

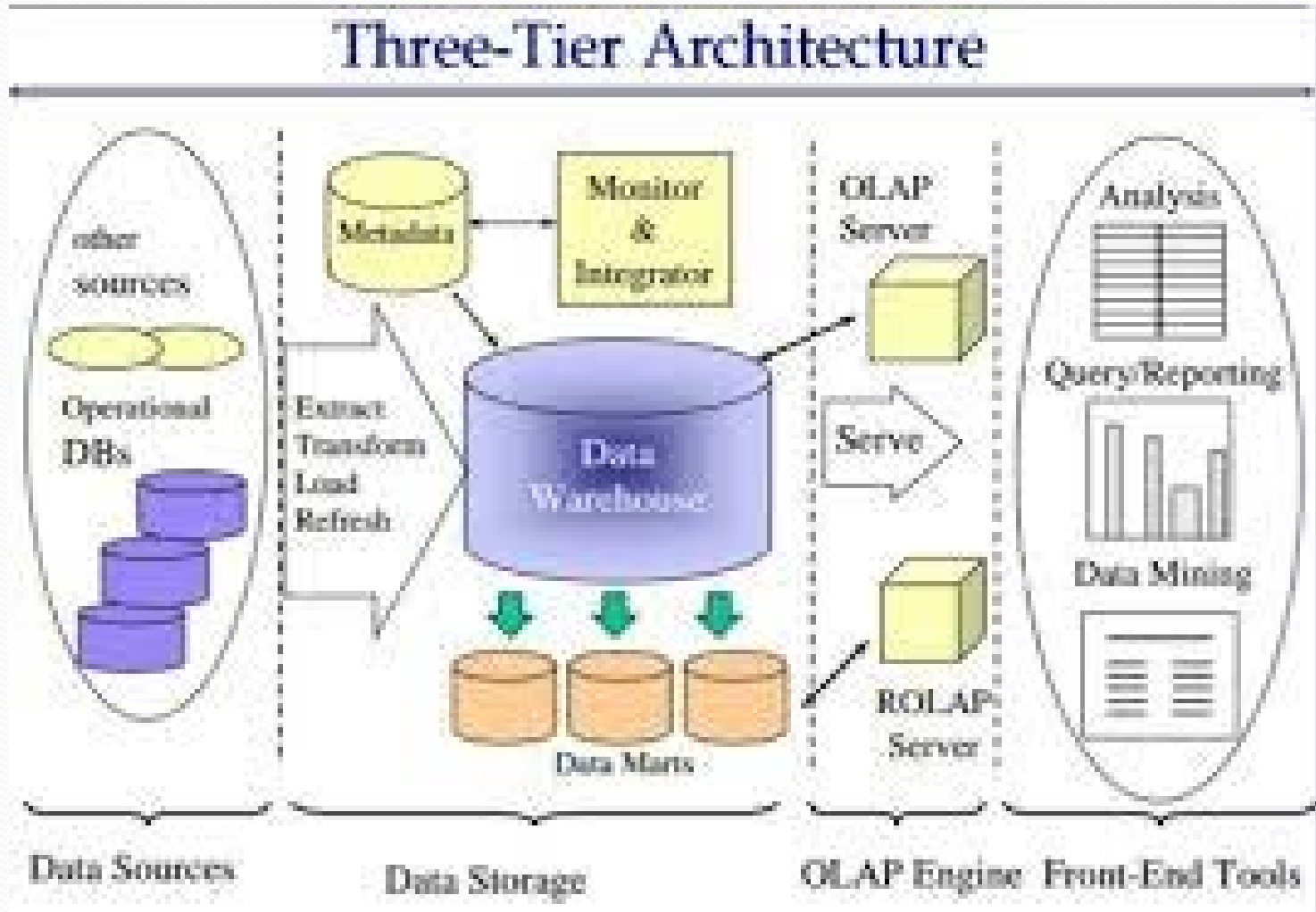
Data Warehouse Architecture

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Data Warehouse

- is a subject-oriented, integrated, time-variant, non-volatile collection of data in support of management's decision making process.

Data Warehouse Architecture



Three Tier Data Warehouse Architecture

Generally a data warehouses adopts a three-tier architecture. Following are the three tiers of the data warehouse architecture.

Bottom Tier – The bottom tier of the architecture is the data warehouse database server. It is the relational database system. We use the back end tools and utilities to feed data into the bottom tier. These back end tools and utilities perform the Extract, Clean, Load, and refresh functions.

- **Middle Tier** – In the middle tier, we have the OLAP Server that can be implemented in either of the following ways.
- By Relational OLAP (ROLAP), which is an extended relational database management system. The ROLAP maps the operations on multidimensional data to standard relational operations.
- By Multidimensional OLAP (MOLAP) model, which directly implements the multidimensional data and operations.

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- **Top-Tier** – This tier is the front-end client layer. This layer holds the query tools and reporting tools, analysis tools and data mining tools.

Virtual Warehouse

A very special case of a data warehouse that adopts a single-level architecture is a virtual data warehouse. It is easy to build a virtual warehouse. Building a virtual warehouse requires excess capacity on operational database servers.

Data mart

- Data mart contains a subset of organization-wide data. This subset of data is valuable to specific groups of an organization.
- In other words, we can claim that data marts contain data specific to a particular group. For example, the marketing data mart may contain data related to items, customers, and sales. Data marts are confined to subjects.

Data warehousing is an increasingly important business intelligence tool, allowing organizations to:

- Ensure consistency. Data warehouses are programmed to apply a uniform format to all collected data, which makes it easier for corporate decision making. Standardizing data from different sources also reduces the risk of error in interpretation and improves overall accuracy.
- Make better business decisions. Successful business leaders develop data-driven strategies and rarely make decisions without consulting the facts. Data warehousing improves the speed and efficiency of accessing different data sets and makes it easier to derive insights that will guide the business and marketing strategies
- Improve their bottom line. Data warehouse platforms allow business leaders to quickly access their organization's historical activities and evaluate initiatives that have been successful — or unsuccessful — in the past. This allows executives to see where they can adjust their strategy to decrease costs, maximize efficiency and increase sales to improve their bottom line.