

## **DIGITAL PRESERVATION IN THE CONTEXT OF INSTITUTIONAL REPOSITORIES IN PUBLIC UNIVERSITIES' LIBRARIES IN GHANA.**

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### **Abstract**

Long-term preservation of digital collections is an integral task for institutional repositories. It ensures that the digital intellectual output of the library is preserved for future access. Digital preservation has been recognized as a complex process, and there are still many unsolved issues which makes it a challenging task for institutional repositories. As such, this paper is aimed at identifying and discussing the issues and challenges of digital preservation facing institutional repositories in public university libraries in Ghana. The study was qualitative. Data used for analysis were drawn from respondents from public universities who had developed institutional repositories to capture, maintain and disseminate their information in the digital form. The key finding of the study was that, although the universities had established institutional repositories to capture and maintain digital collections, existing digital preservation methods and systems were inadequate and could lead to consequences such as denial of access to their digital collections or total loss of information. Recommendations based on findings included the development of comprehensive digital preservation policies to provide mandate and direction to preservation of the libraries digital collections.

**Keywords:** Digital Preservation, Institutional Repositories, Public Universities, Libraries, Ghana.

### **Background**

The development of networked communication and digital technologies has radically changed how researchers create, distribute, and access scholarship. The speed of dissemination and ease of access to scholarly material has never been faster or easier (Oehlerts & Liu, 2013). As our world becomes increasingly digital, libraries started digitization projects to make their holdings available to their users and to develop new library services (Dubirisky, 2014). This transformation of traditional libraries into their digital variants is the establishment and growth of institutional repositories (IRs). IRs are mainly described as the aggregation of scholarship reflecting the range and scope of intellectual output generated by the community of scholars affiliated with any single academic institution (Brown & Abbas, 2010). For this study, IRs are digital collections that capture and preserve the intellectual output of a single or multi-university community (Crow, 2002). IR is a new but important area within the educational landscape. IRs have been noted not only as constituting an integral part of present day libraries but also as tools that make it easier to disseminate and share

research output to support the open access goal of scholarly communication. In fact, in addition to users who find information more easily, the potential benefits of IRs extends to institutions which increase their research profile, and funders, who see wider dissemination of research outputs (Rafiq & Ameen, 2012).

Juan (2012) and Mapulanga (2013) have however observed that a major challenge to the success of every instructional repository is the preservation of content in the repository. According to Gbaje & Zakiri (2013) one measure of the success of an IR is its ability to provide long term access to its holdings. Achieving long term access in the IR is dependent on effective and efficient digital preservation practices. This Ezeani & Ezema (2011) indicated is because the notions of accessibility and integrity of digital information are central to the process of digital preservation (DP). DP has been defined as the ability to keep digital documents and files available for time periods that can transcend technological advances without concern for alteration or loss of readability (ALA, 2007). Thus, the goal of DP is to maintain the ability to display, retrieve, and use digital collections in the face of rapidly changing technological and organizational infrastructures and elements. The problem however is that, although, academic libraries all over the world are establishing IRs resulting in the digitization of their collections, long-term DP as a broad and evolving facet of digital asset management is often overlooked by library administration and understated in library operations (Amollo, 2011). Baro (2010) complained that digital preservation has not been embedded as an integral part of IRs workflow and there is neither much experience nor commonly agreed best practice as to how DP is best performed. Eke (2011) advised that institutions with growing digital collections and institutional repositories need to address this topic. Consequently, this paper aims to discuss the current situation of DP as well as issues and challenges faced in IRs of public universities in Ghana.

## **Literature Review**

### **Digital preservation in Institutional Repositories**

Since the advent of IRs, issues of long term preservation have been an inherent weakness in most academic institutions in the world and especially in Africa. This according to Vrana (2006) when not addressed will in future erode the credibility and goals of IRs. Baro, Oyeniran & Ateboh (2013) have observed that a significant barrier for IRs in developing and emerging economies in achieving their obligations is the ability to preserve the digital content in order to provide long term access to its patrons. This challenge, Lorie (2001) indicated, tops the list of problem areas in the development and maintenance of IRs. Malik & Mahmood (2011) argued that posting intellectual assets into institutional repositories requires that all are able to trust the ability of the repository to secure the information over the long term. Unfortunately, DP has not being accorded much consideration and support in IRs (Swanepoel, 2013). Digital preservation is a complex process and there are many unsolved

organizational, managerial and technical issues that make it a challenging task for those managing IRs. The focus of many repository activities to date has been on creating repositories, depositing content, promoting discovery and access and/or encouraging the necessary cultural change but not on DP. Lending credence, Baro, Oyeniran & Ateboh (2013) have noted that the longevity of digital objects is usually taken for granted by many institutions, and are often perceived as a needless or less significant task. As such, although the need to have long term access to information in the IRs is understood, DP management practices are not considered as priority areas and invariably ignored.

### **Contextual Setting**

Digitization activities, including participating in collaborative digitization projects and creating digital collections began in Public Universities in Ghana in the late 2000s. Materials digitized and made available to patrons include, heritage materials, journals, reports, research articles, and university readers among others (See Appendix 2). Documents and images submitted by faculty and students are usually born digital; whilst all others are digitized in-house. In addition to providing access for research and scholarship, IRs in the public universities are committed to archiving and preserving these materials for perpetual access. These IRs are coordinated or administered through the university's library.

### **Research Objectives**

The study's objectives were to:

- Examine the authority and practices in IRs for the long term preservation of digital documents, including IRs staff and their competencies.
- Assess the level of management support for digital preservation of IRs
- Make appropriate recommendations based on findings of the study.

### **Significance of the Study**

The findings of this study are expected to point out various measures that can be adopted to strengthen DP as a critical component in scaling up IRs. The study will also provide an insight into the importance of DP and as a result assist management of IRs to plan and make decisions concerning preservation of their IRs. Furthermore, it is intended to draw the attention of policy makers' in the selected universities to the importance of DP and to consider DP as a pre-requisite in achieving IRs objectives. Finally, this study is intended to add to existing literature on the topic.

### **Methodology**

The study was purely qualitative, and as such the case study design was adopted. Three public universities from three regions in Ghana were considered as the cases for the study. These comprised the University of Ghana in the Greater Accra Region, the Kwame Nkrumah University of Science and Technology in the Ashanti Region, and the University of Cape Coast in the Central Region. These were considered because statistics shows that they were the first public universities to develop IRs in Ghana. The study population comprised of three (3) respondents purposively drawn from the universities. These respondents were selected because the researcher was informed that they were in the best position to provide the required information to answer the study's objectives. The respondents comprised of individuals who were designated as 'heads' of the IRs. Data used for analysis were obtained using face-to-face and telephone interviews (See Appendix 1). For the sake of anonymity and confidentiality, the names of the interviewees are not mentioned but denoted with the letters of the alphabet: XX, YY and ZZ.

## **Findings and Discussion**

Data obtained from interviews have been analyzed using qualitative approaches. The researcher presents and discusses the findings under the following themes:

- Background Information
- Digital Preservation Activities
- Staff Qualifications and Training
- Management support

### **Background information**

The study revealed that even though all the three universities use DSpace as the IRs software, none of them had a department for the purpose of long term preservation of the content in the IRs. This findings collaborate studies which found out that most IRs in Africa use the DSpace software to create the IRs (Hockx-Yu, 2006; Ekoja & Gbaje, 2012) but usually do not have dedicated sections for DP activities (Decman & Vintar, 2013; Voutssas, 2013).

### **Digital preservation activities**

Questions here were geared towards policy issues and preservation practices in the IRs. In relation to the availability of DP, all the interviewees indicated that apart from their general IRs policies which had a section on preservation there is no separate policy or any other policy on long term access to the content in the IRs. Even at that the respondent from XX made the following comments:

...we don't have a comprehensive policy or guidelines for preservation, and we actually not using the one that we have in the IRs general policy. To me, the policy is just a Nice Paper not been utilized at all.

This finding concurs with studies which have found out that most organizations have developed policies for their IRs but do not have comprehensive DP policies to serve as guidelines for ensuring continues access of documents in the IRs (Li & Banach, 2011; Becker & Rauber, 2010; Ezeani, 2009).

When asked to indicate activities that were consider part of the scope of the DP function, respondents mentioned: backup issues, transformation/migration of formats, file format identification, server management, space management, secure storage management, technology watch, development and maintenance of tools, development of preservation policies and strategy, preservation education, training and outreach. This indicates that the respondent had knowledge on issues concerned with DP.

Questions were also designed to elicit information about the scope of preservation efforts in the IRs. This was focused on the amount of digital content each IRs was preserving and expected to be preserving in the near future. the responses from the interviewees showed that apart from the respondent in ZZ who knew how much space (2TB) the IRs had for its digital content, the others (XX an YY) were not sure of the space available. On additional backups available in the IRs, all respondents indicated that they had backups for their IR documents. The backup devices included external hard disk, CD-ROM, and double layer DVD's.

Furthermore, the study revealed the absence of written disaster plans for protecting their digitized content in case of any disaster. When asked how soon respondents think the IRs can bring the backup their systems fully in case of any system failure or catastrophic natural or manmade, respondent gave different maximum recovery periods. For XX-within 48 hours, for YY- within 24 hours and for ZZ- within 6 hours. They however mentioned that this time periods will work when there is access to power and internet. When asked to estimate the probability that contemporary digital documents in the IRS will still be available and usable in the future the respondent from XX lamented:

...if care is not taken we might lose all that we have in the future. We may not be able to access them anymore. Even now, once a while, something goes off and the whole data is gone. Some of the backups are also not very durable devices so sometimes it becomes very difficult to open or get access to the information served on them when needed.

The respondent from YY also made the following comments:

...the document will still be available in future, after all that is the reason for the IRS. But management must give us their full support to be able to achieve this. If they don't am afraid things will not go as we expected.

The respondent from ZZ also said:

...well my prayer is for us to be able to always make the IRs usable even in the next 500 years, but the IRs is managed and maintained by staff and I believe that to accomplish this aim we need dedicated staff who eat and drink IRs to make this happen.

Additionally, respondents were asked to indicate whether the long-term preservation of digital documents should be considered as an intrinsic task of libraries or not. With regards to this, all respondents agreed that it should be a task of the library. They explained that it is better for the library to train or hire its own staff to take up long term preservation of its IRs documents because in the long term, it will be cheaper in terms of cost, and the library will also have its own staff who will also be available at all time.

More also, responses obtained from the interviewees on how important respondent considered the long term access of digital documents in the IRs shows that the respondent regarded DP as an important element in IRs. This was for instance captured in the words of the respondent from YY:

...institutional repositories are developed to make access to information easier and to ensure future access. But this can only be achieved when there are efficient an effective mechanism put in place to preserve the content in the IRs. So there can't be an IR without Digital preservation.

Finally, respondents were asked to make suggestions regarding how the DP in the IRs and the IR as a whole can be enhanced to achieve its goals and objectives. The responses are listed below.

- Marketing of the IRs to faculty, students, the library staff and the world at large
- One person should not be given the whole IR work. There should be an IR librarian
- Staff should be given adequate training
- An official IR office should be made available

### **Management support**

### **Staff Qualifications and Training**

Questions here were asked to elicit information on: availability of staff with requisite skills and knowledge in DP, the desired qualifications of DP staff, and whether the organizations had any

programmes to train their existing employees to manage DP functions. Apart from the ZZ respondents who emphatically indicated that the IRs had qualified staff, the other respondents: XX and YY said that they did not have qualified personnel. The XX interviewee for instance complained:

...in fact when this IRs thing started, some of us had to learn the techniques on our own through exposure from outside the country and later through workshops and seminars. So we don't even have enough qualified staff of the IRs to be able to have some purposively for the preservation of its content.

Equally, the respondent from ZZ reiterated by saying:

... the staff at the IR are good, but in my opinion and experience do not have the required skills and expertise on what they are mandated to do. I think they should be trained properly including me, because as far as am concerned none of us has been trained.

Responses provided on qualifications respondents required DP staff should have were very interesting. First, all respondents mentioned that the staff should have at least: a degree in Information Technology or Computer Science, and diploma in archival studies and library studies. The respondent from XX however declared:

...for me even if you have the degrees I have mentioned without any outside exposure on IRs and DP I will not recommend you.

When asked why, the respondent explained:

...because, 90% of what I know about IRs and DP is form my education and exposure outside the country. There is no institution in Ghana that trains people in IRs management or digital preservation. The only library and archives school we have in Ghana is not also taking up this task.

The respondent continued:

...the only course in the Department which tries to teach DP is preservation of information resources which I remember I did when I was a student in the department, but I must say that the course does not teach us anything in DP. It was only on paper documents and microfiche.

Similar sentiment was expressed by another the ZZ respondents who said:

...the world is now going digital so I think that the only school in Ghana which trains librarians and archivists should also try to go digital by replacing most of its courses to suit contemporary job requirements.

### **Management support**

IR management is a function performed through the collective support of all individuals in an organization. In particular, successful IRs which includes DP programmes require commitment from management of the organization. As such, the researcher tried to find out whether there were any forms of management support as far as DP in IRs were concerned. Questions here were geared towards finding out whether there were dedicated budgets for DP, and if IRs staff were consulted on issues concerning their work. The study revealed that there were budgets for the IRs, but these budgets were factored into the overall budget for the library within which they operate. The respondents however complained that because IRs budgets are factored into that of the library, the facilities which are needed in the IRs have to compete with the needs of the division, and as such does not allow for peculiar IRs needs to be met. A respondent from YY for instance indicated:

...it is a challenge to have access to funds to be able to get some of the things needed for the IRs especially for preservation of its content. In fact, the lack of financial support for IRs activities is manifested in the inadequate facilities for digital preservation.

Also, research (Joo & Park, 2010; Elele & Fields, 2010) has shown that one of the factors which contributes to satisfaction and commitment of staff to their job is the involvement of the staff in plans that affect their work in one way or the other. On the contrary, the respondent complained that they were not often consulted by management on issues relating to their work.

### **Recommendations**

Based on the findings of the study, and suggestions from respondents, the following recommendations and strategies have been suggested to be useful in strengthening and improving DP practices in IRs in public university librarians in Ghana.

#### **Digital preservation activities**

The findings of this study revealed the need to strengthen DP as a vital instrument in IRs in public universities in Ghana. As such, management of the libraries should consider DP as a policy issue. In other words; there is the need for management of the libraries to develop comprehensive DP policies to provide mandate and direction to long term preservation of documents in their respective IRs. The study revealed that there were no plans for protecting digitized documents in the event of a disaster. Thus, it is necessary for the libraries to draw up disaster management plans for managing disasters



that are likely to occur. This can range from system failure, fires or flood etc. This plan should address the protection of vital documents, and risk assessment exercises should also be undertaken.

### **Staff qualifications and training**

Findings of the study revealed that the IRs do not have staff with the requisite skills, expertise and education in IRs and DP. Those already on the job should be given adequate on-the-job training in DP with available facilities to attend workshops and seminars on IRs and DP practices. IRs responsibilities should not be a one “man show”. The IRs should have IR librarians. Staff hired or deployed to the IRs should have some knowledge in IT.

### **Management support**

Top level management support should be provided to ensure that DP in IRs is a success. If possible, budgets for managing the DP and the IRs as a whole should be separated from the overall budget of the library or otherwise be a dedicated budget that will also be channeled to IR activities. Staff involved in all activities of the IRs management should be consulted on issues concerning what they do.

### **Efforts from the Department of Information Studies**

If possible, the Department of Information Studies, University of Ghana, should revise the library and information studies curriculum to take into account digital preservation. This could be made possible through collaborations between the department and IT department in the university in the designing of courses that will help train librarians in DP.

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## **Appendix 1: Interview Questions**

### Background Information

Is there a dedicated digital preservation department within your library? If yes, please indicate the name of the department.

Which software solution do you use (or intend to use) for your institutional repository?

### Digital Preservation Practices

Does your library have any written guidelines for the long-term preservation of digital documents?

Which activities are considered part of the scope of the digital preservation function within at the IR?

How much online/offline storage space are you using for your digital content?

Please estimate the probability that contemporary digital documents in the IR will still be available and usable in future.

What additional backup provisions does the repository have against content loss or corruption?

Does the IR have an information disaster plan to protect its document?

In the case of primary system failure or catastrophic natural or manmade disaster, how soon can the IR bring the backup system fully?

Do you consider the long-term preservation of digital documents to be an intrinsic task of libraries? If no, why do you not consider the long-term preservation of digital documents to be an intrinsic task of libraries? In your opinion, who should take over this task? If yes, why do you consider the long-term preservation of digital documents to be an intrinsic task of libraries?

How important do you consider the long-term preservation of digital documents in the IR?

#### Staff Qualifications and Training

Do you have staff with the requisite skills and knowledge on the preservation of digital content?

What would you consider as important if you were hiring a new digital preservation staff in your library?

#### Management support

Is there any dedicated and adequate budgetary allocation for IR activities?

Is your unit consulted by management on issues concerning your work?

How is the long-term preservation of digital documents in the IR financed at your library?

#### Appendix 2: Homepages of the Public Universities IRs



