Review on Database Architecture and Management

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Abstract: ***Today's IT government faces a significant challenge in handling huge and growing amounts of data and delivering a quality-led software product that makes maximum use of capital with minimal costs. The query language is a cryptographic protocol i.e. a series of programmers, offering its consumers processes in which users can define, build, manipulate and share their databases with each other. The DBMS is the software set that allows the people to access records, manipulate the data, report/constitute data. This also allows monitor database direct exposure. It is not a new phenomenon that content management technologies were first introduced in the 1960s as such. A "database" is a traditional reference to a number of data and its organization. Database Management System (DBMS) generally requires access to this data, and requires an automated software development package and enables users to communicate with one or more repositories and provides accessibility to all the data stored in the domain (although limitations that deny access to certain data that serve a purpose). DBMS offers a number of features that enable vast volumes of knowledge to be accessed, processed and retrieved and includes ways of managing the management of this material. This paper reviews the database so far developed.***

Keywords: Database Architecture, DBMS, Information Technology, domain limitation, SQL, NoSQL

INTRODUCTION

A structured data gathering, normally electronically registered and accessible from a software system, is a repository. Where computer systems are more complicated, structured design and modelling strategies are often used. A software for interacting with end consumers, implementations and the database itself for data collections and analyzes is the database management system (DBMS). In fact, the DBMS package provides core functions for the maintenance of the application. A "database" constitutionally refers to a number of associated data and its organization. Transport to such data is generally presented by a DBMS (Database Management System), comprised of an incorporated software package, which permits customers to communicate in one or more repositories and enables direct exposure to all the information collected in the database.

The DBMS has different characteristics that enable large amounts of information to be entered, stored and retrieved, and delivers methods of managing how this data is organized. The word "database" is sometimes used implicitly to relate to a repository or DBMS for its administration due to the current strong relationship among them. Except for enterprise IT, the word database is often employed for the intent of using a database management program in any set of related data (e.g., database or a card index) as scale and use criteria.

Data interpretation, adjustment, and the elimination of interpretations that defines the institution of the data are the main features of existing DBMSs something that enables the administrators of a repository and its data, which can also be divided into four primary practical communities. Retrieval - Providing details in a way that is immediately accessible or to be further accessed by other programs. Inclusion, alteration, exclusion of real data. The information gathered can be made accessible as a result of updating or merging existing information from the registry in essentially equal form to the type contained in the computer database or in a newer form[1]–[6].

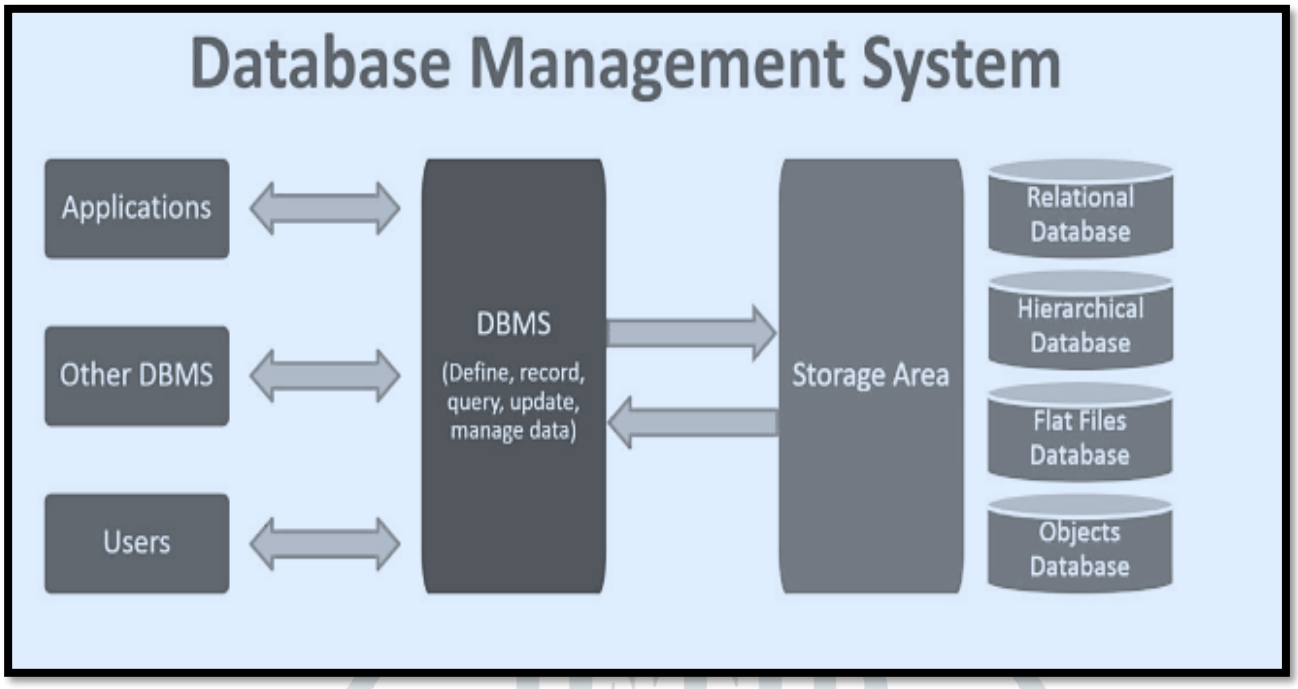

Figure 1 Database Management System

The standard database management system comprise of following modules and units. A database module as the first layer of the system which deals with the applications, users/clients and other sub-databases. The database module interacts with the users and the application to define, update, query and manage the stored data. A storage area is associated with the database module, the area has some pre-defined sections such as relational, hierarchical, flat files, objects sections. Some applications of the database management systems are described below provided tables 1, 2 and 3. Table 1 presents the applications of the database into an educational section.

Table: 1 **Applications of database in educational sector**

Universities and colleges	Examinations are done online today and universities and colleges maintain all these records through DBMS. Student's registrations details, results, courses and grades all the information are stored in database.
Library, Management System	There are thousands of books in the library so it is very difficult to keep record of all the books in a copy or register. So DBMS used to maintain all the information relate to book Issue dates, name of the book, author and availability of the book.

Table 2 illustrates the application of database management system in financial sector.

Table: 2 **Applications of database in Financial Sector**

Banking	Thousands of transactions through banks daily. So how banking has become so easy that by sitting at home we can send or get money through banks. That is all possible just because of DBMS that manages all the bank transactions.
Credit card transactions	For purchase of credit cards and all the other transactions are made possible only by DBMS. A credit card holder knows the importance of their information that all are secured through DBMS.
Telecommunications	Any telecommunication company cannot even think about their business without DBMS. DBMS is must for these companies to store the call details and monthly post-paid bills.
Finance	Those days have gone far when information related to money was stored in registers and files. Today the time has totally changed because there are lots of thing to do with finance like storing sales, holding information and finance statement management etc.

Table 3 presents applications of data in various other sectors

Table 3. **Applications of database in miscellaneous sector**

Social Media Sites	Social media websites to share our views and connect with our friends. Daily millions of users signed up for these social media accounts like Facebook, twitter, Pinterest and Google plus. But how all the information of users are stored
Military	Military keeps records of millions of soldiers and it has millions of files that should be keep secured and safe. As DBMS provides a big security assurance to the military information so it is widely used in militaries.
Online Shopping	Online shopping has become a big trend of these days. No one wants to go to shops and waste his time. Everyone wants to shop from home. So all these products are added and sold only with the help of DBMS.
Human Resource Management	Big firms have many workers working under them. Human resource management department keeps records of each Employee's salary, tax and work through DBMS.

- A cloud-based database management system

The Database-as-a-Service (DBaaS) model has been encouraged by cloud computing technology to deal with large quantities of consumer-generated data utilizing NoSQL databases. There are various configurations for NoSQL, for example, text, column and key-value, ensuring high accessibility, defect compassion and interoperability to meet specific customer needs. However, various NoSQL models could also incorporate needless stratification in DBaaS, even farther limiting the consumer to move application development utilities as per the alterations in enterprise or innovations.

They implement a NoSQL data management foundation throughout their publication to promote data accessibility throughout large and diverse cloud-based NoSQL data directories. The attitude is to standardize data and classify phases for effective surveying and interpretation around various NoSQL storage arrays premised on the Cloud. In the cloud-based paradigm application, three individual data patterns are supported: memorandum, column and chart. In addition, the implementation is meta-driven, enabling developers to expand their assistance for new models in the repository. Our solution provides an online information transformation hashing algorithm (document to graph), which needs up to 57 percent less room for a dataset repository. The proportion of substations in the pressurized diagram repository has also been reduced significantly (48% to 66%). Their published paper ignominiously recommends a meta-model driven mechanism that offers a standard model to avoid differentiation between multiple cloud-based NoSQL storage arrays. Due to the crucial role played in the migration of information by the meta-model driven framework, this research provides foundational cartography between several NoSQL strategies. They were also very concerned about the standard model of the meta-model oriented system to eradicate differentiation in various NoSQL storage arrays predicated in the cloud. Figure 1 illustrates the base structure.

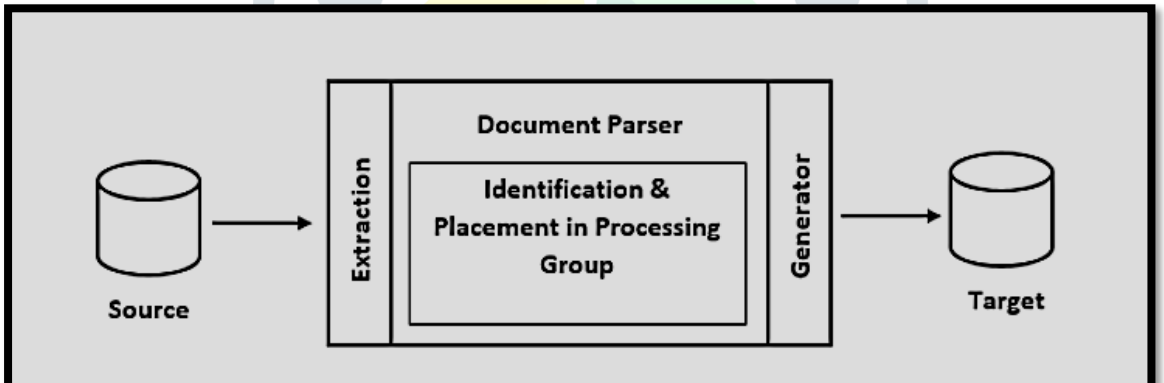

Fig. 1. Direct Translation of Document-based NoSQL to Graph

They suggest a new way to relocate data into large and diverse cloud-based NoSQL storage arrays. Specifically, the smooth transfer of information from NoSQL repositories to NoSQL data repositories is given in this study. They analyzed various report and graph-based NoSQL repositories and introduced the strategy for transliteration into specified graph repositories from the outlet, e.g. information bases "(e.g. BSON, YAML, XML, JSON)". The main underlining features of their proposed framework are explained below table 4.

Table 4: Underlining Features

1. Data-Types Support	**A document database supports primitive and hierarchical data such as documents within documents, arrays within documents, documents within arrays, or any other combination. Likewise, a graph database is independent of any particular data type and supports hierarchical data**
2. Strong consistency	**A document database may exhibit multi-level documents i.e. a document can contain another document (up to many levels). Conversely, a graph database describes the relationships between hierarchical nodes to establish consistency.**
3. Indexing	**A document database provides multiple index types such as single field, compound, and multi-key to encourage different data types and queries.**

Figure 2 explains the complete working of the proposed framework. Some modules and units are present in their framework. The first one is a database module which has name, collections, data, documents their respective IDs, keys and their associated values. The database is preferably MongoDB. The processing stores the array, document and ID into another database namely Neo4J. Meta-modeling is also present in their respective proposed framework[7]–[10].

Points disclosed in the published paper are presented in Table 1.

Table 1 points disclosed

1. The database in MongoDB which contains different collections is mapped to the partition key in a meta-model.
2. The collections (attributes) are mapped to collection columns in Azure Table using meta-model
3. The document ID key is directly mapped to a meta- model entity key which is later stored as a row key in the Azure Table.
4. Other keys and values are mapped to property names (column names) and property values (row values) respectively

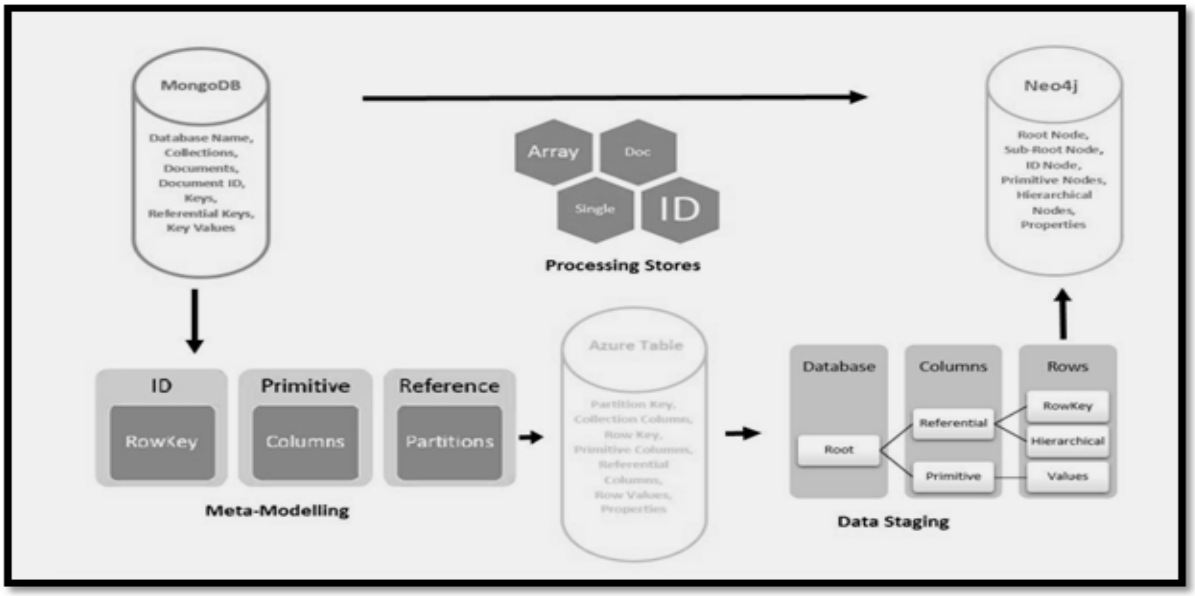

Figure 2 explains the complete working of the proposed framework

CONCLUSION

This review paper studies databases along with their types. This paper also came across various definitions of the database. As a conclusion, the database is generally an assortment of data which is done to manage and update the data stored in a regular interval of time. The standard databases usually have accumulations of records of data or files. This paper reviews the cloud-based database along with a semantic-based database and draws a conclusion that the various types of databases are efficient according to the condition or circumstances. For instance, for handling meta-data (i.e. data of data, large storage is required, so in that case, cloud-based database works efficiently but in case the customer wants a specific amount of data, the data is of a specific type then semantic-based database works efficiently. Additionally, this review paper also explains some applications of databases in various fields such as finically, educational. This review also evaluations the architectures of the database.

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