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Abstract

Prior to the development of Database Management System (DBMS), data was accessed by application programs. Hierarchical data model was developed to deal with problem of representing logical data relationship and the problem of data integrity. In the hierarchical data model, data is accessed through predefined relationship. Navigational nature of hierarchical data model allowed fast access to data through predefined relationship. Hierarchical model was implemented by IBM's information Management System (IMS). To eliminate restriction on the hierarchical models database designers developed network model which can be regarded as generalization of hierarchical model. Network model was initially proposed by Database Task Group (DBTG) of the Committee on Data System Languages (CODASYL) Network models can represent many to many relationship but such relationship are complicated and difficult to maintain. Relational Database Management System (RDBMS) was a major change in the development of data models. Most of the database products developed since 1970s are based on the relational approach Date, C.J [1]. Relational system is based on a mathematical concept 'relation'. A relation from a set A to B is a subset of AxB. Relation is a mathematical term to represent a table: Therefore 'relation' and table are taken synonymous. Roughly speaking a relational system is a system in which data is perceived by the user as tables and few operations are at the user disposal. Since 1970 many relational product were developed, for example, DB2 (IBM corporation) Rdb/VMS) Digital Equipment Corporation) INGRES (Ingres Division of the ASK Group fix) SYBASE (Sybase Inc.) ORACLE (Oracle Corporation). Relational System provided superior adhoc queries to earlier data models but had a drawback in respect of performance. Some researchers felt that relations products were inadequate in some ways and felt the need of adding some feature of object oriented programming languages into database system Date, C.J [1]. In a traditional database system, data and their relationships are stored in the database and procedures in an application program. In Object oriented database system one combines procedures with data. This is a new approach which calls for detailed investigation into advantages and disadvantages this approach. Researchers have strong reservation in replacing RDBMS with OODBMS.

In view of the navigational nature of OODBMS, it may not well suited for adhoc queries. Relational databases are widely in use because of a standard query language (SQL) which

provides a convenient way of manipulating the data in the database. The object oriented data model is an extension of object oriented programming. Two languages namely Object Definition Language (ODL) and Object Query Language (OQL) have been developed with the intension that these two languages play the some role for object databases as SQL does with the RDBMS Jan L. Harrington [2].

The present thesis entitled" A Comparative Study of RDBMS and OODBMS" is devoted to a comparative study of RDBMS and OODBMS. The entire work is divided into seven chapters. In Chapter 1 deals with Preliminaries in respect of Relational database and Object Oriented database. In Chapter 2, we consider various factors that influence us to migrate from RDBMS to OODBMS. We have shown that impedance mismatch, complex data structure and transparent persistence are some of the causes of migration. The "impedance mismatch" is completely avoided when using an OODBMS. We have also shown how to create the data structure for storing the data in RDBMS and OODBMS. Chapter 3 is devoted to the study of migration from RDBMS to OODBMS in view of data security. The data security in database plays an important role. We have compared RDBMS and OODBMS from security point of view and implemented the concept of object oriented programming, access specifiers Public, Private and Protected in Object Oriented database.

Chapter 4 focuses on architectural difference between OODBMS and RDBMS. We have found that the architecture of OODBMS is better than that of RDBMS. Developers can achieve high performance building object systems linked to relational databases. Object models must be modified to take into account the strength and weaknesses of the underlying data storage. The schema in OODBMS is easier to understand because it is structured, contains more of the semantic of the data, and is intuitive. In Chapter 5 we have observed that the Performance of OODBMS is better than RDBMS as the access time for simple retrieval in OODBMS is constant whereas in RDBMS it varies. We experimented on both type of databases. Both technology OODBMS & RDBMS can handle large database. In this chapter we have analyzed the performance of OODBMS and RDBMS on a random medical data. The OODBMS provides direct, fast, application-pertinent object access. In Chapter 6 we have found that the OODBMS is better for large volume of data. OODBMS may be used in application such as medical data, multimedia data and molecular data where volume of data is more. All business data can be stored in an RDBMS, and an OODBMS can be used for fast access to data with a limited lifespan. In this chapter we have developed application software for managing a random University data using Relational databases and Object Oriented database as well. We have found that OODBMS performs better than RDBMS, when the data is large and complex. Based on the above two application software we have developed a framework for selection criteria of RDBMS and OODBMS. RDBMS is used where small number of relations is required. When the number of relations is large, the performance of RDBMS reduces. Normally RDBMS is used where data is not complex. On the other hand, an OODBMS may be considered when data is complex. Based on various operations we developed a framework for selection Criteria of RDBMS and OODBM. Chapter 7 is on Conclusions.