

THREE-TIER ARCHITECHTURE OF DATA WAREHOUSE

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ABSTRACT:-

A promising new star on the IT horizon, Data Warehousing overcomes many of the shortcomings of early Decision Support and Executive Information System. A key to successful Data Warehousing though is to understand that a Data Warehouse is not just a collection of technologies but architecture. Data warehousing methodologies share a common set of tasks, including business requirements analysis, data design, architectural design, implementation and deployment. This paper explains the various components of a matured Data Warehouse architecture. It examines the different evolutionary routes that an organization can take to developing a Corporate Data Warehouse solution. The presented data warehouse architectures are practicable solutions to tackle data integration issues and could be adopted by small to large clinical data warehouse applications.

KEYWORDS:-

Data Warehouse, Data Integration, Data Warehouse Architecture –Three-Tier Architecture.

INTRODUCTION:-

Data warehousing is an algorithm and a tool to collect the data from different sources and Data Warehouse to store it in a single repository to facilitate the decision-making process. A leading architect in the construction of data warehouse systems, a data warehouse is a subject-oriented, integrated, time-variant, and non-volatile collection of data in support of management's decision-making process. This short, but comprehensive definition presents the major features of a data warehouse. The four keywords— subject-oriented, integrated, time-variant, and non-volatile distinguish data warehouses from other data repository systems such as relational database systems, transaction processing systems, and file systems.

PROPERTIES OF DATA WAREHOUSE:-

Subject-oriented:

A data warehouse is organized around major subjects, such as customer, vendor, product, and sales. Rather than concentrating on the day-to-day operations and transaction

processing of an organization, a data warehouse focuses on the modelling and analysis of data for decision makers. Hence, data warehouses typically provide a simple and concise view around particular subject issues by excluding data that are not useful in the decision-support process.

Integrated:

A data warehouse is usually constructed by integrating multiple heterogeneous sources such as relational databases and online transaction records. Data cleaning and data integration techniques are applied to ensure consistency in naming conventions, encoding structures, attribute measures, and so on.

Time variant:

Data are stored to provide information from a historical perspective (e.g., the past 5-10 years). Every key structure in the data warehouse contains, either implicitly or explicitly, an element of time.

Non-volatile:

A data warehouse is always a physically separate store of data transformed from the application data found in the operational environment. Due to this separation, a data warehouse does not require transaction processing, recovery, and concurrency control mechanisms. It usually requires only two operations in data accessing: initial loading of data and access of data.

THE 3-TIER ARCHITECTURE:-

The data warehousing has three-tier architecture. The first-tier is known as the extraction and transformation tier. The second-tier is known as middle or connective tier, and the third-tier is known as data access and retrieval tier.

First Layer: - Extraction and Transformation Tier (Bottom Layer-Data Warehouse Server)

The extraction is the process of refining the data that is collected from the different sources like internal database of the organization, external databases from various departments of the institute, other leading educational libraries in the city, etc. Two methods can be used for the extraction of the data from sources, viz., bulk extraction and change-based extraction.

The entire process of extracting data from multiple sources, transforming it into a unique standard format and finally the loading into the warehouse is referred as extraction, transformation and loading (ETL) process. The transformation tolls helps in transforming the data in to a particular format after extraction and before loading it in to the warehouse.

Client

- GUI/presentation logic
- Query specification
- Data analysis
- Report formatting
- Data access

Application/Data Mart Server

- Summarizing
- Filtering
- Meta data
- Multidimensional view
- Data access

DW Server

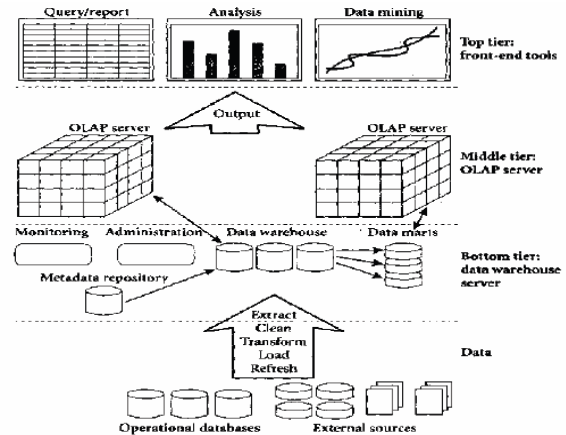
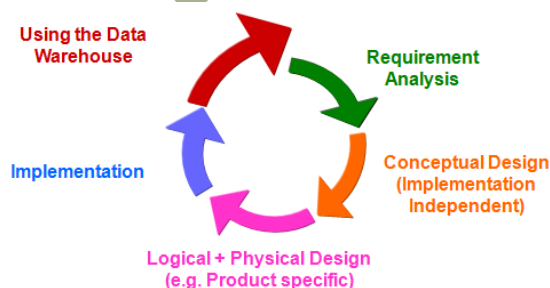
Data logics
Data services
Metadata
File services

Second Layer:- Connective Tier (Middle Layer- OLAP Server)

Data source rules and the programs applied for the transformation, the data structure and contents are all members of the Meta data, which is known as data about data. In the middle tier within the Meta data, data warehouse is a single and central repository of the enterprise wide data of all possible subject areas.

Third Layer: - Data Access and Retrieval Tier (Top Layer - Front-End Tool)

OLAP tool allows the user to generate queries against the warehouse database while reporting tool helps to produce canned, graphic intensive, sophisticated reports. The non-trivial extraction of actionable knowledge from datasets is known as data mining



Architecture of Data Warehouse- Three Tier Architecture

APPLICATIONS OF DATA WAREHOUSE:-

- Industry Application
- Finance Credit Card Analysis
- Insurance Call record analysis
- Telecommunication promotion analysis
- Banking Power usage analysis

CONCLUSION:-

Digital libraries have emerged over the last Decade and are being used beyond the research Community And selected institutions. Libraries should prepare to exploit these digital collections for decision-making And provide services To suit the digital society. This can be facilitated by Using the three tier architecture of data Warehousing.

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