What is Business Intelligence?

- Business intelligence is a collection of refined techniques that combines understanding of risk analysis, business strategy, and political science and covert the collected data into facts and insights which helps in decision making

Features of BIS:

1. Data integration: By using ETL we can collect data from multiple sources.
2. Data analytics: Tools like OLAP can be used for analysing multidimensional data.
3. Reporting and Querying: It can be used for creating custom reports as per the requirement.
4. Data visualization: It can be used for representing data in the forms of charts and graphs.
5. Performance management: KPI's and scorecard can be used for measuring performance and success.
6. It increases user interactivity by providing operations like drill down, slice and dice

Advantages of BIS:

1. Improves decision making
2. Increases efficiency
3. Enhances data quality
4. Better customer insights

Disadvantages of BIS:

1. High implementation cost
2. Complexity
3. Data authenticity
4. Data privacy and data security: difficult to handle large volume of data

Applications of BIS:

1. BI tools can be combined with advanced technologies like NLP and ML to automate data analysis, generate insights and provide personalized recommendation
2. BI tools can utilize power of AI to automate repetitive task, predict future trends and uncover hidden patterns in data.
3. It can be used with IOT devices to get real time data analysis.
4. Reverse ETL enables seamless data flow from data warehouses to operational systems.

BIS Tools:

1. SAP business objects
    a. It is a business intelligence software which offers reporting, analysis and interactive data visualization
    b. It focuses on categories such as Customer experience and customer relationship management
    c. Expensive software

2. Power BI
    a. It is a web-based business analytics tool offered by Microsoft for data visualization.
    b. It allows to identify real-time trends and integration with their application

3. Yellowfin BI
    a. It offers natural language query feature which gives users suggestions and options instead of asking question to users.
    b. Data storytelling – it helps user to create data stories and presentation

4. Zoho analytics
    a. It offers in-depth reporting and data analysis.
    b. For non-technical users they have integrated an AI assistant named Zia which can analyse your data, identify trends and recommend relevant data visualization.
    c. It also gives a unique commenting section which increases collaboration.

5. Domo: cloud-based data management system which provides real time insights.
6. Tableau: It is known for its user friendly data visualization capabilities

Components of BIS Architecture:

1. Data sources: Operational systems, ERP, CRM ,flat files, SQL server etc
2. Data integration layer: ETL process: data cleaning, data validation, data transformation, data aggregating, data loading
3. Data warehouse: stores collected data. Example: Amazon redshift. Google Big-Query, Microsoft azure, snowflake
4. Data modelling layer: creates physical and logical data model and defines structure.
5. BIS tools: OLAP, reporting, analytics, Dashboards, Data visualization

Different types of User in BI:

1. Data Analyst or business analyst
2. Head or manager of the company
3. IT engineer
4. Small business owner
5. Government officials
6. End user

Different types of chart in Power BI:

1. Stacked bar chart
2. Stacked Column chart
3. Bar chart
4. Line chart
5. Pie chart
6. Donut chart
7. Gauge
8. Histogram
9. KPI
10. Table

DAX:

a. It stands for data analysis expression is a formula language used in Power BI to create calculated columns, measures and customer tables.
b. Calculated columns are the new columns created from existing columns by performing some operations like SUM, AVERAGE.
c. DAX allows to apply filter to table and also in defining relationship between tables in your data model

RANKX – a function in DAX which is used for assigning rank based on some expression

RANKX(<table>, <expression>, [<order>] [, <ties>])

Workspace in power BI:

Workspaces are Power BI containers for dashboards, reports, workbooks, datasets, and dataflow. It acts as a collaborative hub for creating, storing, and sharing BI content with your colleagues.

Data modelling:

It's the process of defining how your data is structured, organized, and related. Defining the relationship between tables based on some common fields.

Different schemas like: Star schema and Snowflake schema

Different types of data modelling:

1. Conceptual data model: This step defines the high-level entities, attributes, and relationships within your data. It's like a blueprint of the data model intended for business stakeholder

2. Logical data model: The logical level involves defining the relationships and constraints between the data objects in more detail, often using data modeling languages such as SQL or ER diagrams.

3. Physical data model: The physical level involves defining the specific details of how the data will be stored, including data types, indexes, and other technical details.

Measuring techniques in BI:

Aggregation: summarizing data using functions like sum, average, min, max, count etc. to calculate total, average.

Filters: They are used for applying conditions to data to focus on specific parts of data.

Slicers: It helps users to interactively filter the data based on predefined criteria.

Reports in BI:

Reports are visual representations of your data created using power BI. Reports consists of various data visualizations such as charts, graphs, tables which helps user to understand data in better way.

Types of reports:

1. Ad-hoc report: To address specific questions or issues as they arise. To answer on the spot question. Example: Sudden drop in sales.

2. Operational report: To provide detailed information on day-to-day operations and transaction with in an organisation. It focus on specific business processes like sales, inventory, production or finance.
   Example: inventory status report

3. Analytical report: To analyse the data and identify trends, patterns and deep insights for decision making. Example: customer segmentation report

4. Strategic report: This type of report focuses on long-term goals. It provide high-level insights and performance metrics to guide strategic decision.
   Example: Strategy planning report.

5. Predictive report: This type of report uses historical data and statistical model to predict future trends. Example: sales forecast.

6. Performance report: This type of report tracks progress, identifies area for improvement and helps make informed decisions.

Dashboard in BI:

It is a visualization tool to display summary of key metrics, performance indicators and insights from the data. It basically takes a snapshot of your performance in real-time.

Scorecard in BI:

A scorecard is a performance management reporting tool that is used for comparing the current activities in your company with the planned objectives and results.

Difference:

Dashboard	Scoecard
1. It is a tool that provied a visual overview of KPI's in real-time	1. A framework that analyses current strategies and compares them with target value
2. It focues on short term goals	3. It focuses on long term goals
It is used to measure performance	It is used to measure progress