



THE ROLE OF DATABASE MANAGEMENT SYSTEM (DBMS) IN INSTITUTION/ORGANIZATION

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ABSTRACT

Today an organization uses large amounts of data. A database management system (DBMS) is a software tool that makes it possible to organize data in a database. Within an organization, the development of the database is typically controlled by database administrators (DBAs) and other specialists. This ensures the database structure is efficient and reliable. In this paper we will look what database management system is all about, and to know the role of DBMS in managing institution records, and also to understand the various areas database can be used. The benefit of DBMS in institution,

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INTRODUCTION

Information plays a vital role in the development and growth of every organization. Currently, the various departments manage student information independently in their own ways. There are no common, standardized process and program for capturing, processing and storing student's information. This has kept student information disintegrated in different departments and information provided to the various departments by the students is characterized with discrepancies. The various departments have systems in place to store and process student data but the systems are not able to talk to each other (Interoperability). This makes it difficult for the registrar to collate information of students across departments. For instance, if the registrar wants information about students with respect to their academic performance urgently, he must go

to all the departments and collect the required data. On occasions where the department is not able to produce the needed information immediately, the business or activity at that particular time would come to a standstill. On the other hand, time is being wasted going round the various departments to solicit data. This situation is very frustrating and impedes smooth operations and decision making process.

A database is a collection of data that is saved and organized to allow easy retrieval when needed. It is the collection of schemas, tables, queries, reports, views, and other objects. In order to maintain and access the database you will need a DBMS (database management system). This kind of system manages and protects data so that the database is safe and secure. Databases consist of tables that include groups of related data fields that are known as records. Staff record system has the ability to control redundancy, the integrity of the information being stored can be maintained, it can restrict access, it can share data, and can backup/recover information. The conversional methods of keeping the records are basically the same in higher institutions.

With so much importance attached to the provision of quality records in this information age, then the need to follow the trend of information technology (I.T) to speed up and reduce the stress in manual method of keeping records is needful.

RELATED LITERATURE

According to Wikipedia (a web encyclopedia), the introduction of the term database coincided with the availability of direct-access storage (disks and drums) from the mid-1960s onwards. The term represented a contrast with the tape-based systems of the past, allowing shared interactive use rather than daily batch processing.

According to Connolly, T. and Begg, C. (2014), A data model is an integrated collection of concepts for describing data, relationships between data, and constraints on the data used by an organization.

According to Oppel, Andrew J. (2014), once the requirements gathering part of the database system development project is complete then it is time for the next database design phase, which is Entity-Relationship modeling (ER modeling). Entity relationship modeling is the process of visually representing entities,

attributes, and relationships, producing a diagram called an entity relationship diagram.

DISCUSSION

DATABASE AND DATABASE MANAGEMENT SYSTEM

A database system is an integrated collection of related files, along with details of the interpretation of the data contained therein. Basically, database system is nothing more than a computer-based record keeping system i.e. a system whose overall purpose is to record and maintain information/data. A database management system (DBMS) is a software system that allows access to data contained in a database. An organization must have accurate and reliable data for effective decision making. To this end, the organization maintains records on the various facets maintaining relationships among them. Such related data are called a database. The objective of the DBMS is to provide a convenient and effective method of defining, storing and retrieving the information contained in the database. The DBMS interfaces with the application programs, so that the data contained in the database can be used by multiple applications and users. In addition, the DBMS exerts centralized control of the database, prevents fraudulent or unauthorized users from accessing the data, and ensures the privacy of the data.



Figure 1: DBMS Integration

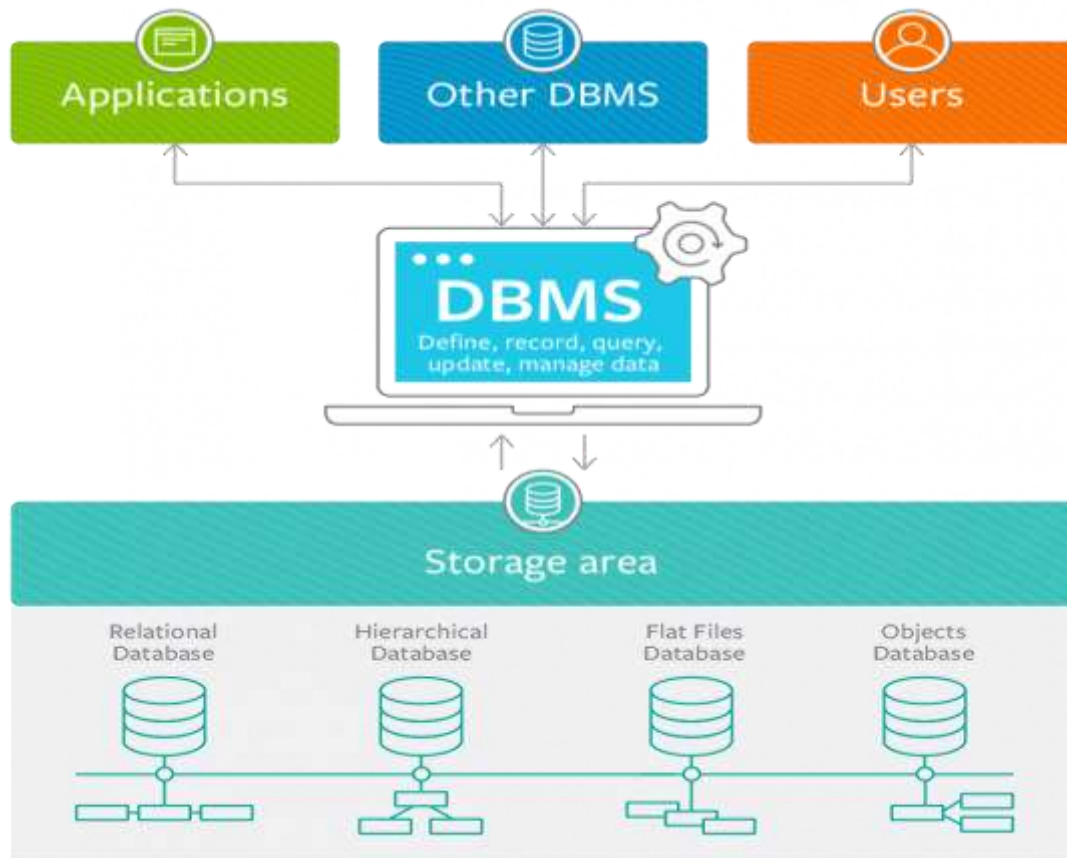


Figure 1: DBMS illustration

DIFFERENT TYPES OF DATABASES

According to Vecchioli, L., (2012), there are different types of databases which are categorised on the basis of their function. Some of these which you may come across are:

➤ Relational Databases

This is the most common of all the different types of databases. In this, the data in a relational database is stored in various data tables. Each table has a key field which is used to connect it to other tables. Hence all the tables are related to each other through several key fields. These databases are extensively used in various industries and will be the one you are most likely to come across when working in IT.

Examples of relational databases are Oracle, Sybase and Microsoft SQL Server and they are often key parts of the process of software development. Hence you should ensure you include any work required

on the database as part of your project when creating a project plan and estimating project costs.

➤ **Operational Databases**

In its day to day operation, an organisation generates a huge amount of data. Think of things such as inventory management, purchases, transactions and financials. All this data is collected in a database which is often known by several names such as operational/ production database, subject-area database (SADB) or transaction databases.

An operational database is usually hugely important to Organisations as they include the customer database, personal database and inventory database ie the details of how much of a product the company has as well as information on the customers who buy them. The data stored in operational databases can be changed and manipulated depending on what the company requires.

➤ **Database Warehouses**

Organisations are required to keep all relevant data for several years. In the UK it can be as long as 6 years. This data is also an important source of information for analysing and comparing the current year data with that of the past years which also makes it easier to determine key trends taking place. All this data from previous years are stored in a database warehouse. Since the data stored has gone through all kinds of screening, editing and integration it does not need any further editing or alteration. With this database ensure that the software requirements specification (SRS) is formally approved as part of the project quality plan.

➤ **Distributed Databases**

Many organisations have several office locations, manufacturing plants, regional offices, branch offices and a head office at different geographic locations. Each of these work groups may have their own database which together will form the main database of the company. This is known as a distributed database.

➤ **End-User Databases**

There is a variety of data available at the workstation of all the end users of any organisation. Each workstation is like a small database in itself which includes data in spreadsheets, presentations, word files, note pads and downloaded files. All such small databases form a different type of database called the end-user database.

ROLE OF DATABASE AS A SERVICE IN ANY INSTITUTION

For many businesses, the ability to create a managed database application is often held up by the ability to control and manage your databases. Database

management is critical to deploying any software, web, or app. More times than not, your businesses IT team is busy on many more business-critical issues that leave little time for creating and managing a database. That's why they turn to a Database as a Service (DBaaS) solution. A good provider will offer a solution that can completely offload the burden, and allow your team to stop thinking about databases and just use them.

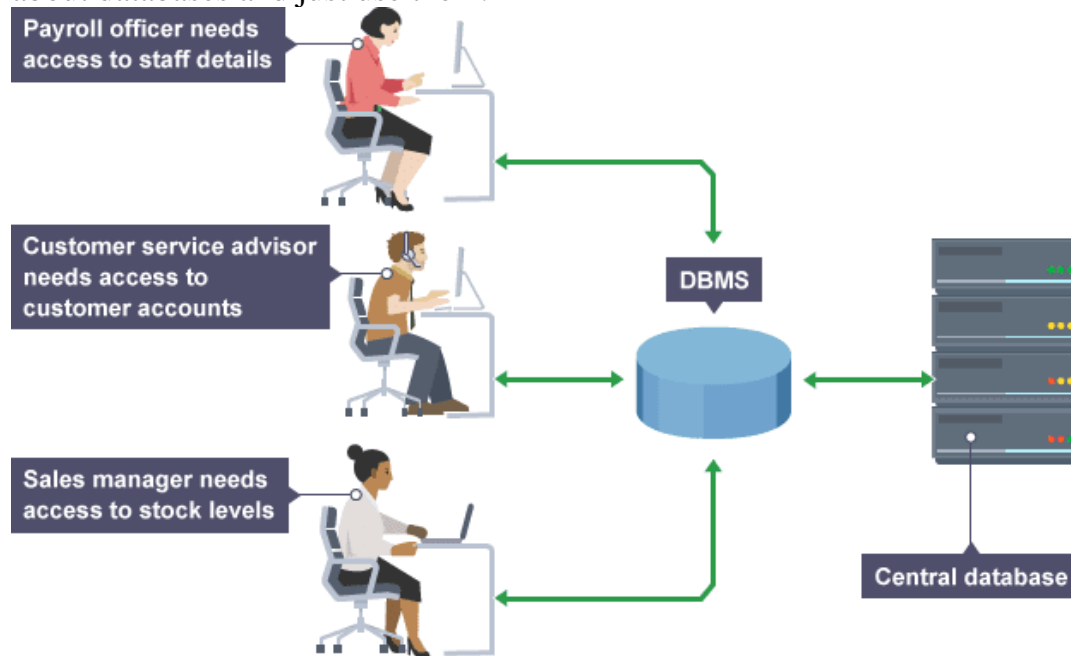


Figure 2: Role of Daas illustrated

Here are four key role of using a DBaaS solution:

1. **Reduce Labor Costs** – The only other alternative you have to keep up with your new DBaaS app is to hire in new staff. Overcoming all of the hurdles created due to the costs associated with a new employee will only delay your app deployment even further. DBaaS reduces the need to hire on new staff. When you choose this solution, you are essentially hiring a whole new team of security, back-up, deployment, and maintenance experts
2. **Automate Back-Ups** – A good provider will incorporate storage and backups into their solution. At Contegix you can choose between an on-premise SAN or an off-site option. As well as choose the frequency that best fits your needs.
3. **Increase Speed of Deployments** – With database management in the hands of experts outside your IT team, creating and managing databases becomes something you can do swiftly and efficiently without worries.

4. **Use It and Move It** – Complete the testing and development stages of your database app on a public cloud, and easily move it onto a more permanent system once you're ready for deployment.

BENEFITS OF DATABASE MANAGEMENT SYSTEMS (DBMS)

The following are benefits of using database management systems in an organization.

- **Data Sharing Is Improved In The Organization**
Proper database management systems help in gaining better access to data as well as better management of the data. In turn, better access helps the end users share the data fast and effectively across the organization.
- **Improvement In Data Security**
A better framework is provided for enforcement of data privacy and security policies. The risks of data security breaches are minimized and corporate data is used properly.
- **Effective Data Integration**
When data management is improved, it promotes an integrated picture of an organization's operations. It becomes easy to see how operations in one segment of the organization affects other segments of the organization. Thus, effective integration of data is accomplished through the use of data management solutions.
- **Database Management Systems Minimize Data Inconsistency**
Data inconsistency occurs when different versions of data exist in different places in an organization. By using a proper management system and data quality management tools, the problem of data inconsistency is minimized.
- **Better Access to Data**
A management system helps in getting quick solutions to database queries, and therefore, data access is faster and more accurate. End users like sales people will have enhanced access to the data, enabling a faster sales cycle and a more sound decision making process.
- **Increase In Productivity Of The End User**
By deploying the best data quality tools and database management systems, the productivity of the end user is increased. With the data management tools, the end users are empowered to make quick and informed decisions that can decide the success and failure of a company in a long run.

➤ **Quick Decision Making**

When data is better managed and access is improved, quality information is generated and the user is enabled to make faster decisions. A good database managing system helps in providing a framework to facilitate data quality initiatives and in turn, higher quality information helps in making better, faster decisions in an organization.

SUMMARY

An organization must have accurate and reliable data for effective decision making. To this end, the organization maintains records on the various facets maintaining relationships among them. Such related data are called a database. A database system is an integrated collection of related files, along with details of the interpretation of the data contained therein. Basically, database system is nothing more than a computer-based record keeping system i.e. a system whose overall purpose is to record and maintain information/data.

CONCLUSION

An integrated institution database system provides a prudent solution to address problems associated with manual system. In order to assess the performance of the institution and members overtime, there is the need to use past records of members without any missing data. The integrated database system which captures and maintains longitudinal data would provide an accurate and reliable data about current and past records.

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