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2015-05-29
University of Ghana
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THE STATE OF DIGITAL HERITAGE RESOURCES MANAGEMENT IN GHANA

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Abstract

In this paper, we discuss the state of digital heritage resources management in Ghana. The paper is based on a PhD research that explored contextual factors that were either enabling or hindering the management and preservation of digital cultural heritage resources in Ghana. The research employed an interpretive case research design. Data was drawn through semi-structured interviews with 27 key stakeholders from 23 institutions in Ghana. The term Digital Preservation Management (DPM) was used to refer to all the procedures, technologies, information infrastructure and processes involved in the general state of digital cultural heritage resources management and preservation in Ghana. Four main clusters of contextual factors; attitudinal-related, resources-related, policy-related, and management-related factors were found to be influencing DPM in Ghana. Although the DPM innovation was not fully diffused in Ghana, related activities occurring at the base, middle and higher levels of the Ghanaian Social System were inadvertently fostering the adoption process. In addition to the study contributing to theoretical understandings in information systems research in a developing country context, it provides policy developers in Ghana and related countries in African with an empirical base for accelerating DPM adoption.

Introduction

Use of the new digital technology is fast developing and rapidly spreading to all sectors of the Ghanaian economy just like many other countries around the world. As indicated by Hinson and Sorenson (2006), businesses in Ghana are passionately embracing digital technologies. But the field of business is not the only area applying digital technologies in Ghana. The country is also experiencing the use of technology in the field of education (Martey 2004), and libraries (Alemna 1998, 2001; Alemna & Cobblah 2005). With the development of the Ghana ICT for Accelerated

Development Policy as a guide (Ghana ICT4AD, 2003), many other areas are also experiencing the application of digital technologies in Ghana. Now the increased use in digital technologies is affecting the creation, use and preservation of heritage records management and other cultural resources in Ghana, generating digital cultural heritage resources in the country heritage (cf. PRAAD, 2015; Ghana Tourism, 2009).

This development in Ghana is consistent with modern trends across the world where digital cultural heritage resources are proliferating in many countries. A challenge with the fast developing technology is that they become obsolete very fast, which can lead to loss of important heritage resources, especially those in digital forms. When loss of heritage is not checked, it can create gaps in future memories. Many countries have realised the importance of preserving heritage resources. As a result cultural institutions, particularly those in advanced areas are developing strategies to effectively manage and preserve their digital heritage resources and to establish national digital memories for their countries.

Although digital heritage resources are coming up in Ghana, the country does not seem to be effective in managing them. This motivated the lead author in this paper to conduct a PhD study that explored contextual factors that are influencing the management and preservation of digital cultural heritage resources in Ghana. The study employed an interpretive qualitative case study approach and was guided by the following research questions:

- What is the state of digital preservation management in Ghana?
- What contextual factors are influencing digital preservation management in Ghana?
- How do these contextual factors influence digital preservation management in Ghana?
- What are the key elements necessary for the development of an NDM for Ghana?

In this paper, we focus on only research question 1 to give an indication of the general state of digital heritage resources management in Ghana based on the perspectives of stakeholders. We begin our discussion with definitions of key concepts. This is followed by a brief overview of the study on which this paper is based, a description of the participants, their institutions and how codes were developed and assigned to specific interviewees. We then present the Ghanaian situation of digital heritage resources management by presenting the various Ghanaian cultural heritage resources available identified by the interviewees, and how digital heritage resources are being created. Following a summary of the main clusters of factors is a conclusion.

Key concepts

We define the key concepts and how these terms are used in the context of this paper as follows:

Digitisation. We adopt the Digital Preservation Coalition's (DPC) definition of digitation as the process of creating digital files by scanning or otherwise converting analogue materials. The resulting digital copy, or digital surrogate, would then be classed as digital material and then subject to the same broad challenges involved in preserving access to it, as "born digital" materials. Following this definition, we see digital materials as 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, 2012).

Digital Preservation. Refers to the principles, practices, methods, strategies and managed activities that ensure long term preservation for continued access to digital materials for as long as necessary (DPC, 2012).

Digital Preservation Management. In this study refers to all the procedures, technologies, information infrastructure and processes involved in the general state of management and preservation of digital cultural heritage resources in Ghana (Boamah, 2014). Where you see the acronym DPM in this paper, it is used to represent Digital Preservation Management.

Cultural Heritage Resources. We apply a recent definition of heritage by Cloonan (2015) as the perpetuation of culture through forms such as monuments, habits, artefacts, ideas, beliefs and oral and written communication that have survived and have been documented. Following this description we perceive cultural heritage resources as encompass all categories of tradition, including tangible and intangible as well as natural endowments and heritage resulting from armed conflict. Tangible cultural heritage can be movable (paintings, sculpture, coins, manuscripts, and formal heritage records), 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 (Cloonan, 2015, p. 19). Figure 1 summarises the various components of cultural heritage as discussed above. When these resources are documented and made available in digital forms, we obtain digital cultural heritage resources. Then they are subjected to digital preservation process.

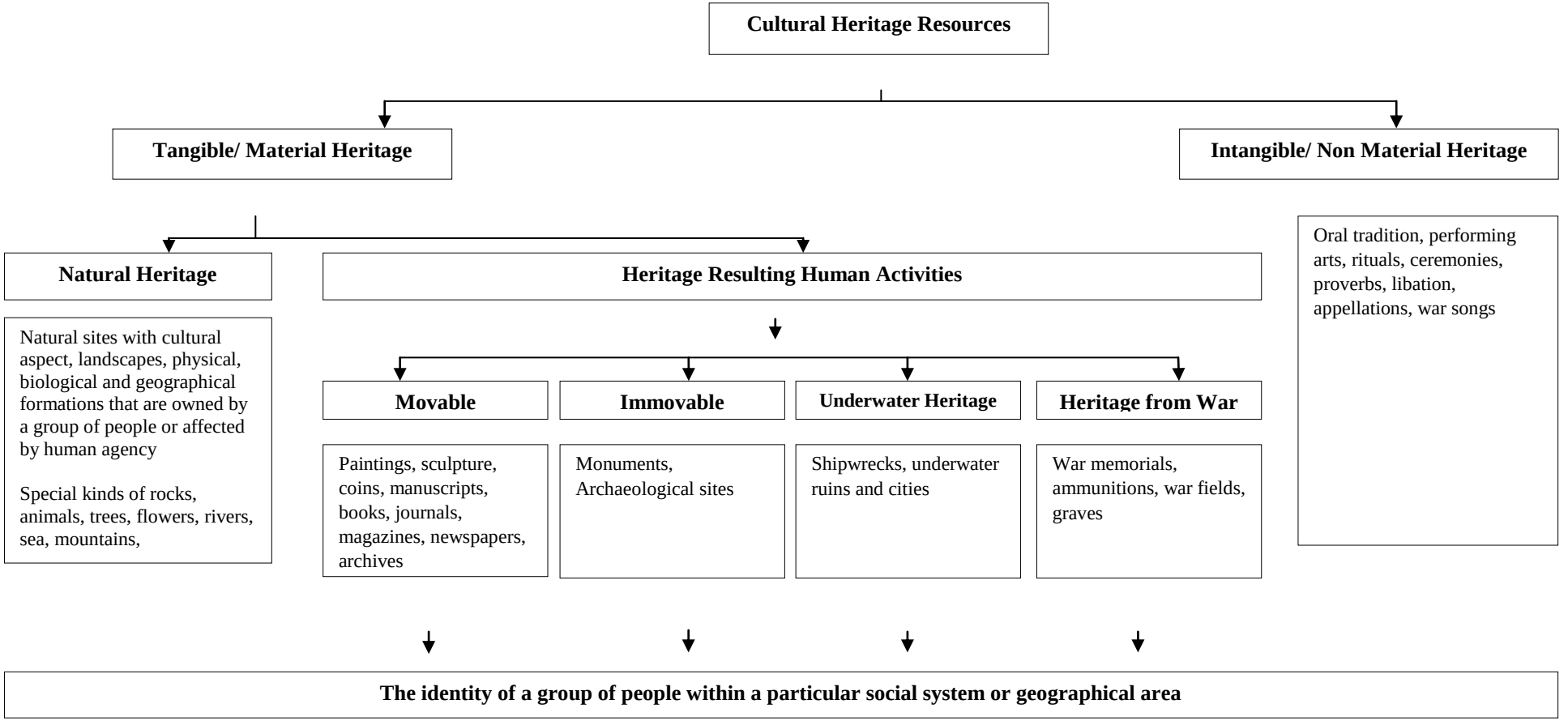


Figure 1: Classifications of cultural heritage resources

The study

The overarching aim of the research on which this paper is based, was to explore and understand the various contextual factors influencing DPM in Ghana. Rogers' Diffusion of Innovation (DOI) theory and Davice's Policy, Strategy and Resources (PSR) troika model were used together with factors from the literature to develop an initial model of factors to guide the research. The study was based on the views and perspectives of a cross section of key players in Ghana. The perspectives of participants were used as the basis to develop a model of four clusters of contextual factors influencing digital heritage resources management in Ghana.

A semi-structured interview technique using the snowball sampling technique was employed. Interviewees included information and cultural heritage experts, scholars, funders of information management and cultural heritage initiatives, school teachers who handled 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.

In all, 27 interviews were conducted. To facilitate coding, the interviewees were grouped into five categories based on their institutions. Table 1 shows the institutional categories of interviewees and their codes.

Interviewees	Code	Number
University Lecturers	UL	4
People from Cultural Institutions (Libraries, Archives, Museums, Chiefs' Palaces)	CI	8
ICT Teachers/ Managers	IT	4
People from Ministries and Agencies / District Assemblies	MD	7
NGOs/Private Institutions	PI	4
Total Number of Interviewees		27

Table 1: Institutional categories of interviewees and their codes

The Department of Information Studies (DIS), University of Ghana, is the main institution that educates information professionals in Ghana. From DIS, four lecturers were interviewed and labelled 'UL'. Specific interviewees from DIS were therefore UL1, UL2, UL3 and UL4. There were eight

participants from the different cultural institutions. Interviewees from cultural institutions were labelled 'CI'. So there were CI1 through to CI8. Participants from various institutions where ICT education and/or its management take place were labelled 'IT'. They included ICT teachers and managers. There were 4 IT interviewees: IT1, through to IT4. Participants from public institutions such as the ministries, departments, agencies and district assemblies were grouped together and labelled 'MD' resulting in MD1 through to MD7. The label 'PI' was used for participants from private institutions and Non-Governmental Organisations. There were 4 PI interviewees: PI1, through to PI4.

Two main categories of institutions represented were represented by interviewees. One group was from the urban areas, where access to information and facilities was relatively easy. The other group of institutions was from rural areas where access to these facilities was relatively difficult. In the next sections, we present the interviewees' comments in a letting-the-data-speak-for-itself fashion to give their impressions about the state of digital heritage resources management in Ghana.

Ghanaian Cultural Heritage Resources

Eleven interviewees from 10 rural institutions and 16 interviewees from 13 urban institutions participated in the interviews. Interviewees' comments showed that the majority of institutions from both sides of the rural-urban divide were either already dealing with digital materials of some sort or were in various stages of converting their records into digital forms. But before we discuss the digital versions of the heritage resources, let us first look at the physical Ghanaian cultural heritage resources in general.

Ghana has varied forms of cultural heritage resources (see Figure 2). These heritage forms, according to interviewees, can be pulled together into a repository and managed to form a memory for the country. Heritage resources in the rural areas were mostly of the ancient and immovable types. A native of Kintampo 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).

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 instance, according to CI1, the Ghana Museums and Management Board has a lot of forts and castles 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.

An interviewee from the centre for national culture did not just describe the Ghanaian cultural heritage his institution was managing and preserving, but also emphasised 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 Ashantis 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 a threat of losing important heritage resources. For example, an expert in cultural knowledge, who was also an academic at the University of Ghana, 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 some interviewees however, regular performances and celebrations of cultural practices can be used in place of documentation to keep the oral heritage resources alive. For instance a manager at a cultural centre acknowledged that the lack of cultural documentation could cause the loss of important heritage resources and described how some near extinct heritage performances were salvaged:

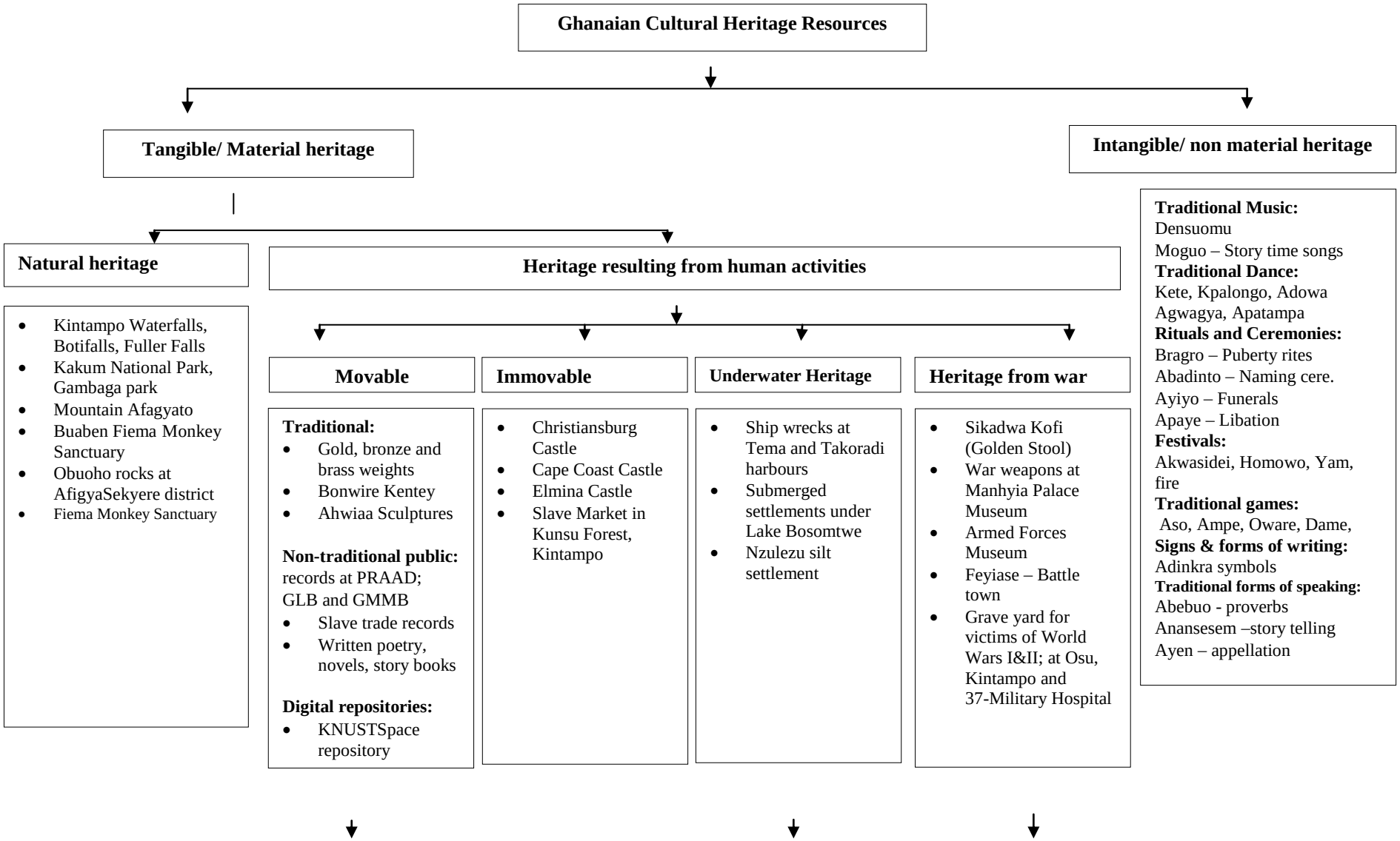
> Last year we had the privilege of the 10th anniversary of Otumfuo [title of Ashanti kings] where through his own request we brought onto the Apatakesie [the biggest auditorium] stage about, 15 of these almost dying traditional musical forms. We went searching for them and performed to the delight of 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 revealed why documenting heritage resources was important. For example the centre for national culture have started recording some of the cultural performances in audio and video formats and also in pictures because they believe that it is only through documentations such as these that the heritage resources can best be preserved for future generations.

Another interviewee described why 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).

Thus, different forms of heritage documentation were happening in most institutions in Ghana, generating different types of cultural heritage resources including both physical and digital forms as shown in Figure 2 below.


Ghanaian Cultural Heritage Resources
Tangible/ Material heritage
Intangible/ non material heritage
Natural heritage
Heritage resulting from human activities
Kintampo Waterfalls, Botifalls, Fuller Falls
Kakum National Park, Gambaga park
Mountain Afagyato
Buaben Fiema Monkey Sanctuary
Obuoho rocks at AfigyaSekyere district
Fiema Monkey Sanctuary
Movable
Immovable
Underwater Heritage
Heritage from war
Traditional:
Gold, bronze and brass weights
Bonwire Kentey
Ahwiaa Sculptures
Non-traditional public: records at PRAAD; GLB and GMMB
Slave trade records
Written poetry, novels, story books
Digital repositories:
KNUSTSpace repository
Christiansburg Castle
Cape Coast Castle
Elmina Castle
Slave Market in Kunsu Forest, Kintampo
Ship wrecks at Tema and Takoradi harbours
Submerged settlements under Lake Bosomtwe
Nzulezu silt settlement
Sikadwa Kofi (Golden Stool)
War weapons at Manhyia Palace Museum
Armed Forces Museum
Feyiase – Battle town
Grave yard for victims of World Wars I&II; at Osu, Kintampo and 37-Military Hospital
Traditional Music:
Densuomu
Moguo – Story time songs
Traditional Dance:
Kete, Kpalongo, Adowa
Agwagya, Apatampa
Rituals and Ceremonies:
Bragro – Puberty rites
Abadinto – Naming cere.
Ayiyo – Funerals
Apaye – Libation
Festivals:
Akwasidei, Homowo, Yam, fire
Traditional games:
Aso, Ampe, Oware, Dame,
Signs & forms of writing:
Adinkra symbols
Traditional forms of speaking:
Abebuo - proverbs
Anansesem –story telling
Ayen – appellation

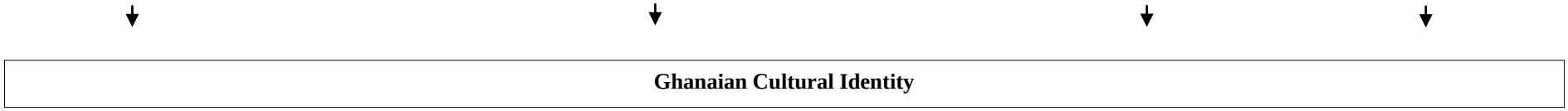


Figure 2: Specific Cultural Heritage Resources in Ghanaian

The types of cultural heritage resources appearing in the interview comments to be in Ghana as shown in Figure 2, were consistent with the classes of cultural heritage materials identified in the literature as shown in Figure 1.

Digital heritage resources creation

Digitisation activities were being undertaken at different levels by various institutions. The digital versions of heritage resources existing in Ghana 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.

The interview comments showed that in spite of their lack of resources, many rural institutions were generating digital records in Ghana. A broadcasting journalist from a rural radio station, for instance, said, any time they conducted interviews on their radio programmes, their technician will record the interviews using computer software programs such as Sound Forge and Nero Wave Editor. After that the technician burns the recorded interviews on CDs and keeps them in the radio station's library (PI 2). Thus, being in a rural area did not prevent some Ghanaian institutions from creating and managing digital materials. A museum manager at a traditional palace also expanded on the tools some rural institutions used and the criteria they were following to digitise heritage materials:

> 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 the study, appearing even in underdeveloped communities of Ghana. Another interviewee from a rural institution explained that "people were 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 (PI 3).

There were indications of some advanced use of digital technologies in the urban areas. Some academic institutions had created institutional repositories to manage their research outputs in digital forms. For instance a manager of a digital repository in a leading university library described their repository this way:

> 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 the advanced areas where there are achievements in DPM progress, cultural institutions such as national libraries, national archives and museums have been in the forefront. Unfortunately however, the various national cultural institutions representing national archive, library and museum in Ghana that should be leading the management and preservation of the country's heritage resources in all forms, were neither having any digital resource to manage nor modern equipment to create digital materials. Managers from two main national cultural institutions said these about the state of their institutions in relation to digital resources management:

> 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).

From the comments above, and from what we observed about the state of affairs during fieldwork, cultural institutions in Ghana did not seem ready or capable to handle the creation and management of digital resources any time soon. In fact, in one of the institutions, records of national importance were packed on the bear floor without even a carpet. Some hope of a future digital project could however be seen in the comment below for one of the national cultural institution:

> 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).

Comments such as the one above cause one to want to find out what inspires Ghanaian institution to digitise.

Motivations for digitising

Various Ghana institutions were exploring possibilities to have their materials digitised. According to the interview data, the motivation for most rural institutions to digitise was to preserve their recorded information. Majority of the interviewees from rural institutions said their main motivation for saving information on the computers and then burning them on other storage media was for future reference. A manager in charge of the digital materials in a rural institution for instance 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).

Another factor that was motivating Ghanaian institutions to digitise was the need 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 more people to see what they have. For example, a museum curator revealed that their 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 the interviewee was because each digital object will have the dating and information with it to make reading easy (CI1). A manager of an institutional repository also 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).

In consonance with what an academic expert said earlier, a director of a cultural centre of national significance 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 access to the original stories through pictures and videos in order to project their true sense of identity.

There were institutions in Ghana who were trying to digitise with the dual motives of preserving as well as creating access to the materials. This comment by a museum manager was one of the examples of the many remarks 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 could 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 digital preservation management in Ghana. One of the interviewees who was solely in charge of managing the digital materials in a rural institution, explaining how he managed and preserved the digital records of his institution said:

> 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 questions as to whether there were any laid down strategies for these digital activities that were springing up among Ghanaian institutions and whether the various institutions had any guiding policies.

Guiding policy for digital preservation management

While different DPM activities were being undertaken by both rural and urban institution, there was no unified policy or strategy to guide the digital activities that were going on. Some urban institutions appeared to have some form of guiding policies, but it was clear that key people within those organisations were not even aware of the existence of any policies. Ghana has developed an ICT policy and was ensuring its implementation at different levels of the country's economy. The focus of Ghana ICT for Accelerated Development Policy (ICT4AD) was to ensure ICT get to every part of the country to benefit especially those in the rural areas. But concerns were whether the policy had been fully understood by these stakeholders even in the urban areas. When asked about their awareness of the ICT policy, interviewees revealed that most Ghanaians were not aware that a policy like that existed.

One respondent for instance said, "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). 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. Interviewees who had heard about the policy were neither sure of its content nor could say what exactly the policy's specific objectives were. They did not believe in the effectiveness of the policy to achieve its purpose. In the perspectives of interviewees, there were insufficient resources and proper management to make the policy effective. An ICT teacher from a rural senior high school 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).

The interview data showed that the ICT policy was not in any way guiding the digital activities they were being undertaking in their various institutions. For instance, although a massive digitisation project was far advanced in one of the public universities. The manager in charge of that project said he did not see how the Ghana ICT policy had had any influence on their project because his institution was not getting any support from government.

The interviewees felt that the Ghana ICT4AD policy is beset with many weaknesses that were hindering the policy from performing as a fully-fledged national digital strategy like similar strategies in countries such as New Zealand that have achieved progress in DPM. Another ICT instructor from an urban high school said:

> 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).

Coming from a government department responsible for the implementation of the policy, another interviewee 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 this research was appropriate. Ghanaian decision makers were only just beginning to consider what content should go into a national digital cultural heritage infrastructure. Such content can come from the various institutions within the country.

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 creation, management and preservation in the country.

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. Most urban institutions had some form of policies to guide their activities. For example, a university librarian 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, a curator 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 the above 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, most of the rural institutions neither had any policies designed by them nor drew from a general one to guide their activities, although interviewees' comments showed that they were also generating some digital materials. An interviewee from a rural institution 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:

> 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 the institution described in the comment above 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, the interview data revealed that Ghanaian institutions faced specific challenges in creating, managing and preserving digital materials.

Issues affecting the management of digital materials

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. An ICT teacher for instance, revealed that because his institution had no form of funding, it was forced to levy students for ICT fees each year. An archivist also lamented that his institution do not appear to see any antidote to the financial problems they were facing:

> 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. A records management expert 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.

His view was strongly supported by the comments a University librarian who thought 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).

Another records management professional also believed that if Ghanaian stakeholders valued information and records management, financing projects in these areas would not be a problem:

> 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. Comments by a principal archivist from a university's archive, agrees with claims above. 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-conditions, 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 a lecturer in information and records management, decision makers and policy developers only showed seriousness in areas that interest them; and that is where they liked to provide financial support. 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 and the lack of infrastructural resources. Others were worried that their institution lacked equipment and the few computers and accessories they had were not adequate for them to manage ICT related issues. Interviewees rationalised that if these are the challenges people face at the head offices, then one can imagine what goes on at the grassroots in the rural areas.

A manager in a cultural institution 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 underscored that Ghana as a country lacked a key DPM resource in the form of a national library. A lecturer in library studies expressed:

> 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).

The 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 this assertion and illustrated that there was a wide gap between rural and urban Ghana. An official from an institution in charge or deploying ICT to rural communities for instance confirmed that most of the rural areas do not have access to electricity at all and where they do, it is not constant, making use of ICT very difficult.

Also, commenting on human resources, knowledge and skills, a manager of the records in a health institution revealed 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).

Further to the above comment, another ICT tutor 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. Similar concerns were expressed by an ICT manager at a district office who described the conditions of his district as having few learning centres and libraries with no computers, no cultural institutions, 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 managing cultural heritage in the country.

Through our analysis of the interview data, we found that the multidimensional 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. The multidimensional nature of the Ghanaian social system resulted in the structuring of the various DPM related activities into layers of actions. These layers of activities 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 was a complex idea rather than one of the simple technological products, systems or services which are common in many other applications of the diffusion of innovation theory which was used as one of the underlying theories in the study.

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, Ghana Library Board, Ghana Library Association, Ghana Museums and Monuments Board and Ghana Investment Fund for Electronic Communications were also involved in DPM related activities. In Figure 3 below we illustrate the different levels of approaches and activities relating to DPM in Ghana and the groups that were participating at those levels.

Level	**Activities**	**Participants**
High Level	Development of ICT Policy	Top decision makers, national DPM institutions
Middle Level	Awareness creation on the use of digital	Traditional leaders, opinion leaders, custodians of the culture,

	technologies for cultural preservation	private institutions
Base level	Education on ICT and Culture	Teachers, rural and urban people and schools children

Figure 3: 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. Figure 3 only gives an indication of the different examples of activities and national approaches that were going on in Ghana. 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 interests in various aspects of DPM such as using digital technologies to document aspects of the culture. These base level activities were fostering the innovation adoption process from bottom up.

Summary of factors influencing Digital Preservation Management

The study on which this paper is based identified four main clusters of contextual factors. The discussions in this also reflect aspects of those four major factors in the areas of attitudes, resources, policy and management related factors. In this section, we only provide a summary of these factors from the above discussions.

Attitude-related factors

There are some positive attitudes in Ghana towards DPM. Some stakeholders have some interest in the new digital technologies, others appreciate the Ghanaian culture. There is also some willingness and desire to safe-guard heritage resources for the future. There positives attitude can lead to faster learning, understanding and adoption of ideas about digital preservation management. But there are also negative attitudes such as general lack of interest in information management and its related institutions, poor information culture, disregard for documentary information, lack of political-will and the poor perception that Ghanaian stakeholders have for information and records management. These negative attitudes were hindering the adoption of DPM in the country.

Resource-related factors

There is broadband Internet connectivity in Ghana. There are also institutions who can manage digital heritage resource in Ghana. There are also funds which when managed appropriately, can be

channelled towards development of DPM initiatives, if the desire is there. The availability of these resources can enable DPM. But other negative contextual issues are making the application of these resources to ensure effective DPM challenging. There is limited access to ICT. Where there is access, lack of skill personnel and capacity is a challenge. Although there is a broadband Internet connectivity, it is not 'broad' in Ghana in that it is very costly and limited only to the main cities. There is lack of basic communication infrastructure and there is inadequate funding. Above all constant power cuts make the resources challenges even more complicated, hindering the rate of adoption of DPM in Ghana.

Policy-related factors

The development of the Ghana ICT4AD policy is an enabling factor for the adoption of DPM in the country. However, there are many deficiencies in this policy. For instance, the policy has not been able to achieve the goals and milestones it specified. None of the strategies accompanying the policy relate to information management or DPM. The absence of effective and complementary DPM policies is hindering the rate of adoption of the innovation in Ghana.

Management-related factors

The lack of effective leadership and the low level of staff motivation were evident. Inadequate capacity of institutions in terms of the staff and resources needed for DPM in Ghana was the result of poor leadership and management practices. Where there was capacity, the interviewees revealed that corruption and ineptitude on the part of both corporate and traditional leaders were acting as barriers to DPM. Interference by political leaders was also a problem that was holding back DPM initiatives initiated by their opponents.

Conclusion

Ghana has varied types of cultural heritage resources include those in physical and digital forms, which can be pulled together into a repository and managed to create a national memory for the country. The digital forms of heritage materials are rapidly proliferating in Ghana in recent times and Ghanaian institutions are providing management of some sort to these digital resources. Various Ghanaian institutions were undertaking digital activities. Although the institutions did not appear to have digital preservation intentions, their activities were inadvertently leading to digital preservation management. The general state of digital cultural heritage resources management in Ghana is beset with various challenges. The study participants, who were selected from various institutions that deal with cultural heritage resources and ICT management as well as government ministries and

departments, revealed through their interview comments that various issues are affecting heritage resources management and preservation both at the institutional and national levels.

Ghana has a national ICT for accelerated development policy. But this policy does not focus on the management of recorded information. There are also no national strategies designed for digital preservation management. The Ghana ICT policy has problems that hinder the achievement of the policy goals. The majority of the institutions in Ghana do not have any institutional policies to guide their digital activities. Majority of stakeholders are not aware of the Ghana ICT policy. There are insufficient resources; infrastructure, equipment, and skilled personnel are very limited. There is a gap between technology use in rural and urban areas of the country. This difference is the result of the lack of development in the rural areas. The Ghanaian perception of information management and cultural institutions is not encouraging. There is disregard for value of recorded information.

Notwithstanding certain negative attitudes to toward digital preservation management, many Ghanaians, particularly the youth are very interested in ICTs. This interest is enabling the use of the technology in all aspects of the society, including information management. The majority of Ghanaians are also motivated to preserve their cultural heritage. This interested and motivation can be translated to enhancing digital preservation management in the country. Most of the existing Ghanaian cultural heritage resources would provide content for a national digital memory for the country. But Ghana does not have such a national memory due to challenges hindering effective digital preservation management.

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