

Assessment of Digital Access Control Methods Used by Selected Academic Libraries in South-West Nigeria

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Abstract

This article is aimed at acquainting and equipping librarians and information professionals with the knowledge that would enable them establish an effective strategy to protect e-resources from such abuses as plagiarism, piracy and infringement of intellectual property rights. The descriptive survey was used, with questionnaire, observation and interview as data collection tools. A survey questionnaire was administered to librarians and library officers in five federal university libraries in Oyo, Osun, Ondo, Ogun and Lagos States. Findings revealed that none of the respondents was aware of anti-circumvention laws and digital rights management systems.

The study creates awareness about access control method(s), policies and regulations for the governance of, and use of e-resources. It is expected that such awareness would reduce litigations associated with abuse of e-resources while protecting the authors and the publishers' interests.

Keywords:

Academic Libraries, Digital Access Control, Digital Access, Digital Rights, E-Resources, Access Management, Nigeria

Introduction

Academic libraries tend to have very large collections of published materials spread across several faculties and departments. Formerly, academic library materials were composed mainly of audiovisuals and prints which users had to access physically in the library. However, with the advent of the computer and the Internet; library holdings are now available in electronic format. Examples include electronic journals, e-books, institutional repositories and more.

In Nigeria, academic libraries as the major repository of information are also catching the e-library fever, albeit at a slow pace. This new trend has increased circulation of published materials that ordinarily would have been accessed by users making physical trips to a traditional library. Consequently, the information management community is confronted with a whole range of challenges. Some of the challenges are how to control access to electronic materials, manage intellectual property right issues and resources protected by copyright (Rosenberg, 2005).

Therefore, a study on access control of the digital content of academic libraries is timely. This will expose methods currently in use by this group of libraries, and how effective they are. Such a study would also aid libraries in the formulation of policies that will eliminate bottlenecks, allow users to have access to published materials and put measures in place to protect library's resources from abuses like piracy, plagiarism, and at the same time enforce copyright issues.

This study focused on five federal universities, namely: Kenneth Dike Library, University of Ibadan

(KDL) founded in 1948, Nimbe Adedipe University Library (1988), Federal University of Agriculture, Abeokuta, Federal University of Technology Akure Library (1982), Hezekiah Oluwasanmi Library, Obafemi Awolowo University (1961) and University of Lagos library (1962). The study examined the methods employed by these academic libraries in controlling access to their electronic resources. The libraries are in five major states namely: Oyo, Osun, Ondo, Ogun and Lagos (South-western Nigeria). All the libraries selected for the study have large collections of both print and electronic resources.

Objectives of the Study

The general objective of this research work was to determine the access control methods used by academic libraries in the South-West zone of Nigeria and how effective these methods have been, with regards to access management and protection of library resources. The specific objectives were to:

1. evaluate access control methods used for e-resources in the selected university libraries.
2. determine the most reliable of these access control methods in the selected libraries.
3. determine the challenges and reliability of these methods.
4. review legal regulation or policies guiding access control of e-resources.

Review of Related Literature

Controlling access to electronic resources is often problematic. Controlling access is usually carried out by implementing processes such as identification, verification, authorisation and accountability in the access control system (Turban, Rainer & Potter, 2001). Some of the methods used in controlling access to digital resources by libraries are: user identification, internet protocol authentication and licensing policies.

User Identification and Authentication (ID/Passwords): - It involves the use of user identification and password (ID/password). ID/password has to be issued for individual patrons or group of patrons in order to access journals, databases and other popular resources. This is being used for most of the electronic database services offered by academic

libraries. Identification and authentication (I&A) is the process of verifying that an identity is bound to the entity (a user) that asserts it. The identification and authentication (I&A) process assumes that there was an initial vetting of the identity, during which subsequently, the entity asserts an identity together with an authenticator as a means for validation. The only requirement for the token of identification is that it must be unique within its security domain. Authentication is commonly based on at least one of these factors: such as a password or a personal identification number. This is based on the assumption that only the owner of the resource knows the password required accessing the resources (Olsen, 1995; CGIAR, 2009).

Internet Protocol Authentication: It is a means of identifying computer systems on a network. The IP address allocated to a computer is determined by the class of network (class A, B, C, etc.) on which it is located. That is the type of network implemented by the library or the parent body. Each network class has a range of IP addresses reserved for computer systems on its network. The use of IP authentication involves verifying that the IP addresses of user terminals or systems connected or accessing the library's network or e-resources falls within the IP range of the library or parent body of the library. This method is less intrusive and the preferred mode for most libraries in the developed world because there is no need to give out passwords to users. Hence, libraries do not have to manage changing passwords mandated by providers. Despite these advantages, access control through IP authentication remains a concern for large academic libraries for the following reasons: Since Internet service in most universities in Nigeria is not reliable, many students and academic staff use other Internet service providers. As a result, they have IP addresses that are not within the IP range of the university. They use IP addresses provided to them by other Internet Service Providers (ISPs). Alternative provision such as the use of proxy servers that identify genuine library users on other authentication schemes must be put into place. Also, many universities are now adopting the use of dynamic IPs ("live IPs"), instead of the old static IP address systems. With the new system, users are given temporary IP addresses. These systems dynamically assign IP addresses. Though these systems are economic for the communications

and computing centres for the universities, however, resolving IP conflicts and other network problems become more problematic for libraries since IP addresses are now dynamic and not always static like before.

Licensing Policies: This involves the use of rules or regulations (policies) to guide the use of electronic resources. Some service providers or aggregators use licensing policies to check access to web sites and electronic resource. There are also policies restricting members of the university community not resident on the main campus. In spite of the varying distant locations, these members of the university community also have equal rights as well as same access privileges and capabilities as their counterparts residing in the main campus. However, with restriction by site they could be denied the same privileges and capabilities their on-campus counterparts have with regard to information access. An example of this is the distance learning students of the University of Ibadan (Brennan et al., 1997, Teets & Murray 2006, Armstrong et al., 2002).

There are many legal regulations guiding the use of e-resources. This is because digital content is increasingly protected by several layers of intertwined legal and technological devices – copyright law, licensing agreements, computer systems and applications, and criminalising anti-circumvention laws. In the digital environment, there are basically four types of protection. These are copyright, licenses, DRMSs and anti-circumvention laws.

Copyright Law: Copyright shield digital content from abuse, it is a legal procedure granting the creator of a recorded work series of rights over the work created. The rights over the work created restrict users from duplicating, distributing, performing, and alteration of the protected work (Prytherch, 2000). The fair dealing exemption is a condition in copyright law that permits the reproduction of a single copy of otherwise protected works for criticism, review or private study (Keenan & Johnston, 2000). According to Amen et al. (2002), the fair dealing exemption authorise free replication of information provided the derived material is used for research, criticism, teaching, in such a way that it will not affect with the rights of the copyright holders. The South African Copyright Act 98 of 1978

stipulates in sections 12(1) explains that Copyright shall not be infringed if a literary or musical work is used solely and then only to the extent reasonably necessary, such as, research or private study, review, reporting current events ,in a newspaper, magazine periodical and/or for broadcasting or in a cinematography. Provided the user of the work is not of the notion that, according to the provisions of section 13, that the word ‘used’ is not authorising the reproduction of a copy of the work or a large part of the work in question and as stated in paragraphs (b) and (c) (i) of the statues that the source and the author’s name are mentioned, if it appears on the work. (South Africa Statutes, 2000:220; Copeling, 1978:41). The above law is also similar to the Nigerian Copyright Act Decree No. 98 1998.

Licenses and Anti-circumvention Laws - Access to digital content is in practice, governed by access licences. This is due to the benefits and ease of access to digital information, (McCracken, 2004). The access license is a form of contract between the library and a vendor, which is normally written by the aggregator, which most of the time is in favour of the aggregator (Wyatt, 2005). The anti-circumvention condition disallow breaking of safety measures put in place to control access digital content (Braunstein, 2000). The United States of America took the lead in evolving its anti-circumvention clause in the Digital Millennium Copyright Act (DMCA) 1998 in section 1201 (DMCA 1998), and nations such as Australia and the United Kingdom have followed. The Australian Digital Agenda Act 2000 emulated the DMCA 1998 by instituting section 116A that forbids any form of circumvention (Lahore & Rothnie, 2004). In the United Kingdom, just as in USA and Australia, section 296 of the Copyright Designs and Patents Act 1988 forbids circumvention of digital content (United Kingdom Copyright, Designs and Patents Act 1988 (c.48), 2000). This law is also being gradually adopted by developing nations in Africa with South Africa at the fore front (Masango, 2007).

Digital Right Management System- Digital Rights Management System (DRMS) is a technical barrier, which is also protected by anti-circumvention law, and is a security measure protecting digital content. This access control measure (various versions of DRMSs) is known as automated rights management (ARM). It is another form of protection

for digital content, as DRMS seek to check unauthorised reproduction of copyrighted materials and can restrict copying unless the user make some payment. The DRMS that is buried within the digital code of copyrighted material has the ability to allow copies of copyrighted materials to be made upon payment (Liebowitz, 2002). In addition, the DRMS controls access to digital content, averts illegal reproduction of digital content, recognise digital content and the owners of such licences, and also ensures that the identification data are authentic (Bygrave, 2002).

Methods

The descriptive survey was used for this study. Descriptive survey attempts to picture or document current conditions or attitudes, i.e. describe what exists at the moment (Aina, 2002). This research method has been adopted to help determine the access control methods in five selected academic libraries and how adequate these methods have been. The instruments adopted for this study are questionnaire, observation and interview. The questionnaire and interview are the main instruments for this study. A questionnaire was designed and administered for completion by librarians and library officers in five university libraries (federal universities) in Oyo, Osun, Ondo, Ogun and Lagos states. Data received from the questionnaire was augmented by on-site visits, observations and discussions with key informant (interviews). The Questionnaire was distributed to one hundred (100) information professionals. Seventy-five copies of the questionnaire were retrieved but only sixty-seven was valid for data analysis, making the response rate sixty-seven percent. The statistical techniques used were percentage and frequency distribution. The data was analysed using Software Package for Social Sciences (SPSS).

Study Population

The population for this study was made up of information professionals in five selected university libraries. This consists of reference librarians, systems librarian, acquisition librarians, cataloguers/cataloguing

librarians, serials librarian and library officers. The library staff was selected because they are involved directly or indirectly in digital access control and are most informed about the acquisition, administration and management of e-resources. After visiting federal universities in the south-west zone of Nigeria, the following universities namely University of Ibadan, Obafemi Awolowo University, University of Lagos, Federal University of Technology Akure and Federal University of Agriculture, Ogun State were purposively selected because they all have e-resources at the time this study was conducted. The only federal university library in this zone excluded from the study is the Federal University, Oye, Ekiti, which was barely one year old at the time of study, thus had limited e-resources. State or private universities were not considered because of the time constraint and limited resources in carrying out the study. Table 1 presents the universities selected for the study.

Findings of the Study

Table 1: Selected Universities for Study

University	No. of Library Staff in Survey	Percentage
University of Ibadan, Oyo State	17	17 (25.4%)
University of Lagos, Lagos State	13	17 (25.4%)
Obafemi Awolwo University, Osun State	17	13 (19.4%)
Federal University of Technology, Akure, Ondo State	10	10 (14.9%)
Federal University of Agriculture, Ogun State	10	10 (14.9%)
Total	67	100%

The distribution of the respondents by post who were involved in access control of e-resources has been provided in table 2. The table shows that a variety of librarians were involved in access control, cataloguing (46.3%) and serial librarians (17.9%) being the

prominent users.

As indicated in table 3, the most popular access control method is the use of username and password

Table 2: Distribution of Respondents by Post N= 67

Selected University Libraries	Cataloguer	System Librarian	Acquisition Librarian	Reference Librarian	Serial Librarian	Library Officer	Total
Kenneth Dike Library University of Ibadan, Oyo State	7(10.4%)	3(4.5%)	2(3.0%)	1(1.5%)	1(1.5%)	3(4.5%)	17(25.4%)
Hezekiah Oluwasanmi Library, O.A.U, Osun State	7(10.4%)	3(4.5%)	2(3.0%)	1(1.5%)	0(0%)	4(6.0%)	17(25.4%)
University of Lagos Library	8(11.9%)	2(3.0%)	0(0%)	1(1.5%)	0(0%)	2(3.0%)	13(19.4%)
Federal University of Technology Library Akure, Ondo State	5(7.5%)	3(4.5%)	1(1.5%)	0(0%)	0(0%)	1(1.5%)	10(14.9%)
Federal University of Agriculture library Abeokuta, Ogun state	4(6.0%)	1(1.5%)	1(1.5%)	2(3.0%)	1(1.5%)	1(1.5%)	10(14.9%)
Total	31(46.3%)	12(17.9%)	6(9.0%)	5(7.5%)	2(3.0%)	11(16.4%)	67(100%)

Control of Access to E-resources

The various methods used to control access to e-resources in the university libraries under study are

presented in table 3. The academic libraries used a combination of methods to safeguard the digital contents and screen impostors. These include IP authentication, User name and password, policies and regulations and to a less extent, the firewall.

Table 3: Methods Adopted to Control Access to E-Resources as Identified by Respondents

Selected University Libraries	Username & Password	IP Authentication	Policies & Regulations	Firewall	All of the above	Total
Kenneth Dike Library University of Ibadan, Oyo State	6(9.0%)	4(6.0%)	1(1.5%)	3(4.4%)	3(4.5%)	17(25.4%)
Hezekiah Oluwasanmi Library, O.A.U, Osun State	5(7.4%)	2(3.0%)	5(7.4%)	2(3.0%)	3(4.5%)	17(25.4%)
University of Lagos Library	4(6.0%)	5(7.4%)	2(3.0%)	1(1.5%)	1(1.5%)	13(19.4%)
Federal University of Technology Library Akure, Ondo State	4(6.0%)	4(6.0%)	1(1.5%)	1(1.5%)	0(0%)	10(14.9%)
Federal University of Agriculture library Abeokuta, Ogun state	4(6.0%)	3(4.5%)	3 (4.5%)	0(0%)	0(0%)	10(14.9%)
Total	23(34.4%)	18(26.9%)	12(17.9%)	7(10.4%)	7(10.4%)	67(100%)

(34.4%), followed by IP authentication (26.9%) and Policies/regulations (17.9%). The use of Firewall (10.4%) for screening out impostors was the least used by the libraries. Four out of the selected libraries, namely: Kenneth Dike Library, UI, Hezekiah Oluwasanmi Library, University of Lagos Library and the Library of the Federal University of technology used the four access control methods with the exception of the Federal University of Agriculture Abeokuta.

Respondents' opinions about reliable methods in terms of controlling access to e-resources are presented in table 4. According to the table, over 50% of the respondents were of the opinion that Username and Password combination was the most reliable of all the methods. The use of policies and regulations was indicated as the least reliable of the four methods.

Reliability of the Methods of Access Control

Table 4: Reliability of Methods of Access Control

Selected University Libraries	Username & Password	IP Authentication	Policies & Regulations	Firewall	Total
Kenneth Dike Library University of Ibadan, Oyo State	9(13.5%)	3(4.5%)	2(3.0%)	3(4.5%)	17(25.4%)
Hezekiah Oluwasanmi Library, O.A.U, Osun State	7(10.4%)	4(5.9%)	1(1.5%)	5(7.4%)	17(25.4%)
University of Lagos Library	8(11.9%)	3(4.5%)	2(3.0%)	0(0%)	13(19.4%)
Federal University of Technology Library Akure, Ondo State	6(9.0%)	2(3.0%)	1(1.5%)	1(1.5%)	10(14.9%)
Federal University of Agriculture library Abeokuta, Ogun state	7(10.4%)	2(3.0%)	0(0%)	1(1.5%)	10(14.9%)
Total	37(55.2%)	14(20.9%)	6(9.0%)	10(14.9%)	67(100%)

Challenges Faced When Using the Methods

Some of the problems encountered by the five libraries when implementing access control measures for e-resources are presented in table 5.

It was observed that respondents indicated "technology problem" as a major challenge constituted 32.8%, "frequent change of password by service providers, (31.3%) and other challenges (19.4%) as shown in table 5.

Table 5: Challenges Faced in using these Access Control Methods for E-Resources

Selected University Libraries	Technology Problem	Frequent Change of password by service providers	Dearth of Staff with adequate knowledge of Access Management	Others(Librarians not having a say in Access Policies)	Total
Kenneth Dike Library University of Ibadan, Oyo State	8(11.9%)	6(9.0%)	2(3.0%)	1(1.5%)	17(25.4%)
Hezekiah Oluwasanmi Library, O.A.U, Osun State	6(9.0%)	4(5.9%)	3(4.5%)	4(5.9%)	17(25.4%)
University of Lagos Library	4(5.9%)	7(10.4%)	2(3.0%)	0(0%)	13(19.4%)
Federal University of Technology Library Akure, Ondo State	2(3.0%)	1(1.5%)	1(1.5%)	6(9.0%)	10(14.9%)
Federal University of Agriculture library Abeokuta, Ogun state	2(3.0%)	3(4.5%)	3(4.5%)	2(3.0%)	10(14.9%)
Total	22(32.8%)	21(31.3%)	11(16.4%)	13(19.4%)	67(100%)

Legal Regulations/Policies Guiding Access Control to E-Resources

Table 6 presents information on legal regulations and policies guiding access control in the five libraries. It was observed that a large percentage of respondents from the selected libraries made use of rules and regulations. The use of rules and regulations was the most popular.

Table 6: Legal Regulations and Policies Guiding Access Control of Library Materials

Method	Frequency	Percentage
Rules/Regulation	28	41.8
Licence	14	20.9
Fair Use Law	11	16.4
Copyright Law	14	20.9
Others (Anti-circumvention, etc)	0	0.0
Total	67	100.0

Discussions

Analysis of data showed that majority of the libraries under study used more than one method when controlling access to e-resources. This is revealed in table 3. This implies that most of the libraries use more than one method. The four access control methods (Username and password, IP authentication, Fire wall and policies) identified by this study are being used by four out of the five selected libraries. While the fifth library, Federal University of Agriculture Library has adopted only three out of the four methods, it has not adopted the use of firewall for controlling access to its e-resources. The use of a single method has been identified as not a reliable approach for screening impostors from e-resources. However, most of the libraries under study made use of user name and password as major criteria for accessing e-resources. Interestingly, the most used legal regulation (41.8%) in controlling access to e-resources is rules and regulations.

A major challenge (see table 5), of controlling access to e-resource is technology problems (32.8%) this included infrastructural problems like technology failures and conflicting IPs. When there is technology failure (like unreliable internet services) students and

faculty staff often use other service providers and as a result, do not have IP addresses within the IP range of the university. Instead, they used addresses provided to them by other Internet Service Providers (ISPs). With this challenge monitoring logs becomes impossible and conflicting IPs can frustrate both the users and the library, because access to e-resources will be erratic. Apart from technology problems, there is "Frequent Change of Passwords by service providers" (31.3%); this happens as a result of abuse by users. While other challenges encountered by these libraries included scarcity of staff with adequate knowledge of access management, there was nobody in the libraries checking logs for local databases. Also, most of the libraries just conform to policies put in place for access control by publishers or service providers.

Conclusion and Recommendations

None of the respondents was aware of Digital Right Management Systems (DRMS). It is important that academic library management educate library professionals on the legal regulations governing the access to electronic resources in each library. Also a handbook on legal regulations governing access to e-resources should be published and made available for use in academic libraries and library schools. This could be used as resource material for library orientation and also for training young librarians in the library schools.

The study also reveals that some of the policies used by the libraries require review. In all the libraries, these policies did not cover issues like a library user within a university community giving his or her password to an outsider. Most of the time, these policies totally exclude undergraduate students or distance learning students from the use some of the libraries e-resources which may be very useful in their course of study.

The following suggestions are made for improved digital access control in academic libraries. Academic libraries in Nigeria should give access control and management of e-resources adequate attention by:

- Reviewing existing library policies, rules and regulations on access control of e- resource.
- Education of library professionals and users

on the legal regulations governing the use of e-resources.

- Courses on legal regulations of library materials which can be included in the curriculum of library schools and users can be informed about these regulations and the implication of not complying with them.
- Implementing access control measures and interfaces that will maximise use of e-resources.
- Training library staff on access management of e-resources.

Finally, it is hoped that this study will stir up more research activities and increase awareness, as well as the change required in access control management of e-resources in academic libraries in Nigeria.

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