The Use Of Databases For Information Storage And Retrieval In Selected Banks In Delta State, Nigeria.

Enakrire Tega Rexwhite, Olorunfemi Yemisi Doreen, Emmanuel Ogaga Akpovoka

ABSTRACT: - This study investigates the use of databases in information storage and retrieval in some selected banks in Delta state, Nigeria. Variables to support the study were reviewed under the following areas: concept of information, concept of databases, concept of information storage and retrieval, role of ICT in information storage and retrieval, challenges of effective information storage and retrieval. A descriptive survey research method was used and data were collected through the use of questionnaire. 92 copies of questionnaire were administered and retrieved back from respondents and the use of statistical tool of simple percentage and frequency count was used for analysis. Research findings revealed that: Parent bodies of banks are the sole source of funding the use of databases in the selected Banks in Delta State, that there are adequate skilled ICT personnel for rendering services through the storage and retrieval of information/data at the banks, there are ICT software and hardware facilities used for storage and retrieval of data/information in the banking industry which includes telephone, finnacle, signature systems, Microsoft exchange, Microsoft excel, credit card management, and flexcable. Staff training in the use of database for information storage and retrieval in Delta State banking industries is mostly quarterly, the normal duration of the maintenance of ICT facilities is mainly on weekly and monthly basis depending on the level of usage, there are problems militating against the services rendered by staff to users/customers in the use of database for information storage and retrieval in the selected banks in Delta state. Recommendations were also made to include; Upgrading of databases by incorporating new innovations and technique in application in banking services and financial information management, proper time management will yield better results in managing information, bandwidth that will accommodate the number of bank staff and customers, an equipped IT department will assist in management of information, constant upgrading of anti-virus to guard against virus attack.

Keywords: - Databases, Information, Information Storage and Retrieval, Information Technology, Banks, Delta State, Nigeria

1. Introduction

Organizations are increasingly aware of the potential of information in providing competitive advantage and sustaining their success [1] as evidenced in a number of published case studies [2] , [3] and commentaries [4] The descriptions of information as an asset and a resource [5] ,are no longer unusual. However, the origin of these descriptions in classical economics ignores the place of information in the fabric of a political system of culture of an organization. If information is to provide competitive advantage, then its full potential, need to be fully considered and utilized [7]. A very useful hierarchy of the definitions of information has been developed in the area of information policy studies. [8] states that the hierarchy is applicable to organizations for a number of reasons; first, it recognizes qualitative differences among definitions of information; second; its macro view is more appropriate to organizations than definitions based only on the individual as an information asset and user; third, it provides a range of definitions which are useful in different situations; and fourth, it foreshadows the need for information policy in organizations. The hierarchy consists of four levels, each based on a category of definitions drawn from different fields of knowledge.

- Enakrire Tega Rexwhite, Olorunfemi Yemisi Doreen are Doctoral students at the University of Zululand, Department of Information Studies, KwaDlangezwa, South Africa, while Emmanuel Ogaga Akpovoka has completed his B.sc in library and Information

1.1 Information as a resource:

Is considered an economic resource, somewhat on par with other resources such as labour, material, and capital. This view stems from evidence that the possession, manipulation, and use of information can increase the cost-effectiveness of many physical and cognitive processes. The rise in information-processing activities in banking industry as well as in human problem solving problem has been remarkable [9].

1.2 Information as a commodity:

Complementary to definitions of information as a commodity is the concept of an information production chain through which information gains in economic value. The notion of information as a commodity incorporates “the exchange of information among people and related activities as well as its use” [8] implies buyer, sellers and a market. In contrast to the absence of power of information as a resource, information as a commodity has economic power.

1.3 Information as perception of pattern:

Here the concept of information is broadened by the addition of context. Information “has a past and a future, is affected by motive and other environmental and casual factors, and itself has effect [8]. The concept of information and its processes is broadened so much so that information in this sense can be applied to a highly articulated social structure. Information has a power of its own although its effects are isolated. The example given is of information reducing uncertainty but only in regard to a single question.

1.4 Information as a constitutive force in society:

Information has a role in shaping context. “Information is not just affected by its environment, but is itself a factor affecting other elements in the environment” [8]. The

definitions in this category "apply to the entire range of phenomena ad processes in which information is involved, can be applied to a social structure of any degree of articulation and complexity, and grant information, its flow and use an enormous power in constructing our social (and ultimately physical) reality" [8]. Information management is the collection and management of information from one or more sources and distribution to one or more audiences who have a stake in that information or a right to that information. Management here means the organization of and control over the structure, processing and delivery of information. Through the 1970s this was largely limited to files, file maintenance, and life cycle management of paper ad a small number of other media. With the proliferation of information technology starting in the 1970s, the job of information management took on a new light. No longer was information management a simple job that could be performed by almost anyone. An understanding of the technology and the theory behind it became necessary, as information was evermore stored via electronic means. By the late 1990s when information was regularly disseminated across computers and other electronic devices, information managers found themselves tasked with increasingly complex devices. With the latest tools available, information management has become a powerful resource for organizations. The use of computers led to the infiltration of computer-base databases in the management of information. The term or expression database originated within the computer industry. Although its meaning has been broadened by popular use, even to include non-electronic databases, this article takes a more technical perspective towards the topic. A possible definition is that a database is a structured collection of records or data which is stored in a computer so that a program can consult it to answer queries. The records retrieved in answer to queries become information that can be used to make decisions. The computer program used to manage and query a database is known as a database management system (DBMS) [5]. The properties and design of database systems are included in the study of information science. As evidently portrayed above, no organization can survive without proper information management, especially banks, which harness very large amounts of vital financial information that must not be manhandled, misused or improperly stored. Thus the use of databases is very essential if the management of information in organizations, especially banks, is to be highly successful. Due to the volatile nature of organizations, especially large organizations like banks and other financial institutions, and their responsibility to cater for a very large amount of people and their financial information, the adequacy of databases to manage information effectively is very essential to the success of these organizations due to the following factors: inadequate financial constraints to acquire relevant ICT facilities, inadequate skilled personnel with ICT competency to handle task, lack of appropriate ICT software/hardware used in the processes of storage and retrieval of information in databases, Lack of constant training among staff in trends of operations, lack of maintenance culture among staff on the use of ICT facilities, and problem of erratic power supply/network signal.

2. Research Questions

The following research questions will be useful in conducting this research:

1) What are the various sources of funding the use of Databases in selected banks in Delta State?
2) Are there adequate skilled ICT personnel to Mann the task of storage and retrieval through the use of Databases in selected banks in Delta State?
3) What are the ICT software/Hardware used for storage and retrieval of information in selected banks in Delta state?
4) How often is staff trained in the use of Databases for information storage and retrieval in selected banks in Delta State?
5) To what extent are ICT facilities maintained by staff of the selected banks in Delta State?
6) What are the problems of erratic power supply/network signals in the selected bank?

3. Purpose of the Study

The purpose of the study is to:

1) Find out other sources through which funds can be gotten in acquisition of facilities and normal running of the organization.
2) To recruit skilled personnel will ICT skills in the manning of the various operations in the selected banks in Delta State.
3) Identify the various databases used by organizations, especially banks, and see how new and appropriate software/hardware can be adopted to improve on their services.
4) To send staff on regular training programmes like conferences, seminars and workshops so as for them to improve on their knowledge/skills.
5) There is need for user education on the maintenance culture of the various ICT facilities used in information storage and retrieval.

4. Concept of Information:

Numerous definitions have been evolved, seeking to distinguish for example, among "Data" information and "knowledge" and recently, there have been attempts at a single concept of information. The word "information" is used, in the context of user or studies need, to denote a physical entity or phenomenon, the channels of communication through which messages are transferred or the factual data, document, transmitted orally [10]. The multiple uses of the term "information" causes confusion because researchers sometimes fail to distinguish between reader who discover by reading different report. Even then, it is sometimes unclear to detect the mind of the researcher on the right information needed for the needs of the people. Whatever type, information has been relied on, by man for achieving varying purpose of life. [11] explained that the different meanings assigned to information is coloured by the background of proponents. [12] stated that, information can be viewed physically in terms of stimulus and its accompanying responses. This information can be described as a response causes by an external stimulus-

that conditioned one's from of behaviour or the amount of impact received from exterior that modifies our state of knowledge". The need of information cannot be over-emphasized because of its vital function in decision-making processes at various level of life. [13] opined that; information has now been universally accepted as vital resources in any organization. However, information can be as knowledge disseminated in accordance with the information requirement of the receiver and in such a way that it will assist him/her in the execution of his/her functions. To this end, [15] defined information as being "an increment of knowledge which can be inferred from data" [14] defined information as "that which is intended for use rather than interest". The user seeks it for a particular purpose in particular circumstances. It is of maximum potential use, to the person who wants it, when it matches his needs, not only in terms of general subject but also in specific subjects too. Additionally, [16] defined information as "data" that has been processed into a form that is meaningful to the recipient and is of real and perceived value in current and future decisions. To this end, [17] described information as that which refers "primarily to the human understanding that steers human actions and consequently control signals in any living organization. This is in accordance with [18] who posited that information is seen as data value in planning, decision making and evaluation of any programme. He goes further to say that it is a data that has been subjected to some processing functions capable of answering user's query be it recorded summarized or simply collected that would help decision making. It is well understood in terms of books, journals of all kinds, whether published for mass circulation or unpublished and restricted or confidential in nature, results of research efforts which are made available to colleagues in form of report book, article and non-printed materials. The researcher concluded that information is required in man's daily activities be it in school, play or work situation. It is a critical resource that enables an organization to function and flourish. Also, it is a cornerstone for long-term organizational survival, serves as a base of competence development, reduces uncertainty, risks in decision-making and a host of others,. Information is an indispensable commodity to the functioning of every society. [19] has identified three principal uses of the word "information" in a literature:

4.1 Information-as-process:

That is, when someone is informed, or what he or she knows is changed. Information in this sense refers to the act of informing or communicating knowledge or "news" of some fact.

4.2 Information-as-knowledge:

That is, information, being new to a recipient, serves to reduce uncertainty and improves existing knowledge. Information in this sense refers to the knowledge communicated concerning some particular facts, subject or event, which, when assimilated, changes the recipients existing knowledge.

4.3 Information-as-thing:

Used attributively for objects, such as data in documents, because they are regarded as being informative, or having the quality of communicating information or impacting knowledge. Usage of the concept of "information" also appears to have changed over time along revolutions in computer technology. In the 1950s and 1960s, it meant the amount of reduction on uncertainty, particularly in the context of communication signals and symbols. In the 1980s it meant decision-relevant data. Hence, [16] focused on the effective use of information by humans to solve social problems. Later, and probably in conformity with the use of 'data processing' to mean everything processed by computer, the word 'information' came to be widely used to denote 'processed data'. Today, with the computer being more and more widely used to support decisions through database systems, spreadsheets and graphics, information has, once again, come to mean information that can help its users to make better decisions.

5. Concept of Databases

5.1 Data:

Data in everyday language is a synonym for information. In the exact sciences there is a clear distinction between data and information, where data is a measurement that can be disorganized and when the data becomes organized it becomes information. Data may relate to reality, or to fiction as in a fictional movie. Data about reality consists of propositions. A large class of practically important propositions is measurements or observations of a variable. Such propositions may comprise numbers, words or images. *Raw data* are numbers, characters, images or other outputs from devices to convert physical quantities into symbols, in a very broad sense. Such data are typically further processed by a human or input into a computer stored and processed there, or transmitted (output) to another human or computer. *Raw data* is a relative term; data processing commonly occurs by stages, and the "processed data" from one stage may be considered the "raw data" of the next [20]. Mechanical computing devices are classified according to the means by which they represent data. An analogue computer represents a datum as a voltage, distance, position, or other physical quantity. A digital computer represents a datum as a sequence symbols drawn from a fixed alphabet. The most common digital computer use a binary alphabet, that is, an alphabet of two characters, typically denoted "0" and "1". More familiar representations, such as numbers or letters, are then constructed from the binary alphabet. Some special forms of data are distinguished. A computer program is a collection of data, which can be interpreted as instructions. Most computer languages make a distraction between programs and the other data on which programs operate, but in some languages, notably Lisp and similar languages, programs are essentially indistinguishable from other data. It is also useful to distinguish metadata, that is, a description of other data. A similar yet earlier term for metadata is "ancillary data". The prototypical example of metadata is the library catalogue, which is a description of the concepts of books [5].

5.2 Database:

The term or expression of database originated within the computer industry. Although its meaning has been broadened by popular use, even to include non-electronic databases, this article takes a more technical perspective

towards the topic. A possible definition is that a database is a structured collection of records or data which is stored in a computer so that a program can consult it to answer queries. The records retrieved in answer to queries become information that can be used to make decisions. The computer program used to manage and query a database is known as a Database Management System (DBMS). The properties and designs of database systems are included in the study of information science. The central concept of a database is that of a collection of records, or pieces of knowledge. Topically, for a given database, there is a structural description of the type of facts held in that database: this description is known as a schema. The schema describes the objects that are represented in the database, and the relationships among them. There are a number of different ways of organizing a schema, that is, of modeling the database structure: these are known as database models (or data models). The model in most common use today is the relational model, which in layman's terms represents all information in the form of multiple related tables each consisting of rows and columns (the true definition uses mathematical terminology). This model represents relationships by the use of values common to more than one table. Other models such as the hierarchical model and the network model use a more explicit representation of relationships. The term *database* refers to the collection of related records, and the software should be referred to as the *database management system* or DBMS. When the context is unambiguous, however, many database administrators and programmers use the term *database* to cover both meanings. Many professionals would consider a collection of data to constitute a database only if it has certain properties: for example, if the data is managed to ensure its integrity, if it allows shared access by a community of users, if it has a schema, or if it supports a query language. However, there is no agreed definition of these properties. Database management systems are usually categorized according to the data model that they support: relational, object-relational, network, and so on. The data model will tend to determine the query languages that are available to access the database. A great deal of the internal engineering of a DBMS, however, is independent of the data model, and is concerned with managing factors such as performance, concurrency, integrity, and recovery from hardware failures. In these areas there are large differences between problems.

6. History of Database:

The latest known use of the term '*data base'* was in June 1963, when the System Development Corporation sponsored a symposium under the title *Development and Management of a Computer-centred Data Base.* Database as a single word became common in Europe in the early 1970s and by the end of the decade it was being used in major American newspapers. (Databank, a comparable term, had been used in the *Washington Post* newspaper as early as 1966). The first database management systems were developed in the 1960s. [20] a pioneer in the field was Charles Bachman. Bachman's early papers show that his aim was to make more effective use of the new direct access storage devices becoming available: until then, data processing had been based on punched cards and magnetic tape, so that serial processing was the dominant activity. Two key data models arose at this time: CODASYL developed the network model based on Bachman's ideas, and (apparently independently) the hierarchical model was used in a system developed by North Americans Rockwell, later adopted by IBM as the cornerstone of their IMS product. The relational model was proposed by E.F. Codd in 1970. He criticized existing models for confusing the abstract description of information structure with descriptions of physical access mechanisms. For a long while, however, the relational model remained of academic interest only. While CODASYL systems and IMS were conceived as practical engineering solutions taking account of the technology as it existed at the time, the relational model took a much more theoretical perspective, arguing (correctly) that hardware and software technology would catch up in time. Among the first implementations were Michael Stonebraker's Ingres at Berkeley, and the System R project at IBM. Both of these were research prototypes, announced during 1976. The first commercial products, Oracle and DB2, did not appear until around 1980. The first successful database product for microcomputers was dBase for the CP/M and PC-/DDOS/MS-DOS operating systems. During the 1980s, research activity focused on distributed database system and database machines, but these developments had little effect on the market. Another important theoretical idea was the Functional Data Model, but apart from some specialized applications in genetics, molecular biology, and fraud investigation, the world took little notice. In the 1990s, attention shifted to object-oriented database. These had some success in fields where it was necessary to handle more complex data than relational systems could easily cope with, such as spatial databases, engineering data (including software engineering repositories), and multimedia data. Some of these ideas were adopted by the relational vendors, who integrated new features into their products as a result. In the 2000s, the fashionable area for innovation is the XML database. As with object databases, this has spawned a new collection of start-up companies, but at the same tome the key ideas are being integrated into the established relational products. XML databases aim to remove the traditional divide between documents and data, allowing all of an organization's information resources to be held in one place, whether they are highly structures or not.

7. Types of Databases:

Databases are usually categorized according to their various models. Various techniques are used to model data structure. Most database systems are built around one particular data model, although it is increasingly common for products to offer support for more than one model. For any one logical model various physical implementations may possible, and most products will offer the user some level of control in tuning the physical implementation, since the choices that are made have a significant effect on performance. An example of this is the relational model: all serious implementations of the relational model allow the creation of indexes which provide fast access to rows in a table if the values of certain columns are known. A data model is not just a way of structuring data: it also defines a set of operations that can be performed on the data. The relational model, for example defines operations such as select; project; and join. Although these operations may not

be explicit in a particular query language, they provide the foundation on which a query language is built.

7.1 Flat Model:

This may not strictly qualify as a data model, as defined above. The flat (or table) model consists of a single, two-dimensional array of data elements, where all members of a given column are assumed to be similar values, and all members of a row are assumed to be related to one another. For instance, columns for name and password that might be used as a part of a system security database; each row would have the specific password associated with an individual user. Columns of the table often have a type associated with them, defining them as character data, date or time information, integers, or floating point numbers. The model is, incidentally, a basis of the spreadsheet.

7.2 Hierarchical Model:

In a hierarchical model, data is organized into a tree-like structure, implying a single upward link in each record to describe the nesting, and a sort field to keep the records in a particular order in each same-level list. Hierarchical structures were widely used in the early mainframe database management systems, such as the Information Management System (IMS) by IBM, and now describe the structure of XML documents. This structure allows one 1: N relationship between two types of data. This structure is very efficient to describe many relationships in the real world; recipes, table of contents, ordering of paragraphs/verses, any nested and sorted information. However, the hierarchical structure is inefficient for certain database operations when a full path (as opposed to upward link and sort field) is not also included for each record.

7.3 Network Model:

The network model (defines by the CODASYL specification) organizes data using two fundamental constructs, called *records* and *sets.* Records contain fields which may be organized hierarchically, as in the programming language COBOL). Sets (not to be confused with mathematical sets) define one-to-many relationships between records: one owner, many members. A record may be an owner in any number of sets, and a member in any number of sets. The operations of the network model are navigational in style: a program maintains a current position, and navigates from one record to another by following the relationships in which the record participates. Records can also be located by supplying key values. Although it is not an essential feature of the model, network databases generally implement the set relationships by means of pointers that directly address the location of a record on disk. This gives excellent retrieval performance, at the expense of operations such as database loading and reorganization.

7.4 Relational Model:

The relational model was introduced in an academic paper by E.F. Codd in 1970 as a way to make database management systems more independent of any particular application. It is a mathematical model defined in terms of predicate logic and set theory. The products that are generally referred to as relational databases in fact implement a model that is only an approximation to the mathematical model defined by Codd. Three key terms are used extensively in relational database models: *Relations, attributes, and domains.* A relation is a table with columns and rows. The named columns of the relation are called attributes, and the domain is the set of values the attributes are allowed to take. The basic data structure of the relational model is the table, where information about a particular entity (say, an employee) is represented in columns and rows (also called tuples). Thus, the “relation” in “relational database” refers to the various tables in the database; a relation is a set of tuple. The columns enumerate the various attributes of the entity (employee’s name, address or phone number, for example), and a row is an actual instance of the entity (a specific employee) that is represented by the relation. As a result, each tuple of the employee table represents various attributes of a single employee. All relations (and, thus, tables) in a relational database have to adhere to some basic rules to quality as relations. First, the ordering of columns is immaterial in a table. Second, there can’t be identical tuples or rows in a table. And third, each tuple will contain a single value for each of its attributes. A relational database contains multiple tables, each similar to the one in the “flat” database model. One of the strengths of the relational model is that, in principle, any value occurring in two different records (belonging to the same table or to different tables), implies a relationship among those two records. Yet, in order to enforce explicit integrity constraints, relationships between records in tables can also be defined explicitly, by identifying or non-identifying parent-child relationships characterized by assigning cardinality (1:1, (0) 1:M, M:M). Tables can also have a designated single attribute or a set of attributes that can as a “key”, which can be used to uniquely identify each tuple in the table. A key that can be used to uniquely identify a row in a table is called a primary key. Keys are commonly used to join or combine data from two or more tables. For example, an *Employee* table may contain a column named Location table. Keys are also critical in the creation of indexes, which facilitate fast retrieval of data from large tables. Any column can be a key, or multiple columns can be grouped together into a compounded key. It is not necessary to define all the keys in advance; a column can be used as a key even if it was not originally intended to be one. A key that has an external, real-world meaning (such as a person’s name, a book’s ISBN, or a car’s serial number) is sometimes called a “natural” key. If no natural key is suitable (think of the many people named *Brown*), an arbitrary or surrogate key can be assigned (such as by giving employees ID number). In practice, most databases have both generated and natural keys, because generated keys can be used internally to create links between rows that cannot break, while natural keys can be used, less reliably, for searches and for integration with other databases. (For example, records in two independently developed databases could be matched up by social security number, except when the social security numbers are incorrect, missing, or have changed).

7.5 Relational Operations:

Users (or programs) request data from a relational database by sending it a query that is written in a special language, usually a dialect of SQL. Although SQL was

originally intended for end-users, it is much more common for SQL queries to be embedded into software that provides an easier user interface. Many web sites, such as Wikipedia, perform SQL queries when generating pages. In response to a query, the database returns a result set, which is just a list of rows constituting the answers. The simplest query is just to return all the rows from a table, but more often, the rows are filtered in some way to return just the answer wanted. Often, data from multiple tables are combined into one, by doing a join. Conceptually, this is done by taking all possible combinations of rows (the Cartesian product), and then filtering out everything except the answer. In practice, relational database management systems rewrite ("optimize") queries to perform faster, using a variety of techniques. There are a number of relational operations in addition to join. These include project (the process of eliminating some of the columns), restrict (the process of eliminating some of the rows), union (a way of combining two tables with similar structures), difference (which lists the rows in one table that are not found in the other), intersect (which lists the rows found in both tables), and product (mentioned above, which combines each row of one table with each row of other). Depending on which other sources you consult, there are a number of other operators- many of which can be defined in terms of those listed above. These include semi-join, outer operators such as outer join ad outer union, and various forms of division. Then there are operators to rename columns, and summarizing or aggregating operators, and if you permit relation values as attributes (RVA- relation-valued attribute), then operators such as group and ungroup. The SELECT statement in SQL serves to handle all of these except for the group and ungroup operators. The flexibility of relational databases allows programmers to write queries that were not anticipated by the database designers. As a result, relational databases can be used by multiple applications in ways the original designers did not foresee, which is especially important for databases that might be used for decades. This has made the idea and implementation of relational databases very popular with businesses.

7.6. Normal Forms:

Relations are classified based upon the types of anomalies to which they are vulnerable. A database that is in the first normal form is vulnerable to all types of anomalies, while a database that is in the domain/key normal form has no modification anomalies. Normal forms are hierarchical in nature. That is, the lowest level is the first normal form, and the database cannot meet the requirements for higher level normal forms without first having all the requirements of the lesser normal forms.

7.7. First Normal Form:

Any table having any relation is said to be in the first normal form. The criterion that must be met to be considered relational is that the cells of the table must contain only single values, and is repeat groups or arrays are not allowed as values. All attributes (the entries in a column) must be of the same kind, and each column must have a unique name. each row in the table must be unique. Databases in the first normal form are the weakest and suffer from all modification anomalies.

7.8. Second Normal Form:

If all relational database's non-key attributes are dependent on the entire key, then the database is considered to meet the criteria for being in the second normal form. This normal form solves the problem of partial dependencies, but this normal form only pertains to relations with composite keys.

7.9. Third Normal Form:

A database is in the third normal form if it meets the criteria for a second normal form and has no transitive dependencies.

7.10. Boyce-Codd Normal Form:

A database that meets third normal form criteria and every determinant in the database is a candidate key, it is said to be in the Boyce-Codd Normal Form. This normal form solves the issue of functional dependencies.

7.11.Domain/Key Normal Form:

The domain/key normal form is the Holy Grail of relational database design, achieved when every constraint on the relation is a logical consequence of the definition of key and domains, and enforcing key and domain restraints and conditions causes all constraints to be met. Thus, it avoids all non-temporal anomalies. It is much easier to build a database in domain/key normal form than it is to convert lesser databases which may contain numerous anomalies. However, successfully building a domain/key normal form database remains a difficult task, even for experienced database programmers. Thus, while the domain/key normal form eliminates the problems found in most databases, it tends to be the most costly normal form to achieve. However, failing to achieve the domain/key normal form may carry long-term, hidden costs due to anomalies which appear in databases adhering only to lower normal forms over time.

8. Dimensional Model:

The dimensional model is a specialized adaptation of the relational model used to represent data in data warehouses in a way that data can be easily summarized using OLAP queries. In the dimensional model, a database consists of a single large table of facts that are described using dimensions and measures. A dimension provides the context of a fact (such as who participated, when and where it happened, and its type) and is used in queries to group related facts together. Dimensions tend to be discrete and are often hierarchical; for example, the location might include the building, state, and country. A measure is a quantity describing the fact, such as revenue. It is important that measures can be meaningfully aggregated- for example, the revenue from different locations can be added together. In an OLAP query, dimensions are chosen and the facts are grouped and added together to create a summary. The dimensional model is often implemented on top of the relational model using a star schema, consisting of one table containing the facts and surrounding tables containing the dimensions. Particularly complicated dimensions might be represented using multiple tables, resulting in a snowflake schema. A data warehouse can contain multiple star schemas that share dimension tables, allowing them to be used together, coming up with a standard set of dimensions is an important part of dimensional modeling.

9. Object Database Model:

In recent years, the object-oriented paradigm has been applied to database technology, creating a new programming model known as object databases. These databases attempt to bring the database world and the application programming world closer together, in particular by ensuring that the database uses the same type of system as the application program. This aims to avoid the overhead (sometimes referred to as the *impedance mismatch*) of converting information between its representation in the database (for example as rows in tables) and its representation in the application program (typically as objects). At the same time, object databases attempts to introduce the key ideas of object programming, such as encapsulation and polymorphism, into the world of databases. A variety of these ways have been tried for storing objects in a database. Some products have approached the problem from the application programming end, by making the objects manipulated by the program persistent. This also requires the addition of some kind of query language, since conventional programming languages do not have the ability to find objects based on their information content. Others have attacked the problem from the database end, by defining an object-oriented data model for the database, and defining a database programming language that allows full programming capabilities as well as traditional query *facilities*. Object databases suffered because of a lack of standardization: although standards were defined by ODMG, they were never implemented well enough to ensure interoperability between products. Nevertheless, object databases have been used successfully in many applications: usually specialized applications such as engineering databases or molecular biology databases rather than mainstream commercial data processing. However, object database ideas were picked up by the relational vendors and influenced extensions made to these products and indeed to the SQL language.

10. Concept of Information Storage and Retrieval

Information as a resource requires careful handling by the information specialist. The major aim of careful information handling is to ensure that the right type of information gets to the right user at the right time with minimum cost [2]. This will enable the recipient to take correct decisions, formulate right policies or communicate effectively. Proper information handling ensures that IT is used in the dissemination of information. [11] saw IT as the coming together of computing and telecommunications for the purpose of handling information. [17] said, “the computer and telecommunications technologies have helped to concretize the network concept”. In related terms, [21] asserts that IT embraces computers, telecommunications and software systems that aid the organization, transmission, storage, retrieval, and utilization of what might better be called “knowledge resources”. [22] is of the view that IT is a term that encompasses the notion of application of technologies to information handling. This includes generation, storage, processing, retrieval and dissemination. Every library’s aim is to provide the right information at the right time and in the right format to its patrons. Thus, the imperativeness of IT in information storage and retrieval in university libraries (especially in this era of exponential growth of knowledge, tagged as “information explosion”) is when IT is being used to check each library’s increasing workload, engineered by influx of information. Lending credence to this view, [23] attested that IT could be used for the management of library processes in terms of information storage and retrieval. He further state that computers can process information much faster than humans and can, therefore, help to increase the flow of work in libraries. It is worthy of note that in order enable the computer to perform an accurate job, data inputted to it must be accurate. This is best explained in computer jargon as “garbage in garbage out” [23]. [24] advised librarians to be aware of the rapid growth being made towards integrated systems. He further advised that this is true because the numerous acquisitions functions cannot be fruitfully performed using the manual system, which is susceptible to delays, accumulation of backlogs, errors, patrons and librarians’ dissatisfaction. IT has eliminated many routine tasks ad increased speed in the acquisition of materials. [25] asserts a computerized catalogue offers so many possibilities that the initial high cost of setting it up should not be a deterrent. He is of the view that computerized/automated catalogue files can produce the following: author or main catalogue, title catalogue plus supplements; classified catalogue; accession list of old and new arrivals to keep the staff up to data on the library’s stock. Additionally, [17] opine that, “information technology such as the computer based circulation systems offer the prospect of regaining detailed knowledge of books usage at a price”. They see the role of computer internet, intranet as rapidly and accurately marrying borrowers’ books and data information together, enabling rapid, easy consultation of issue files at any time so as to detect where any book is located and this helps in restoring any items (print and electronic) that are returned from loan. It also detects delinquent borrowers at the point of issuing books and amends circulation records promptly [17]. This is an information age, the dawn of the new age where information increases with the promise of new ways of thinking, living and working [26] Information scientists assert that information is the life blood of any organization, as very little can be achieved in any organization through manual processes. They believe that information is an essential ingredient of any control system- the library. The possession and the use of appropriate IT ensures organizational function ability [26]. The manual process of storing and retrieval of information has been faced with a number of problems and weaknesses that frustrate librarians as well as library patrons [17]. University libraries have every reason for embracing IT because it offers greater efficiency in operations/information services, adding reality, clarifies communications, and stimulates interest and speedy comprehension [17]. It is important to note at this juncture, that the services provided by IT, in information storage and retrieved, are more accurate and consistent and authentic than in a manual system [17]. IT has equally helped with the selection, acquisition and organization storage and retrieval. Librarians now embrace new techniques within IT to assist in meeting the information needs of users. The importance of information technologies in information storage and retrieval as stated by [27] are: “to group the effects of information technology on society, readers should try to imagine a world without electricity or

automobiles". It is interesting to note that a world without IT is difficult to comprehend because changes are less tangible. [28] posits that, "automated or computerized methods for information development helps to accommodate dramatic growth both in the amount of information and in the need to provide access to it".

11. Storage Devices:

[29] Stated that information storage and retrieval is meaningless without the corresponding storage device. There are two types of storage device:

11.1. Primary and Secondary Storage.

A computer's main memory (RAM) is known as primary storage. In order to execute a program, the program instructions and the data on which it is to operate have to be loaded into the main memory. Primary storage, however is volatile; when a computer is switched off, all the contents of the memory are lost. This is one good reason for frequently saving to disk when working on, for example, a word-processed document. A more permanent, non-volatile form of storage is required by all computer systems to save software and data files. Magnetic tape, magnetic disks, CD-ROM and microfilm are all examples of what is known as secondary storage.

11.2. File processing concepts:

Data stored on secondary storage is typically stored in files, with a file of data being defined as a collection of records. A payroll file, for example, will contain a record for each employee, and a stock file will contain a record for each stock item. The manner in which these files are processed depends on whether every record in the file is to be processed one after the other, or whether individual records will be processed in no particular sequence. These two methods of processing are known as sequential and random processing.

11.3. Sequential processing.

Each record in the file is read. If only the 200th record on the file needs altering, the first 199 records must be read anyway, and left as they are. Sequential processing is very fast and efficient for an application such as payroll where every record needs to be processed because every person in the company will be paid.

11.4. Random processing.

Each record on the file has its own address, which can either be calculated from its unique key, or held in a separate index, so the record can be directly accessed. This type of processing is essential if, for example, you want to look up the prices of an item of stock on a file of 2000,000 items. These two types of processing are similar to the different ways in which you would access a particular song on a cassette tape and on a CD. On a tape, you have to wind forward until you find the song you want, whereas on a CD, you just select the track ad press the correct button. Note, however, that whereas you can "process" a CD sequentially (listen to all the tracks from beginning to end) you cannot go directly to a particular song on a tape. Similarly, some files need to be processed sequentially on some occasions, and randomly on others.

11.5. Floppy disks and Zip disks:

The standard 3.5-inch floppy disk is a thin, flexible plastic disk coated in metal oxide, enclosed in a rigid plastic casing.

- A high-density disk has a storage capacity of 1.44MB.
- It has a write-protect hole with a built-in tab that can be positioned to leave the notch open, which write-protects it so that it cannot be written to. Positioning the tab so that the hole is closed enables the disk for writing.
- A zip disk is slightly larger and thicker than a floppy disk, and has its own drive. These disks hold 100 or 25MB of data.

12. How data is stored:

A diskette consists of two surface, each of which consists typically 80 concentric circles called tracks. Each track is divided into sectors. Microcomputer disks are soft-sectored: the sectors are not present when you buy a new floppy disk, but are defined when you first format the disk. If you reformat a disk that already has data on it, all the data will be erased (although you can also do a "quick format" which erases only the file folder).

12.1. Hard disks for microcomputers*:*

The hard disks used with PCs consist of one or more disk platters permanently sealed inside a casing. Hard disks typically have a capacity of between 500MB and 5GB (1GB = 1,000MB).

12.2. Hard disks for minis and mainframes:

For large-scale applications storing huge amounts of data, several hard disk units will be required. The disks may be either fixed (sealed inside the unit) or removable. Fixed disks are faster, more reliable, and have a greater storage capacity. As with other types of disks, data is stored on concentric tracks, with tracks being divided into sectors. All the tracks that are accessible from one position of the read-write heads form a cylinder; data is recorded cylinder by cylinder to minimize movement of the read-write heads, thereby minimizing access time.

12.3. Magnetic tape:

Data is recorded in "frames" representing one byte. The frames form tracks along the length of the tape, with nine tracks being common, giving eight data tracks and one parity track. Magnetic tape is a serial medium, meaning that an individual record can only b accessed by starting at the beginning of the tape and reading through every record until the required record is found. Likewise, it is impossible to read a record, amend it in memory, then backspace to the beginning of the block and overwrite the old record. Therefore, updating a magnetic tape file always involves copying the file to a new tape with the amendments made.

12.4. Uses of magnetic tape:

Tape is a cheap and convenient medium for backup, and is also used for achieving past transactions or other data that may be needed again, for example, weather records collected over a number of years. Cartridge tape drives are in common use for backing up the hard disk of personal

computers, being much more convenient than using dozens of floppy disks.

12.5. CD-ROM:
These devices (CD-ROMs) can store around 680MB of data, the equivalent of hundreds of floppy disks. The data may be in text form, or may be in the form of graphics, photographic images, video clips or sound files. Although they do not transfer data as fast as a hard disk drive, their speed is increasing every year and is acceptable for most applications. As the name suggests, the disks are read-only. When the master disk is created, a laser beam burns tiny holes in the surface of the disk, which (unlike a magnetic disk) has a single spiral track divided into sectors. To read data from the disk, a laser beam is reflected off the surface of the disk, detecting the presence or absence of pits in the surface, which represent binary digits.

12.6. Worm disks.
Write Once, Read Many optical laser disks look similar to CD-ROM disks, but they are often gold rather than silver in colour. An end-user company can use these disks to write their own materials, typically for archiving or storing say, graphic or photographic images that will not be changed. These disks are also widely used for pirated software; whereas silver CDs are pressed in factories, gold CDs are usually written one at a time on PCs in garages ad back bedrooms.

12.7. Magneto-optical disks:
Magneto-optical disks integrate optical and laser technology to enable read and write storage. A 512-inch disk can store up to 1,000MB. These disks may in the future replace current magnetic disks but at present the technology is still developing and the disks are too expensive, slow and unreliable to be in widespread use.

12.8. Microfiche:
Computer output on microfilm (COM) devices are used to prepare microfiche, a 4 X 6 inch hardcopy film that is sometimes seen in libraries and bookshops being used for reference purposes. Each microfiche sheet is divided into as many as 270 frames each containing a page of information that can be read using a special viewer. COM is also extensively used for archiving materials such as old cheque or income tax returns.

13. Role of Information and Communication Technology in Information Storage and retrieval.

ICT is a merge of both the computer and the Telecom Systems. This merger/convergence has brought both systems, which have before now worked independently, together to function as one. ICT therefore, is divided into: Computer System and Telecom System

13.1. Computer System:
This is subdivided into the;

a. Hardware and
b. Software

13.2. Hardware:
This refers to the physical components of the computer system. It is made up of the electromagnetic components of the computer. The Hardware is further divided into the: *Central Processing Unit and Peripherals.*

13.3. Central Processing Unit (CPU):
The CPU is the brain of the computer. It is in the CPU, that every activity of the computer is initialized and performed. The major components of the CPU are:

- Internal Memory (IM)
- Arithmetic Logic Unit (ALU), and
- Control Unit (CU)

***13.4. Internal Memory (IM)**:*
This is the region of the computer where data and instructions are primarily stored for processes. The Read Only Memory (ROM) and Random Access Memory (RAM) are major components of the IM.

***13.5. Arithmetic Logic Unit (ALU)**:*
This region takes care of all the arithmetic processes of the computer system.

Control Unit: This unit takes care of the coordination of signals to and from all parts of the computer system. It controls the flow of signals and ensures against "clashing of signal" in the computer system. In its coordination of signal movement, it gives priority to some parts of the system over others.

13.6.Peripherals:
Peripherals refer to:

- Input Devices
- Output Devices and
- External Storage Devices.

13.7. Input Devices:
These are devices that aid the imputation of data into the computer system. Some examples are: Keyboard, Mouse, Scanner, Joystick, etc.

13.8. Output Devices:
These are devices that display and produce the finished result of processed inputted data. Some examples are: Monitor (displays/produces "Soft Copies", printer (produces "Hard Copies"), speakers, etc.

13.9. Eternal Storage Devices:
These are also called Secondary/Auxiliary Storage Devices. Due to the limitation of memory capacity of the computer, external storage devices are created to aid in storing information. Some good examples include: floppy Diskettes, Magnetic Disks and CD-ROMs, etc.

14. Software:

This refers to the programs that control the operation of the computer. There are two types of software:

14.1. Application Software:
This is software that is designed by the Bank to aid their use and meet the needs of both staff and customers of the

bank. Application software does not require extreme expertise to design them.

14.2. System Software:
This is software that is basically supplied and introduced by the manufacturer of the computer. It is also called "Utility Software", that is software that controls the booting, compilers, translators, etc. of the computer.

14.3 Telecom System:
This system aids the transmission/communication of data/information from/to other computer systems. (more recently, it aids communication to GSM phones, pagers, etc).

15. Challenges of effective Information and Storage and retrieval

The intensive penetration of computers and other information and telecommunication technology in the former socialist countries- countries in transition has contributed to the automation of many information activities in organizations and enterprises and has changed considerably their ability to access and use information from distant information resources. This, however, has not changed the information behaviour in these countries; it has not automatically triggered higher information awareness or changed the attitudes towards information and communication activities. In spite of the technological possibilities and an increased number of computer engineers and information systems professionals, most organizations continue to face serious information problems due to the lack of interdisciplinary knowledge required for an integrated approach to the complex information activities involved in every aspect of work and doing business. Neither librarians nor other information professionals have the interdisciplinary knowledge needed for organizing and managing information activities in a broader context. Thus they cannot fully understand the information phenomenon and the implications of the global information societies and information highway trends. Under these circumstances an abundance of money is spent on expensive technology and gadgetry that is not exploited to the greater benefit of the organization. All organizations and enterprises, regardless of the socioeconomic and political systems in which they operate, need enormous amounts of information. This is particularly true for those in transitional economies. Many organizations and enterprises in countries in transition suffer from inefficient and ineffective administration and exploitation of their information resources. They have no organized special libraries, information centres or services of any kind and also suffer from a lack of suitably trained professional library information manpower. Relevant information, whether internally generated or externally available, is still not tapped. Management and operational functions both the macro and micro levels (in government and in private organizations) are performed without the benefit of timely, relevant and reliable information. In many organizations we find a great number of different information resources managed in a diffuse way. There are no vertical or horizontal connections and the resources are not applied in a synergistic way toward the fulfillment of strategic objectives [30]. As far as special libraries and information services are concerned, managers do not, as yet, recognize that locating; accessing, retrieving, processing and disseminating information are activities of great importance for the successful functioning of their organizations. Managers still tend to see the library/information centre as a cost, rather than as a strategic, resource. The lack of appreciation of the role, functions and services of special libraries and information centres has led to a situation in which organizations have no proper instruments to make them aware of the wealth of domestic and foreign information sources that technically are now available in the countries in transition. Such a situation is very symptomatic when it is widely recognized that organizations need specialized help in dealing with information, as noted in a recent statement by Peter Drucker: To think through what the business needs requires somebody who knows and understands the highly specialized information field. There is far too much information for any but specialists to find their way around. The sources are totally diverse. Companies can generate some of the information about themselves, such as information about customers and non-customers or about technology in one's own field. But most of what enterprises need to know about the environment is obtainable only from outside sources-from all kinds of data banks and data services, from journals in many languages, from trade associations, from government publications, from Would Bank reports, etc, (Peter F. Drucker: "The Information Executives Truly Need, Harvard Business Review, January-February 1995:54-63).

15.1. Problems:
After many years of neglect, in former socialist countries the library and information sector has deficiencies which are now creating problems during the current transition. Dynamic and complex socioeconomic and technological changes have found many librarians and information professionals unprepared to react facts, adapt and take advantage of the developments in their field. Most of them are still working in the traditional manner, focusing mainly on classic library routine. There are no cost benefit analyses of these processes and thus it is impossible to evaluate their operations and their impact on the parent organization. With librarians often lacking the appropriate academic and professional background, their status is relatively low, exacerbating the situation. Due to lack of funding, slow action and reaction, and insufficient professional knowledge the library/information sector in countries in transition has lagged behind developments in the field. Newly created library and information systems are often outdated by the time they are developed and implemented. It takes courage to radically cut and abandon existing inefficient practices. This then leads to situations in which scarce funds and precious time are wasted in fruitless discussions and endeavours. The poor financial support and lack of education and research in the field have made it difficult for professionals at all levels to conceptualize meaningful national and corporate information policies, devise financial solutions and introduce incentives, stimulate or subsidies where necessary for the development of the library and information sector. Well-articulated information policies are lacking both at the macro and micro levels. Information policies on the national level are needed to define a framework for cooperation

among the various agents in the information infrastructure of the country and also to ensure wider access to external (international) sources of information as well as international access to national information sources (i.e., to present them in the international information systems and networks). At the micro level, organizations in these countries need information policies that will ensure consideration of all the factors relevant to the acquisition, flow and use of information, the development of strategic plans for information activities and appropriate information resources management. One of the greatest problems is that of the lack of capital. This perpetuates chronic under-investment in the information infrastructure. Budgeting and other financial issues in the information sector have been difficult in industrialized countries and better organized economies. The lack of capital and poor market mechanisms render these issues even more difficult in countries with transition economies. The weak demand for information services in the previous economic systems has necessarily led to non-existent or underdeveloped markets of information services and products. Services are scattered and uncoordinated. The marketing of information services is still generally poor. Even where fairly good information services exist, they are not well known and are not easily available to potential users from the national and international communities, though the World Wide Web possibilities are changing the situation. The manpower position is the most crucial. For many years there was practically no regular professional education and training. Without professional education, in particular at the postgraduate level, there were very few research projects, survey or empirical studies that could have clarified the problems in the library/information sector and brought about solutions. Keeping pace with the unprecedented speed of developments in the area of information and telecommunications directly affecting information and library work has been a traumatic experience even for information professionals in industrialized countries that have undergone a more or less continuous development in the field. For information professionals in countries in transition this has been an even greater problem [31]. Many information professional in countries in transition lose confidence when faced with a general lack of understanding of their vocation, lack of opportunities for regular and continuous professional training, and the imperative to keep abreast with the rapid development of information and telecommunication technology.

16. Research Methodology

The study adopted descriptive survey design grounded on quantitative research method and the population sampled are:

1) Oceanic Bank International, PLC 30
2) Ecobank Nigeria PLC 10
3) Afribank Nigeria PLC 10
4) Unity bank PLC 15
5) Zenith Bank 15
6) United Bank of Africa PLC 12

A proportionate population across the sampled banks was selected due to the availability of staff in those banks. This made the researcher to made use of the 92 as sample size since the population was so small. The research instrument use to obtain data from respondents was the questionnaire. This was personally administered by the researcher across the six sampled banks, after which, collated questionnaire were analyzed using simple percentage statistical tool.

17. Analysis, Discussion and Research findings

Table 1 Source of Funding the Use of Databases in Banks

Source of Fund	Frequency	Percentage
Parent bodies of Banks	50	54.3
Individual	10	10.9
Government	12	13.0
Philanthropic organizations	20	21.7
Total	92	100

Table 1 shows source of funding the use of databases in banks in Delta state. Parent bodies of banks 50(54.3), philanthropic organizations 20(21.7%). This signifies that parent bodies of banks 50(54.3%) carries the majority.

Table 2 Skilled ICT Personnel to mann task of storage and Retrieval.

Skilled ICT Personnel	Frequency	Percentage
Yes	70	76.1
No	22	23.9
Total	92	100

Table 2 shows that there are adequate skilled ICT personnel for services of storage and retrieval of information/data at the banks. Evidence shows 70(76.1%) which makes the majority.

Table 3 ICT Software/Hardware used for Storage and Retrieval.

ICT Software/Hardware	Frequency	Percentage
Finnacle	5	5.4
Signature systems	3	3.3
Microsoft Exchange	8	8.7
Microsoft Excel	6	6.5
Credit card management	6	6.5
Flex-cube	4	4.3
Globus	5	5.4
Electronic Cheque	3	3.3
Electronic cash	3	3.3
Internet	7	7.6
Computers	10	10.9
E-mail	8	8.7
Telephone (land and mobile)	10	10.9
Master cards/visa	5	5.4
Fax machines	4	4.3
Automated teller machine	5	5.4
Total	92	100

Table 3 above shows the various ICT software and hardware use for storage and retrieval of data/information in the banking industry; Telephone (land and mobile) 10(10.9%) has the majority. Data gathered shows that finnacle had 5(5.4%), signature systems 3(3.3%), Microsoft exchange 8(8.7%), Microsoft excel 6(6.5%), credit card management 6(6.5%), flexcabe 4(4.3%).

Table 4 Duration of Staff training in the use of databases for information storage and retrieval.

Duration of Staff Training	Frequency	Percentage
Monthly	24	26.1
Quarterly	52	56.5
Yearly	16	17.4
Total	92	100

The ranking of responses above shows that duration of staff training is quarterly 52(56.5%), monthly 24(26.1%) while yearly 16(17.4%). This signifies that staff training is categorized into quarterly intervals.

Table 5: Maintenance of ICT Facilities

Maintenance of ICT Facilities	Frequency	Percentage
Daily	10	10.9
Weekly	40	43.5
Monthly	20	21.7
Quarterly	18	19.6
Annually	4	4.3
Total	92	100

Table 5 shows the duration of the maintenance of ICT facilities, daily 10(10.9%), weekly 40(43.5%), monthly 20(21.7%), quarterly 18(19.6%), annually 4(4.3%). This indicates the ranking that ICT facilities are maintained weekly and monthly depending on the level of usage.

Table 6: problems of erratic power supply and network signals

Response	Frequency	Percentage
Lack of e-banking services in remote and rural areas in Delta state	12	13.0
Lack of inter-bank clearing of deposits	5	5.4
High cost of computer, internet access and other ICTs	13	14.1
Poor ICT knowledge and skills among some staff	12	13.0
Phobia for use of ICT facilities by staff	10	10.9
Insecurity in Banks	16	17.4
Bank network/systems breakdown	14	15.2
Electricity supply is epileptic	10	10.9
Total	92	100

Tables 6 reveal the problems of erratic power supply and network signals. From results it was seen that bank network/systems breakdown 14 (15.2%), Insecurity in Banks, 16 (17.4%), high cost of computer, internet access and other ICTs 13 (14.1%) and lack of e-banking services in remote and rural areas in Delta State 12 (13.0%) makes the majority while lack of inter-bank clearing of deposits 5 (5.4%) was the least. This signifies that there are multiple problems encountered by staff while storing and retrieving information for a better service delivery to customers.

18. Research Findings

The following are the findings from this research.

1) That parent bodies of banks are the sole source of funding banks so as to have a befitting services through the use of databases for information storage and retrieval in the selected Banks in Delta State.
2) That there are adequate skilled ICT personnel to render services of storage and retrieval of information/data at the banks.
3) That there are ICT software and hardware facilities used for storage and retrieval of data/information in the banking industry which includes Telephone (land and mobile) finnacle, signature systems, Microsoft exchange, Microsoft excel, Credit card management, and flexcabe.
4) That staff trained in the use of database for information storage and retrieval in Delta State is mostly quarterly.
5) That the normal duration of the maintenance of ICT facilities is mainly on weekly and monthly basis depending on the level of usage.
6) That there are problems militating against the services rendered by staff to users/customers with the aid of the use of database for information storage and retrieval by banks in Delta state and this is greater influenced by Insecurity in banks.

19. Recommendations

The following recommendations were made:

1) Upgrading of databases by incorporating new innovations in banking and financial information management.
2) Proper management of time will yield better results in managing information.
3) A reasonable bandwidth that will accommodate the ever increasing number of bank staff and customers.
4) A well-equipped Information Technology department will assist in proper management of information.
5) Constant upgrading of anti-virus will guard against virus attack.

REFERENCES

[1]. Allan, T and Stephen, F. (1994). *Information Management for Business* London: ASLIB

[2]. Angela, A. (1996). *Information as a Corporate Resource: Moving to centre storage.* Management Bulletin; issue 77, p. 9-12.

[3]. Grimshaw, A.S.(1995). "Parallel Processing and Object Technology," IEEE Computer, 28(10): 63-64, Oct 1995.

[4]. Blaise, C. (ed) (1992). *Information Management: from strategies to Actin.* London: ASLIB.

[5]. Angela, A. and Nigel, O. (2001). *Competing with Knowledge: the Information professional in the Knowledge Management Age.* London: Library Association with TFPL.

[6]. Brown, M.E. (2005). ‘‘Tackling information tasks’’. Retrieved 25th August, 2012. From: www.southernct.edu/.brownm/2445big6html.

[7]. Kirk, Joyce (1999) "Information in organisations: directions for information management" Information *Research*, **4**(3) Available at: http://informationr.net/ir/4-3/paper57.html

[8]. Braman Sandra (1989) Defining information*: An approach for policy makers*. Retrieved 26th August, 2012. From https://pantherfile.uwm.edu/braman/www/bramanpdfs/003_defining.pdf

[9]. Broadbent, M. (1977) The emerging phenomenon of knowledge management, *Australian Library Journal* 46, 6-23.

[10]. Elizabeth, O. (1999) Practical Information Policies: how to manage Information Flow in Organizations (2nd ed.). Aldershot: Gower.

[11]. Madu, E.C. (2004) *Technology for Information Management and Service.* Ibadan: Evi-Coleman publications.

[12]. Shibanda, G.G. (2000), ‘‘Managing and strategising Africa’s information in global computerisation’’, African Journal of Library, Archives and Information Science, pp. 35-41.

[13]. Elaine, S. (2005) The Intellectual Foundation of Information Organizations. Massahussets: MIT Press.

[14]. Joyce, K. (1999) *Information in organizations:* Directions for Information management. Information Research: Vol. 4(3).

[15]. Kirk, J. (1999) *Information in Organization: Directions for information management.* Retrieved October 9th, 2007 from http://www.infoormationr.net/ir/4-3/paper57.html.

[16]. Macevičiūtė, Elena and Wilson, T.D. (2002). "The development of the information management research area" *Information Research*, **7** (3) Available at: http://InformationR.net/ir/7-3/paper133.html.

[17]. Aguolu, C.C. and Aguolu, E.I. (2002). Libraries and Information Management in Nigeria, Ed-Linform Services, Maiduguri.

[18]. Burton, P.F. (2004). ‘‘Review of existing microcomputer systems for online access’’, paper presented at Online Public Access to Library Files: A National Conference, 3-5 September.

[19]. Katherine, B. (1996) *The Information Audit: an Important Management Tool Managing information;* Vol. 3(6), p. 34-35.

[20]. Barrett, R. (2001). Developments in Optical Disc Technology and the Implication for Information Storage and Retrieval, British Library, London.

[21]. Wilson, T.D. (2002), ''Information management'', in Feather, J. and Sturge, P. (Eds), Encyclopedia of Library and Information Science, Routledge, London.

[22]. Oketunji, I. (2002), ''Application of information technologies in Nigerian libraries: problems and prospect'', in Osase, P.F. and Nwako, K.L. (Eds), Information Technology in Library and Information Science Education in Nigeria, NALISE, Ibadan, pp. 7-20.

[23]. Tibi, E.U. (2003), ''Strengthening library to serve the nation through information communication technology'', paper presented at the Annual Conference of Nigeria Library Association held at Agbor.

[24]. Uwaifo, S.O. (2006), ''Introduction to information science''. Lecture note for undergraduate students, unpublished.

[25]. Molholt, P. (1997), ''A view from the clip: the influence of information technology on libraries and librarianship'', IFLA Journal, Vol. 13 No. 1, pp. 14-22.

[26]. Capron, H.L. (1993), Computers: Tools for an Information Age, Benjamin/Cammings Publishing Company, New York, NY.

[27]. Dijken, V.P. (2003), ''Information security: a vital link'', Information Technology Journal, Vol. 84 No. 12, pp. 6-7.

[28]. Burton, P.F. (2004), ''Review of existing microcomputer systems for online access'', paper presented at Online Public Access to Library Files: A National Conference, 3-5 September.

[29]. Heathcote, P.M. (2000), AS Level ICT, Payne-Gallway Publishers, Coventry.

[30]. Omotoso, R.O. (2000), ''The role of information technology in the making of an information society: the place of African'', Niger Biblios, Vol. 13 No. 3, pp. 6-10. Longley, D. (2000), ''The concept of information storage and retrieval tools'', in Aguolu, I.E. (Ed.), Library Computerisation in Nigeria, towards a Steadier Progress, Lagos Librarian, 1&2, pp. 8-13.

[31]. Nightingale, J.R. (2002), ''The use of microcomputer for information retrieval and other purpose in the engineering departments of BP International Ltd.'', Journal of Information Science Principles and Practice, Vol. 8 No. 3, pp. 5-10.