Original Article   **Open Access**

Application of Database Management System in the Library of Federal University, Lafia

Ivongbe, Matthew Ihaza
Igbinedion University, Okada, Edo State, Nigeria

Abdulsalami, Lucky T.*
Igbinedion University, Okada, Edo State. Nigeria

Omorogbe, Harry O.
Igbinedion University, Okada, Edo State, Nigeria

Abstract: This study assessed the database management system application in the library of Federal University, Lafia. In order to achieve the objectives of the study, four (4) research questions were formulated that border on accessibility of database, their usage, level of satisfaction, challenges and solutions to the problems associated with the use of database in the library. Survey research method was adopted and the number of staff served represented the research population. Descriptive statistics was used to analyse the data collected. The study discovered that database was accessible and were mostly used for research and also in ordering and acquisition of journals. It was also evident that the staff was familiar with the use of these databases but some challenges were discovered which include problem of network and electricity, lack of skill to search the information, lack of awareness, poor maintenance, low bandwidth, lack of standard, and insufficient computer systems.

Key words: Library Database, Application of Database, Database Access, Database Management System

1. Introduction

Databases are structured along types of content: repositories, text, images, numeric and alphanumeric symbols it contains. Database management systems typically rely on a standard operating system to provide these functions including ability to provide for many different users to share data and process resources. This process involves the collection of programs that provides database professional opportunity to program a database. According to Jeffrey (2007), the database management system varied functionalities and ways to manage how that information is managed.

Effective management of Database is one of the means through which university Library can be able to achieve development, safeguard its data, as well as organize its data in a way that a user can adequately benefit from it. Abdulsalami and Achebe (2013) explained the various terms and applications associated with database management system that provide various functions that allow management of large data output and then provide ways for storage and retrieval. Before the introduction of database management approach, the Library at the Federal University Lafia relied on the manual method of data processing and storage. Each file was specialized to be used with a specific application. This was in line with Okore (2006) summary that file processing becomes bulky, costly and non-flexible when it comes to supplying needed data accurately and promptly. Assess the state of database management in every academic library from time to time becomes very imperative.

1.1. Statement of the Problems

The Library at the Federal University, Lafia has complex nature of managing its data right from its Establishment in 2012, a development which resulted to complex ways of managing the data in the course of: delivering improved performance, data integration issues, lack of people resources, securing private data, and high data volume growth. Hence, there is need to conduct such a study to assess ways and pattern of managing data resulting from the development and restructuring. In the light of the above, the researchers intend to assess the application put in place in the Library at the Federal University Lafia, and seek for possible solutions to challenges that abound.

1.2. Objectives of the Study

The aim of this research is to assess the system application in the Library of Federal University, Lafia. The specific objectives are to:

1. Determine the various system application used in the Development of the Library.
2. Investigate the methods used for system application in the University Library.
3. Find out the challenges faced by system managers in University Library.
4. Provide the possible solutions to the challenges faced by database managers in the University Library.

1.3. Research Questions

Based on the statement of problems above, the following questions are formulated to guide the study.

1. What are the various application software used in the University Library?
2. What are the methods used for system application in the University Library?
3. What are the challenges faced by database managers in University Library?
4. What are the possible solutions to the challenges faced by system managers in the University Library**?**

From the various definitions highlighted above, database management system is expected to:

1. Allow users to create new database and specify their scheme (logical structure of the data), using a specialized language called a data definition language.
2. Give users the right to query and modify the data manipulation language.
3. Supports large storage of data in gigabytes over a long period of time and keeping it secure from accident or authorized users, allowing efficiency access to data for queries and database modification.
4. Control access to data from many users at once without allowing the actions of one user to affect the other users and without allowing simultaneous access to corrupt the data accidentally Lee (2012).

1.4. Application Software

The end users of applications software sometimes are for a specific purpose and programmed for simple or complex tasks. It can be a single or a group of small programs that usually called an application program suite. Some examples of **Application Software are** Word processing software like Microsoft Word, Spreadsheets Software like Microsoft Excel, SPSS, etc. Jing (2009) further discussed the methodology involved in acquiring application software, whether proprietary or off the shelf.

1.5. Types of Personal Application Software

General-purpose or off-the-shelf application programs support specific business function and are referred to as personal application software. This type of software consists of nine widely used packages that are described below:

Spreadsheets: With spreadsheets, users can also develop and use macros, which are sequences of commands that can be executed with just one simple instruction. Uses of computer spreadsheet packages include among others; financial information, such as income statements or cashflow analysis, forecasting sales, insurance and actuarial analysis, summarizing income tax data, and analyzing investments.

According to Lee (2012) different types of personal application software are relevant for many other types of data that can be organized into rows and columns. Although spreadsheet packages such as Microsoft Excel and Lotus 1-2-3 are thought of primarily as spreadsheets, they also offer data management and graphic capabilities. Therefore, they may be called integrated.

 Data Management: Data Management software supports the storage, retrieval, and manipulation of related data. Two types of data management software , these are: simpexistle filing programs after traditional, manual data-filing techniques, and database management programs that take advantage of a computer's extremely fast and accurate ability to store and retrieve data in primary and secondary storage media. File-based management software is typically very simple to use and is often very fast, but it offers limited flexibility on how the data can be searched. Database management software has the opposite strengths and weaknesses. Microsoft's Access is an example of popular database management software.

Word Processing: Word processor allows the user to manipulate text and numbers. Modern word processors contain many productive writing and editing features. Wang *et al.* (2008) gave a full

description of a typical word processing software package to consist of an integrated set of programs including an editor program, a formatting program, a print program among others.

Desktop Publishing: Desktop Publishing software represents a level of sophistication beyond regular word processing. In the past, newsletters, announcement, advertising copy, and other specialized documents had to be laid out by hand and then typeset.

Graphics: graphic software allows the user to create, store and display or print, chart, graphs, maps, and drawings. Graphics software enables users to absorb more information more quickly and to spot relationships and trends in data more easily. There are three basic categories of graphics software packages, these are: presentation graphics, analysis graphics, and computer-aided design software.

Multimedia Program: Multimedia software combines at least one media for input to produce an output data. According to Kenny (2008), these media include audio (sound), voice, animation, video, text, graphics, and images. Multimedia can also be thought of as the combination of spatial-based media (text and images) with time based media (sound and video).

Groupware: Groupware facilitates communication, coordinate operations, and collaboration among people. Groupware is important because it allows work-group who need to interact with one another within an organization to communicate and share information, even when they are working together from remote locations. Mulac (2012), summarized that groupware can provide many benefits to businesses, including more efficient and effective project management, location independence, increased communications capacity, increased information availability, and improved workflow.

1.6. Methods Used for Database Management

Accordingly, database management systems are designed to use these keywords structure to provide simplistic access to information to the user. The keyword structures are:

1. Networking
2. Event monitoring
3. Security
4. Backup
5. Computation

Networking: Networking consists of complex relationships that relates to man's records and accesses them by following a particular path. The structure may allow and enables the user to be connected and has link relationships to work together for online effective communication. This is done through the help of database management programming.

Event monitoring: An event monitoring allows you to collect information about transient events that would be difficult to monitor through snapshot, such as deadlocks, transaction completion, and completion information that includes how long a transaction has taken place. Monitoring a database manager event results in information being return when that events occurs. The information provides a good summary of the activities of a particular event.

Security: For security reason, it is desirable to limit users that can manipulate specific attributes or graphs of attribute. There are three security levels that are: control access to universal database management data and functions. The first of security checking is authentication, when the operating system verifies a user ID and password. Once user authentication is carried out, authorization is the next level of security where the users must be associated with database management by using what is called SQL. The outbid can also be the same as the user ID and is normally used for proper identification at any moments in the surroundings and searching view. In essence, privileges are right granted to users work with objects within a database, such as view an object or search light.

Backup: Backup refers to a computing process in which a computer system files and folders are duplicated or data substitute in anticipation of system data being corrupted, deleted or lost. Database management systems is usually provided with utilities to manage the process of or restoring

Computation: Common computations require a counting, summing, averaging, sorting, grouping, cross-referencing attributes. Rather than to have each system application implements that from scratch, they then rely on the database management system to supply each calculation. Lee (2012) proposed that a number of database administration management tasks can be performed while the database is still in operation, "while users are still connected". This makes data to users. Some management tasks that can be done online include loading data, backing up data, creating table spaces, and altering tables or spaces.

1.7. Gaps in Technical Capability

The most talented and experienced database management administrators don't know everything. Sometimes an obscure feature requires attention. Perhaps an odd error such as, a report on disk usage contains a number greater than that drive's actual capacity needs to be resolved before a backup can continue. Unfortunately, such specific example requires high level research and it will consume valuable time. No matter how well a database management administrator knows a system, they are likely to run into problems they don't know how to immediately solve.

Adebayo (2009) in his study pointed out that a system administration service provider produces a deep and wide range of experience that a client can draw on whenever the need arises. If the primary databases are developed in oracle, but there exist just one SQL. it may be a challenge for the Oracle Developer to administer partner that provide fractional support for an outlaying technology at a lower cost that may not have much else to do beyond supporting that single database

1.8. New and Emerging Database Platforms

Sangma (2013) is of the view that database management administrators tasked with providing around-the-clock operational support as well as needing to tend to routine projects and daily troubleshooting request have precious little time for training or ongoing professional development.

1.9. Dependency on Software Vendors for Support

Sangma (2013) identified that a software vendor support contracts don't usually provide any support for those using the software. They support updating the software by keeping it patched and bug-free. Asking for assistance is viewed as training by software vendors a feature is not included in a standard database support contract. The fees for "training" may be prohibitive when added to the price of a software package. Most database management system administrators need assistance, not training. They need workers to help cover routine tasks and requests. They need colleagues to brainstorm improvements. They don't really need "training".

Cost – Information Technology (IT) budgets are now reasonably static and the need to be more efficient and do more with less is increasing in the face of the current economic predicament. The downtime cost for such databases is often very high. Database management administrators are now specializing in different areas such as performance, data warehousing, application support, etc. It is becoming very hard to find an experienced database management administrator with expert knowledge in all areas of database management system.

Keeping up-to-date- it is increasing difficult for database management administrators and the organizations they work for to keep up to date with the latest database technologies. Database software is becoming more complex and takes years to master. Training is not only costly but also time consuming, with key database management administrator staff needing time out of the office.

Proactive vs. Reactive- database management administrators are involved in non-core IT functions which infers that the vital monitoring and management of database has to be sidelined. Overworked database management administrator teams may not function in full capacity in the discharge of their duties. Instead, may just react once a problem has occurred and business users are already feeling the effects.

2. Methodology

The researchers adopted survey research method for this study which allows an insight into the thoughts and opinion of the respondents. The research population consists of 25 academic and non-academic librarians in E-library Department and Public Relation Department of the library at Federal University Lafia, because they are the one who are managers of databases in University Library. The entire members of the population were used as sample because of the small nature of the population. The instrument for data collection used was questionnaire. Closed-ended questionnaire was developed by the researcher as it captured related items in the research questions. The data collected were analyzed using descriptive statistics. The data generated were analyzed using distribution tables, frequencies and percentages.

2.1. Response Rate

A total number of twenty-five (25) questionnaires representing 100% copies were administered to the respondents in University Library, the questionnaires were all completed and returned.

Table 1. Application Software Used for Database in the Library of Federal University, Lafia

S/NO	Database software used in FUL	Response	Percentage
1	Dspace	11	44
2	Greenstone	5	20
3	E-print	7	28
4	Others	2	8
	Total	25	100

Source: Field Work

From table 1 it can be seen that Dspace with 11 (44%) respondents was the most used application software used in managing database in FUL, because is accessible to all types of user and the materials are not alter by patron. 7(28%) Posit that E-print are software use, 5(20%) opine Greenstone while 2(8%) opine others.

Table 2. Accessibility of Databases in the Library of Federal University, Lafia

S/NO	Availability of databases in F.U.L.	Response	Percentage
1	Highly accessible	5	20
2	Accessible	15	60
3	Not accessible	3	12
4	Undecided	2	8
	Total	25	100

Source: Field Work

From table 2 it can see that, respondents with 15 (60%) indicated that databases were accessible, while respondents with 5(8%) posit highly accessible, 3(12%) opine not accessible while 2(8%) were undecided. From this analysis, we can see that most of the respondents are able to access databases in FUL.

Table 3. Method Used for Database in the Library of Federal University, Lafia

S/NO	How effective are the methods used for system management in F. U.L	Response	Percentage
1	Very effective	7	28
2	Effective	11	44
3	Not effective	4	16
4	Undecided	3	12
	Total	25	100

Source: Field Work

From the table above 3, 11 (44%) of the response indicates that the methods used for database management in FUL are effective and while 3 (12%) are yet to decide. The analysis clearly indicates that the methods they use for system management in FUL are effective.

Table 4. Purpose for Using Database in the Library of Federal University, Lafia

S/NO	Purpose for using database in KIL	Response	Percentage
1	Research purpose	12	48
2	Satisfy users need	7	28
3	Ordering and Acquisition	5	20
4	Administration purpose	1	4
	Total	25	100

Source: Field Work

Table 4 shows the different purpose for using database in FUL and among the respondents 12 (48%) indicates that databases are used for research, 7 (28%) indicates that they use database to satisfy users need, 5 (20%) indicates that database are used for ordering and acquisition and while 1 (4%) show is for administration purpose. From the analysis 12 (48%) has the highest in number.

Table 5. Satisfaction Level with the Use of Database in the Library of Federal University, Lafia

S/NO	Satisfaction Level with the use of database KIL	Response	Percentage
1	Very satisfied	5	20
2	Satisfied	15	60

3	Not satisfied	2	8
4	Undecided	3	12
	Total	25	100

Source: Field Work

From the above table 5 respondents with 15(60%) indicates that they are satisfied with the used of database in KIL while 2(8%) of the respondents are not satisfied. From the analysis, we can see that overall, most of the respondents were confirmed satisfied over the use of database in kashim Ibrahim library.

Table 6. Challenges facing by the database users in the Library of Federal University, Lafia

S/NO	Challenges with use of database in KIL	Response	Percentage
1	Lack of standard by generator	2	8
2	Insufficient computer system	1	4
3	Lack of skills to search or access the information	5	20
4	Problem of network and electricity	7	28
5	Lack of awareness	5	20
6	Low band width allocated to the library for students to access the information	5	20
	Total	25	100

Source: Field Work

Table 6 above shows that among the challenges observed when using database in FUL, is problem of network and electricity with 7(28%) respondents, while insufficient of computer 1(4%). From the analysis, we can see that problem of network and electricity is the major challenge facing by database managers in FUL.

Table 7. Solutions to the Challenges Associated with Use of Database in the Library of Federal University, Lafia

S/NO	Solution to the challenges with use of database in KIL	Response	Percentage
1	Provision of standard power supply	10	40
2	Provision of infrastructure	5	20
3	Staff training	7	28
4	Purchasing more computer system for accessibility	3	12
	Total	25	100

Source: Field Work

From the above table 7, respondents with 10 (40) indicates provision of power supply and network, while 3(12%) respondents indicate purchasing of more computer system for accessibility. We can see from our analysis that the respondents were divided and as such all the options should be adopted to complement one another to reduce the challenges associated with the use of database in the Library of Federal University, Lafia.

2.2. Findings
Based on data presentation and analysis, we discovered the followings;
1. Dspace, greenstone and E-print were used in Federal University Lafia (FUL)
2. Databases available in FUL are used mainly for research purpose, to satisfy users need and ordering /acquisition.
3. Most of the staff are satisfied with the use of database in the library.
4. Some of the challenges observed when using database in the library include: insufficient computer system, lack of skills and awareness to search or access the information as well as problem of network and unstable electricity supply

3. Conclusion
In conclusion, there is a widespread adoption of database application in the library and staff are willing to be part and parcel of the moving train in the digital age. The use of database in the library has in one way or the other changed the way and manner things are done and how services were rendered. Databases are available in the library and are used by the staff for research, to satisfy users need and for

ordering and acquisition. It was also indicated that the staff were had a widespread satisfaction with the use of database in the library but challenges were discovered to include: insufficient computer system, lack of stills to search or access the information, problem of network and poor electricity supply.

4. Recommendations

In view of the findings, the following recommendations were made

1. There should be regular training of staff to keep up with the trends in ICT revolution and there should be more computer system for easy access of the information needed.
2. Since the staffs are satisfied with the use of database in FUL, there should be increased and improved effort to consolidate on the gains already made.
3. Fund should also be available to the library to acquire more database facilities.
4. The staff should exploit alternative service that can be provided with the use of database to serve the user and the researchers better.
5. In order to reduce the challenges faced when using database in the library, there should be stand by generator in case of electricity failure, and also to amend the issue of network failure.

REFERENCE

Abdulsalami, T. L. and Achebe, N. E. E. (2013). The effect of digital divide on information accessibility among undergraduate students of Ahmadu Bello University, Zaria. Maxwell science organization. *Research Journal of Information Technology (RJIT) Pakistan, 5(1): 1-10.*

Adebayo, E. L. (2009). Quality assurance and the implication for the management of university libraries in Nigeria. Library philosophy and practice. Available at: http://unllib.unl.edu/LPP/Adebayo.htm.com.

Jeffrey, U. (2007). First course in database systems, Prentice–Hall Inc., Simon & Schuster, Page 1, ISBN 0-13-861337-0.

Jing, B. D. C. (2009). *Introduction to Database system (7th Edition) Addison Wesley.*

Kenny, S. M. (2008). Database backup and recovery basics. Available at: http://www.download.oracle.com. *2-12*.

Lee, S. (2012). Test cases Design for Software Database Provisioning Development, IJAST. *49*:

Mulac, M. C. (2012). Fundamentals of Reference. Chicago: American library Association Chicago: American Library Association.

Okore, A. M. (2006). The Challenges of Information Communication technologies for Nigerian academic libraries. *Global Review of Library and Information Science, 1(1): 84-93*.

Sangma, S. K. (2013). Fundamentals of database systems (3rd Edition), pearsson Education.

Wang , X., Raul, F. C. and Dwaine, R. S. (2008). Introduction to DB2 .Retrieved 17 March 2013. This article quotes a development time of 5 years involving 750 people for DB2 release 9 alone. Retrieved 2013. *7-12*.