SUBJECT : DATA WAREHOUSE AND BUSINESS INTELLIGENCE.

INTRODUCTION OF BUSINESS INTELLIGENCE :

Business intelligence refers to the process of gathering, analyzing and interpreting data to make informed bussness decisions.

Business intelligence combines business analytics, data mining, data visualization, data tools and infrastructure and best practices to help organizations make more data-driven decisions.

The term Business intelligence was coined in 1989, alongside computer models for decision making.

Modern BI solutions prioritize flexible self-service analysis, governed data on trusted platforms, empowered business users and speed to insight.

Key Aspects of business intelligence include :

a. Data collection and integration.

b. Data Analysis and reporting.

c. Data visualization

d. Performance Metrics and benchmarking

e. predictive analytics.

f. Business analytics.

Types of BI Tools and Software :-

a. Spreadsheets :

Spreadsheet like microsoft Excel and google Docs are some of the most widely famous.

b. Dashboard :

A real-time User interface that displays data visualizations that reflect the current status of data.

c. Online analytical processing :

BI tools provide a computing method that enables multi-dimensional analytical queries.

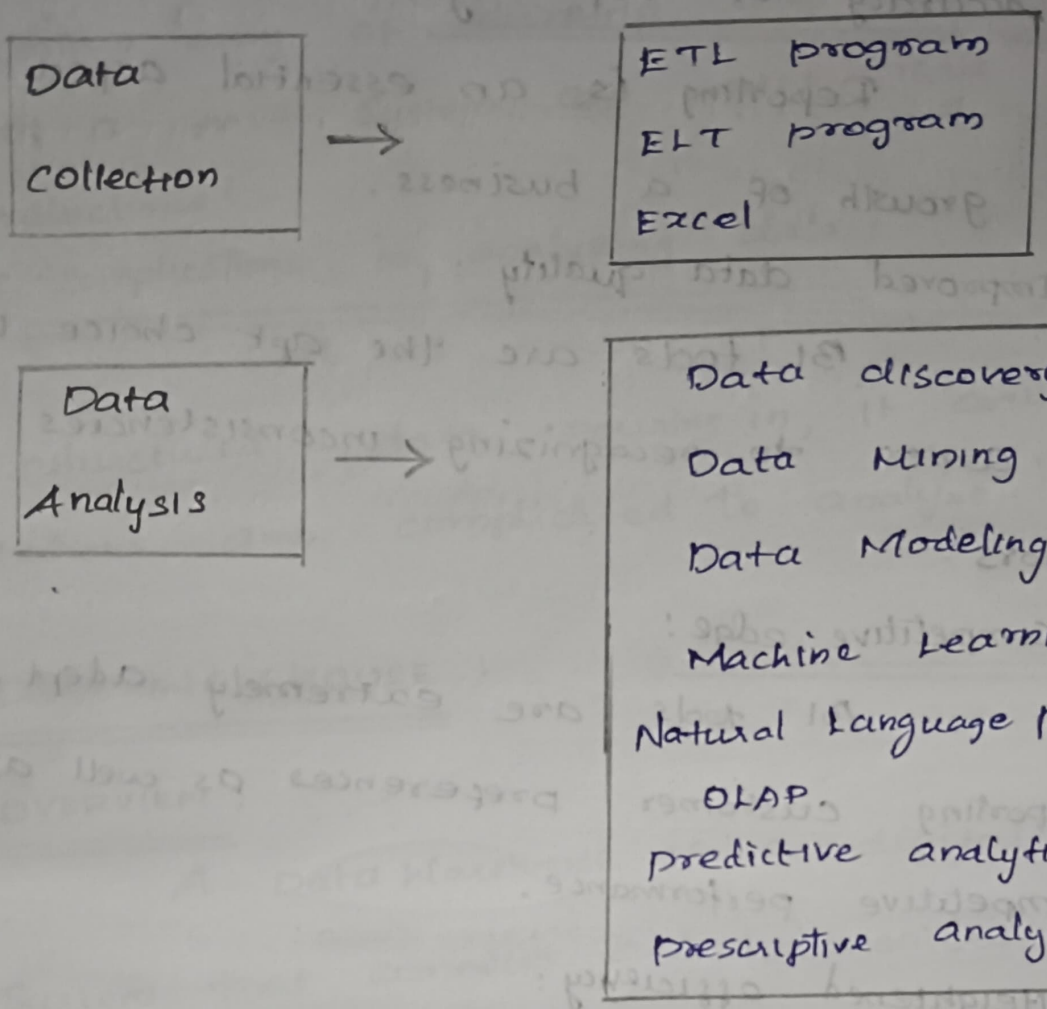
d. Mobile BI :

Software that optimizes desktop business intelligence for mobile devices.

e. Real-time BI :

An advanced enterprise analytics approach that delivers real-time information to users by feeding business transactions into a real-time data warehouse.

Business Intelligence process :



The BI Workflow, from data sources and collection to insight-driven actions plans.

Advantages of BI :

a. Accuracy in reporting :

Reporting is an essential aspect of the growth of a business.

b. Improved data quality :

BI tools are the apt choice when it comes to recognizing inconsistencies and errors

c. Competitive edge :

BI tools are extremely adept in reporting customer preferences as well as competitive performance.

d. Heightened efficiency :

BI tools enable automation of many processes such as collection of data and offering insights.

e. Cost Savings :

With the help of the BI tools, a major part of the business is automated and streamlined.

Disadvantages of BI :

a. Implementing costs :

The costs of implementing business intelligence tools can be a huge challenge for most companies.

b. Staff reluctance :

Your existing staff is used to a certain way of working and the introduction of a new system can meet their reluctance.

c. Complications in analyzing data :

With all kinds of structured and unstructured data pouring in, it could get tedious and complicated to analyze it.

DATA WAREHOUSE :

OVERVIEW :

A Data Warehouse is a digital storage system that connects and harmonises large amount of data from many different sources.

Its purpose is to feed business intelligence, reporting and analytics and support regulatory requirements.

Data Warehouse store current and historical data in one place and act as the single source of truth for an organisation.

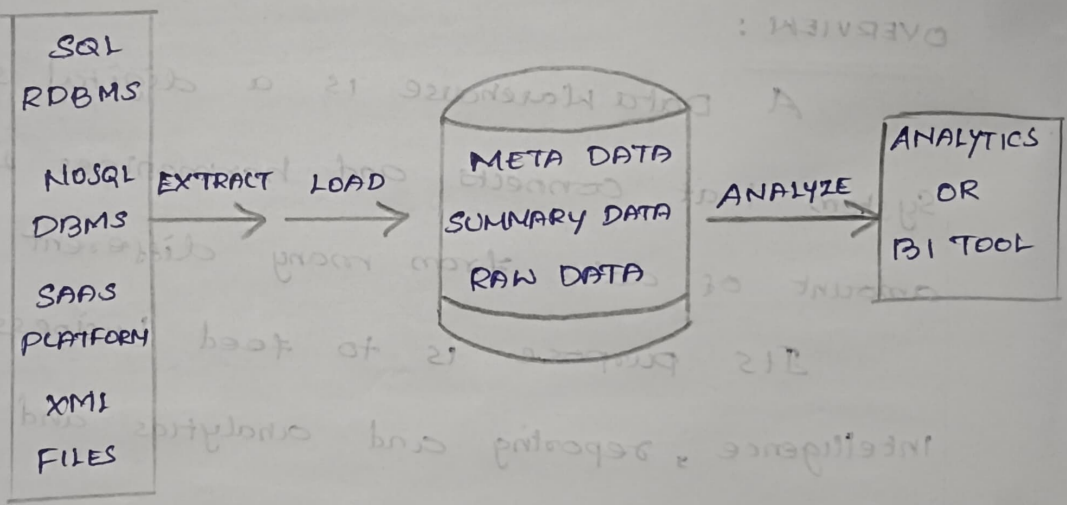
The emergence of cloud computing has caused a shift in the landscape.

Data Sources → Data Warehouse → Analysis, Reporting, Data Mining

Modern datawarehouse :

The Modern data warehouse are designed to handle both structured and unstructured data, like - videos, image file and sensor data.

Modern ELT process :



The enterprise datawarehouse itself typically has a three-tier architecture as follows.

a. TOP tier :

This tier consists of a front-end User interface which allows you to perform ad hoc analysis and view reports

b. Middle tier:

This tier represents the analytics engine tier, usually an OLAP server, used to access and analyze your data.

c. Bottom tier:

This tier involves the database server, usually a relational database system, where data is loaded and stored.

Key Features of Datawarehouse:

a. Subject oriented:

A datawarehouse target on the modeling and analysis of data for a decision-makers.

b. Integrated:

A data warehouse integrates various heterogeneous data sources like RDBMS, flat files and online transaction records.

c. Time Variant:

Historical information is kept in a data Wavehouse.

These variations with a transactions System, where often only the most current file is kept.

d. Non- Volatile :-

It is a physically separate data Storage, which is transformed from the Source operational RDBMS.

Goals of Data Warehousing :-

a. To help reporting as well as analysis

b. Maintain the organizations historical info.

c. Be the foundation for decision making.

Need for Data Warehouse :

a- Business User :-

Business users require a data warehouse to view a summarized data from the past.

b. Store historical data :

Data warehouse is required to store the time variable data from the past.

c. Make Strategic decisions :

Some strategies may be depending upon the data in data warehouse.

d. For data consistency and quality:

Bringing the data from different sources at commonplace, the user can effectively undertake to bring the uniformity and consistency in data.

e. High response time:

Datawarehouse has to be ready for somewhat unexpected loads and types of queiers, which demands a significant degree of flexibilty and quick response time.

Advantage of data warehouse:-

a. Delivers enhanced business intelligence:

A significant benefit of data warehouses is their capacity to enhance Business intelligence.

b. Ensures Data Quality and Consistency:

Data quality and consistency are very important in a data management.

c. Saves time and Money:

Data warehouse can is cost-effetive in terms of time and money.

d. Tracks historically intelligent data :

Historical data is a goldmine for an organisations.

e. Generates high ROI :

Investing in a data warehouse can dead to a high return on investment.

Disadvantages of data warehouse :

Additional reporting :

Additional work is required for using data warehouses because data stored in a warehouse is structured.

Inflexibility and Homogenization of data :

Datawarehouse depend on a structured data, which is organized into predefined formats.

ownership Concerns :

Data warehousing systems often involve multiple departments and teams.

Demands for Large Amt of resources :

Implementing and maintaining data warehouse can be resource - intensive.

Hidden issues consume time:

Datawarehouses are not immune to hidden problems.

Examples of Data warehousing:

a. Teradata

b. Snowflake

c. Amazon redshift

d. IBM Db2 warehouse

e. Action Avalanche

f. Oracle exadata

g. SAP BW / 4HANA

h. Google big query.