Lecture 1

Introduction of Data Warehouse

Data Warehouse is a relational database management system (RDBMS) construct to meet the requirement of transaction processing systems. It can be loosely described as any centralized data repository which can be queried for business benefits. It is a database that stores information oriented to satisfy decision-making requests. It is a group of decision support technologies, targets to enabling the knowledge worker (executive, manager, and analyst) to make superior and higher decisions. So, Data Warehousing support architectures and tool for business executives to systematically organize, understand and use their information to make strategic decisions.

Data Warehouse environment contains an extraction, transportation, and loading (ETL) solution, an online analytical processing (OLAP) engine, customer analysis tools, and other applications that handle the process of gathering information and delivering it to business users.

What is a Data Warehouse?

A Data Warehouse (DW) is a relational database that is designed for query and analysis rather than transaction processing. It includes historical data derived from transaction data from single and multiple sources.

A Data Warehouse provides integrated, enterprise-wide, historical data and focuses on providing support for decision-makers for data modelling and analysis.

A Data Warehouse is a group of data specific to the entire organization, not only to a particular group of users.

It is not used for daily operations and transaction processing but used for making decisions.

A Data Warehouse can be viewed as a data system with the following attributes:

It is a database designed for investigative tasks, using data from various applications.

It supports a relatively small number of clients with relatively long interactions.

It includes current and historical data to provide a historical perspective of information.

Its usage is read-intensive.

It contains a few large tables.

"Data Warehouse is a subject-oriented, integrated, and time-variant store of information in support of management's decisions."

History of Data Warehouse

The idea of data warehousing came to the late 1980's when IBM researchers Barry Devlin and Paul Murphy established the "Business Data Warehouse."

In essence, the data warehousing idea was planned to support an architectural model for the flow of information from the operational system to decisional support environments. The concept attempt to address the various problems associated with the flow, mainly the high costs associated with it.

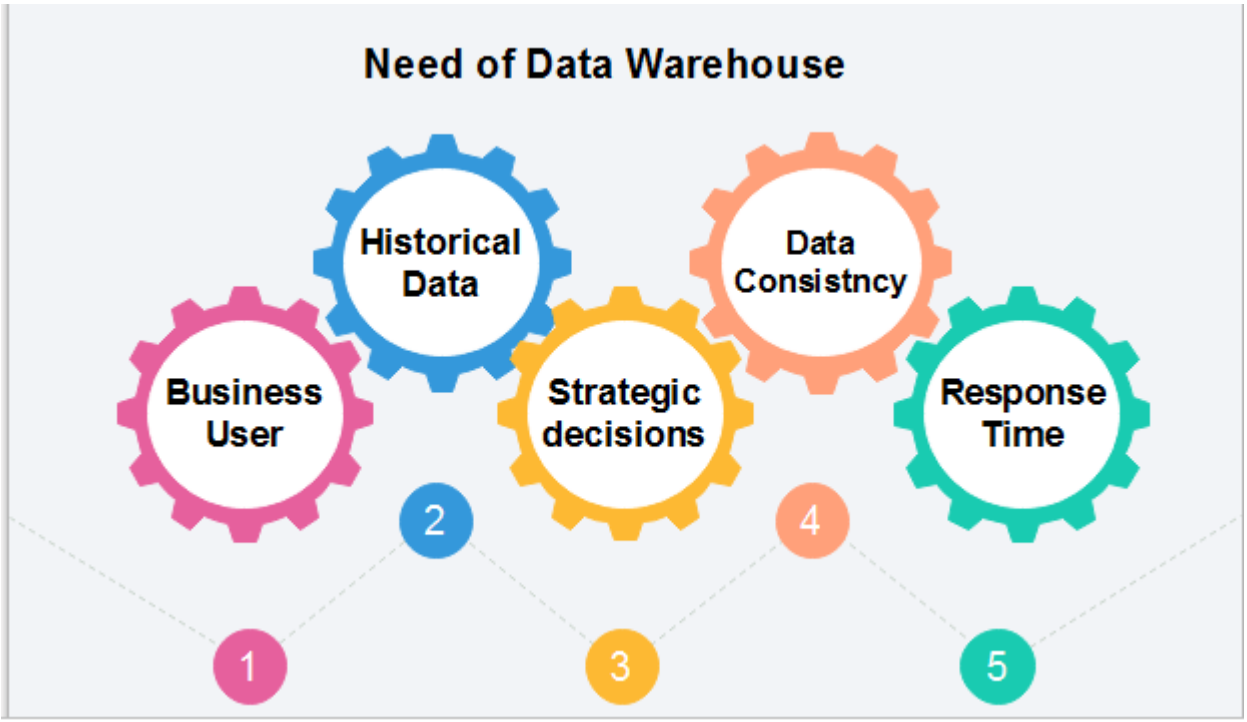
In the absence of data warehousing architecture, a vast amount of space was required to support multiple decision support environments. In large corporations, it was ordinary for various decision support environments to operate independently.

Goals of Data Warehousing

- To help reporting as well as analysis
- Maintain the organization's historical information
- Be the foundation for decision making.

Need for Data Warehouse

Data Warehouse is needed for the following reasons:



1. 1) **Business User:** Business users require a data warehouse to view summarized data from the past. Since these people are non-technical, the data may be presented to them in an elementary form.
2. 2) **Store historical data:** Data Warehouse is required to store the time variable data from the past. This input is made to be used for various purposes.
3. 3) **Make strategic decisions:** Some strategies may be depending upon the data in the data warehouse. So, data warehouse contributes to making strategic decisions.
4. 4) **For data consistency and quality:** Bringing the data from different sources at a commonplace, the user can effectively undertake to bring the uniformity and consistency in data.
5. 5) **High response time:** Data warehouse has to be ready for somewhat unexpected loads and types of queries,

which demands a significant degree of flexibility and quick response time.

Benefits of Data Warehouse

1. Understand business trends and make better forecasting decisions.
2. Data Warehouses are designed to perform well enormous amounts of data.
3. The structure of data warehouses is more accessible for end-users to navigate, understand, and query.
4. Queries that would be complex in many normalized databases could be easier to build and maintain in data warehouses.
5. Data warehousing is an efficient method to manage demand for lots of information from lots of users.
6. Data warehousing provide the capabilities to analyze a large amount of historical data.

Reference

https://www.javatpoint.com/data-warehouse