

Full Length Research

Use of database management system as an Academic gizmo for information resource sharing in Nigerian University Libraries

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The study is about using a database management system as a tool for sharing information resources with university libraries. The beauty of being able to efficiently convey information services to users at the right time and in the correct format can be inferred from the effectiveness of library services. The purpose of this work was to explore data, database, database management systems, academic library, and resource sharing. The paper provided a brief history of database management systems' development stages, as well as the reasons for their introduction into the librarianship profession, the benefits derived from their application, the components of database management systems, the areas in librarianship where database management systems can be applied, and two specific methods with which database management systems can be applied.

Keywords: Database, Academic Libraries, Database Management System and Information Sharing.

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INTRODUCTION

On a daily basis, the planet rotates around the Sun, and information goes throughout the globe in large numbers. In the past, information seekers had to travel long distances to obtain a specific amount of information, but with the advent of information technologies, both information providers and information seekers have been able to devise new ways to acquire, organise, and make information accessible to users for quick retrieval. As a result of this development, database management systems and resource sharing have been two essential players in activating and achieving these developmental strides of easy access and distribution to information resources or data throughout the world.

The word data existed before database, data is defined as information, especially facts or numbers, collected to be examined, considered, and used to aid in decision-making, or information in an electronic form that can be stored and used by a computer, according to Cambridge dictionary (2015). Data, according to Gleason (2018), is true information (such as measurements or statistics) that is utilised as a foundation for reasoning, discussion, or calculation. Furthermore, the Oxford learner's dictionary (2017) defines data as facts or information that is analysed and used to learn something or make a decision. To this aim, data can be characterised as a collection of specific details such as values or quantities expressed in numbers, phrases, measurements, observations, and even item explanations.

According to Eze, Etus, and Uzukwu (2014), a database is any logically coherent collection of data arranged for storage and retrieval by computers as a single, potentially massive repository of data that may be used by multiple users at the same time. To put it another way, database refers to the collection of data. It's a computerised platform where information is digitally structured and processed to fulfil the needs of information seekers. Bibliographic Databases, Knowledge Databases, Graphic-Oriented Databases, and Decision-making Databases are some of the types of databases that can be classified as a central pool of data that can be shared by a community of users.

The university library, as the central point for providing information to all types of information seekers within the university community, will never delegate this vital task of information dissemination to any other unit of the institution. Her main goal is to provide critical information to information seekers both inside and outside the university community at the right time and in the correct format. This necessitates a concerted effort on the part of the university library to meet all of the necessary demands in terms of providing users with information satisfaction. Atamu (2021) defines university libraries as an integral part of a higher education institution tasked with providing information resource materials (printed and non-printed) to support the parent institution's academic curriculum.

Academic research, according to Bouchrika (2017), is a systematic investigation into a problem or situation with the goal of identifying facts and/or opinions that will help solve the problem or deal with the situation. As a result, an academic researcher is someone who uses their professional knowledge to publish research papers in peer-reviewed or well-respected journals, books, or book chapters in a specific field.

The idea of sharing information resources stems from a mutual understanding and agreement between libraries and other information resource centres to share their information needs in order to provide better information dissemination service delivery to their consumers (Bouchrika 2017). Members of staff, mechanical support, and online and offline information collections (print and non-print) are some of these information resources. This notion has become necessary since no single library entity on the planet is capable of delivering all of the information resource resources that library customers require. Resource sharing, according to Christian and Salatiel (2020), is a mutual agreement amongst libraries to share their resources in order to provide better services to their clientele.

To be at the forefront of meeting users' growing demands for large volumes of information resources, the university library must employ her best means of information dissemination, one of which is resource sharing, keeping in mind that no single library in the world is self-sufficient in terms of information resource acquisition and provision, and that the needs of library users change over time.

According to Bappah (2012), resource sharing is the process by which the information resource materials of a group of network libraries are made available to the total number of people who are entitled to use any of those libraries, and it is a broad term that encompasses library cooperation, library systems, networking, and more. It's an all-encompassing term that encompasses collaboration, coordination, interlibrary loans, cooperative acquisition, storage, and processing. Muthu (2013) goes on to say that resource sharing is nothing more than the sharing of library resources among participating libraries based on the idea of cooperation. This applies to document sharing, people, services, space, and equipment. Orbis Cascade Alliance (2021) defines resource sharing as coming together in the spirit of innovation and combined expertise, seeking efficiency and productivity to strongly promote the success of students, faculty, staff, and researchers by bringing multiple perspectives together to challenge traditional thinking and elevate our ability to deliver outstanding services, programmes, and collections by bringing multiple perspectives together to challenge traditional thinking and elevate our ability to deliver outstanding services, programmes, and collections. It is a type of collaboration in which each participating library shares its information resource materials and useful services with other libraries at the lowest possible cost. It entails employing one library's resource to generate services for another library (Bouchrika, 2017).

Brief history of database management systems

The first database management system was created in the early 1960s by Charles Bachman, who created an Integrated Data Store (IDS) based on the network data concept. IBM (International Business Machine Corporation) developed the Integrated Management System (IMS) in the late 1960s, which is now the industry standard database system. Edgar Codd invented the relational database model in 1970 as a follow-up to future development. This strategy broke with precedent by requiring programmes to search for material based on content rather than following links. Since then, this approach has become the global standard for database design.

However, in the 1980s, when commercialization of relational systems began as a surge in computer purchases fueled the database market for business, there was a further upgrade. IBM introduced the Structured Query Language (SQL), which ISO and ANSI defined as a query standard language. The useable Internet/World Wide Web appeared in the 1990s. This enabled remote access to legacy data-laden computer systems. With the widespread use of GCC (GNU Compiler Collection), CGI (Computer Generated Imagery), Apache, and My SQL, open source solutions became available. With many businesses adopting point-of-sale (POS) technology on a daily basis, online transaction processing (OLTP) and online analytical processing (OLAP) have matured.

The Extensible Markup Language was also introduced in the 1990s (XML). It is a markup language that specifies a set of rules for encoding documents in a human- and machine-readable format. Database applications grew rapidly in the early twenty-first century. More interactive applications emerged, such as the use of PDAs (Personal Digital Assistants), POS transactions, and vendor consolidation – (Berg, Seymour, and Goel – 2013).

A database management system (DBMS) is defined by Foote (2021) as a system that allows a person to organise, store, and retrieve data from a computer system. It's a computer system that defines an organised set of data that may be accessed in a variety of ways. It is a well-organized collection of data stored in a programmed environment for quick retrieval when needed. It is a collection of data organised in such a way that a computer software programme can swiftly access and respond to questions. A database management system (DBMS) is a platform for storing and retrieving information using standardised queries and languages for simple access. Database Management System (DBMS) is defined by Eze, Etus, and Uzukwu (2014) as software that interacts with users, database applications, and the database and allows users to insert, update, remove, and retrieve data from the database.

Database management solutions are used for a variety of reasons.

The reason for the development of a database management system, according to David (2020), is that it has an extension of human logic reasoning that can quickly answer a large number of questions in a short amount of time, and its rate of processing information is highly overwhelming, so its automation quality is the key to efficiency. All of the following reasons for database management are deeply ingrained in the library system in Nigerian universities for proper academic curriculum delivery to users. The database management system is designed to respond quickly to user requests, provide multiple users with free or low-cost access to a variety of information, provide easy access to information resources as they emerge from publishing houses, and provide online storage devices to protect such information and eliminate outdated information resources. These are some of the advantages acquired from the deployment of database management systems to academic libraries at Nigerian universities, based on this fact.

BENEFITS DERIVED FROM THE APPLICATION OF DATABASE MANAGEMENT SYSTEMS IN LIBRARIANSHIP.

The advantages of implementing database management systems in librarianship.

The use of a database management system to ensure the seamless operation of university libraries operations allows many people to access information at the same time, regardless of their location. This can be accomplished by using a network database management programme. This feature of the database management system allows the library to publish and share information with information searchers all over the world via the internet. Database management systems programmes such as Web Dewey, OPAC, Library of Congress Online Catalogue, Machine Readable Catalogue 21, Library of Congress Classification Web, and Z39.50 enable information resources to be shared around the world and information seekers to have access to them to meet their information needs.

The Machine Readable Catalogue (MARC21) is an international standard digital format for the description of bibliographic items developed at the Library of Congress (LC) to facilitate the creation and dissemination of computerised cataloguing from one library to another and between countries, according to Obuh and Ogheneme (2012). According to Fabunmi and Asubiojo (2013), an OPAC is an interface of an information retrieval system that allows users to access library resources via several access points. OPAC allows library customers to search for books by subject, author, title, and even class mark from any place and share the same data with multiple authorised users. It can also be used by the readers' services librarian to check out and check in books and non-books. As may be seen from the following, database management systems programmes improve information resource sharing in university libraries.

Database management system components.

According to Wikipedia (2020) online sources opined that database management system is made up of five components in total. Hardware, software, data, procedures, and data access language are all included. These essential components are what allow the database management system to operate as efficiently as possible around the world. The database management system hardware component consists of all of the computer system's physical peripherals together for effective data transfer and distribution. The physical components of the database management system include hard drives, keyboards, mice, ROM, RAM, monitors, joysticks, and so on.

The software components of database management systems are the programmes that are stored in the system and control the computer's operation. They give a simple interface for storing, accessing, and retrieving data from a computer database. This tool can decipher the database access language and translate it into actual database commands. The data components of database management systems are the information resources that database management systems are designed to improve. These data are saved and used by the database system, as well as by

end users who request them from the database system. The procedure components of a database management system are the general and detailed instructions and information on how to utilise the system. This includes, for example, how to set up or install programmes, as well as how to login and log out (Wikipedia, 2020).

The data access language components of database management systems are basic language commands for accessing, inserting, removing, updating, and storing any data in the database.

Database management systems make information readily available for a variety of purposes to information seekers. The easily available information in database systems improves the efficient flow of information for various reasons. Some of the most popular database management software includes Microsoft Access, Microsoft Office (Word processor), Microsoft Excel, Corel Draw, and other desktop publishing programmes that allow users to alter text, numbers, and graphics to suit any function they are required for. Reader Services Librarians, Cataloguing Librarians, Reference Librarians, Serial Librarians, and others at university libraries can use the freely available information in the database to improve their job performance (Wikipedia, 2020).

AREAS DATABASE MANAGEMENT SYSTEMS CAN BE APPLIED IN LIBRARIANSHIP

In what areas can database management systems be used in librarianship?

Cooperative acquisition, specialty purchasing programmes, exchange publications, sharing of bibliographic data, interlibrary loan, and exchange of library expertise and personnel are some of the common areas where database management systems can be used for information resource sharing in Nigerian university libraries.

- **Cooperative acquisition:** This can be defined as when independent academic libraries band together to purchase library information resource materials such as books, reports, government publications, periodicals, and audio-visual materials, among other things, in order to strengthen and protect the Library's unparalleled collection of academic and artistic resource materials. According to Razaq and Sodiq (2018), acquisition is a process of identifying and verifying the information resources needed by library users, placing orders for them, and making payments for such information resources. It is a means by which books and non-book materials are added to the library. The use of database management systems in cooperative acquisition has improved resource sharing in Nigerian university libraries. This approach has allowed library users from all over the world to have access to any information held by a participating library.
- **Publication exchange:** Wikipedia (2020) defines publication exchange as "the process of creating literature, music, information, software, and other content that is available to the public for sale or free." It is a term that traditionally refers to the creation and distribution of printed works such as books, newspapers, and magazines; however, with the advent of digital information systems, the scope has expanded to include electronic publishing such as ebooks, academic journals, micropublishing, websites, blogs, video game publishing, and other forms of electronic publishing. The employment of a database management system in the exchange of publication of information resource materials for library users has had a huge impact on the profession of librarianship. With the help of the necessary database management systems, publications of various categories can be exchanged, making information materials available to all users who request them.
- **Interlibrary loan:** One of the most advanced ways for libraries to meet the needs of complete service delivery is through interlibrary loan. According to J-gate (2018), interlibrary loans (ILL) are a technique in which participating libraries form agreements to transfer items in order to improve their library holdings. Interlibrary loan (ILL) is a cooperative arrangement between libraries that allows patrons from one library to borrow books and other resources from another library. It can also be defined as the procedure by which a library borrows or delivers information resource material to another library.
Books, reports, government publications, magazines, and audio-visual resources, as well as library workers, are examples of such information resource materials. However, the lending library imposes fees or charges on this service, which are paid by the patron at the time of item collection. Database management systems have aided in the simplification of this way of providing library users with information services. Assuming there is a mutual agreement on resource sharing between Delta State University Abraka, Nigeria and University of Benin, Nigeria, and a researcher from Delta State University Abraka, Nigeria requests information resource materials that are not owned by Delta State University, Abraka, Nigeria but are owned by University of Benin, Nigeria, the University of Benin Library can electronically make such information resource materials available to Delta State University Abraka, Nigeria (MOU).

- **Bibliographic data sharing:** This entails university library management using database management software to share bibliographic details of both print and non-print information resource resources with library users. It includes the usage of tools like KOHA, OPAC, and NewGenLib, among others. According to Agrawal (2015), New Gen Lib is a complete library solution that combines library automation software, digital library software, and a database search facilitator. It can easily communicate bibliographic details of any information resource materials in its database to any information searchers throughout the world thanks to its five primary modules: cataloguing, circulation, acquisitions, serial, and management. Because of its versatility in sharing bibliographic data with information seekers, New Gen Lib has been effectively implemented in 2500 libraries in 58 countries around the world.
- **Specialize your shopping strategy:** The use of a database management system (DBMS) to supply information services in Nigerian university libraries will improve the university library's purchasing programme. Most library database management systems already have purchasing programmes built in, which aid in the process of purchasing information resource materials. When a user requests information about purchasing particular information resource materials, the programme provides and shares the detailed technical information needed to complete the procedure. According to Chan and Nwosu (2022), a specialty purchasing programme, also known as electronic commerce (EC), electronic procurement (EP), can simply be defined as business-to-consumer (B2C), business-to-business (B2B), or business-to-government (B2G) purchases and sales of goods, services, works, or supplies via the Internet and other networking and information systems.

Two distinct approaches, Database Management System can be used to share data resources.

The central theme of this academic work is the usage of database management systems (DBMS) in information resource sharing in Nigerian university libraries. The following are some of the ways DBMS can be utilised in Nigerian university libraries to exchange information resources:

Hierarchical Methodology: This is a database approach that allows you to store information resources in a tree-like layout. The data is saved in the form of a collection of fields, each of which contains only one value. Through a connection, the records are linked together. To extract information from a field, you must navigate through each field until you find the records you're looking for. According to Gaurav & Simmi (2012), a hierarchical database model is a data model in which data is arranged into a tree-like structure and the structure allows describing information using parent/child relationships: each parent can have several children, but each kid only has one parent.

This model can be used to store and organise the library's automated information resources collection, and the information can then be made available and shared to anyone seeking information from any location. Academic researcher can utilise this model to provide bibliographic facts about an author, a subject and even a book title. This database's information can be instantly viewed and updated. When an academic researcher searches this database for information, the root field, which serves as the parent, may be immediately retrieved (base). You can link up to any information relevant to the sourced information from this base till the actual information is retrieved. Online books and other online information resource materials can be saved in this database, and information can be retrieved and shared with interested users in any location via the upward/downward (parent to children or children to parent) link, as long as the user is linked to the database. The use of this approach among libraries highlights collaborative efforts and ensures that information resource resources not available in one library are purchased or requested from other cooperating libraries.

Database System for Networks: It's a database system that allows information to flow from many points of request to many points of accessibility, as the name implies. Unlike the hierarchical database system, which only allows for one to many relationships (the website paradigms)? File sharing, blogging, wikis, and tagging are all possible with this system. Network database management system is defined by Arjun (2022) as a system that employs a network structure to form a relationship between elements and is primarily utilised on huge computers. The use of this database system enables collaboration between libraries and information centres that have agreed to share and access information resources. So long as there is mutual agreement on information resource sharing among various libraries, information resource materials kept in this database enable for full accessibility and retrieval by many users from many points of diverse assessment. When the necessity arises, academic researchers from many locations can share a large number of information resource resources at the same time. A library can retroactively programme all of its information resource materials utilising the network database system and elect to share exclusively with participating libraries with whom they have a common agreement on sharing information resource materials.

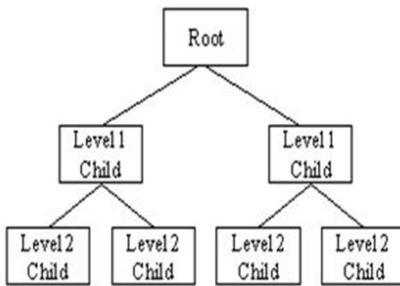


Figure 1: Hierarchical

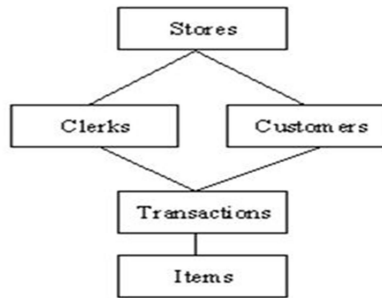


Figure 2: Network DBMS

CONCLUSION

The usage of database management systems in information resource sharing by Nigerian university libraries has developed in expectation to improve information service delivery. Database management systems and information resource sharing are inseparable twins that cannot exist without the other if modern librarianship is to provide excellent and full current information services. If these two notions are separated, the current library automation information dissemination services delivery method will be misplaced. This paper has demonstrated that database management system (DBMS) is a very useful tool for academic researchers in broadcasting information services delivery in librarianship and resource sharing has greatly enhanced the circulation of library professional services across the world, thus putting to rest the issue of lack of information resources acquisition in a single library due to a lack of funds, human resource personnel, and so on. Database management systems are really a technique that is utilised to improve information resource sharing in Nigerian university libraries.

REFERENCES

- Agrawal, P. R. (2015). New GenLib: a new generation open source library automation software. In Veer, Dharmaraj K. et al (Eds.). Advanced applications of ICT in libraries (pp 161-171). New Delhi: Agri-Biovet Press. ISBN: 9789384502065
- Arjun, P. (2022). Types of database management system. *C#Coner*. Available at: <https://www.google.com/search?client=firefox-b-d&q=types+of+dabase+management+system+pdf>
- Bappah, M. A. (2012). Resource sharing among libraries in Nigeria. Available at: https://www.researchgate.net/publication/277991953_RESOURCE_SHARING_AMONG_LIBRARIES_IN_NIGERIA/link/567bf9ac08ae1e63f1e1d04a/download
- Berg, K.L., Seymour, T.J. &Goel, R. (2013). History of databases. *International journal of management and information science*; Vol.19 (1), pg 29-36. Available at: https://www.researchgate.net/publication/298332910_History_Of_Databases/link/578902dc08ae5c86c99acd01/download
- Cambridge dictionary (2015). Meaning of data in English. <https://www.dictionary.cambridge.org/dictionary/english/data>
- Chan, A.P.C. &Owusu, E.K. (2022). Evolution of Electronic Procurement: Contemporary Review of Adoption and Implementation Strategies. *Buildings* 2022, 12, 198. Available at: <https://doi.org/10.3390/buildings12020198>
- Christian, M. & Salatiel, C. (2020). Information Resource Sharing in Academic Libraries: Tanzanian Context. *Library philosophy and practice (e-journal)*. Available at: <https://digitalcommons.unl.edu/libphilprac/4685>
- Bouchrika, I. (2017). Definition of academic research. *Research.com*. Available at: <https://research.com/research/definition-of-academic-research>.
- David, S.B. (2020). 7 reasons why you need a database management system. *Techopedia*. Available at <https://www.techopedia.com/2/31970/it-business/7-reasons-why-you-need-a-database-management-system>.
- Derclaye, E. (2005). What Is a Database? *The journal of world intellectual property*, Vol.5(6):981-1011. Available at: https://www.researchgate.net/publication/229702234_What_is_a_Database
- Eze, U. F., Etus, C., &Uzukwu, J. E. (2014). Database system concepts, implementations and organizations-a detailed survey. *International Journal of Scientific Engineering and Research (IJSER)*. Vol.2(2): 2347-3878. Available at: <https://www.google.com/search?client=firefox-b-d&q=Database+System+Concepts%2C+Implementations+and+Organizations-A+Detailed+Survey>

- Fabunmi, O.M. and Asubiojo, B.O. (2013). Awareness and Use of Online Public Access Catalogue by Students of Obafemi Awolowo University, Ile-Ife, Nigeria. *Library Philosophy and Practice (e-journal)*. 922. Available at <http://digitalcommons.unl.edu/liphiprac/922>. Accessed on 12/11/2021
- Foote, K. D. (2021). A brief history of database management. *Dataversity: Data Topics*. Available at <https://www.dataversity.net/brief-history-database-management/>
- Gaurav, J. & Simmi, B. (2012). Hierarchical Model Leads To the Evolution of Relational Model. *International journal of engineering and management research*, Vol. 2(4), August 2012. Pg.11-14. Available at: https://www.researchgate.net/profile/GauravJindal/publication/284180806_Hierarchical_Model_Leads_To_the_Evolution_of_Relational_Model/links/56503ab108aefe619b13f2d8/Hierarchical-Model-Leads-To-the-Evolution-of-Relational-Model.pdf?origin=publication_detail
- Gleason, H. A. (2018). "Data." *Merriam-Webster.com Dictionary*, Merriam-Webster, <https://www.merriam-webster.com/dictionary/data>.
- J-Gate (2018). What is Inter-library loan and how does it work? Available at: <https://jgateplus.com/home/2018/01/15/what-is-inter-library-loan-and-how-does-it-work/>
- Muthu, M. (2013). Resource sharing in libraries: a vital role of consortia. *Journal of library and information science*, Vol.3(1). Available at: <https://www.semanticscholar.org/paper/Resource-Sharing-In-Libraries%3A-A-Vital-Role-of-Muthu/84514300f1181ef0082ace90403c9874b8ebade4>
- Orbis Cascade Alliance (2021). Definition of resource sharing. Available at: <https://www.orbiscascade.org/about>.
- Obuh, A.O. and Ogheneme, A. (2012). Library Automation the Ingredients for System hardware and Software Interoperability. *International journal of library science* 2012. 1(2): 23-27. Available at www.sapzib.org/global/showpaperpdiaspx?doi=10.5923/f.library..02. Accessed on 27/05/2021.
- Oxford Learners' Dictionary (2017). <https://www.google.com/search=firefox-b-d&q=What+is+the+meaning+of+data+in+Oxford+dictionary%3F>
- Razaq, F.Q. & Sodiq, O. (2018). Acquisition patterns of academic, special and public libraries in Kwara State, Nigeria. *International journal of advance library and information science*, Vol.6(1), pp.440-447. Available at: https://www.researchgate.net/profile/Sodiq-Onaolapo/publication/322368259_Acquisition_Patterns_of_Academic_Special_and_Public_Libraries_in_Kwara_State_Nigeria/links/5a956861aca2721405691fb3/Acquisition-Patterns-of-Academic-Special-and-Public-Libraries-in-Kwara-State-Nigeria.pdf?origin=publication_detail
- Wikipedia (2022). The free encyclopedia. Available at: <https://en.wikipedia.org/wiki/Publishing>.