Need for Data Anaysis

- Managers must be able to track daily transactions to evaluate how the business is performing
- By tapping into the operational database, management can develop strategies to meet organizational goals.
- Data analysis can provide information about short-term tactical(routine) evaluations and strategies

What Is BI (Business Intellience)

- Business Intelligence (BI) is a term used to describe a comprehensive,cohesive and integrated set of tools and processes used to capture,collect,integrate,store, and analyze data with the purpose of generating and presenting information used to support business decision making.
- BI is about creating intelligence about a business.
- BI is a set of processes, architectures, and technologies that convert raw data into meaningful information that drives profitable business actions.
- BI systems help businesses to identify market trends and spot business problems that need to be addressed.
- BI technology can be used by Data analyst, IT people, business users and head of the company.
- BI system helps organization to improve visibility, productivity and fix accountability
- BI is not a product by itself, but a framework of concepts practices, tools and technologies that help a business.
- BI involves the following general steps:

    1.**Collecting and storing** operational data.

    2.**Aggregating** the operational data into decision support data.

    3.**Analyzing decision support** data to generate information.

    4.**Presenting** such information to the end user to support business decisions.

    5.**Making business decisions,** which in turn generate more data that is collected, stored, etc.

    6.**Monitoring** results to evaluate outcomes of the business decisions.

- The draw-backs of BI is that it is time-consuming costly and very complex process.

The Benefits of Business Intelligence

There are several benefits of using business intelligence (BI) tools in an organization. Here are some of the key benefits:

- **Improved decision-making:** BI helps users analyze data quickly and easily, allowing them to make informed decisions in a timely manner.
- **Increased efficiency:** BI tools automate data collection and analysis, reducing the amount of time and effort required to generate reports and insights.
- **Better collaboration:** BI tools can be used to share insights and collaborate with others, helping teams work together more effectively.
- **Increased revenue:** By providing insights into customer behavior and market trends, BI tools can help businesses identify new opportunities and improve revenue generation.
- **Reduced costs:** BI tools can identify areas where costs can be reduced, such as supply chain management or marketing campaigns.

Advantages and disadvantages of BI

some of the key advantages and disadvantages of using business intelligence (BI):

Advantages of BI	Disadvantages of BI
Allows for more informed decision making based on data insights	Implementation and maintenance costs can be high
Helps identify trends and patterns in data that may not be visible otherwise	Requires a significant investment in time and resources to collect, store, and analyze data
Provides a more comprehensive view of business operations and performance	Can be complex and difficult to use for non-technical users
Can increase operational efficiency and productivity by automating data analysis	May raise concerns about data privacy and security
Improves the accuracy and timeliness of reporting and forecasting	Results are only as good as the quality of the data being analyzed
Facilitates collaboration across departments and teams	Can lead to overreliance on data, which may not capture the full complexity of certain situations
Helps companies stay competitive by enabling them to adapt to changing market conditions and customer preferences	May be subject to bias and misinterpretation if not used correctly

Business Intelligence Architecture

- BI is to gather, integrate, and store business data for the purpose of creating information.
- BI integrates people and processes using technology in order to add value to the business.
- BI tools focus on the strategic(Basic) and tactical (Routine) use of information.
- **A business intelligence architecture** is a framework for organizing the data, information management and technology components that are used to build business intelligence (BI) systems for reporting and data analytics.
- The main components of business intelligence are data warehouse, business analytics and business performance management and user interface.
- Data warehouse holds data obtained from internal sources as well as external sources. The internal sources include various operational systems.
- Business analytics creates a report as and when required through queries and rules. Data mining is also another important aspect of business analytics.
- Business performance management is a linkage of data with business objectives for efficient tracking. This business performance is then broadcasted to an executive decision-making body through dashboard

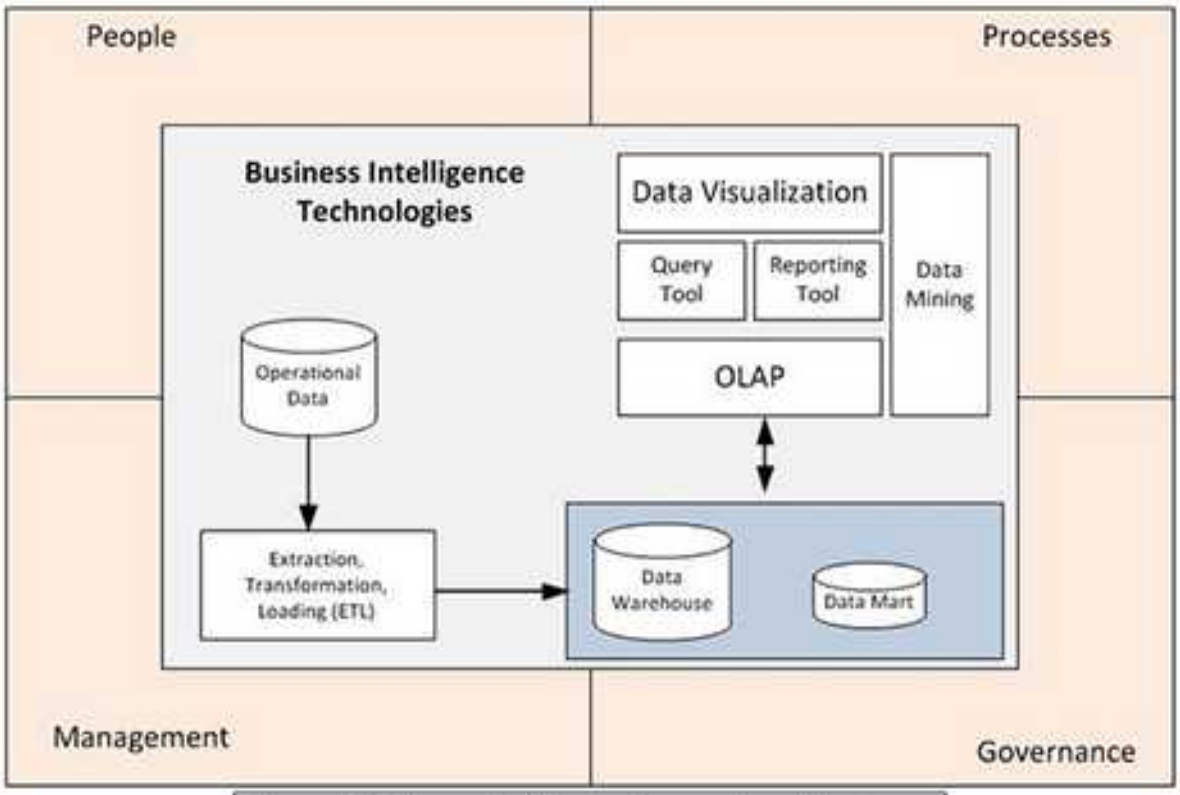

Figure 1. Business intelligence framework architecture

Key Features OF BI Architecture

- **MDM (Master Data Management)** is a collection of concepts, techniques, and processes for the proper identification,definition, and management of data elements within an organization. MDM's main goal is to provide a comprehensive and consistent definition of all data within a organization.

- Governance is a method or process of government. BI provides a method for controlling and monitoring business health and for consistent decision making.

- KPI are quantifiable measurements that assess the company' effectiveness or success in reaching its strategic and operational goals.
  - There are many different KPI used by different industries. Some Examples of KPI are :

    General : Year-to-year measurements of profit by line of business, same store sales, product turnovers, product recalls, sales by promotion, sales by employee, etc.

Finance : Earnings per share, profit margin, revenue per employee, percentage of sales to account receivables,assets to sales, etc.

Human resources: Applicants to job openings, employee turnover, employee longevity, etc.

Education : Graduation rates, number of incoming freshmen, student retention rates, etc.

BI Archtecture Component

Components	Description
ETL tools	Data **extraction, transformation, and loading (ETL)** tools collect, filter, integrate, and aggregate operational data to be saved into a data store optimized for decision support. For example, to determine the relative market share by selected product lines, you require data on competitors' products. Such data can be located in external databases provided by industry groups or by companies that market the data. As the name implies, this component extracts the data, filters the extracted data to select the relevant records, and packages the data in the right format to be added to the data store component

Components	Description
Data store	The **data store** is optimized for decision support and is generally represented by a data warehouse or a data mart. The data store contains two main types of data: business data and business model data. The business data are extracted from the operational database and from external data sources. The business data is stored in structures that are optimized for data analysis and query speed. The external data sources provide data that cannot be found within the company but that are relevant to the business, such as stock prices, market indicators, marketing information (such as demographics), and competitor's data. Business models are generated by special algorithms that model the

Components	Description
Data query and analysis tools	This component performs data retrieval, data analysis, and data-mining tasks using the data in the data store. This component is used by the data analyst to create the queries that access the database. Depending on the implementation, the query tool accesses either the operational database, or more commonly, the data store. This tool advises the user on which data to select and how to build a reliable business data model. This component is generally represented in the form of an OLAP tool.

Components	Description
Data presentation and visualization tools	This component is in charge of presenting the data to the end user in a variety of ways. This component is used by the data analyst to organize and present the data. This tool helps the end user select the most appropriate presentation format, such as summary report, map, pie or bar graph, or mixed graphs. The query tool and the presentation tool are the front end to the BI environment.

DATA MINING : It refers to analyzing massive amounts of data to uncover hidden trends, patterns and relationship etc.. In other words , data mining focuses on the discovery and explation stages of knowledge acquisition.

OLAP : Online analytical processing provides

- multidimensional data analysis
- Advance data support
- Easy to use end user interface

DATA MART : It is a small , single-subject data warehouse subset that provides decision suport to a small group of people.