1. Explain the role of an enterprise data warehouse and data marts within a business intelligence (BI) system.

Much like engines want gasoline to run, reporting and analytical gear want data to perform. Without statistics, those merchandises have no value. So somehow this equipment needs to get admission to the information accrued in productions databases, due to the fact it's wherein maximum of the provision information needed by means of the customers’ residences. Technically, it’s feasible to connect the ones reporting gear without delay to the manufacturing databases.

The following definition was introduced by Bill Inmon in one of his popular books on data warehousing entitled Building the Data Warehouse, which was published in 2002.

"A data warehouse is a subject-oriented, integrated, time-variant, nonvolatile collection of data in support of management’s decision-making process."

While Data Marts are targeted on turning in commercial enterprise objectives for departments within the organization. And the facts warehouse is a conformed size of the records marts. Kimball (1996) describes a data mart as a subset of data warehouse. The data warehouse is the sum of all the data marts, each representing a business process in organization by a means of a star schema, or a family of star schemas of different granularity.

Business Intelligence (BI) ideas have continued to play a vital position in its ability for managers

to make excellent enterprise choices to resolve the business needs of the enterprise. BI

programs come in handy which allows managers to question, recognize, and examine current

records inside their businesses so that you can reap purposeful know-how which then help them

in making stepped forward and knowledgeable choices.

\*\* W.H. Inmon., (2002) Building the Data Warehouse Third Edition

https://www.r-5.org/files/books/computers/databases/warehouses/W\_H\_Inmon-Building\_the\_Data\_Warehouse-EN.pdf

\*\*Kimball R. and Ross M., (2002) the Data Warehouse Toolkit: Second Edition, the

Complete Guide to Dimensional Modeling.

1. Describe how online analytical processing (OLAP) cubes function in dimensional analysis. Provide an example of how an OLAP cube might be used to analyze sales performance across multiple dimensions, such as time, geography, and product categories.

They facilitate dimensional evaluation with the aid of organizing facts into multi-dimensional arrays, permitting customers to discover statistics from numerous perspectives and tiers of elements. This shapes for immediate and efficient querying, aggregation, and summarization of data, in the long run supporting analysts to discover developments and insights.

OLAP cubes permit in-depth overall performance evaluation throughout dimensions like time, geography, and product categories by means of allowing customers to quickly and without difficulty explore statistics from numerous angles, drill down into specific segments, and compare specific dimensions to become aware of styles and trends.

This would come in handy when examining sales performance by means of quarter and vicinity, evaluating income throughout distinct time durations and geographical places. Observe which product classes are performing properly in specific regions, or to become aware of seasonal tendencies in performance data by analyzing monthly sales records.

1. Assess alternative methods for retrieving data from a data warehouse or data mart. Compare at least two approaches, such as SQL-based querying and BI tools, discussing their advantages and disadvantages for analysts and business users.

several strategies can be used to retrieve information from data warehouses or data marts, everyone with varying ranges of complexity and efficiency. The most common methods consist of SQL queries, ETL processes, BI tools, and OLAP cubes. The technique decided will depend on the necessity, and complexity of the information, desired for the retrieval.

SQL is often used to query and manipulate data from relational databases. Data warehouses and Data marts will often fall into the category of relational databases. The structured query language allows for retrieval based on desired criteria and can become complex depending on how the data needs to be presented.

BI (Business Intelligence) tools provide friendly user interfaces and dashboards for exploring and visualizing the data, an example may be the software Tableau. This software can allow the data to be easily queried and analyzed without the need to write SQL. However, initial set up can be cumbersome to provide the interface users will expect to see for easy viewing.

1. Identify potential data sources that organizations can leverage for analytics initiatives (e.g., transactional databases, social media data, IoT data). Evaluate the challenges and benefits of incorporating these sources into analytics projects.

Data sources can come from a multitude of places, including internal databases, gauges, sensors, Internet Websites or social media. Various sources can be used to gain information into the business or behaviors of consumers, identify trends all to help improve decisions to drive businesses.

As an example, when I was working in IT as a contractor for ExxonMobil, they would want information on the refining of gasoline to help drive decisions if they needed to cut production, or plan for outages based on performance of the facility and units in each of the production housing areas, or how consumers would react to environmental forces, such as when covid struck, the refinery needed to cut production as there came an over abundance of fuel saturating the market because no one was going anywhere. This information required the business to make staffing less abundant and as a result many people lost their jobs, while this was unfortunate, it allowed the business to continue with fewer financial impacts.