a form of the latest technology such as a laptop, the latest mobile phone, an iPod or a digital camera. Consequently, even though many people were seen to be using the new technology in Ghana, most devices were not used to their full potential or purpose. This is because the majority of the users just wanted to show off with the technology. In a similar manner, institutions wanted to be seen to be working with the

new digital technologies rather than to employ the digital technologies to really manage information. The desire to merely show off with technology superseded the concern to preserve access to the digital content, which according to the literature, is the main essence of DPM (Dorner et al., 2006; DPC, 2009).

Thus, even though some institutions were going digital, interest in how to ensure continual access to digital content was low just as there was little concern for the digital records being generated. For instance, some staff members in various institutions kept records of daily transactions in their personal emails, which means when they leave the institutions those records go with them. If the interest in becoming digital was really about DPM, the institutions would be concerned about the digital materials they were generating (such as corporate records in digital forms) and ensure their continual access. Thus, one of the main influencers of the adoption rate of the DPM innovation in Ghana revolved around stakeholders' attitudes such as lack of interest in information management. This attitude was affecting all other influences such as the design of policies and strategies around digital resources management, resourcing and collaboration in Ghana.

7.6 The DPM Adoption Process

The nature of the adoption process of the innovation could be perceived in three ways following people's access and use of the technology in the country. While some people were thinking about digitisation, as could be seen in the comments by Naaba, Kwakubonsam, Atuguba, Komfoanokye, Diawuo and Funtun (see section 5.3.1), others were concerned about how to manage and keep the digital materials they already have, as noted by Abronoma, Kuntane, Akokyem and Otadie (see sections 5.3.1 and 5.3.2). Yet, other stakeholders were considering how their activities could lead to the establishment of an NDM for Ghana, as remarked by Komfoanokye, Kwakubonsam, Kuntane and Adieyepena (see section 5.3.7).

7.6.1 Institutions

In section 6.9 where I discuss time of the DPM innovation in Ghana, I explain early and late adopter of the DPM innovation. Institutions that have already begun to undertake DPM related activities can be seen as early adopters and those who will later learn from the examples of the already practicing ones can be said to be late adopters.

For instance, the KNUST Library had adopted the idea of digitisation and had progressed to develop an institutional repository where its digitised materials were being managed and preserved. So it can be considered an early adopter of aspects of the DPM innovation in Ghana. Also, some institutions were thinking about, and were beginning to consider DPM related digitisation projects. From my analysis of the interview data, I observed that the Kuntane Health Research Centre (KHRC), the Manhyia Palace Museum and the University of Ghana Balme Library, were examples of late adopters of the DPM innovation. These institutions were planning to digitise their materials at a later date in order to learn from the successes of early adopters like the KNUST Library.

The literature identifies major national cultural institutions and professional information associations as leaders in information management initiatives (Akussah, 2005; Alemna, 1989; Carnaby, 2009; Dorner et al., 2002; Oliver et al., 2010). Similarly, my findings identify the Public Record Administration and Archives Department (PRAAD), the Ghana Library Board (GLB), Ghana Museums and Monuments Boards (GMMB) and the Ghana Library Association (GLA) as leading institutions that other institutions in Ghana look up to, in terms of innovations and initiatives in information management such as DPM.

But, these major institutions in Ghana lack the capacity to lead other institutions through the adoption of DPM in the country. I observed that other *minor* institutions which were mostly private non-governmental organisations could later learn about the adoption and implementation of DPM from these major institutions. But, the major leading institutions were in very poor shape (see for instance, Appendix 3B).

7.6.2 Human Agents

Apart from the institutions there were some human agents in my research who I identified as change agents in the DPM adoption process in Ghana. Some librarians and other information managers, IT managers, traditional custodians of heritage resources, teachers and journalists were communicating ideas in Ghana to influence others with regard to understanding importance of aspects of DPM. I saw change agents as those individuals who were promoting the advantages or disadvantages to stakeholders such as decision makers, politicians and other key players to influence them to make decisions to adopt aspects of the innovation in the country. Their decisions related to the adoption of DPM were influenced by the effectiveness of the promotional efforts of the change agents.

According to Rogers' (2003) definition, change agents either influence adoption decisions in a positive way (i.e., to adopt) or in a negative way (i.e., not to adopt) towards an innovation. From my analysis of the interview data, change agents in Ghana were influencing potential adopters in a positive way. Although some traditional custodians of the culture feared loss of their heritage resources through DPM, there was no evidence that they were trying to influence potential adopters in a negative way.

In Chapter six, I discussed the various influencers of DPM in Ghana through the different attributes of the DPM innovation. I summarised the various influencers into four main clusters of factors, showing the enablers and hindrances. In the innovation adoption process as discussed in this section, what enables decision, i.e. change agents' promotional efforts, having knowledge in the innovation, collective decision making (with regards to DPM in Ghana) and implementing policies and strategies to confirm the innovation, all relate to the clusters of factors presented in section 6.13. In the innovation adoption process, reason for the various hindrances as discussed in this section, emanate from digital divide, cultural complexities, political issues historical and economic reasons.

I found that institutional and human adopters of the DPM innovation in Ghana were in three groups. Major cultural institutions such as PRAAD, GLB, GLA and GMMB who usually take leading roles in projects involving information management in Ghana such as DPM were the hypothetical early adopters. When these institutions understand and adopt DPM, the innovation is likely to develop into an NDM for Ghana. This is because the major information management institutions can guide other minor institutions to whom they provide mentoring and leadership to also adopt DPM. Stakeholders believed that when Ghanaian institutions make the effort towards DPM adoption and show passion for effectiveness in the innovation, decision-makers and politicians who control finances of the country were likely to be persuaded to also adopt DPM as a priority area leading to the establishment of an NDM for Ghana.

7.7 Relationship to the Point of Reference

I consider New Zealand as an early adopter of the DPM innovation in comparison to Ghana, a late adopter. Learning from New Zealand can therefore be useful to enable Ghana to achieve progress while eliminating avoidable mistakes in the adoption processes of the

innovation. New Zealand has effective change agents whose effort impact DPM activities not only within the country or the Pacific region, but across continents to Ghana as well. The introduction of the PARBICA good governance toolkit in Ghana (see section 2.4) is a significant step for Ghana to adopt effective records management and DPM practices from New Zealand.

Apart from human agents, major New Zealand institutions such as the Library and Information Association of New Zealand Aotearoa (LIANZA), the National Library of New Zealand, Archives New Zealand and the Museum of New Zealand worked collaboratively and adopted ideas in the DPM innovation. They later communicated the ideas for their government and decision makers to adopt. The situation in New Zealand can be related to the findings of this study.

The findings show that major Ghanaian institutions such as PRAAD, GLB and GLA believe that DPM is a good idea (see section 6.7). But they have not been able to convince government and decision makers about the relative advantages of the innovation. Lack of effective collaboration among these institutions in Ghana explained their inability to work together to develop strategies for the digital materials that were proliferating in the country.

The institutions in Ghana have not agreed on common ideas on how to achieve progress in the adoption of the innovation. For instance, GLB and GLA had conflicting ideas about the establishment of a national library which was seen as a key institution for developments in DPM, but was lacking in Ghana. Thus, while New Zealand developed a National Digital Content Strategy (NZDCS) to guide DPM activities in the country, Ghana has no strategy or policy around its digital activities which include DPM. Efforts by change agents in promoting DPM needs to be effective to influence decisions by stakeholders on the adoption of the innovation in Ghana. The Ghana ICT4AD policy, which is the only policy that relates to digital activities in the country, has no section to guide the management and preservation of digital materials. Thus, the DPM adoption process in New Zealand is progressing faster than the situation in Ghana. Rogers (2003, p. 170) identifies five stages in the innovation decision process (see sections 3.3.1.2 and 6.12). Unlike New Zealand, Ghana is still at the initial stages where change agents are applying some efforts to enhance stakeholders' knowledge of the innovation.

Knowledge about an innovation is an important influence on the decision for the adoption that idea (Rogers 2003, p. 170). The majority of Ghanaian stakeholders did not understand the DPM concept because they were unaware of it (see section 6.2), indicating that knowledge about the DPM innovation in Ghana was inadequate to enable its adoption. I found in my study, that efforts by change agents in promoting ideas about DPM were ineffective in Ghana, which may explain the inadequate knowledge of the DPM innovation in the country. Ghanaian change agents were concerned that there were insufficient resources to enhance their efforts. According to interviewees, modern communication equipment and tools enhance promotional efforts, which can enable the appropriate change. But the resources were inadequate in Ghana (see for example interviewee comments in section 5.3.2.2).

From my analysis of the interview data, I observed that Ghana is at the knowledge stage of the innovation-decision process where change agents were trying to increase awareness about the innovation. As could be seen from comments by Agya, Komfoanokye, Ntim, Otadie and Kwakubonsam, (see sections 6.8 and 6.11) there were specific programmes to promote DPM in Ghana (albeit unconsciously). Yet, the various promotional activities were hindered by difficulties in using communication channels available via the Ghanaian media. These difficulties included: the high costs for television and radio airtime; constant interruptions caused by unreliable electricity supply and constant power-cuts; and poor transmission due quality due to outdated broadcasting technologies. Other communication channels that could be used for promoting DPM related ideas included newspaper articles, posters exhibitions and public lectures, but these communication channels were patronised by very few people because Ghanaians have a negative attitude toward reading and most of the stakeholders did not like such formal promotional media.

From my analysis of the interview data, I observed that Ghanaian stakeholders perceived DPM projects to be huge and costly. This belief was hindering the adoption process. Nonetheless, there were indications that stakeholders who gained some knowledge about DPM through the various promotional activities were being persuaded to adopt the innovation.

When stakeholders do not understand the importance of DPM and its benefit to them, it is difficult to persuade them to adopt the innovation. LIANZA and the other major institutions

in New Zealand progressed (see Carnaby, 2009, p. 252) because they were able to create an understanding of the innovation for New Zealand stakeholders to decide to adopt. With similar passion Ghana can also achieve progress in DPM and establish a Ghanaian national memory. This is why my study also has sought to find out from the perspectives of stakeholders what elements are necessary for the development of an NDM for Ghana. Hence, in the next sections, I reflect on the appropriateness of applying the PSR troika model in my study and I discuss the elements of an NDM for Ghana.

7.8 Reflection on the Use of PSR Troika Model

The PSR troika model was discussed in detail in section 3.5. Unlike the DOI theory, the PSR troika model is infrequently used in the literature. Also, works that have cited the PSR troika model usually refer to a definition of one or two of its elements to establish a point. I have discussed various studies that have used the PSR troika and the ways it has been used (see section 3.5.1). In my study, all three elements in the troika model have been essential to enable my understanding of the need for appropriate policy development, effective strategy implementation and proper allocation of resources.

In this study, the troika model assisted my understanding of the policy, strategy and resource related factors that are influencing DPM adoption in Ghana. The interview data revealed deficiencies in each of the three stones of policy, strategies and resources (see section 5.3.5). The ICT policy does not make any mention of information management and there is no indication of strategy for DPM in Ghana. The troika model mentions causal relationships between policy, strategy and resources where resources enable effective strategy implementation and strategies enable that achievement of policy goals with policy influencing both strategy and resource allocations (see section 3.5). The contextual factors identified (see chapter 6) show that there is a lack of effective interconnection between policy development, strategy implementation and resource allocation in Ghana.

The model also has assisted in my understanding of the various elements necessary for the development of an NDM for a country. In the next sections, I discuss these elements and the process leading to the development of an NDM for Ghana. First, I revisit the various literature that highlights the qualities of an NDM. Then I showcase the specific elements in Ghana that in the perspectives of stakeholders, are required for the development of an NDM for the country.

7.9 Fundamental Elements of NDM Identified from the Literature

As noted in section 1.8 of this thesis, the American Memory defines an NDM as:

> a repository that provides free and open access through the internet to written and spoken words, sounds recordings, still and moving images, prints, and sheet music that document a country's experience, history and creativity for education and lifelong learning (American Memory, 2010).

Also, I consider the New Zealand National Digital Heritage Archive (NDHA) as an NDM for New Zealand. The NDHA assisted in my understanding of the elements of an NDM because it explains that its core elements are:

> a system of software applications that support a digital storehouse for sounds and vision files, digital images and other born-digital and digitised items that make up New Zealand's growing digital heritage collections (NDHA, 2010).

The definitions above indicate that an NDM contains digital cultural heritage resources of a nation and it must be online. I visited and observed the New Zealand NDHA to gain more in-depth understanding of an NDM. This visit assisted me to identify the key elements of a future NDM for Ghana from interviewees' comments (see next section), namely: *The digital versions (whether converted or born-digital) of all the cultural heritage resources from all the different tribal groups embedded in Ghana, and the processes, procedures and activities that take place to ensure that Ghanaian digital cultural heritage resources are organised into a collective national digital repository for management and preservation online, to form the memory of the country for its future generations.*

The work of Steve Knight in documenting the factors that influenced DPM in New Zealand has already been mentioned (see section 2.7.1). When I look at staff attitudes towards the NDHA as presented in Knight (2010), for instance, I could identify that there are certain factors which can lead to a successful establishment of NDM for any country. Interest, willingness, commitment and persistence could be seen as key attitudinal elements that enabled the establishment of the NDHA. I applied these attitudinal factors as a basis for comparison with the attitudes of stakeholders in Ghana. In addition, the New Zealand NDHA has certain components that Ghana could emulate. Knight (2010, p. 90) emphasises that when carefully considered, those elements (see section 2.7.1) can provide a guide for other institutions in different countries that intend to develop digital preservation programme.

I consider that Knight's factors also relate to the elements in the PSR troika model. *Choice of a business model* for instance, relates to the design of policy, *defining the exact purpose of digital preservation programme* conveys outlining the policy goals of DPM. *Defining strategic drivers* concerns the characterisation of the various strategies to employ to achieve the policy goals. Then *deployment and staffing* tell about resource allocation. So, I employed these factors as a reference point to guide my exploration.

Also, my conceptualisation of an NDM incorporates a digital repository (see definitions of NDM above). Therefore, I used Gibbons (2004, p. 4-8) institutional/digital repositories examples as basis for my exploration of the elements of an NDM for Ghana. Features identified by Gibbons include: Digital content; Community-driven and focused; institutionally supported; Accessible content; and, Durability and permanence.

In addition, Zuraidah (2008, p. 546) identified that institutions within a nation must work cooperatively in order to contribute towards the successful establishment of a National Digital Cultural Heritage Repository (NDCHR) for a developing country (see section 2.7.2). I found her factors to be a useful reference for my exploration in Ghana.

The factors from the literature have assisted me to identify the specific elements for a Ghanaian NDM from the perspectives of stakeholders which I discuss in the next sections.

7.10 Specific Elements Necessary for the Development of a Ghanaian NDM

Based on my examination of the interviewees' perspectives about an NDM and the factors identified in the literature, I was able to categorise the potential features of an NDM for Ghana under the following headings:

- National cultural heritage resources (physical content)
- Stakeholders' attitudes
- Policies and strategies
- Infrastructure and other resources
- Collaboration
- Effective management and preservation of the content.
- Digital content
- Ghana National Digital Heritage Repository (Ghanaian Memory)

From my analysis of the elements for the Ghanaian NDM I have identified a process of sequential development from the physical national heritage content, through stakeholders' attitudes, which influence the development of policies and strategies. Positive attitudes ensure proper allocation of infrastructure and other resources. Effective resources allocation encourages collaboration, which enhances effective management and preservation of the content as well as effective application of the new technology to generate digital cultural heritage content. The digital content is then fed into the national digital repository to achieve the ultimate, an NDM. In the sections that follow, I justify the identification of the elements in Ghana.

7.10.1 National Cultural Heritage Resources

The concept of cultural heritage has been discussed in the literature review to refer to the aspects of culture that a group of people transfer to the next generations (see section 2.2). These aspects include all facets of the culture from the food the people eat, through the clothes they wear, music, dance, festivals, occupations and even their natural environment. Just as was indicated at the introductory chapter of this thesis, evidence of cultural activities forms the national cultural heritage resources that are inherent in a country and can be managed using the technology of the day. When managed effectively, these resources can lead to the establishment of a memory for the country in the future (see section 1.2 and 5.3.7). As Qereqeretabua (2008, p. 1) states, these cultural expressions, including the intangible ones, form the soul of a society.

The Ghanaian stakeholders who I interviewed believed that the country has the potential to develop an NDM from its existing cultural heritage resources (see section 5.3.7). They felt that Ghana has its own unique cultural heritage resources that provide the potential for the establishment of an NDM. The idea of managing Ghanaian cultural heritage resources to form a future memory for the country corroborates with a comment by Blake (2000, p. 65) that there is the need for cultural heritage resources to be effectively managed, protected and preserved in order to keep a group of people and their society alive in the future. An NDM for Ghana will provide a means to keep the country alive in the future. Some of the actual cultural heritage resources which came up in the interviewees' comments have been discussed at various points in this study and are summarised in Figure 7.2.

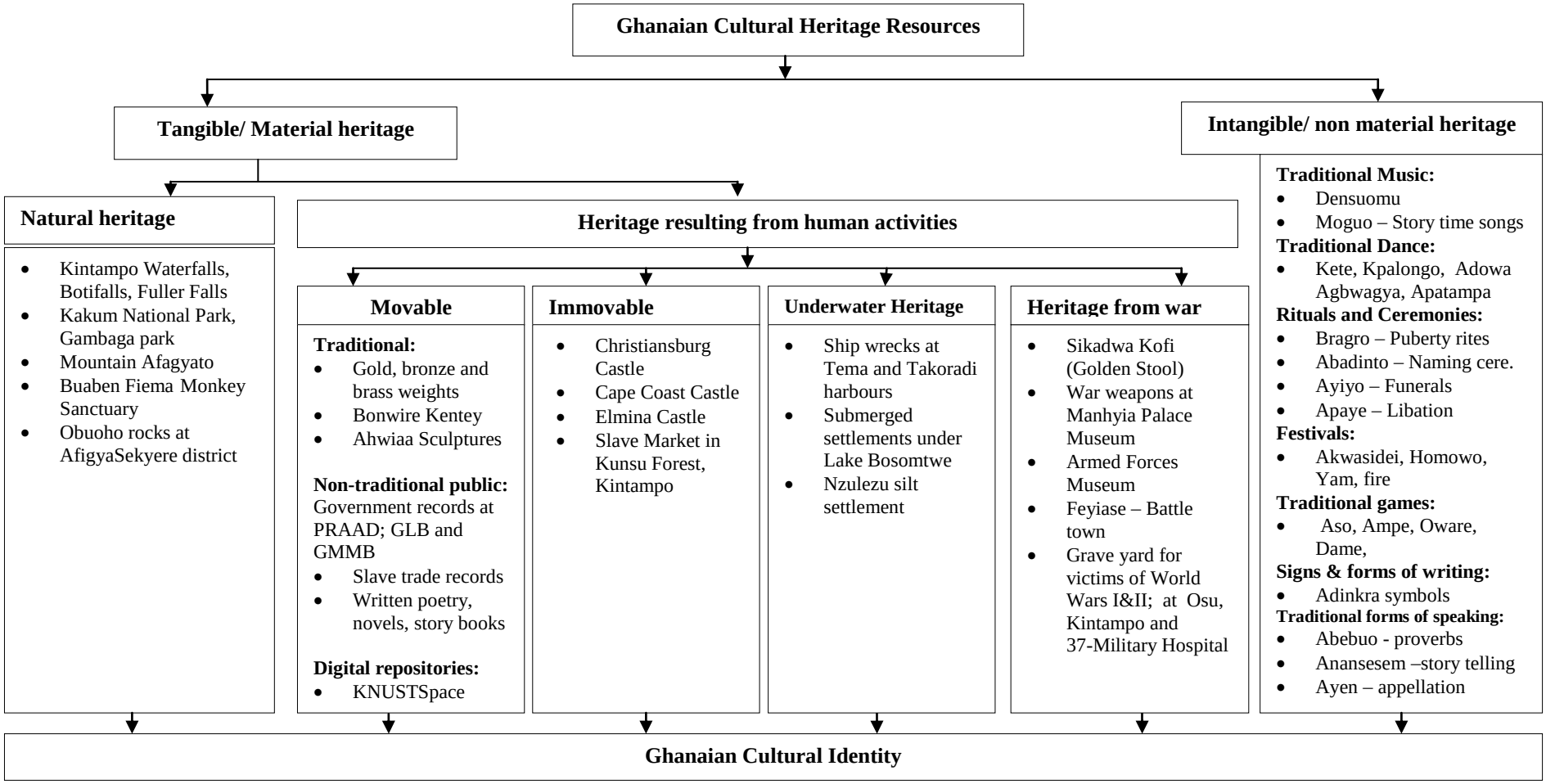

Figure 7.2: Specific Cultural Heritage Resources in Ghanaian.

The types of cultural heritage resources appearing in the interview comments to be in Ghana were consistent with the classes of cultural heritage materials identified in the literature review and summarised in Figure 2.1 (see section 2.2). Although some digital versions of these heritage resources are scattered on the internet, there has not been any national effort to capture these heritage resources at a central point and make them accessible through the internet. None of these Ghanaian heritage resources were being managed or preserved to form a memory for the country. Analysis of interviewees' comments showed that the successful establishment of a digital memory for such cultural heritage content depended on careful and planned documentation. The effectiveness of such documentation is achieved through the interest and commitment of all stakeholders. But, there were concerns about whether the attitude of the Ghanaian stakeholder was supportive.

7.10.2 Attitudes by Stakeholders

Interviewees' comments indicate that Ghana was not effective in the management of digital resources. Interviewees felt that this lack of effective management was a result of negative attitudes by stakeholders in the country towards heritage resources and information. For example Agya, Kwakubonsam, Funtun, Kuntane, Komfoanokye and Adieyepena all emphasised that developing an appropriate attitude, such as showing interest, having motivation and appreciating the Ghanaian culture, should precede all other efforts towards the adoption of DPM. According to the comments, special interest should first be cultivated by all stakeholders before any thought of developing policies and strategies, and allocating resources for effective management of heritage resources and the establishment of NDM.

The understanding I gathered from observing the New Zealand context and analysing the perspective of interviewees was that attitudes by stakeholders is an important element to be considered when thinking of establishing an NDM. Positive attitudes by stakeholders of a culture enable the effective management and transfer of the heritage resources of that society to its future generations. This understanding was consistent with views in the literature that support the idea of stakeholders' attitudes as an element of NDM. Feather (2006, p. 1) indicates that special attitudes should be developed towards existing cultural heritage resources so that it is well managed for transmission to subsequent generations. Special interest in and commitment towards

heritage resources management and preservation are examples of positive attitudes. Full commitment by New Zealand stakeholders was instrumental in their initiatives towards the establishment of the NDHA (see Carnaby, 2009; Dorner et al., 2002; Knight, 2010).

Cultural heritage documentation comes with issues that require passion to deal with. Legal and privacy issues affecting cultural heritage management were also usually influenced by stakeholders' attitudes towards the culture. A conception of privacy arising from the interview comments was that most Ghanaian cultural heritage resources were not owned by one particular tribe in the country. Yet, like New Zealand, DPM in Ghana will very likely be influenced by privacy issues. This is because 11 of the 27 interviewees suggested there was an attitude of custodians keeping most of the culture secret even though many aspects are left open. Osagyefo for example, commented:

> We can face issues. First the legal, and secondly the privacy; But even there, most of our cultural things are not owned by any one particular tribe. The only privacy issue I may think of is that most of our cultural things are shrouded in secrecy and we need to draw a line between what to digitise and what not to digitise. (UL4)

Attitudes by DPM stakeholders as an element of NDM appearing in the interview comments, were consistent with the key elements mentioned by Knight (2010) regarding the New Zealand NDHA. It also corroborated with the conditions identified by Zuraidah (2008) that contributed to the establishment of a national digital cultural heritage repository in Malaysia. Zuraidah identified *cooperation and commitment from all stakeholders including institutions* (2008, p. 540). Stakeholders' commitment depended on the kind of attitudes they show towards DPM. The attitudes aspect was also consistent with the *community-driven and focused* factor among Gibbons' (2004) features of digital repositories. When stakeholders have the community at heart they will develop the repository to suit the needs of the community.

An examination of the attitudes feature shows that without stakeholders committing to the national cultural heritage content of their society, cultural heritage content cannot be developed to establish an NDM for that country. Stakeholders in Ghana need to develop special interests in efforts towards effective DPM adoption; be willing to

apply all possibilities to develop and sustain the culture; to appreciate and be proud to share with other cultures and keep the cultural heritage for future generations. Interviewees' comments show that there were indications in Ghana that attitudes could positively influence the establishment of an NDM for the country. Asempayetia for instance revealed that there was a desire by some stakeholders to do digital preservation in Ghana. A comment by Bosomuru also agreed with Asempayetia's perspective, but Bosomuru went further to indicate that lack of infrastructure and poor working conditions were killing the interest that some stakeholders had in DPM.

Asempayetia and Bosomuru's remarks indicate that stakeholders sometimes showed positive attitudes towards DPM. But, other factors such as the lack of resources were rendering it impossible to put their positive attitudes into practice. In addition to the positive attitudes mentioned by the interviewees, cultural appreciation and desire for cultural protection were also identified from the comments. Nevertheless, negative attitudes such as conflicting interests, disregard for information management laws, poor information culture, bitter feelings, political deception and empty promises, were hindering DPM adoption in Ghana and were not contributing to successful establishment of an NDM in Ghana. New Zealand, by way of contrast, appears to have stakeholders who appreciate their cultural heritage resources, seem highly motivated to preserve them, and are willing and interested in DPM (see Carnaby, 2009; Dorner, 2009; Knight, 2010). Thus, New Zealand has been able to establish the NDHA.

The positive attitudes existing among Ghanaian stakeholders notwithstanding, the interviewees revealed that the negative attitudes by the stakeholders in Ghana (see section 6.3.4) were greatly affecting the establishment of an NDM in Ghana. This was because attitudes by stakeholders affect other elements such as policy and strategy implementation, resource allocation and collaboration, which were also very essential for the successful establishment an NDM.

7.10.3 Policies and Strategies

The interviewees in my study felt that when stakeholders are committed to ensuring the survival of their national cultural heritage resources, they are willing to develop a plan and put measures in place to nurture the effective management, preservation and

lasting memory of such heritage resources. In the literature, Frimpong et al., (2006) for instance, advocated that the management of digital heritage resources requires effective planning and implementation of strategies. Also, there was emphasis in the literature that strategy creation and implementation is about creativity and innovation (see Chakravarthy et al., 2003, p. 1). The emphasis on creativity and innovation shows that the uniqueness of an NDM is defined by contextually developed policies and strategies to guide the operations of that NDM. Interviewees believed that policies and strategies developed based on contextually understood factors would make a Ghanaian NDM unique.

The *policy and strategies* elements in my research are consistent with the policy and strategy stones explained in the PSR troika model. The description of policy and strategy as fundamental elements for the development NDM also explains the relationship between the elements in the troika as depending on one another, requiring equal consideration and weighting to achieve the goals of DPM.

The policy and strategy elements also corroborate with the factors Knight (2010) identified with the NDHA: d*efinition of strategic drivers, choice of a suitable business model* and *defining the exact purpose of digital preservation programme*. I consider these factors as elements of the NDHA. Again, the policy and strategies element was consistent with the factors that Zuraidah (2008) identified as contributing to the establishment of NDCHR in Malaysia: S*trong policy by government*; *clear digital policy*, and *good planning and implementation* (p. 546). I have discussed the policy and strategies situation affecting DPM in Ghana in sections 5.3.6 and 6.4.3.

Ghana has the ICT4AD policy that comes with explained strategies. But the strategies outlined in the Ghana ICT4AD policy do not enable effective DPM or lead to the establishment of an NDM for the country. The policy and strategies in Ghana do not corroborate with the digital strategies that enabled New Zealand to undertake DPM as has been discussed earlier (see sections 3.5.3 and 3.5.4). Interviewees considered that the situation in Ghana does not enable effective DPM and hinders the establishment of an NDM for the country because the ICT4AD policy lacks resources to make them effective.

7.10.4 Resourcing

National Digital Memories are built on an information infrastructure which also involves the new digital technologies (see Sugihara, 1994, p. 82). According to the PSR troika model, '*resources'* is the basic element required to make strategy effective (see section 3.5). Deployment of different types of resources such as funds, buildings, communication equipment, human training and education, skills, knowledge and staff capacity are required to ensure development of an NDM for Ghana. The factors that influence resources allocation in Ghana are discussed in section 6.4.4. I consider these resources factors as an important element for the establishment of an NDM for Ghana. The resource element was also consistent with the factors enumerated by Knight (2010). Knight mentions *staffing aspects* and also *deployment and implementation* as part of the success factors for the establishment of an NDM. Also, Zuraidah's (2008) factors such as *adequate funding, skilled staff in required areas, adequate information resources* and being *equipped with the latest technology* (p. 546), suggest the infrastructure element of an NDM.

New Zealand and other developed nations that have undertaken DPM have deployed and allocated appropriate resources to build the right infrastructure for their NDMs. However, even though some resources, such as cultural heritage institutions, information management and ICT experts, ICT infrastructure and some funding exist in Ghana, these resources have not been adequately deployed to build the appropriate infrastructure (see section 5.2.2) to effectively lead the country towards the establishing an NDM. For instance, the Ghana Library Board (GLB) and the Ghana Library Association (GLA) as the respective major information management institution and organisation have been unable to lead the country in efforts towards DPM.

According to interviewees, the GLB and GLA have been competing for supremacy in status and about ideas on the establishment of a national library for Ghana. The state of these institutions in Ghana has been negatively affecting the resource element of Ghana. A national library is needed to lead and facilitate DPM activities such as a national digital repository for Ghana. But, the country has been unable to decide on the building, place and needed equipment for a national library because the GLB and

GLA gave different recommendations to government and each wanted their recommendations to be considered the better option.

This situation has left the government undecided about a national library for Ghana. PRAAD, which is the official records management institution, has been neglected (see section 7.6.1) by the government. These developments make resourcing in Ghana problematic for the establishment of an NDM. Interviewees believed the way forward in this situation is for all stakeholders to cooperate and ensure that there is effective collaboration among relevant institutions.

7.10.5 Collaboration

A strong perception appearing in the interview comments revealed collaboration as an important element of an NDM. This suggests that collaboration may be causal agent that connects the three elements in the troika to achieve the goals in DPM and NDM effectively. All my interviewees were concerned that collaboration among Ghanaian stakeholders and relevant institutions was inadequate because of rivalry. Bosomuru, Odomankoma, Adieyepena, Diawuo, Otadie, and Funtun for example, explained that Ghanaian stakeholders were aware of the importance of effective collaboration as an enabler for DPM adoption in Ghana. They therefore suggested ways that could improve the situation and enable the adoption of DPM in Ghana. For instance, Bosomuru said:

> All institutions can come together for the national effort but there should be a regulatory body, which better be a single institution to avoid rivalry. That body can then give directives as to control how public heritage should be managed taking on-board digitisation. (UL1)

From the same institution, Odomankoma also said:

> The decision-makers in government have had an expert meeting recently and a document have been put together as a national information management policy where the national library proposal has come up and it's going to be a joint umbrella of museums, libraries and archives coming together to forge forward the national policy with the national library spear-heading, but that hasn't come to operation yet. (UL3)

Interviewees further emphasised that not only could collaboration enable effective DPM initiatives; it could also lead towards the establishment of an NDM for the country. Effective collaboration enables effective digital resources management and

preservation while lack of collaboration can hinder it (Alemna, 1999; Buchanan et al., 2012; Dong, 2012). In section 2.8.3 of the literature review, I discuss collaboration as an enabling factor for effective digital resources management. Buchanan et al., Buchanan et al. (2012, p. 342) identify that collaboration enhances access and improves quality of service, creates awareness and improves relationships among organisations.

In the framework of the factors that contribute to the successful establishment of an NDCHR identified by Zuraidah's (2008), *cooperation and commitment from all institutions* demonstrates the collaboration element. Also her identification of *coordination by the governing body* as a factor relates to the collaboration element. Interviewees in my study felt that there must be different institutions, persons and entities for the government to coordinate. It is in collaboration that institutions and individuals cooperate with a controlling body coordinating. The National Library of New Zealand and the Library and Information Association of New Zealand Aotearoa took the leading roles, brought together all required institutions and Ministries within New Zealand to bring their ideas and resources on board (see Carnaby, 2009; Dorner et al., 2007; Knight, 2010).

These factors demonstrate that collaboration is an important element of an NDM. The interview comments show that without this element the establishment of an NDM would be impossible for Ghana. And though effective collaboration is an important element of an NDM, I found that the inadequate collaboration that existed in Ghana was hindering efforts that can lead to the establishment of NDM for the country.

7.10.6 Effective Management of Content

The element discussed in this section points to how the national cultural heritage resources in Ghana are being managed using the new digital technologies to generate digital cultural heritage content. The main management issues affecting DPM adoption in Ghana are summarised in Table 6.5. They include challenges in leadership and capacity building. Interviewees, for example, Togbwe, Komfoanokye, and Funtun, indicated that effective leadership was required to organise, direct, control, and coordinate activities regarding heritage resources management and preservation in the country. Although stakeholders were aware that effective leadership and capacity

building could enable effective digitisation programme, these essential management elements were lacking in Ghana.

I have identified *effective management* of the national heritage content as an element of an NDM. The factors enumerated by both Zuraidah (2008) and Knight (2010) reveal *skilful staff* as a very important element for effective management and operations in handling digital materials. Zuraidah (2008) summarises the factors that contribute to effective DPM and which can lead to the establishment of a national digital cultural heritage resources in developing countries as: human factors; government factors technological factors; and, content management factors (p. 540).

Human factors involve having skilled personnel who are knowledgeable in using the new digital technologies for cultural heritage management. Government factors involve decision making both at the institutional and national levels. Management factors involve persons with a sense of direction and drive to lead skilled staff who can handle DPM in the country. Content management involves decisions on the digital content that requires managing and preserving. It involves determining which aspects of cultural heritage are to be selected, and how to systematically prepare them for management and preservation through effective direction and control. The technological factors regard the tools to use to ensure that the contents are effectively managed and involve the new digital technologies. Interviewees felt that these management factors were not adequately being applied to the digital contents in Ghana, making efforts towards the establishment of an NDM difficult in the country. When national heritage resources are effectively managed, it generates digital heritage resources which form content for an NDM.

7.10.7 Digital Cultural Heritage Content

In my research, digital heritage resources themselves are considered as a necessary element for the successful establishment of an NDM. Gibbon's (2004, p. 6) analysis of a digital repository points out that digital content (example videos, images and texts) is an essential component of the successful establishment of an institutional repository. Discussions in section 5.3.1 show that there were some existing digital cultural heritage materials that can form content for an NDM in Ghana. Section 5.3.3 also identifies various challenges and issues affecting the management of these digital

materials. Challenges to the management of digital resources may not be a hindrance to effective DPM. For example, in spite of the challenges, New Zealand appears to be effective in DPM.

Developing countries like Ghana can draw upon examples of DPM initiatives in countries like New Zealand that have achieved progress because such examples can be used to assist in developing digital preservation initiatives. My observations show that New Zealand's national cultural heritage resources were well managed and led to the establishment of the New Zealand NDHA, which I consider as New Zealand's national memory.

7.11 Development of the Elements of a National Digital Memory

In this section, I discuss how the various elements of an NDM develop from the national cultural heritage content, through attitudes by stakeholders, policies and strategies development and collaboration, to attain national digital cultural heritage content to establish NDM. I illustrate the elements as they appear in the context of Ghana (see Figure 7.4) in juxtaposition to how they appear in the context of New Zealand (Figure 7.3).

7.11.1 Development of the Elements of NDM in New Zealand

New Zealand has undertaken DPM and has moved on to develop an NDM in the form of its NDHA. In Figure 7.3, I illustrate how New Zealand's *national cultural heritage resources* developed into *digital cultural heritage content* for management and preservation in the NDHA. My illustration of the New Zealand situation is based on the analysis of the literature and my observations of New Zealand cultural institutions.

Development of the elements of a New Zealand NDM

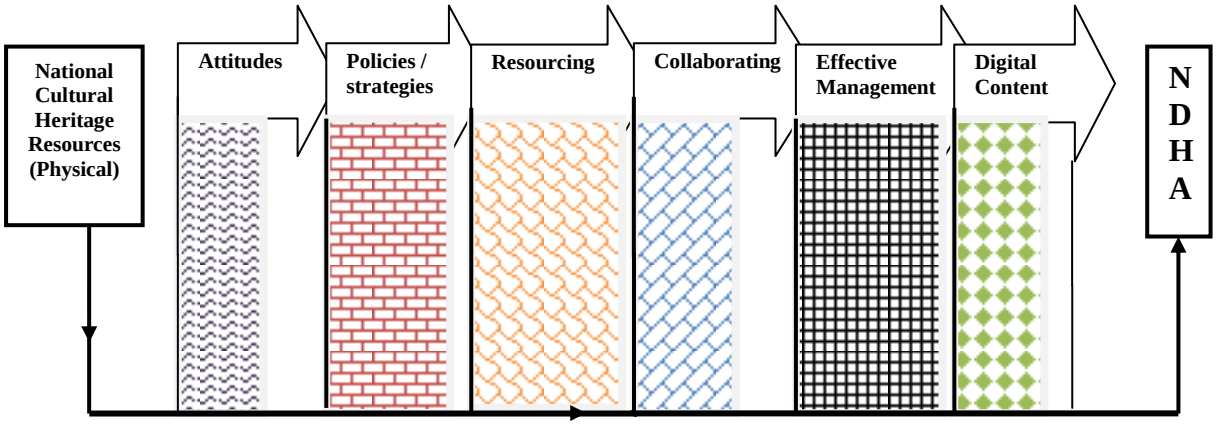

Figure 7.3: Elements of an NDM occurring in New Zealand

In both Figure 7.3, I use shadings in boxes to indicate the estimated effectiveness (no actual measurements were undertaken) of the various elements in relation to the development of an NDM in New Zealand. I do the same in Figure 7.4 (see section 7.11.2) in relation to the development of an NDM in Ghana. The shaded portions in the boxes indicate the degree of effectiveness whereas the unshaded portions indicate the degree of ineffectiveness of an element. The amount of shading is based on my analysis of documentary resources for New Zealand in Figure 7.3 and on the interviewees' responses for Ghana in Figure 7.4. The shaded areas are meant to be indicative only and are not based on any statistical calculations.

7.11.1.1 National Cultural Heritage in New Zealand

New Zealand's culture is comprised of both the indigenous Maori and the White (Pakeha) cultures which together shape the country's national cultural heritage resources. Positive attitudes enabled New Zealand stakeholders to design strategies, allocate resources and collaborate to build the existing cultural heritage resources into digital cultural heritage content and establish their NDM which they call the NDHA.

7.11.1.2. Stakeholders' attitudes in New Zealand

Positive attitudes that enabled New Zealand stakeholders to develop the NDHA include: their special interest and appreciation of New Zealand culture; their motivation; their determination; their commitment; their resilience in the face of challenges; and their willingness to work hard. I illustrate the effectiveness of the

attitudes by New Zealand stakeholders with the wave shading in the *attitude box* in Figure 7.3. As can be assumed by the blank portion in the *attitudes box*, there are certain attitudinal limitations in New Zealand.

Custodians of the Maori culture do not allow access to their indigenous cultural knowledge (Matauranga Maori) by anybody outside the Maori culture (Makoare, 2005; Metge, 1978; Mutu, 1994). I discuss indigenous cultural knowledge in section 2.2.1. The fear by Maori people of losing cultural knowledge is affecting the completeness of the *national digital cultural heritage content* that finally goes into the NDHA, creating a gap in New Zealand memory.

According to Makoare (2005, p. 76) Maori believe that Matauranga Maori is the embodiment of their understanding of knowledge of the world and their very nature of existence, but they also believe that people outside the culture do not understand the essence of Matauranga. Mutu (1994, p. 5) explains that allowing access to Matauranga will mean the description of indigenous concepts in Maori culture using the language of another culture. As expressed by Winiata (2005, p. 10) Maori feel their very survival is threatened by allowing access to their Matauranga. The Maori have therefore decided not to allow their cultural knowledge to be digitised and managed together with other New Zealand cultures such as the white Pakeha culture. A feeling among many Maori people was that although people from the two cultures in New Zealand now live in one country, digitising and preserving the cultures together must not happen because they are not the same people. Sentiments like this could be seen in Makoare (2005):

> There are those in these times who would have us believe that we are all New Zealanders, that we are all essentially the same, and that any view against this is not only wrong but unfair, unjust. How can we be the same? Those who promote this view are obviously people who are not familiar with the bliss, the shared pleasure of Maori way of life. (p. 76)

With such beliefs in the country, New Zealand seems unlikely to have a comprehensive NDM.

According to an account by David Jones[19] who is a Maori researcher, forefathers of the Maori traditions and culture established Matauranga Maori by sacrificing their lives. One way to honour the departed heroes and acknowledge their sacrifices was to attribute the evidence they have left behind to their very souls, which is the blood they left on some of the documents. To the Maori people, the best way to accord this evidence of culture with the necessary reverence was to render it as sacred as possible. People outside the culture are unable to understand this cultural reverence, hence, the need to keep Matauranga to only Maori.

David Jones explained that during the Maori-European wars, Maori warriors kept dairies in which they documented everyday happenings, sometimes while on battle fronts. Jones continued that some of the warriors died with their dairies still tucked under their coats. According to Jones, some of the dead warriors had the swords or bullets that killed them, passing through the books or papers on which they kept the daily records. Thus, most of the records today still have blood stains on them. As a result, before a Maori reads such a document or discusses issues in the knowledge contained with it, certain rituals have to be performed in honour of the person who wrote it. David stressed that most people outside the Maori culture will not perform this ritual. Those outsiders who will perform the ritual however will not understand its true meaning, so there is no need to allow access to the knowledge in the document by outsiders.

David commented that some of these records have been digitised and made available on the Internet. Nevertheless, whether anybody has access to Matauranga Maori through a non-Maori website, the fact still remains that Maori alone have the rightful access and use of Matauranga. Thus, these kinds of attitudes affect the content of the New Zealand NDHA as shown in the *attitudes box* in Figure 7.3. This situation in New Zealand is creating a gap in the country's memory because they are perhaps never likely to capture all digital cultural heritage content in the NDHA.

7.11.1.3 Policies and strategies in New Zealand

I consider policies and strategies as the building blocks of effective DPM and subsequent establishment of NDM. I illustrate the state of policies and strategies in

[19] David Jones, personal communication, May 6, 2010

New Zealand with the horizontal brick shading in the *policy and strategy* box in Figure 7.3. The New Zealand National Digital Content Strategy (NZDCS) and the Digital Preservation Strategy (DPS) by Archives New Zealand appear to be adequate and effective to guide digitisation and digital preservation initiatives in the country (see Digital Strategy 2.0, 2008). The fast implementation rate of the NZDCS has enabled rapid developments in digitisation and digital preservation initiatives in New Zealand (see also NDF, 2012). The NZDCS has been a very important element of the NDHA (see NDHA, 2010) and demonstrates that the policy and strategy element has been effective in New Zealand. Despite this effectiveness, the DPS by Archives New Zealand has not yet been nationally recognised. This raises questions as to what might be delaying the national acceptance of such an important strategy in a country that has achieved significant progress in DPM. I represent this doubt with the unshaded space in the *policy and strategy box* in Figure 7.3.

7.11.1.4 Resourcing in New Zealand

New Zealand cultural institutions, such as the National Library of New Zealand (NLNZ), the Museum of New Zealand and Archives New Zealand have been instrumental in leading efforts towards the development of the New Zealand NDHA. Also instrumental are professional associations like the Library and Information Association of New Zealand Aotearoa (LIANZA). Apart from the effectiveness of institutions and associations, the New Zealand government has made funds available for initiatives in digital preservation. My observations of various New Zealand institutions such as NLNZ, the Museum of New Zealand, Archives New Zealand, Radio New Zealand and Statistics New Zealand, confirmed the availability of DPM equipment and technologies. High powered technologies in the form of powerful cameras, scanners and other highly sophisticated digitisation equipment are being used in these institutions to digitise, manage, and preserve digital cultural heritage resources. I do not perceive problems with resourcing in New Zealand as I illustrate with the shingle shading in the *resourcing box* in Figure 7.3.

7.11.1.5 Collaboration in New Zealand

It is difficult for any one country to claim complete success in digital preservation activities. Collaboration is therefore an important element for the establishment of an NDM. The situation in New Zealand cannot be said to be faultless. The country's

peculiar challenges with Matauranga Maori hinder progress. The country's advancement in DPM so far, has been achieved through collaboration between government, decision makers and the various institutions. Collaboration in New Zealand has been mentioned earlier in various sections (see for example sections 2.7.1 and 3.5.3. It has been relatively effective both at the institutional and national levels. For instance, the Digital Preservation Practical Implementers Guild (DP-PIG) brings digital preservation experts from all institutions together to share ideas and discuss successes, problems as well as challenges facing each institution in their efforts toward effective DPM and they learn from one another (see DP-PIG, 2013). I illustrate the level of collaboration in New Zealand with the diagonal-brick shading in Figure 7.3.

Nevertheless, the fact that the DPS (which was developed through a collaboration involving a partnership by the National Library and Archives New Zealand) is not yet considered as a national strategy for the whole of New Zealand. This situation raises questions about the smooth progress in DPM in New Zealand. It is possible that the DPS is not seen as a priority by collaborating partners, similar to what the interviewees portrayed about Ghana (see section 6.3.4.). Also, the reluctance of some cultural heritage custodians in New Zealand to collaborate with the national cultural heritage digitisation programme in the country also casts a shadow on the collaboration element in New Zealand. I illustrate this gap by the un-shaded portion in the *collaborating box* in Figure 7.3.

7.11.1.6 Management of Digital Cultural Heritage Content in New Zealand

The foregoing discussions demonstrate that New Zealand is effective in its digital cultural heritage resources management and preservation. The key stakeholders have positive attitudes towards their cultural heritage resources and they developed and implemented effective digital strategies to guide their digitisation and digital preservation activities. New Zealand also has the needed infrastructure through the support of government and decision makers. The key stakeholders have used the infrastructure very well to create digital cultural heritage content for the national digital repository. There has been effective collaboration between decision makers and practitioners and also among institutions. These activities have enabled New Zealand to be very effective in managing its digital cultural heritage resources and

have led to the development of the New Zealand NDHA. I indicate the state of DPM in New Zealand with the small grid shading, and as shown in Figure 7.3 the management box is fully shaded because the management of digital resources is very effective in New Zealand.

7.11.2 Development of the Elements of NDM in Ghana

The level of effectiveness of the specific elements in the development of an NDM for Ghana as described by interviewees and discussed in sections 5.7 and 7.10, is illustrated in Figure 7.4 below.

Development of the elements of a Ghanaian NDM

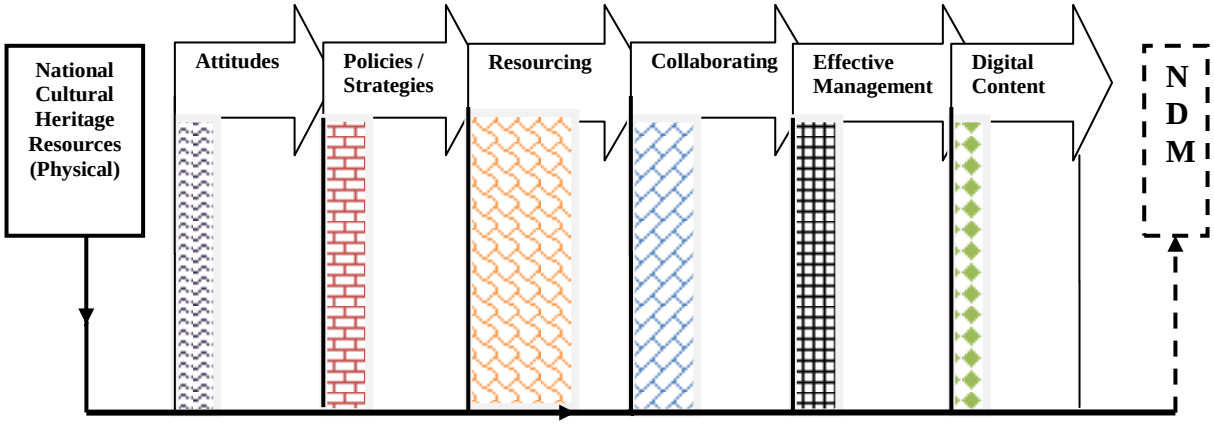

Figure 7.4: Elements of an NDM occurring in Ghana

As noted earlier, the shaded portions in the boxes are estimates of the degree of effectiveness and the unshaded portions are estimates of the degree of ineffectiveness of an element with regard to the development of an NDM for Ghana. It is important to bear in mind that the size of the shadings are based on my analysis of the interviewees' perceptions and are indicative only. They are not based on any statistical calculations.

The evidence of various activities and traditional practices by the various tribes and cultures in Ghana has shown that there is a wide range of cultural heritage resources that need to be managed and preserved for the nation. In the interviews, I identified some positive attitudes by stakeholders to manage and develop Ghanaian cultural heritage resources. The small dimension of the wave shading in the *attitude box*, illustrates the positive outlook in Ghana. The big blank space in the *attitude box*

shows that Ghanaian stakeholders have more negative attitudes towards information management, and by extension, DPM than positive ones. The various attitudes in Ghana are discussed in detail in the previous chapter (see section 6.3.4).

Although there is an ICT policy and some strategies in Ghana, they are not geared towards DPM (see section 6.4.3). The PSR troika model suggests that policy development and strategy implementation should be geared towards the achievement of policy goals (see section 3.5). Thus, not aligning the policy and strategies in Ghana to achieving goals in DPM makes it difficult to achieve progress in DPM and the development of an NDM.

I indicate the policy situation in Ghana with the length of horizontal-brick shading portion in *policy and strategy box*. The interview comments show that the lack of infrastructure, which is hindering the adoption of DPM in Ghana, is not because the country did not have resources per se. But these resources were directed towards other areas of the decision makers' interest at the expense of DPM related activities. That is why the shingle shading in the *resourcing box* is comparatively bigger than the shading in the other boxes. It indicates that the resource element in Ghana is capable of sustaining any meaningful initiative towards the establishment of an NDM. But the lack of positive attitudes by Ghanaian stakeholders is hindering the effective management of the country's heritage resources.

Stakeholders are also unable to collaborate and design effective strategies because of the lack of commitment and willingness to persevere in the face of challenges. As a result, the level of collaboration in Ghana is not effective (see section 6.3.4 and 7.10.5). I illustrate this with the diagonal-brick shading in the *collaborating box* in Figure 7.4. The small shaded area signifies that there is some sort of collaboration going on, and the big blank area in the box indicates that collaboration in Ghana is ineffective.

Notwithstanding the challenges, there is some management already going in Ghana, implying that adoption of DPM is possible. I show the level of effectiveness of digital resources management in Ghana with the length of the small-grid shading in the *effective management box* of Figure 7.4. Nevertheless, interviewees perceived the

adoption process of DPM as slow. Even though digital materials were fast multiplying, digital cultural heritage resources that have been rendered and could be used as content for an NDM were few. This was as result of ineffective digital resources management. Based on interviewees' comments and in reference to what is happening in New Zealand, I illustrate the level of rendered digital heritage content in Ghana with the solid-diamond shading in the *digital content box* of Figure 7.4. The broken line around the NDM box indicates that Ghana has not yet established an NDM.

7.12 Chapter Conclusion

The main elements fundamental for a process leading to the development of an NDM for Ghana, include: the *national heritage content* itself; *attitudes* by stakeholders towards the content; *resourcing*, *collaboration*, and, *effective management* of the physical content to generate *digital heritage content* which eventually will go into the national digital cultural heritage repository to form the NDM. The effectiveness of these elements occurring in a country influences the country's ability to achieve progress in the development of an NDM.

Also, the usefulness of the NDM elements follows how effectively contextual factors enable DPM in the country. The main contextual factors shaping the adoption of DPM in Ghana are discussed in the previous chapter. In Ghana, there are more hindrances to the adoption of DPM than enablers (see section 6.3 and 6.4). This situation has affected the elements for a process leading to the development of an NDM. Ghana therefore does not have an NDM.

In New Zealand, the effectiveness of the elements has been relatively high which has enabled the development of an NDM. Although both New Zealand and Ghana have national cultural heritage resources, stakeholders in New Zealand have been able to apply positive attitudes, to design and implement digital policies and strategies, to provide infrastructure and resources, to collaborate effectively, and to manage and preserve their heritage resources successfully, thus creating national digital cultural heritage content for the establishment of the NDHA (see Figure 7.3). By referring to the situation in New Zealand, I have understood the factors affection DPM in Ghana and identified the specific elements of a future NDM in Ghana.

In the literature review, I identify these elements as success factors that can lead to the effective establishment of a digital repository or an NDM (see Gibbons, 2004; Knight, 2010; Zuraidah, 2008). As discussed above, the successful employment of these elements enabled New Zealand to achieve good progress in its efforts towards DPM and has enabled the country to establish the NDHA, which represents its national memory. New Zealand has its own challenges and no doubt has made some mistakes in DPM. By referring to the examples that worked for New Zealand and learn from New Zealand's challenges, Ghana can become effective in DPM and is likely to make good progress towards establishing an NDM. Emulating success stories of other countries (see section 2.8.4) has been identified as very rewarding for any country that hopes to achieve success in initiatives regarding the new digital technologies (see Alemna, 1999; Corrales & Westhoff, 2006; Kyobe, 2011). In the next chapter I present the conclusions of this research.

Chapter Eight: Conclusions

8.1 Introduction

In this study I identified four main clusters of contextual factors that are influencing *the management and preservation of digital cultural heritage resources* (or Digital Preservation Management (DPM))[20] in Ghana: attitudinal, resource-related, policy-related, and managerial-related factors. Identification of these factors was facilitated by the use of a single case study approach, applying a semi-structured interview technique to elicit the perspectives of stakeholders from Ghana. The interview transcripts were thematically analysed to assist in an in-depth understanding of the factors in Ghana, while referring to DPM situations in the context of New Zealand. Perceiving DPM as an innovation in Ghana, I used my observations of DPM in some New Zealand cultural institutions as my point of reference for the exploration in Ghana. Rogers' (2003) Diffusion of Innovation theory (DOI) and Davies' (2000) Policy Strategy and Resources (PSR) troika model were used to underpin this research. Factors from the literature and theory were used to construct an initial model (see section 3.6) to guide the investigation.

In this chapter, I present the refined model of contextual factors based on the findings of my research. Stakeholders perceived the design of appropriate strategies, adequate resource allocation, and proper implementation of policies as key enabling factors for effective adoption of DPM in Ghana. A lack of interest in cultural institutions (libraries, archives and museums) and in information management on the part of decision-makers and the general public, hinder the adoption of DPM in Ghana. The research questions which directed the flow of this investigation (see section 1.6) are revisited in this final chapter and I summarise how the case study answers those questions. Limitations of the study as well as its implications to theory and practice are also presented. I end this study with some recommendations and suggestions of areas for further research.

8.2 Conceptual Model of Factors

The preliminary model of factors which was developed using ideas from theory and literature to guide this exploration is refined based on the perspectives of key

[20] See section, 1.8, for explanations on DPM.

stakeholders in Ghana and presented in Figure 8.1 below. This framework of factors can be used as a guide to assist with any DPM initiative that may be implemented in Ghana. The framework consists of factors that have been carefully investigated by considering the main contextual conditions in Ghana to assist in understanding the adoption process of DPM in the country.

Conceptual model of contextual factors influencing DPM in Ghana

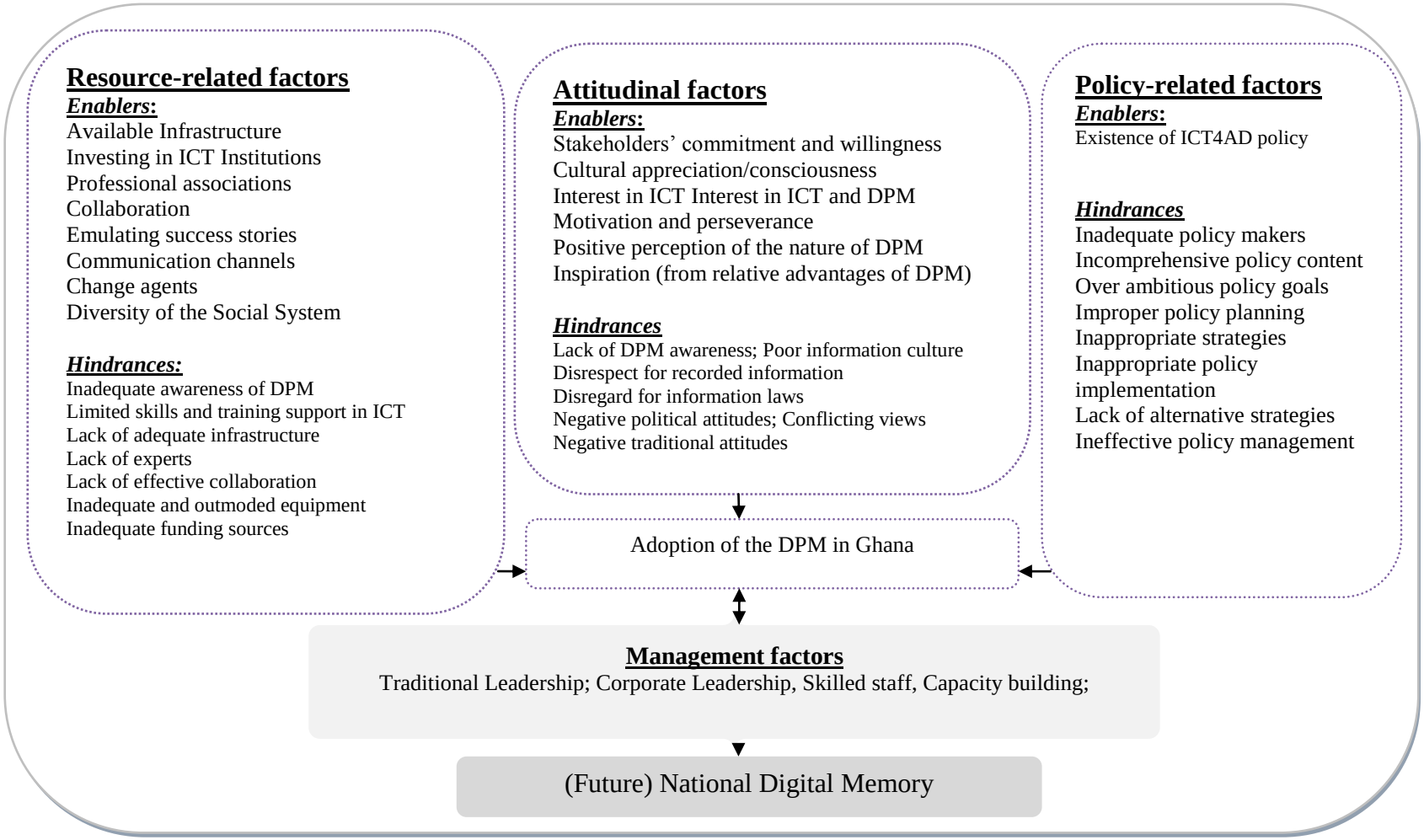

Figure 8.1: A conceptual model of factors influencing DPM adoption in Ghana

The adoption process of the DPM innovation in Ghana is influenced by elements relating to stakeholders' attitudes, resource allocation, policy implementation and management issues.

8.2.1 Attitudes

The literature review (see sections 2.8.2 2.8.4 and 2.8.6) indicated that positive attitudes such as full commitment on the part of stakeholders, emulating success stories from other countries and investing in ICT enable successful implementation of DPM initiatives (see also Carnaby, 2009; Cullen, 2003; Knight, 2010; Kyobe, 2011). These factors were incorporated in the preliminary model to guide the exploration of the factors in Ghana. Also, the theory used in preliminary model identifies attitudes. Stakeholders' willingness to collaborate and share ideas on DPM, inspiration and motivation for DPM, positive perceptions and interest by stakeholders in DPM were encompassed by the factors provided by the DOI theory. For instance:

- Extent of change agents promotional effort indicate commitment, willingness and motivation to promote ideas about the DPM innovation
- Nature of the social system, its norms, degree of network interconnectedness as well as types of innovation-decision, indicate desire and inspiration to collaborate for DPM
- The perceived advantages of the innovation also affects stakeholders' perception of DPM

These factors from literature and theory which were used in the preliminary model were confirmed by the research findings but not by the nature of the social system, which was so complex. In addition to that the study found attitudes such as lack of attention for information management and cultural institutions, disregard for documentary information and certain negative traditional attitudes such as animosities among tribal groups and the fear of losing heritage resources. These factors are discussed in detail in chapter 6. The refined model indicates that the adoption of DPM is possible in Ghana.

8.2.2 Resourcing

The literature review (see section 2.8.2) shows that having sufficient funds, appropriate infrastructure, experts and skills in ICT, collaborating and emulating success stories, all contribute to enabling initiatives in DPM (Buchanan et al., 2012; Dong, 2012; Kyobe, 2011; Oliver et al., 2010). Also, one of the three elements in the PSR troika model is resource allocation. The DOI identifies the need for effective use of communication channels and agents. These resource-related factors from literature and theory were incorporated in the preliminary model. The findings confirmed the importance of these factors to enable DPM adoption in Ghana. However, in the perspectives of stakeholders, these resources were inadequate in Ghana.

The findings also showed a direct relationship between stakeholders' attitudes and resource allocation. For instance, even though decision makers could get funding for other projects such as buying expensive cars for leaders, DPM initiatives are not resourced in Ghana because stakeholders' priorities are not geared towards improving information management. It is however, promising that people are interested in the use of the new digital technology and are committed to apply them in DPM. Such positive attitudes may contribute to future change.

8.2.3 Policy

Discussion in the literature (see section 2.8.1) showed that developing policies and implementing strategies enable successful initiatives in DPM (see Carnaby, 2009; Digital Strategy 2.0, 2008; Dorner et al., 2002; Dorner et al., 2007; Knight, 2010; NLNZ, 2010a). The PSR troika model also provided factors on policies and strategies which were used in the design of the preliminary model. The findings corroborated with these factors as shown in the refined model. The refined model shows that although there is an ICT policy in Ghana, the policy is not about DPM and there are no strategies in Ghana that are planned towards achieving goals in DPM. Analysis of the interview data showed that it is only when appropriate policies and strategies are developed for DPM and effectively implemented that effective DPM adoption can happen in Ghana. Nevertheless, the existence of a policy for digital activities, perhaps indicate that other policies may be forthcoming.

8.2.4 Management

Management factors apparent in the literature focused on corporate managerial issues such as staffing and leadership concerns (see Knight 2010; Zuraidah, 2008; and Carnaby, 2009). The findings revealed that there management-related issues in Ghana are woefully inadequate and hindering DPM adoption in the country. There is lack of effective leadership and staff motivation, lack of capacity to handle ICT issues and lack of strong institutions are some of the problems in Ghana (see section 5.3.2). These management issues are affecting the development of policies, planning and resource allocation (see section 6.4.3). In addition to the corporate management factors, the findings of this study reveal that there are also traditional management factors, which were enabling DPM in Ghana (see section 6.13.4). Effective DPM through traditional management is very likely to lead to the establishment of an NDM for Ghana (see Figure 8.1).

8.3 The Research Questions

This study was undertaken to answer four main research questions that investigated the state of heritage resources management, various contextual factors and how they influence the DPM adoption process in Ghana. The study also examined the elements of an NDM for Ghana.

8.3.1 Research Question 1

What is the state of DPM in Ghana?

The state of DPM in Ghana is described in Chapter five. Referring to interviewees' descriptions in Chapter 5 and the discussions in section 2.4 of the literature review, the state of DPM in Ghana can be summarised as follows.

Heritage resources in Ghana are scattered. A collective national digital heritage repository is difficult to achieve because there are many different cultural and tribal groups who do not agree on a single national culture. The over 100 different tribes and cultures in Ghana provide many cultural heritage resources (see sections 2.2, 5.3.7 and 7.10.1) which are owned individually by the various tribes. In addition to the traditional cultural heritage materials, formal transactions in the various

institutions also generate documentary records which should be regarded as contributing to Ghanaian heritage resources.

Subsequent to the rapid uptake of digital technologies in the country, the majority of Ghanaian institutions are using the new digital technologies to convert analogue heritage resources into digital forms. Use of digital cameras, laptops, iPods, scanners, printers and mobile phones is increasing in the country (see section 2.4 and 5.3.1). Thus, many cultural activities are being captured on these digital technologies, resulting in digital cultural heritage resources. Use of these technologies is spreading through both the rural and urban areas of the country, expanding the creation of digital cultural heritage resources, and requiring effective management and preservation. However, inadequate funding, lack of experts, limited knowledge in ICT, negative stakeholder attitudes, inadequate policies, lack of DPM strategies and poor managerial skills are hindering the effective management and preservation of the increasing digital heritage resources in Ghana.

Some international organisations are collaborating with Ghanaian institutions and local experts to embark on DPM and electronic records management projects in Ghana (see sections 2.4). The International Records Management Trust (IRMT) has since 1998 been carrying out records management projects in Ghana to enable effective record keeping for trusted information to enhance transparency and accountability in governance (IRMT, 2012). Some foreign missions such as the Italian Foreign Affairs Ministry and The United States High Commission in Ghana are also supporting information management and DPM related projects in Ghana. Yet, Ghanaian stakeholders lack motivation and interest to persevere in the face of challenges. Most of them also have lackadaisical attitudes towards information and records management. Such attitudes do not encourage these collaborative projects, and are hindering the adoption of the DPM innovation in the country.

Most Ghanaian institutions do not have any policy or strategies regarding the management of the digital heritage materials they have started creating (see section 5.3.2.1). There is also no national strategy for DPM. Digitisation is perceived as a current trend. So institutions give it a try when there is the opportunity to digitise their materials. Managers and decision-makers in these institutions digitise with little or no

DPM awareness. They also try to digitise without reference to any authoritative standards. Institutions that do use policies of some sort are following generic policies from international organisations such as the United Nations Educational Scientific and Cultural Organisation (UNESCO). The Ghana Museums and Monuments Board (GMMB) for instance, does not have a policy of its own. Its activities are guided by UNESCO policies (see Abronoma's comment in section 5.3.2). Few institutions in Ghana develop policies that are designed based on factors within the contexts of those organisations. Thus, DPM related activities done by various Ghanaian institutions are haphazardly undertaken without any guiding policies and strategies.

There is an ICT policy in Ghana (Ghana ICT4AD). It is the only policy in the country that relates to DPM (see sections 3.5.4.1, 5.3.5 and 6.4.3). However, the focus of the Ghana ICT4AD policy is to enhance the deployment of ICT to all parts of the country and various sectors of Ghana's economy. Unlike the New Zealand Digital Strategy (NZDS) and the Digital Preservation Strategy designed by Archives New Zealand and the National Library of New Zealand together (see section 3.5.3.1), no aspect of the Ghana ICT4AD focuses on DPM (see Ghana ICT4AD, 2003). Consequently, there is no national digital policy or strategy in Ghana to provide any standard or guidance for the various institutions digitising materials, or creating born-digital materials. Most Ghanaian stakeholders are not even aware of the existence of the Ghana ICT4AD (see section 5.3.5). However, stakeholders showed signs that once they clearly understand the innovation they are likely to adopt it faster.

The different tribes and cultures in Ghana have some privacy issues about their cultures. The issues relating to cultural privacy do not appear to pose real risk to a holistic approach to DPM. Although some cultural heritage materials in Ghana are shrouded in secrecy, most are freely accessible. Nonetheless, animosities among Ghanaian tribes does restrict cultural groups in Ghana from allowing uncontrolled access to some cultural resources and thus limits learning about each other's culture. A fully implemented DPM programme would provide more insight into the willingness of tribal leaders and custodians of the Ghanaian culture to allow aspects of their cultures to be incorporated into a DPM programme which can lead to the establishment of an NDM for Ghana.

Challenges affecting DPM related activities in Ghana include digital divide (see section 5.3.3). Digital divide in Ghana was preventing access to the new digital technology by some people. Although interviewees believed that the digital divide in Ghana can be related to widespread illiteracy mostly in the rural areas, some interview comments showed that illiteracy per se did not prevent people in rural communities from getting access to and using the new digital technologies (see Otadie's comment in section 5.3.1). Interviewees believed that the digital divide in Ghana is as a result of decision-makers' inability to provide ICT infrastructure many areas of the country. Nevertheless, some of the interview comments (see for example Sunkwa's comment in section 5.3.3) showed that efforts were being made to send ICT facilities to all areas of Ghana.

8.3.2 Research Question 2

What contextual factors are influencing DPM in Ghana?

The DPM innovation in Ghana, its various attributes and the Ghanaian social system are discussed in Chapter six. The discussion revealed DPM as a multifaceted innovation (see section 6.2) with a complex social system (see section 6.10). The multidimensional Ghanaian social system was found through my analysis of the interview data, to be structured into three different layers: base level, middle level and high level. Although the DPM innovation was identified to be not fully occurring in Ghana, there were different DPM related activities going on at the different levels of the social system (see Figure 6.1). Most of these activities were not planned and partially planned ones were not geared toward achievement of goals in DPM. While most of these DPM related activities were unintentionally being undertaking, they were unconsciously fostering the adoption process of the innovation. The majority of Ghanaian stakeholders were unaware of the DPM innovation. But stakeholders who were knowledgeable about the innovation found it beneficial to the Ghanaian society (see section 6.7 for interviewees' perceptions of the relative advantages of DPM).

Using the framework of the innovation and its attributes as a guide, I identified the various influencers of the DPM adoption process in Ghana and clustered them into four main areas: Attitudinal, resource- related, policy-related and management factors. Some of the elements in these factors have been discussed in section 8.2.1 above.

- Attitudinal-related factors

  Positive attitudes such as interest in the new digital technologies, cultural appreciation, the willingness and desire to safe-guard heritage resources for the future are enabling people to learn about, and apply the new digital technologies to manage and preserve heritage resources. Such positive behaviours enable the adoption of DPM in Ghana. On the other hand, undesirable attitudes such as general lack of attention for information management, poor information culture, disregard for documentary information, political deception, failed promises and the poor perception Ghanaian stakeholders have for information and records management are hindering the adoption of DPM in Ghana (see section 6.3).

- Resources-related factors

  Having adequate resources enable the innovation adoption process. In section 6.4, I discuss how lack of access to and the inability to use ICT is complicating the rate of adoption of the DPM innovation in Ghana. The existence of a broadband Internet connectivity; DPM related institutions, such as PRAAD, GLB, GMMB, GIFEC, Ministry of Information, Ministry of Communication and other private institutions which are responsible for dealing with ICT and information management issues were fostering the DPM adoption process in Ghana. Nevertheless, the difficulties in accessing and using digital technologies in Ghana, the ineffectiveness of various cultural institutions, lack of skilled personnel, the lack of basic communication infrastructure and inadequate funding, are some of the resource-related issues that are hindering the adoption of DPM in Ghana. But the availability of some resource elements suggests hope for a successful DPM in Ghana.

- Policy-related factors

  The development of policy and strategies enables the effective adoption of DPM (see section 3.5.3). The development of the Ghana ICT4AD policy (see sections 3.5.4.2 and 5.3.5) can therefore be perceived as an enabling factor for

the adoption of DPM in Ghana. However, as discussed in section 6.4.3, there are many deficiencies in this policy. For instance, the Ghana ICT4AD policy has not been able to achieve the goals and milestones it specified. There are no DPM strategies accompanying the policy; the absence of effective and complementary policies is hindering the rate of adoption of DPM in Ghana.

- Management-related factors

  Capacity to handle ICT is key to effective management of DPM (Berry, 1996; Kyobe, 2011). Management practices for information resources including ICT in Ghana are inadequate (Alemna, 1998, 1999; Martey, 2004a). There is insufficient human and institutional capacity to handle DPM in Ghana (see sections 5.3.2.2).

The effective management of these clusters of factors would increase the rate of adoption of DPM and could lead to the establishment of an NDM in Ghana. However, progress in heritage resources management and preservation in Ghana is hindered because the management of these factors is not effectively occurring, slowing the adoption process of the DPM innovation. The ideas presented in this study are therefore timely for policy makers to consider all necessary elements such as strategies, resources allocation and the values of the people equally to enable effective achievement of policy goals in Ghana.

8.3.3 Research Question 3

How do these contextual factors influence DPM in Ghana?

As already mentioned in 8.3.2 above, enable the adoption of DPM. These attitudes also influence the appropriate allocation of resources, developing and implementing appropriate policies and impact on the effective management and preservation. However, the negative factors such as fear of permanent loss of tribal heritage resources, animosities between various tribes, conflicting ideas, poor information culture, political deception and failed promises, disregard for information and cultural heritage management laws in Ghana, hinder the rate of adoption of DPM. Specific resources factors in Ghana include communication systems and ICT infrastructure, cultural institutions, collaboration and professional associations who can advocate for

change. Availability of these resources in Ghana could enhance effective information management and enable the adoption process of DPM. However, findings from this case study raise questions about the adequacy of these resources to support effective DPM in the country.

Although communication media exist in many forms in Ghana, they are not being used as channels for communicating ideas about the DPM innovation per se (see section 7.4). Certain radio and television programmes are used by journalists, traditionalists and custodians of culture to discuss historical and cultural heritage issues with the aim of educating the people about their past and teaching them about the Ghanaian culture (see section 6.8). Information technology experts are also using Ghanaian media (radio, television, newspapers, websites, etc.) to discuss the new digital technologies. Even if such activities in Ghana relate to digital preservation concerns, understandings gained from this case study show that such discussions are not done with the intention of enhancing the digital preservation innovation in the country. Discussion takes place for a range of other reasons such as educating people about their culture or using the technology for other purposes. Stakeholders in Ghana have a desire to do digital preservation.

Specific ICT infrastructural resources in Ghana, apart from Internet connectivity and ICT equipment, include ICT training institutions, laboratories, information centres and the experts who manage these resources. This study provides an understanding that these ICT resources themselves and indicates their management are inadequate to enable DPM in Ghana.

Professional associations such the Ghana Library Association and the ICT Teachers Association bring experts together. The existence of these infrastructure and professional associations in Ghana provides a cluster of assets that can support initiatives in digital preservation in the country. However, understandings gained from the case study indicate that ICT institutions in Ghana lack adequate resources to enable them to function effectively. Thus, even though these institutions exist, they are not supporting the adoption of DPM in the country.

Collaboration among institutions appears as a resource factor in Ghana. The collaboration networks going on between Ghana Investment Fund for Electronic Communication (GIFEC) and other institutions (see section 5.3.3 and 5.3.4) in Ghana enable DPM. Ghanaian institutions also collaborate with various organisations outside the country to enable initiatives in the new digital technologies (see section 6.8).

While such activities can enable effective applications of the new digital technologies, understandings gained from the case study indicate that Ghanaian institutions do not collaborate with the aims of fostering the DPM adoption process. The primary aim of collaborative activity among Ghanaian institutions is for accessing resources. For instance, they collaborate to enable access to ICT for communications about their work. Thus, collaboration to enable DPM adoption is lacking in Ghana. Developing effective strategies and achievable policy goals enable rapid adoption of the DPM innovation. Although the Ghana ICT4AD has 14 strategies, none of the strategies focuses on DPM or recorded information. The absence of policy and strategies to guide DPM in Ghana is hindering the adoption of the innovation in the country.

8.3.4 Research Question 4

What are the key elements necessary for the development of an NDM for Ghana?

Specific elements of a future NDM for Ghana are identified in section 7.10. The various cultural heritage resources in Ghana (see Figure 7.2) could be developed through other elements such as attitudes, the development of policies and implementation of strategies, appropriate development of infrastructure, collaboration among institutions and through effective management to obtain digital cultural heritage content. The digital content would be managed by a Ghanaian national digital cultural heritage repository which would form the NDM for the country. The DPM innovation is yet to be adopted by stakeholders in Ghana. However, digital cultural heritage resources are proliferating in the country. Understanding the various contextual factors that are influencing DPM would contribute to the adoption of the innovation at a faster rate in the country and could lead to the establishment of a NDM for Ghana.

8.4 Implications for Theory

In her discussion of Information Systems (IS) discourse in developing countries, Avgerou (2008, p. 140) called attention to the potentially significant theoretical contribution which IS research in developing countries provides to assist in understanding IS innovations in social contexts and in the development of theories and policies. My research contributes to understanding the adoption process of the DPM innovation in the context of a developing country. The study provides insight into how technological innovations relating to DPM could be diffused and adopted into Ghana. Both DOI and the PSR troika model have been applied in developed countries, but rarely to the African context, and never in Ghana. This study adds to the literature by providing a developing country perspective on the adoption of DPM.

My research contributes to further understanding of the DOI theory and the PSR troika model. The elements of both the DOI theory and the PSR troika model have been explored in-depth by applying them to examine the influences of various contextual factors on the adoption of DPM in Ghana. Through a synthesis of the literature and using the iterative processes of sorting, listing, arranging and clustering, I identified the main contextual factors influencing DPM. I mapped the innovation attributes of DOI to the factors to understand how they influence the adoption process of DPM in Ghana (as shown in chapter 6). I also employed the PSR troika model to understand the effectiveness of the various elements in a process for the establishment of an NDM for Ghana (see sections 7.10 and 7.11).

While the application of the elements of DOI and PSR troika assisted in my understanding of how the various factors are influencing DPM in Ghana, this study also extends the application of the theories into a new context. It provides insight into the challenges of applying the elements of DOI and PSR troika to study a complex innovation like DPM at a national level (see sections 7.2.2 and 7.8). Though the DOI theory may be suitable for the study of the diffusion and adoption processes of simple technological innovations, I found that it presents challenges when investigating the adoption of a complex innovation such as DPM which is occurring across Ghanaian society at different rates for the different components of the innovation.

8.5 Implications for Practice

This study brings Ghanaian stakeholders to the awareness of the need for collaboration and unity among the different cultural groups in order to develop a singular, uniquely defined Ghanaian collective national cultural heritage to enable effective DPM and assist in the establishment of NDM.

This study was timely, calling on Ghanaian stakeholders to seriously consider the adoption of DPM in order to safeguard continued access to the digital heritage resources at a time when digital materials are rapidly proliferating in Ghana, raising concerns in the literature (Alemna & Cobblah, 2005; Azangweo, 2006; Falch, 2004; Ghana ICT4AD, 2003; Hinson & Sorensen, 2006). The study findings also confirm the rapid increase in digital heritage resources (see section 5.3.1), and provides insight into the various hindrances and enablers of DPM adoption in the country. Awareness of these factors is likely to assist Ghanaian stakeholders to develop different views towards DPM. This research can serve as a reference point to assist Ghanaian policy developers. As mentioned earlier, ideas in the revised model can be used as a guide for future implementation of DPM activities.

This research also has practical implications for New Zealand. New Zealand has undertaken DPM and achieved remarkable progress. The country has also been providing advisory services for developing countries particularly, in the Pacific region. Findings from this study can assist New Zealand in providing contextually designed advisory services to other developing nations such as small Pacific Island states.

8.6 Recommendations and Suggestions

This exploration of the contextual factors influencing DPM in Ghana has shown that there are more hindrances to DPM than enablers, making a process for the development of an NDM for Ghana difficult. The following recommendations and suggestions therefore arise from the research.

There is a need for a positive change in attitudes by stakeholders:

- Programmes that integrate all the cultures of the different tribes in Ghana need to be promoted. Cultural fairs that have aspects of every traditional area in Ghana can be showcased to the outside world as a single but multifaceted

Ghanaian culture while each tribal group develops its specific culture to enhance unity in diversity in Ghana. By so doing the people of Ghana will see themselves as one and assist in eliminating the animosities existing among the various tribal groups. Such unity can help traditionalists to eschew the fear of permanent loss of tribal heritage (See sections 4.6, 6.3 and 7.5)

- Traditionalists and custodians of the Ghanaian traditions and culture should be applying modern methods and tools to teach aspects of their traditions to youth. This may assist in promoting awareness and appreciation of their culture among young people in the face of modern influences. Contemporising Ghanaian culture could raise awareness of the need to preserve it using modern technologies for the future. (See sections 5.3.6, 6.2,6.3 6.8,7.3 and 7.5)

- Although Ghanaian tribes do not agree most of the time because of cultural differences, there are certain aspects of the modern ways of life in Ghana that usually bring people together. Modern games like soccer and boxing competitions help Ghanaians to see themselves as people with a shared national identity. An NDM for Ghana could therefore leverage off these common interests. For instance, an NDM for Ghanaian soccer games and boxing competitions could be developed. If people became interested and engaged, they could be more willing to contribute other aspects of their cultures to the repository. (See sections 5.3.7, 7.5.1 and 7.5.2)

- The English language has become embedded in the Ghanaian culture as the only common language. An NDM for Ghana can therefore be built using English as a lingua franca. (See section7.5.2 and 5.3.7)

- Reading and writing competitions both in English and in the Ghanaian languages should be encouraged in the Ghanaian education system. This will promote the importance of reading and writing in the Ghanaian social system right from infancy and ultimately contribute to building respect for documentary heritage resources. (See for instance, sections 6.3.2, 6.3.4.5, 7.5.1 and 7.7)

- Politicians need to honour their promises and desist from using unwarranted investigations to interfere with DPM projects that various institutions initiate. This will encourage both private and public initiatives in DPM. Incumbent governments should also endeavour to build on projects that have been initiated by previous governments. This practice will benefit Ghana in maximising its resources and enable the continuous development of DPM projects and lead to the establishment of an NDM for Ghana. (See sections 6.3.2, 6.3.4.5 and 7.5.3)

- Heritage professionals, record managers, and information professionals in Ghana need to be proud of their professional roles and carry themselves well. They should write about, and promote their profession for stakeholders to appreciate and understand what is going on. This may help alleviate the poor perception of the information management filed in Ghana. (See for instance, Funtun's comment in section 5.3.6 and 6.3.2)

- There is the need for adequate resourcing to enable DPM.

- Appropriate policies with achievable goals need to be designed and accompanied with alternative or optional approaches to enable the implementation of strategies effective. (See sections 3.4.1.1, 3.5, 5.3.5 and 6.4.3)

- Traditional management practices should be encouraged to foster DPM adoption. The chieftaincy institution and traditional systems need to be resourced and supported. This will empower chiefs and traditional leaders as well as the Ghanaian public to appreciate the challenge of managing heritage resources in the modern world of digital technologies.

8.7 Further Research

In this investigation I have employed an interpretivist, single case study to explore and understand the various contextual factors that are influencing DPM in Ghana.

Further research in the following areas might enhance a deeper understanding of the DPM innovation in Ghana:

Since the DPM innovation was found to be multifaceted and the social system was identified to be complex, a multiple case study approach can be employed to study multiple facets of the innovation at the same time.

A quantitative methodology can also be employed to ascertain the exact nature of the state of DPM in the Ghanaian society.

As stated in section 1.12, the scope of this study did not include showing Ghana how to develop DPM plans, policy or strategy. Based on the factors identified a more specific study on how to develop DPM strategies can be conducted in Ghana.

Since this study found out that other West African neighbouring countries also developed institutional repositories around the same time the KNUSTSpace was developed, a larger scale survey can be conducted to include Ghana and its neighbouring countries. Such a study can be used to identify how these countries are collaborating in terms of DPM development, given the linguistic barrier between Ghana and its neighbours (i.e., Ghana being an Anglophone country and all its neighbour being Francophone countries), and what contextual factors pertain to the various countries (similarities and differences).

The findings of this research can be the basis to guide projects on how to create a national collection of digital heritage resources with the ultimate goal of developing an NDM for Ghana.

These areas are very likely to enhance the understanding of the of DPM adoption in Ghana.

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Appendix 1: Interview Guide

These questions are only indicative of the areas I seek to cover.

Introductory Questions

1. What is your role in this institution?
2. How long have you been working here?
3. What tools or technologies do you apply in your work?
4. Does your institution deal with any digital materials of some sort?

What is the state of digital cultural heritage resources management and preservation?

My interest here is to understand the circumstances that surround the creation, use and preservation of digital cultural heritage resources in Ghana, first on the institutional or organisational level and then on national level

Digital resources management, organisational level

5. What sorts of materials does your institution have in digital forms?
6. How are they created? What technologies are used in creating these digital materials?
7. What has been your motivation to create digital materials? Why do you digitise?
8. Are there any policies regarding the selection of particular materials for digitisation?
9. What strategies do you employ in managing these digital materials?
10. Who are involved in the development and implementation of policies and strategies in your organisation regarding digital materials management?
11. How do you ensure that these digital materials are preserved for the long-term future?
12. How do you safeguard tangible/analogue objects once they have been digitised?
13. What considerations do you think are enabling or can enable the effective management and preservation of digital materials in your organisation?
14. What hiders the smooth and effective management and preservation of these materials?

Digital resources management, national level

15. How do you see the level of influence of the digital technology on the lives of Ghanaians?
16. Are you aware of any national policy regarding digital resources management?
17. How effective has this policy been so far? If any?
18. What do you suggest should be done to effectively manage and ensure that digital cultural heritage resources are well preserved for future generations?
19. What aspects of the Ghanaian culture heritage need to be digitised? Why should they be digitised?
20. What aspects of the Ghanaian culture heritage do you think must be well preserved for future generations?

21. What do you think about cultural privacy issues and digitising aspects of the Ghanaian cultural heritage?

22. Do you think the development and implementation of a national strategy regarding digital cultural heritage resources is important?

23. What should be the content of a national strategy for digital resources management?

24. Who should be involved in the development and implementation of strategies for the effective management of digital cultural heritage resources?

25. What specific roles should national strategy developers and implementers engage in?

26. What alternative strategies would you suggest need to be implemented to ensure the achievement of the goals of policies regarding digital resources management in Ghana?

27. Who should be responsible in Ghana for the development and implementation of a national strategy for digital resources?

28. What kinds of resources are required to make such a strategy effective?

29. Which organisation(s) do you think should be responsible for coordinating policies and strategies regarding digital resources management in Ghana?

30. What characteristics must such an organisation have?

31. What features do you perceive for a national digital memory for Ghana?

Wrap up

32. What factors need to be considered to enable the implementation of strategies for the effective management of digital cultural heritage resources in Ghana?

33. What factors, in your opinion hinder the implementation of strategies for the effective management of digital cultural heritage resources in this country?

34. Should you be in charge of the Ghanaian information infrastructure what would you change to ensure the effective management of digital cultural heritage resources in the country?

35. Are there any areas of relevance to this topic that we haven't discussed?

Appendix 2: Some Ghanaian digital cultural heritage resources found scattered on the Internet

Akan gold cast leopard stool

The Asante Golden Stool

Native sandals[21]

Akan gold cast scimitar (Afenaa)

A golden cast soldier

Akan gold cast passengers in a boat

[21] Source of photos: http://www.pinterest.com/vesterbrogade/ashanti/

Other photos: http://www.maltergalleries.com/archives/auction02/112402auctioncat1.htm

A Queen mother

An Asante traditional amour

A Ga chief sharing mashed yam at Homowo festival

Hobgetsotso festival by the Ewes[23]

A presentation at the fire[22] festival by Dangombas

[22] Source: http://itsghanabeawesome.blogspot.co.nz/2014/01/who-by-fire.html

[23] Source: http://mdinvestmentltd.com/thevoltayouthdev/

Appendix 3: Photos taken from Research Site

In this section I present some photos I took from some of the institutions I visited during data collection. The photos were taken with the permission from participants and appropriate authorities in these institutions. Where I was not allowed I did not take any photo.

Appendix 3A: Photos showing some of the equipment that were being used for a Digitisation Project in an academic library in Ghana

Figure 3A1: Preservation room in an Academic Library

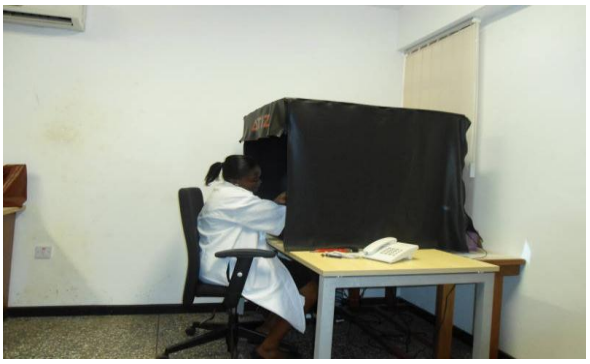

Figure 3A4: A staff member scans pages of a book during a digitisation process

Figure 3A2: Examples of preservation equipment in a preservation room

Figure 3A5: Some preserved microfilms prepared for digitisation

Figure 3A3: A staff member explains how a dehumidifier works in their library

Source of photos: Researcher's own collection

Appendix 3B: Photos showing how records are managed at a major records management institution in Ghana

Figure 3B1: The search room at a major records management institution in Ghana

Figure 3B2: An office in a major records management institution in Ghana

Figure 3B3: Some of the stored records at a major records management institution in Ghana

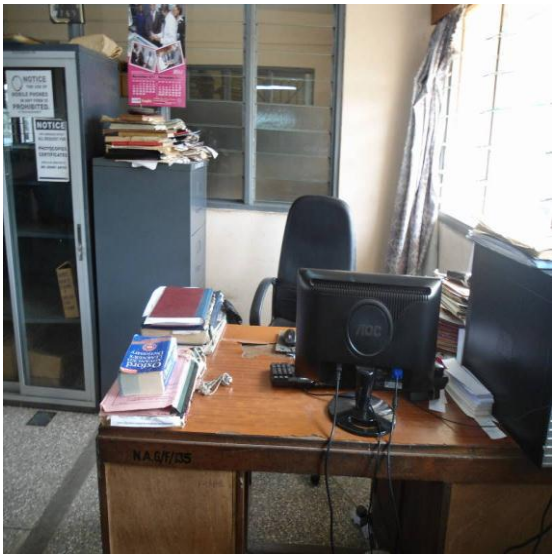

Figure 3B4: One of the only two computers found in a major records management institution in Ghana

Source of photos: Researcher's own collection

Appendix 3C: Photos taken from the 2011 Ghana Cultural and Policy Fair

Figure 3C1: A stand at the 2011 Ghana Cultural and Policy Fair

Figure: 3C2: Another stand at the Fair showing some of the participating institutions

Figure3C3: Another stand at the Fair for one of the institutions

Figure 3C3: A stand at the Cultural and Policy Fair showing some cultural materials

Figure 3C5: Another stand displaying photos of Ghanaian culture

Source of photos: Researcher's own collection

Appendix 3D: Ancient Slave Market in the Kunsu Forest in the Kintampo Traditional Area

Figure 3D1: Shackles still tacked in the trees

Figure 3D2: Some of the locals try on a shackle which is still tacked in a tree

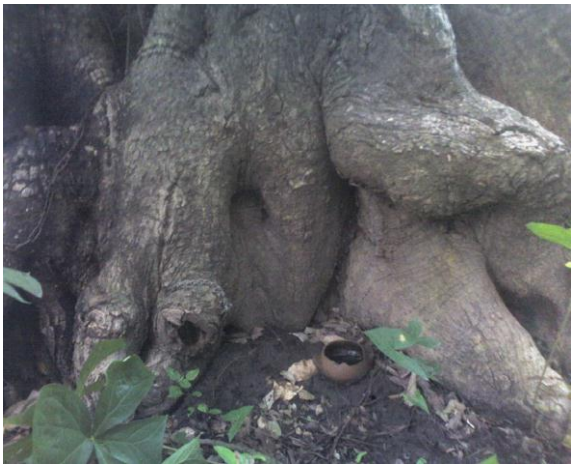

Figure 3D3: A rocky pot use to serve water to slave in the forest

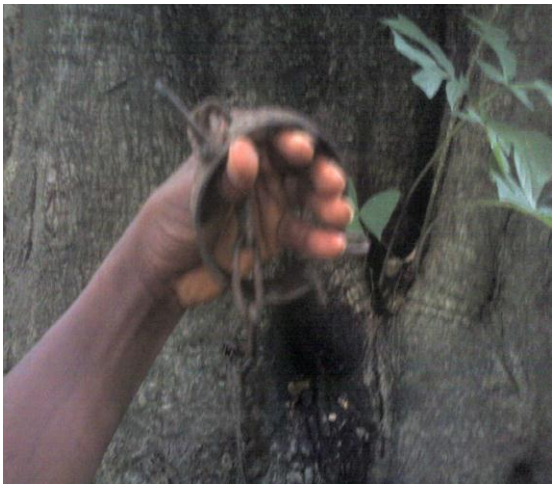

Figure 3D4: Some locals try on myself

Figure 3D5: Chains and drinking pot used to keep slaves at sales points

Figure 3D6: The rock enclosure in which slaves were kept in the forest and prepared for sale

Appendix 3E: A Community Information Centre

Figure 3E1: School children within that community who do not have ICT laboratory in their schools come to the community information centre for ICT lessons

Figure 3E2: ICT classes in session at the community centre

Figure 3E3: Some elderly citizens from the community also come for ICT lessons

Figure 3E4: Inadequate equipment at the community information centre

Appendix 3F: The state of equipment in the ICT laboratory of a major College of Education

Figure 3F1:ICT Laboratory at a major College of Education

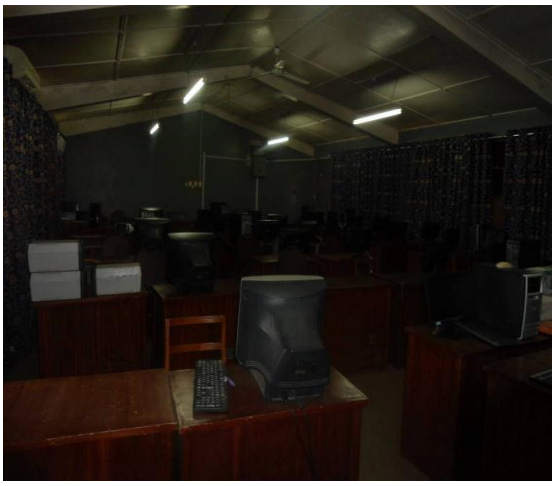

Figure 3F3: Computers in an ICT Laboratory of a major College of Education

Figure 3F2: Broken down computer are parked away because of high cost of repair. There is also lack of modern equipment.

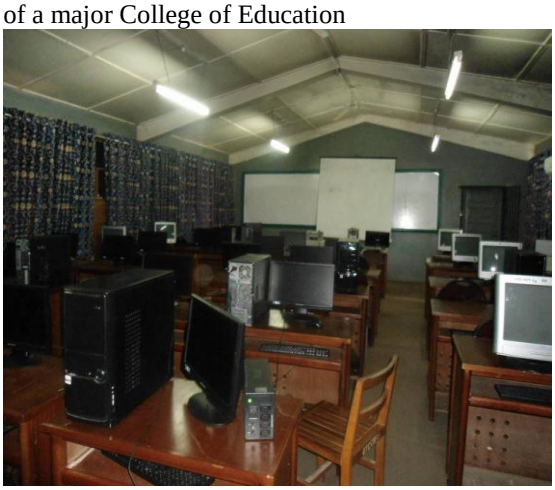

Figure 3F3: Only few of the computers are working. There is also no internet connectivity.

Source of photos: Researcher's own collection