The challenge of managing electronic records in developing countries
Implications for records managers in sub Saharan Africa

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Abstract

Purpose – Electronic records management is new to most records officers and archivists in contemporary sub Saharan Africa. It transformed the traditional mode of recordkeeping and brought with it some constraints which records managers have to contend with if they are to remain relevant in the information society. This paper aims to examine the background of these problems as well as the strategies for e-records management in Africa.

Design/methodology/approach – Relevant literature on archives development in Africa, electronic records, information technology, and records management were reviewed and the author gathered much insight on electronic records management in a digital environment. These were applied to fortify the author's arguments.

Findings – The study shows that the major problems of e-records management in Africa are administrative and the technically induced challenge and the benefits of managing hybrid records in Africa can only be realized if the appropriate infrastructures, workable legislation and regulatory frameworks, adequate finance, and competent ICT personnel are available.
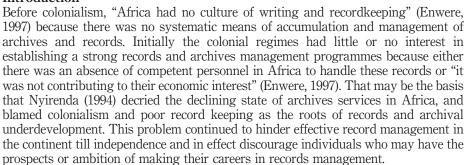
Practical implications – Introducing technological solutions to e-records management in Africa without first addressing those necessary preconditions would increase the vulnerability of public records and jeopardize public services in the continent.

Originality/value – The study highlights the potential problems and provides guidelines which information professionals and stakeholders in developing countries should adopt for successful implementation of e-records management.

Keywords Africa, Electronic archives, Electronic records, Records management, Information technology, Developing countries, Archives management

Paper type Research paper

Introduction

Before colonialism, "Africa had no culture of writing and recordkeeping" (Enwere, 1997) because there was no systematic means of accumulation and management of archives and records. Initially the colonial regimes had little or no interest in establishing a strong records and archives management programmes because either there was an absence of competent personnel in Africa to handle these records or "it was not contributing to their economic interest" (Enwere, 1997). That may be the basis that Nyirenda (1994) decried the declining state of archives services in Africa, and blamed colonialism and poor record keeping as the roots of records and archival underdevelopment. This problem continued to hinder effective record management in the continent till independence and in effect discourage individuals who may have the prospects or ambition of making their careers in records management.

Colonial environment
The failure of the colonial imperialist to enact strong and credible archival legislation in their colonies contributed to deficient physical facilities and marginalization of national archives and records. It led to inadequate archives and records management legislation and infrastructures in Africa. The level of development of records and archives institution was not encouraging as records management lacks international standard until independence.

Post-colonial environment
As soon as African nations were granted political independence, the state of records and archives management in most countries deteriorated progressively due to a number of factors: there was a massive growth in the number of personnel and a gradual slacking of work discipline and orientation to output (Tough, 2003); corruption and bribery invaded the bureaucracy and informal practices supplanted formal rules and efficient public administration was of secondary importance to providing employment (IRMT, 2004). While the civil service expanded steadily, bringing with it the proliferation of paper records, more formal ways of working gradually collapsed. There was increased recruitment into the public service and rapid promotion of inexperienced personnel which diluted the established tradition of good records keeping (Tough, 2003).

Consequently, institutions degenerated into making decisions without referring to records. There was little incentive to maintain effective record keeping systems or to allocate adequate resources for records storage. In some other cases, the failure to create and maintain effective records systems was motivated by the purposive desire to conceal financial fraud and other irregularities (IRMT, 2004). Staff had limited training or experience on record keeping work, and hence record management was allowed to deteriorate. Low morale and poor remuneration accompanied records managers and lowered their prestige, their status, and created a general lack of recognition of the importance of records as evidence. The national archives in many countries become marginalized with insufficient resources, deficient physical facilities and inadequate infrastructures.

This was complicated by the absence of rules and guidelines for what should be kept and for how long. In addition, staff was reluctant to authorize destruction of inactive records and in effect offices became severely congested with older records. Modern and international standard for records management practices have not been fully understood and introduced. The issues of archival underdevelopment in Africa have not been tackled by record managers and archivists in Africa before the emergence of digital records and this marked the roots of all the challenges and problems of effective e-records and e-archives management in Africa today.

The issues/information technology age
The entrant of ICT into records/archives management compounded this situation and made electronic record keeping practice in many African countries to be different from the methods they have been practicing. Commenting on this approach, Barry (n.d.) said that in a system where the basic strategy was to convert paper forms to an automated environment, where file management system predominated, and systems characterized by each units creating and managing its own files in isolation from other applications,

it was possible to devise a records management strategy based on capturing screen views and converting them to paper documents.

Today the culture of keeping and management of physical records is being taken over by records in electronic formats and as Wamukoya and Mutula (2005) noted sound recordkeeping practices are "increasingly being emphasized on and demanded to enhance performance, transparency and accountability in government". This revolutionary pressure is making the jobs of record managers and archivists in many organizations converge, and as the ICA Committee observed, they have served as a catalyst for series of changes in organizations, including: flattening the organizational hierarchy. They are eliminating middle management positions and delegating more responsibility to individuals and teams. It is replacing rigid administrative or bureaucratic units with flexible teams and work groups, and redefining the tools and business purpose of many organizations.

The major trend which has affected the way records are created result from the rapid penetration of microcomputers into the markets and into office environment of the government and the private sectors. Linked to this penetration are the development of local area networks (LANs) and the large area networks (LANS). Since then computer-based information systems and the internet are revolutionizing the ways business is carried out and the manner electronic record and archives is created, managed and accessed. It has led to the rapid and unprecedented proliferation of text and data files and the difficulty of inventorying, appraising and preserving these files "The penetration of technology has led to electronic information revolution and transformed the way people do their work" (Blais, 1995). It is leading to new practices of communication and new form of records management (Bearman, 1992). Information technology is redefining the nature of human interaction and imposing new forms of orality to social exchanges (Taylor, 1987). The twenty-first century is a decade that saw the emergence of networking and widespread sharing of information (Barry, n.d.). The interconnection of computing and telecommunications in vast networks has important implications for the ways records are created and maintained in developing regions.

Most writers on records management in Africa have revealed startling issues accompanying electronic archives and records management in the continent. Yahaya (2002) observed that computer workstations in government ministries and offices were generating enormous volumes of e-mail, word-processing documents, and automated databases, but the problem is how to preserve and manage the mounting plethora of these digital records. In a case study undertaken by Akotia (2000) in the Ugandan Ministry of Finance on the management of financial records, he found that throughout the ministry, ICT was considered an indispensable tool for enhancing productivity, but little attention was paid to the information management issues and to understanding the forces of change that affect the form and integrity of records created within an IT environment. Akotia further noted that the Ministry had neither the capacity for managing the basic elements of an electronic records programme, nor the staff who understood the functional requirements for record keeping; the competencies and skills needed to manage electronic information delivery systems; the legal and administrative requirements.

Commenting on this state of electronic records management in Africa, Mukotekwa (2002) pointed at the minimal activities on e-records management going on in many African countries. Mutiti (2002) observes that the technological infrastructure within

the region varies significantly from country to country, noting that computers were being used for word-processing, record control of holdings through databases including audiovisual collection. Mutiti (2002) also noted that the responsibilities for managing electronic records in Africa are not well defined. She cited an example in Kenya and Malawi, where individual departments took responsibility for managing their own records while in Botswana, Kenya and Zimbabwe this mandate was derived through the National Archives legislation. She revealed that apart from South Africa, which has put in place measures to manage, destroy and dispose of e-records through a disposal authority, the other countries did not have an explicit policy for managing electronic records.

The problem is that a lot of writers on records and archives management in Africa have revealed a terrible state of archives and records underdevelopment in the continent, but very few have carried an in-depth study or discussion on the impacts of information technology on electronic records.

In technologically developed countries, advances in networking and development of software that support complex information flows and collaborative work, has allowed more organizations the opportunities to adopt systems that not only process and store information, but also maintain the organization's records. In Africa, records managers are yet to capture the basics of electronic record management. Most offices use computers to assist in some portions of the organization's recordkeeping and are still producing more and more paper documents that are stored as "record copy". The issue now is: what factors are promoting this precarious situation in this twenty-twenty century Africa, and what are the ways forward? This article looks at those issues, challenges, and constraints involved in managing electronic records in sub-Saharan Africa and find some solutions.

Problems of e-records and e-archives management in Africa
Once one sets out on a wrong road, whether he runs fast or simply strolled, he cannot arrive at the intended destination. From the historical background discussed above, e-records management challenges in Africa is discussed in this paper under two broad sub-headings: administrative/management induced challenges and challenges imposed by information technology.

Administratively induced problems
Weak legislative and organizational infrastructures
In Sub Saharan Africa, there are cases of serious weakness of records management legislation, policies and organizational frameworks. For example, at independence many of the English speaking African countries patterned their archival laws and legislations in line with the old Canadian Archival Act which unlashed terrible confusions and consequently weakened archives and records management practices in the continent. For example, the archival laws and legislation in most countries was characterized by: allocation of few powers to record managers on many important issues. It made the record managers to have few or indirect say about what should be retained or disposed of, which deviated completely from the responsibilities clause in the ISO 15489 (ISO, 2001) which prescribes that records management responsibilities should be defined, assigned, and promulgated throughout the organization and delineates who is responsible for taking necessary action (ISO, 2001).

Secondly, in the inherited archival laws, there was provision for archives committee which has the power to determine what should be destroyed or preserved. Unfortunately, members of this committee were composed of political office-holders who were not trained in archives and records management and have little or no knowledge of archives management.

These weaknesses in early archival laws have some serious implications for archival underdevelopment in Africa till today. For example, it created conflicting scenario in the management of archives and records in Africa; made the powers to appraise, retire, dispose of, and or transfer records to the archives to be hanging. This problem was highlighted in a report by the ICA Committee when it noted that in Africa, relevant realistic and enforceable legislation was not in place. Instead, what existed was patchwork of national laws which do not provide a coherent recordkeeping regime, and consequently archives legislation regulates only the custody of archives. In the electronic environment, there would be limited chance of protecting records if the law excludes archivists from managing active records.

Inadequate ICT skills and competences
In most African countries records managers and archivists lack the fundamental skills and competences that would enable them to handle records in electronic environment.

Studies by Kemoni and Wamukoya (2000), Iwhiwhu (2005), and Egwunyenga (2009) confirmed that African records keepers lack the basic skills and competences for handling records and archives in the public sector. There is a serious problem of technophobia in most offices in Africa especially among the older employees. Due to inadequate skills in information technology, many traditional librarians, records managers, and archivists are very conservatives and have phobia for computers. This may be due to generation gaps between the new and old professionals which led analogue information managers to perceive computers as a threat to their status as experts. Ezeani (2010) in her studies observed that younger librarians are faster in capturing the use of ICTs than the older librarians because "older librarians are finding it difficult to cope with the requirements of the digital age". Also, Ojedokun (2008) noted that older librarians are "too reluctant to jettison the old practices for new one". Successful application of information handling technologies in the management of electronic records in developing countries requires an ability to overcome staff and personal resistance.

The practical situation today is that there are few or no country in Sub Saharan Africa where archivists and records managers have acquired all the basic skills and competences in readiness for electronic records management now. The reason was that while information technologies have brought enormous benefits to organizations, they have simultaneously introduced a number of challenges and difficulties and consequently increased the risks of losing data and records; risks to reliability and authenticity of e-records; loss of security and privacy, increased costs of managing record and decentralization of information; increased need for information technology specialists, and so on.

Growing use of information technologies in record management
In Africa and many developing countries governments are looking forward to computerizing their core functions and compelled most African countries to use ICTs

in their public services by adopting e-government. Regrettably these projects fail to succeed because governments neither assess the available information framework suitable for e-records management, nor consult the records mangers to determine how the process of automation will not affect the role of records managers in providing reliable and authentic evidence.

In Miller's (2004) view, "the conversion from traditional records keeping activities to electronic environment will not succeed [in Africa] if the underlying processes are not structured in an efficient and effective fashion". Many Africa states are jumping into the information technology bandwagon without adequately incorporating good records keeping strategies.

Low level of ICT literacy

Management of electronic archives and records in organizations may not succeed if the established policies and infrastructures are not supported by qualified and experienced records and archives personnel, and the existence of adequate and regular training of employees. In Africa, most records keeper and archivists are not professionally trained in records management, rather, they are recruited with their secondary school leaving certificates and from there, they climb up the ranks and become records managers either through promotion or by seniority without formal training in archives and records management. For example, Ugwunze (1992), Nwosu (1993), Nyirenda (1994), Wamukoya (1999), Kemoni and Wamukoya (2000), Wamukoya and Mutula (2005), Iwhiwhu (2005, 2010), Egwunyenga (2009), in their various research found that archivists and records managers in Africa obtained higher educational qualifications outside records management. Also Asogwa (2012) in his recent study on the electronic records management readiness of federal universities in Nigeria discovered that all the staff in the registry departments has never had any training specifically on records and archives management. Worthy (1984) and Mazikana (1992) also affirmed that the two major challenges facing archives and records institutions in Africa were inadequate personnel who are mostly not trained in archives and records management. This lack of proper training and low level of education made these personnel to suffer from declining monetary remuneration and low morale profile. The greatest problem of archives management in Africa is that it does not meet global standards. For example, the ISO 15489 (ISO, 2001), clause on training, states that any organization that is adopting the standard should "establish an ongoing programme of records training [. . .] that should encompass the roles and responsibilities of all members of management [. . .]"

Corruption or inadequate finance

Corrupt leaders in Africa do not provide adequate funds, facilities, and infrastructures for proper and efficient electronic recordkeeping. Instead, corrupt bureaucrats intentionally distort public policies, public records, decision-making apparatuses, and sometimes go to a length to transfer experienced records managers in a bid to create opportunities for embezzlement.

Bribery and corruption contributed to 90 percent of the underdevelopment of Africa and their ineffective records management institutions. For example, studies have shown that the African Union (AU) in September 2002 estimated that corruption costs African economies more than $148 billion dollars a year. Also Uneke (2010) quoted the

then president of the World Bank, Paul Wolfowitz to have disclosed (in *The Guardian* of October 30, 2006) that Nigerian leaders and officials had stolen more than $300 billion of the nation's wealth over the past years. The crux of the matter is that most of the times records pertaining to this heinous crime are concealed amongst the conspirators and perpetrators in the organized fraud. It only comes to light when there is crisis of confidence among them. Again Ayttey (2002) in Lawal (2007) cited a *French Weekly* of 1997 to have published the fortune which some African leaders have looted from their country's treasury as shown in Table I.

Lack of control or proper management of financial records creates opportunities for fraud. It leads to loss of control of revenue and impedes fiscal planning; makes decisions, actions and business transactions very difficult and impossible for auditing and incremental planning and development.

In Africa, the problem or causes of poor records management have links with bribery and corruption as most corrupt and fraudulent leaders would not permit accurate recordkeeping pertaining to finance so that they would not be linked with the crime. That may be the rationale behind missing files, misplaced or willfully destruction of vital records or finance offices in some government establishments in Africa. Reliable, trustworthy records and archives are the citizens means of determining whether revenue collected on their behalf is spent on services that benefit them. Unfortunately, record keeping in sub-Saharan Africa has been a low priority in governments. Instead, government leaders focus their energies on decisions and actions that benefit them and their party members.

Political instability
Lack of political stability accounts for majority of the development problems in the post-colonial Africa. The ethnic diversity of the continent, the linguistic differences (around 900 separate language groups had been identified in Africa) led to lack of continuity of development projects. National endeavors have been hampered by the internal conflicts and civil wars and at worst promotes anarchy as seen in Somalia, Sudan, Liberia, Sierra Leone, Congo, Libya, Burundi, Rwanda to name but these few. Political instability in Africa has frustrated every effort to sustainable records and archives management as vital archival buildings and their resources have been

S/N	President	Country	Looted in dollars
1	General Sani Abacha	Nigeria	20 billion
2	President H. Boigny	Ivory Coast	6 billion
3	General Ibrahim Babangida	Nigeria	5 billion
4	President Mobutu S.	Zaire	4 billion
5	President Mouza Traore	Mali	2 billion
6	President Henri Bedie	Ivory Coast	300 million
7	President Dennis N'gness Mbasogo	Congo	200 million
8	President Omar Bongo	Gabon	80 million
9	President Paul Biya	Cameroon	70 million
10	President Haile Mariam	Ethiopia	30 million
11	President Hissene Habre	Chad	3 million

Table I.
African past leaders and the levels of their involvement in corrupt practices

Source: Lawal (2007)

ravaged by war. Funds and other resources are diverted for execution of war and potential record and archives managers are ether killed or displaced. In addition, electricity, telecommunications and other information infrastructures that would have been used for archives and records maintenance and services are destroyed.

Poor funding
The costs of implementing efficient electronic records and archives management system are very prohibitive. Many studies worldwide have shown that in Australian national archives, for example, electronic records management programme was successfully implemented because over 80 percent of the budget was dedicated to staff training alone. This implies that for e-records and management programme to succeed in Africa, far-reaching financial and human resources measures have to be available to address these problems of constantly changing technologies.

Constantly changing technology and applications
Despite tremendous improvements in the capabilities and performance of information systems, the technology continues to evolve rapidly. The introduction of new processes and systems is driven primarily by market forces over which consumers have relatively little influence. Computer hardware and software manufacturers mostly in developing countries increase their market share by introducing new products with new features and enhanced capabilities. As a consequence, organizations or consumers are likely to upgrade their systems frequently and to completely change computing systems every few years if their records are going to be accessible and relevant in future.

The relatively short life of hardware and software has important implications for long-term preservation of electronic records in developing countries because of their backwardness in technological development. Organizations replace their systems when their supplier ceases to support an obsolete system or when new products offer advantages over older software. Transferring records from older proprietary systems called legacy systems to current technology may require substantial reformatting and restructuring of the records. Not only is such a process expensive, it may require substantial changes to the structure and format of the records that compromise their integrity as evidence

Examples, the 8 inch, $5\frac{1}{4}$ inch, and $3\frac{1}{2}$ inch floppy disks are hitherto rarely if ever used, even though they were the predominant storage devices for electronic records for decades. Today they are replaced with floppy diskettes, flash drives, and CD-ROM. Many software programs that were once extremely popular are also now obsolete.

The risk of technological obsolescence is further compounded by the harsh environmental conditions in Sub-Saharan Africa which is not conducive for electronic machines. Magnetic and optical media will deteriorate quickly when exposed to high temperatures, humidity and contaminants, often resulting in the partial or complete loss of electronic data.

A lot of financial involvement is required for maintaining records, the software and hardware if these resources are to be accessed in the future. Unfortunately, few African governments are willing to finance the maintenance of the technologies and the resources they house.

Overcoming technological obsolescence often requires frequent and perhaps considerable investment in financial, human and technological resources. Conversely, a

lack of committed resources will render any electronic records management strategy ineffective and unsustainable. If an organization is going to commit to using information technologies in records and archives management, it needs to guarantee that it will provide the resources needed to maintain and upgrade those technologies indefinitely.

Deterioration of digital media
Deterioration of digital media is responsible for the disappearance of, or inaccessibility of digital information in Africa. This is because media deteriorates or decays within few years after digitization. Vital records were reported to have been lost by many offices in organizations in developing countries and in Africa due to technological obsolescence of hardware and software (Cain and Thurston, 1996). For example, Cain and Thurston (1996) in Ngulube (2001) revealed that in Zimbabwe the Salary Service Bureau (a government department for processing civil servants salaries, allowances, and pensions) lost all the information which they created and preserved on computer tapes between 1980 and 1994. The problem was noticed and reported when a new and different model of computer based information technology introduced in the office could not accept most of the older computer tapes. This problem is bound to be experienced in many developing countries because they do not have adequate plans for preservation of information in electronic format (Mutiti, 2002). Another challenge is that digital media get lost during disaster or virus attacks, and in Africa there may be absence of, or inadequate organizational plans to manage e-records. These, in addition to the harsh environmental conditions of the Sub-Saharan Africa, which accelerates degradation of electronic equipment demand for re-digitization. Hughes (2004) writing on the rational for re-digitization advocated that the reason why re-digitization is inevitable is the likelihood that electronic resources created in previous years using older technologies may not be accessible or compatible with the new technologies.

Problem of reliability and authenticity
Changes in information and computer systems require that information be migrated to new technologies if the information is to remain accessible over time. This process of migration can affect the authenticity and reliability of information, as the process itself can change the content or structure of the records. Unlike paper records, which can be moved, filed, re-filed, copied and otherwise used and re-used without change, electronic records need to be managed and preserved in such a way as to secure their authenticity as evidence.

Similarly, the way in which electronic records are created can limit their value as authentic records. For example, computerized electronic mail (e-mail) systems do not always capture accurate information about the author of the original email message. Further, as e-mail messages are forwarded, copied, replied to, they may be edited or altered, and the integrity of the original message may be lost as the email communication progresses and therefore ceases to possess vital qualities of good records.

Legal issues and legislative constraints
The legislation governing many aspects of information creation, management, use, and preservation has not kept pace with the rapid change in technology – and archives

legislation is no exception. In most countries in Africa, archival laws were written with paper records in mind and with a simpler model of the archival function and the role of archival institutions. Many archival institutions are discovering that the options available for dealing with electronic records are constrained by basic archival legislation. Some issues that are particularly problematic in Africa and other developing countries include: the legal definition of a record, especially when it does not encompass records in electronic form; laws that do not accept electronic records as legitimate evidence in legal proceedings; legislation that defines the role of the archives as a strictly custodial one; and so no. In Africa there are no laws or legislation on electronic records and electronic archives management, and therefore it is useless to manage these records without procedural and legal laws since they are not fully recognized in law courts as legal document because of their propensity for alteration at whims.

Loss of security and privacy
The introduction of information technologies has also affected and gradually impacting on the way government and private organizations in Africa preserve and make records in their custody available. Computers and the internet allow organizations to create large and complex databases and make huge amounts of information available electronically. Databases containing personal financial and medical records, for instance, may be extremely useful to the individuals themselves, but without proper security protections that information may also be accessed by others, thereby threatening the privacy of the owners. Today, people have an inherent right to privacy that can be violated, intentionally or by accident, in an electronic environment.

For instance, the risk of identity theft is now very real in the electronic world. Some unscrupulous individuals and companies compile and sell personal information about people; this information has been gathered, usually illegally, from electronic sources such as credit databases, land title files, motor vehicle records or medical files. This information may be used to gain access to credit cards, bank accounts and even property title documents. Archivists in Africa should be careful

Issues in backing up records
Information and communications technologies can fail, whether because the storage device "crashes" or because the computer becomes "infected" with a computer virus or other malicious code. Such failures can result in devastating lost or corruption of data. People can also accidentally delete files from their computers, or auditors can ask to see records that are no longer in current use. To protect valuable data from inadvertent deletion, special backup applications are usually run. Again, there are some hazards that accompany backups which records managers and archivists in Africa should bear in mind. Often, backups are done on a general or wholesale basis in which all data in a computer system are copied all at once. While the backup process certainly copies records, it does not do so in a way that is relevant to the record-keeping needs of the business unit.

Most of the time IT sections does not test their backups to ensure successful recovery, either because they do not have the staff to do so or their systems do not have the capacity to do so without interfering with the daily operations that the technology

supports. And the time and cost involved in searching through all electronic data storage devices is so great that many organizations simply cannot comply with urgent requests or emergency situation. As a result, organizations end up paying fines, losing court cases or otherwise being punished for their inability to fulfill their obligations for information disclosure. They are not suffering from a lack of computer technology but from the absence of an effective electronic records management infrastructure to guide the management of information created using that computer technology.

Summary and conclusion

Effective records management programme and the desire to keep and show evidence of transactions led the Europeans to introduce modern recordkeeping system in their colonial Africa. Records if properly managed are important assets that assist individuals and organizations in meeting their goals. Effective recordkeeping provides evidence of business transactions between individuals, groups or organizations; it guarantees transparency and accountability, revamps continuity in civil service functions and strengthens financial management.

In the electronic age, records managers in Africa are facing a new threat, the challenge of working in a digital environment, with new tools and different work approach. The experience and training of archivists and records managers in the sub-Saharan Africa is often inadequate to face the challenges which may include weak legislation, absence of organizational frameworks, inadequate ICT skills and competencies, colonial legacy, corruption and political instability, among other factors. The most important step to curtail these changes is for record managers in developing countries to get more closely involved with the other professionals in electronic information ventures.

To manage electronic records in African environment, there are certain technical skills and competencies that are inevitable for records managers in order to remain relevant in the digital cyberspace:

- Ensure that records created in the old system will remain available, understandable and usable to the clients, organizations must be migrating their older records to the new environment system.
- Possession of recognized core competencies on how to manage, appraises, acquire, and provide access to electronic records and other digital assets. There is a need to possess abilities to communicate and collaborate with information technologists and members of allied professions at a basic level.
- Equipment of self with advanced knowledge of information technology and digital asset management techniques so that they can serve as a source of expert knowledge, conduct research, and anticipate changes in technology so that the profession is better prepared to respond swift.
- Develop, accept, and implement widely accepted global standards for archival functions for born digital records and digitized archival assets utilizing readily available tools.
- Posses a variety of educational opportunities to acquire and improve electronic records-related competencies at the introductory, advanced, and continuing education levels.

- They should be able to formulate appropriate advocacy strategies based upon a sophisticated understanding of the role of information policy in the creation and accessibility of records in virtual environment.

Planning successful electronic records management programmes and ensuring a robust information architecture environment involves understanding the nature of, and strengths and weaknesses of IT infrastructures. Success also depends on establishing strategies and procedures to ensure that information and records are protected in the event of IT damage or failure. Critical to all IT systems and networks are adequate power supplies, robust networks, sufficient bandwidth, suitable technical support and effective computer backup systems (IRMT, 2004). Rather than rely on a general backup process that copies all data and all associated software programs, it is more effective to establish a formal backup routine that targets the most important records and data created by the organization.

References

Akotia, P. (2000), *Financial Records Management Project: Phase Three*, Government of Uganda, Kampala, 17-28 January, pp. 1-24.

Asogwa, B.E. (2012), "The readiness of universities in managing electronic record: a study of three federal universities in Nigeria", *The Electronic Libraries*, in press.

Ayttey, G. (2002), "Biting their own tails: African leaders and the internal intricacies – of the rape of a continent", paper presented at the SORAC, New Jersey, November 7-9.

Blais, G. (1995), *Access to Archival Records: A Review of Current Issues*, A Ramp Study, UNESCO, Paris.

Barry, R. (n.d.), "Electronic records management: a review of the work of a decade and a reflection on future directions", available at: www.google.com.ng (accessed 23 February 2012).

Bearman, D. (1992), "Management of electronic records in Europe and America", *American Archivist*, Vol. 55, Winter, p. 169.

Cain, P. and Thurston, A. (1996), "Speaking a new language: advocating records management in the developing world", *Records Management Bulletin*, No 72.

Egwunyenga, E.J. (2009), "Records keeping in universities: associated problems and management options in South West geographical zone of Nigeria", *International Journal of Education and Science*, Vol. 1 No. 2, pp. 109-13.

Enwere, J.C. (1997), "Archival legislation, a watershed in the development of archives and records management in Africa", paper presented at Janus, Archival Review, Pan African Conference on Archival Policies and Programmes in Africa, Abuja.

Ezeani, C. (2010), "Information and communication technology: an overview", in Madu, E.C. and Ezeani, C.N. (Eds), *Modern Library and Information Science for Professionals in Africa*, TextKinks, Ibadan, pp. 7-29.

Hughes, C.A. (2004), *Digitizing Collections: Strategic Issues for Information Managers*, Facet Publishing, London.

IRMT (2004), "Module 1: Understanding the Context of Electronic Records Management – Training in Electronic Records Management", IRMT.

ISO (2001), "ISO 15489", International Standard on Records Management, ISO, Geneva, available at: www.archives.govt.nz/advice/international-standards/iso-154489 (accessed 28 March 2012).

Iwhiwhu, E.B. (2005), "Management of records in Nigerian universities: problems and prospects", *The Electronic Library*, Vol. 23 No. 3, pp. 345-55.

Iwhiwhu, E.B. (2010), "Electronic records management in Africa: problems and prospects", *Handbook of Research on Information Communication Technology Policy: Trends, Issues and Advancements*, IGI Global, Hershey, PA.

Kemoni, H. and Wamukoya, J.S. (2000), "Preparing for the management of electronic records at Moi University, Kenya: a case study", *African Journal of Library, Archives & Information Science*, Vol. 10 No. 2, pp. 125-38.

Lawal, G. (2007), "Corruption and development in Africa: challenges for political and economic change", *Humanities and Social Science Journal*, Vol. 2 No. 1, pp. 1-7.

Mazikana, P. (1992), *Survey of the Archival Situation in Africa: A RAMP Study*, UNESCO, Paris.

Millar, L. (2004), "Authenticity of electronic records: a report prepared for UNESCO and the International Council on Archives", UNESCO, available at; www.ica.org/download.php?=1623 (accessed 28 March 2012).

Mukotekwa, M.C. (2002), "Film archives of national archives of Zimbabwe", *ESARBICA Journal*, Vol. 21, pp. 56-8.

Mutiti, N. (2002), "Computerization of archives and records in the ESARBICA region", *ESARBICA Journal*, Vol. 21, pp. 114-9.

Ngulube, P. (2001), "Strategies for managing digital records and documents in the public sector in sub Saharan Africa", paper presented at the 67th IFLA Council and General Conference, August 16-25.

Nwosu, C.O. (1993), "Records and information management at the University of Nigeria", *The Nigeria Archivists*, Vol. 1 No. 4, pp. 27-35.

Nyirenda, H.D. (1994), "Archives administration in Tanzania: quo vadis", *African Journal of Archives Library and Information Science*, Vol. 4 No. 2, pp. 107-16.

Ojedokun, A.O. (2008), "Transition to Automated Library Information Systems and the Challenges for Libraries in Africa", in Aina, L.O. *et al.* (Eds), *Knowledge and Information Management in the Digital Age: Concepts, Technologies and African Perspectives*, Third World Information Service, Ibadan.

Taylor, H. (1987), "Transformation in the archives: technological adjustment or paradigm shift", *Archivaria*, Vol. 25, Winter, pp. 12-28.

Tough, T. (2003), "Records management standards and the good governance agenda in the commonwealth Africa", *ESARBICA Journal*, Vol. 22.

Ugwunze, J.C. (1992), "An examination of records management in the University of Lagos registry", *African Journal of Library, Archives and Information Science*, Vol. 2 No. 1, pp. 39-46.

Uneke, O. (2010), "Corruption in Africa south of the Sahara: bureaucratic facilitators or handicaps to development?", *The Journal of Pan African Studies*, Vol. 3 No. 6, pp. 111-28.

Wamukoya, J. (1999), "Records and archives as a basis for good government: implications and challenges for records managers in Africa", paper presented at the ESARBICA Conference, Zanzibar, July 26-30, pp. 26-30.

Wamukoya, J. and Mutula, S.M. (2005), "Transparency and integrity in government: building capacity for managing electronic records in the East and Southern African region", paper presented at the International Records Management Trust, London, January 11.

Worthy, J.C. (1984), "Management concepts and archives", *Modern Archives Reader*, John Wiley, Washington, DC.

Yahaya, D.H.Z. (2002), "Keynote address: national archives of Malaysia", *ESARBICA Journal*, Vol. 21.

Further reading

Bearman, D. (1991), "An indefensible bastion: archives repositories in the electronic age",
in Bearman, D. (Ed.), *Archival Management of Electronic Records*, Archives and Museum
Informatics Technical Report 13, pp. 14-24.

IRMT (2000), "Managing records as a basis for effective service delivery and public
accountability in development: an introduction to core principles for staff of the World
Bank and its partners", The World Bank, New York, NY, available at: http://siteresources.
worldbank.org (accessed 10 February 2012).

Mnjama, N. and Wamukoya, J. (2004), "E-government and e-records management", paper
presented at the SADC Workshop on E-government, Gaborone, April 14-16.

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