iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 6 **Issue:** V **Month of publication:** May 2018

DOI: http://doi.org/10.22214/ijraset.2018.5293

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 6 Issue V, May 2018- Available at www.ijraset.com

Review on Record Based Model

Ramanpreet Kaur[1], Harwinder Kaur[2]
[1, 2]*Department of Computer Science, Baba Farid Group of Inatitutions*

Abstract: A database is made up of multiple tables. Just like Excel tables, database tables consist of columns and rows. Each column corresponds to an attribute, and each row corresponds to a single record. Each table must have a unique name in a database. A database simply holds data. To make real use of the data, you need a Database Management System (DBMS). A DBMS is the database itself, along with all the software and functionality to retrieve data from the database, or to insert data. A DBMS create reports, enforces database rules and constraints, and maintains the database schema. Without a DBMS, a database is just a collection of bits and bytes with little meaning.
***Keywords*: DBMS, DBTG, SQL, M: M, M:1**

I. INTRODUCTION

Data models means how the logical structure of the database is modeled. It also shows the logical structure of a database including the relationships and constraints. Data models define how data is connected to each other and how they are processed and stored inside the system. The basic building blocks of the data models are:

A. *The Various Record Based Model are*

1) Hierarchical Model
2) Network model
3) Relational model

II. HIERARCHICAL MODEL

The hierarchical model is the oldest database model. The hierarchical model organises records in the tree structure i.e. hierarchy of parent and child record relationship. In this model each entity has only one parent but can have several children. At the top of hierarchy there is only one entity which is called root.

A. *Operations on Hierarchical Model*

Now we shall discuss how the basic operations (Insertion, Deletion, Retrieval and Updation) are performed in a hierarchical model.

1) *Insertion operation:*-The Insert operation is used to insert a new record into the database. The newly inserted record becomes the current record for the database. If the inserted record is a root record then it creates a new hierarchical tree with the new record as the root. But if it is a child record then we should make its parent first because a child node cannot exist without a parent(root).
2) *Deletion operation:*-The delete operation is used to delete a record fron the database. To delete a record from the database, we first make it the current record and then issue the delete command.
3) *Updation operation:*-The updation operation is used to upate a record in the database.
4) *Retrieval operation:*-The process of searching and fetching of a record in the database is known as retrieval of a record.

B. *Advantages of Hierarchical Model*

The following are the main advantages of hierarchical model:

1) *Simplicity:* In this model, records are related in the form of parent/child relationship.so performing various operations in this tree like structure on perent and child segments is easy and simple.
2) *Data Security:* Each child segment can be linked to only one parent and a child can only be reached through its parents in this model.so for deleting child segment proper information of parent segment is needed. Thus it provides data security which is enforced by DBMS

C. *Disadvantages of Hierarchical Model*

1) *Inflexibility:* A hierarchical database lacks flexibility. Any changes in the record type often result in a very complex system management tasks.

©IJRASET: All Rights are Reserved

2) Difficult to manage and lack of standard
3) Lacks structural independence
4) Applications programming and use complexibility
5) Implementation limitations

D. Applications of Hierarchical Model

Hierarchical models are ideal for applications such as:

1) Fermentation monitoring in biotech or food
2) Gasoline blending in petroleum refining
3) Reaction monitoring in chemical manufacturing
4) Optimizing workflows for routine at line analysis applications

III. NETWORK MODEL

Due to some limitations in hierarchical model, designers developed the network model. The main distinguishing feature from the hierarchical model is the ability to this model to handle many to many (M:N) relationships between its records. The Network data structure looks like a tree structure, except that a dependent node, called child or member may have more than one parents or owner node.

A. Operations on Network Model

The various basic operations which can be performed on a network model include-Insertion, Deletion, Updation, Retrieval.

1) *Insertion:*-It is clear that new SUPPLIER or PART can be inserted very easily.
2) *Deletion:*-Deletion operation is also very easy,no link to be removed. No one information is lost. For example: if we want to remove PART we delete the connector record occurrence linking this part.
3) *Updation:*- Updation is also very easy. We want to change PART 1 with PART 2 we can make this change by changing the link. Hence updation is very easy.
4) *Retrieval:*-Unlike the hierarchical model, the retrieval operation i.e. process of searching and fetching a record is symmetric but complex.

B. Advantages of Network Model

1) *Simplicity:*-The Network Model is conceptually simple and easy to design.
2) *Ability to handle more relationship types:*-The Network Model can handle the one-to-many and many-to-many relationships.
3) *Lesser storage requirements:*-In this model, a record occurs only once without repetition so lesser storage requirements are there for storing the records in database.

C. Disadvantages of Network Model

1) *System Complexity:*-The structure of the Network model is very difficult to change. This type of system is very complex.
2) Insertion is very difficult.
3) If we want to delete certain node then the information above the node and below the node will be deleted.
4)

IV. RELATIONAL MODEL

The Relational Model was first introduced by Dr. Edgar Frank (Ted) codd, an Oxford trained mathematician, while working in IBM Research centre in 1970's. It is the primary data model, which is used widely around the world for data storage and processing. This model is simple and it has all the properties and capabilities required to process data with storage efficiency.

A. Operations of Relational Model

The four basic operations performed on sample database in a relational model are insertion, deletion, updation and retrieval.

1) *Insertion:* The insert operation is used to insert a new record into the relation (Table) The data values will not be inserted into a relation when the following conditions occurs: If we enter a duplicate value for the attribute which is chosen as a primary key If we try to insert a NULL value in primary key.
2) *Deletion:* The delete operation is used to delete a record from the relation(table).

©IJRASET: All Rights are Reserved

3) *Updation:* the updation operation is used to update the data values of a record in the relation (Table). In other words, it is used to change the data value of one or more attributes in a tuples of some relation.
4) *Retrieval:* The retrieval operation is used to search and fetch a record from the relation. This operation is very simple and symmetric as compared to previous models.

B. *Advantages of Relational Model*

1) *Structural independence:* This model does not depend on the navigational data access system.
2) *Simplicity:* A relational data model is simple than hierarchical and network model**.**
3) Easier database design, implementation, management and use.
4) Powerful database management system.

C. *Disadvantages of Relational Model*

1) *Hardware overheads:* This model needs more powerful computing hardware and data storage devices to perform RDBMS assigned task.
2) Possibility of poor design and implementation.
3) Potential "islands of information" problems.

V. CONCLUSIONS

TABLE I Comparison among Record based logical models:

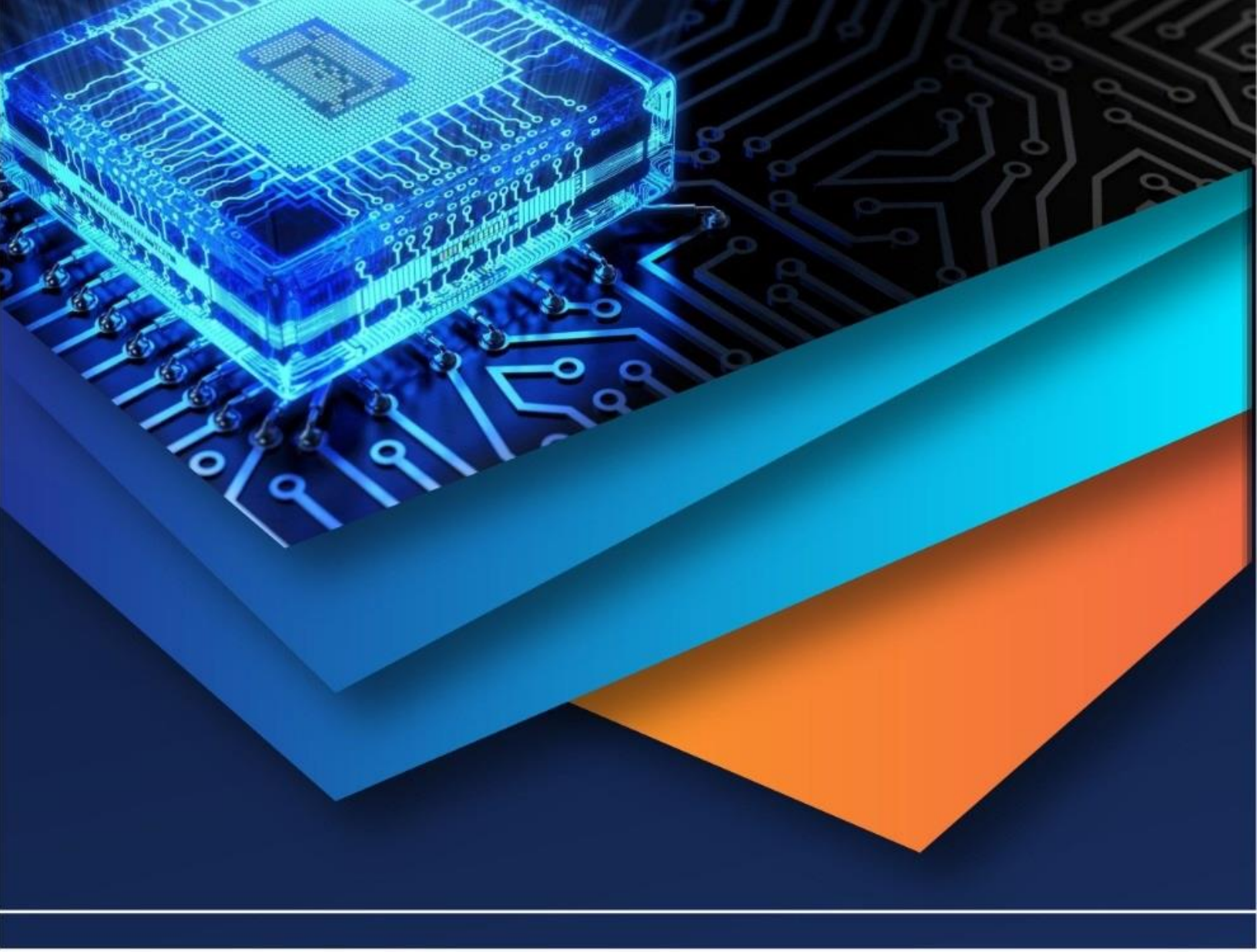
Hierarchical Data Model	Network Data Model	Relational Data Model
i).It creates the relation between different entities and attributes in a particular entity. ii).It organizes record in tree structure. iii). Only one to one(1:1) and one to many (1:N) relationships can be implemented using pointers. iv). Lack of declartive querying facilities. v). Insertion, deletion and updation is very easy. vi). Language used in relational model is SQL, Ingres, sybase etc. vii). It is simple in nature.	i). It creates the linkage between two or more entities. ii).It organizes records in form of directed graphs. iii). In addition to(1:1) and (1:N),many to many(M:N) relationships can also be implemented. iv).Lack of declartive querying facilities. v).Little difficult to insert, delete & update. vi). It has IMS language. vii). It is complex in nature.	i). It creates the chain among different entities. ii).It organizes records in form of tables. iii).All the relationships can be implemented easily. iv).Provides declartive querying facilities using SQL. v). Very difficult to insert, delete and update. vi). It has DBTG set having different classes and members. vii). More complex than Relational model and Hierarchical Model.

Any nontrivial application can use a database and a SQL-based database is a good place to start. Once you have mastered the configuration and administering of the database then you have to learn SQL to make it work well. The speed at which a database can retrieve data is astonishing and modern RDBMS are complex and highly optimized applications.

REFERENCES

[1] "New Database Software Program Moves Macintosh Into The Big Leagues". tribunedigital-chicagotribune. Retrieved 2016-03-17
[2] Ramakrishnan, Raghu; Donjerkovic, Donko; Ranganathan, Arvind; Beyer, Kevin S.; Krishnaprasad, Muralidhar (1998). "SRQL: Sorted Relational Query Language" (PDF). e Proceedings of SSDBM
[3] Pratt, Philip J.; Last, Mary Z. (2014-09-08). Concepts of Database Management (8 ed.). Course Technology. p. 29. ISBN 9781285427102
[4] Sumathi, S.; Esakkirajan, S. (13 Feb 2008). Fundamentals of Relational Database Management Systems. Springer. ISBN 3540483977. The product was called SQL/DS (Structured Query Language/Data Store) and ran under the DOS/VSE operating system environment
[5] Date, C. J. (2003). An Introduction to Database Systems (8th ed.). Pearson. ISBN 978-0321197849.
[6] North, Ken (10 March 2010). "Sets, Data Models and Data Independence". Dr. Dobb's. Archived from the original on 24 October 2010.
[7] Halder, Raju; Cortesi, Agostino (2011). "Abstract Interpretation of Database Query Languages" (PDF). COMPUTER LANGUAGES, SYSTEMS & STRUCTURES. Elsevier. 38(2): 123–157. doi:10.1016/j.cl.2011.10.004. ISSN
[8] Beynon–Davies, Paul (2003). Database Systems (3rd ed.). Palgrave Macmillan. ISBN 978-1403916013
[9] Teorey, T.; Lightstone, S. and Nadeau, T. Database Modeling & Design: Logical Design, 4th edition, Morgan Kaufmann Press, 2005. ISBN 0-12-685352-5

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)