RDBMS

Presented by

Sagar
Java Consultant

File Based Data Management

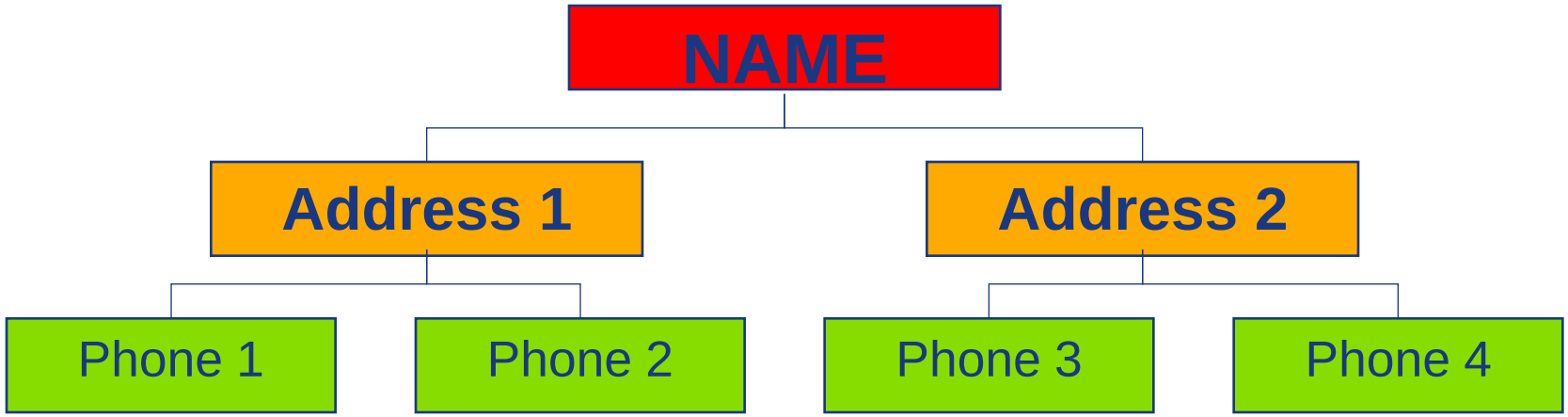
- File based data management systems are the first method used in storing data for computers (used a lot in the early mainframe systems).
- Sequential reading refers to retrieving data from the file by reading from the beginning until the data is found.
- To delete data in the file, the whole file is re-written without that data.
- To update data, the whole file is re-written with the new value of the data.
- Normally referred to as ‘flat files’.

Disadvantages of File Based System

- Redundancy of Data – Since no relationships are established between the files, data must exist for every file.
- Data Integrity Issues – Since data is stored repeatedly in several files, updating one file might not be sufficient, and updates may be necessary for other files with the same set of data.
- Complex Data Manipulation – To resolve data integrity issues, a programmer must track down all files requiring updates once a certain data is updated.
- Complex File Access – Actual file locations must be used to access data, which creates additional complexity.

Hierarchical Database

- Introduced by IBM® in the mid 60s through Information Management System (IMS). It is the first logical database model.
- Data has a tree-like structure.
- Allows a 1:N or 1-to-many relationship.
- Child elements are accessed through the parent node only.

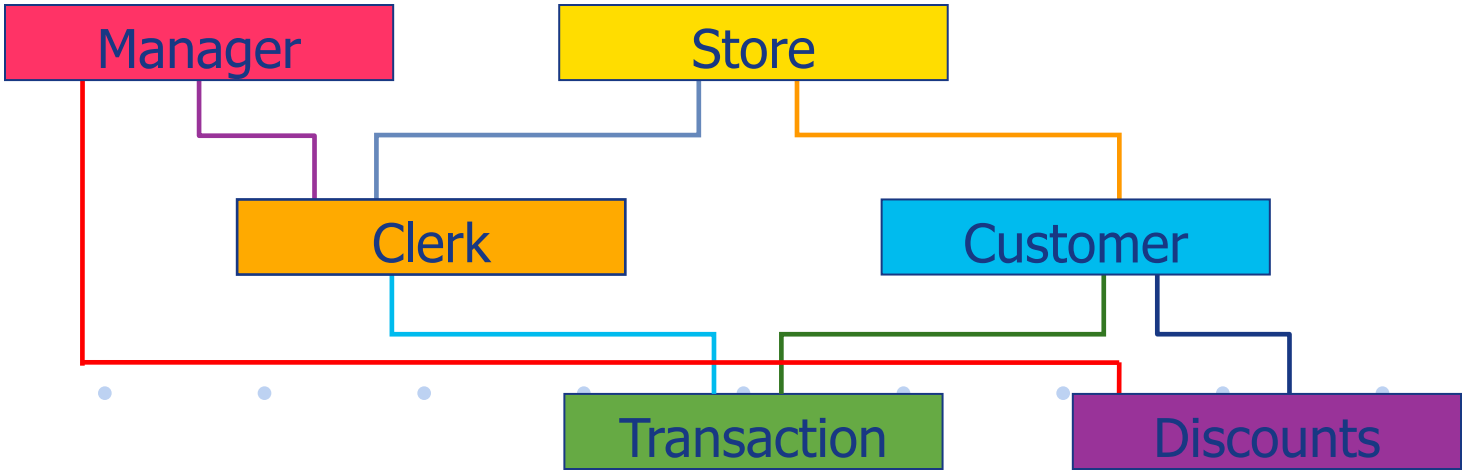


Disadvantages of Hierarchical Databases

- To access a child node, one must go through the parent node.
- Hierarchal databases do not allow a many-to-many relationship. A child can only have one parent.
- The design of the hierarchical tree is usually based on one type of application. To serve another application, a different type of hierarchical tree would be required. With this situation, data redundancy would be inevitable.

Network Database

- Developed in the late 60s and was standardized by Conference On Data Systems Languages (CODASYL).
- Example of a popular network database: Integrated Database Management System (IDMS) from Computer Associates.
- Allowed N:N or many-to-many relationships.
- Pointers are used to link data elements.



Disadvantages of Network Databases

- The pointer concept was cumbersome to use and access the system.
- Network Database was not user-friendly and was geared towards highly advanced programmer.
- Maintenance of relationships was cumbersome due to the pointer concept.

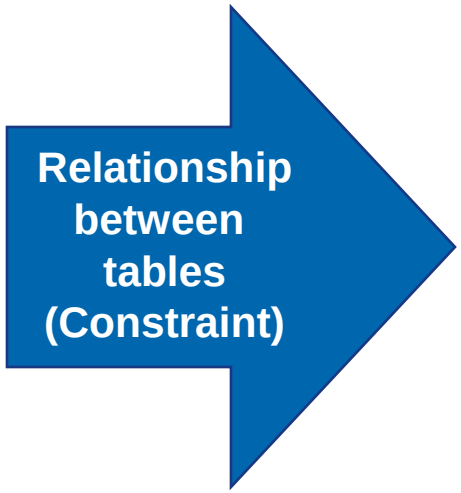
RDBMS

- Tables (also called a relation) is used to store data. This is the core of the relational model.
- Data stored in tables is independent from the application. This implies that several applications can use the same set of tables.
- Maintenance of relationships between tables is easy because tables can be created and removed any time.
- RDBMS provides a robust Standardized Query Language (SQL).

Overview of the RDBMS Advantage

Employee Table

Name	Level	Dept
MARK	STF	IT
JEN	STD	CAFE
CAROL	STF	IT
JERRY	SUP	HR



Department Table

Dept	Location
IT	Building A
HR	Building B
CAFE	Building C
ADMIN	Building B

Differences

Category	Hierarchical	Relational (RDBMS)
Navigation / Data Access	Fixed	Dynamic
Data Structure Flexibility	More or Less Permanent	Easier to Change / Modify
Speed of Access	Fast	Possibly Slower
Development Cycle	Slow	Faster
Data Integrity	Very Little	Has various ways of ensuring data integrity


Thank you!