

workloads.

2.4.4. Characteristics of Data Warehouse

The data warehouse has specific characteristics that include the following:

- 1) **Subject-Oriented:** Information is presented according to specific subjects or areas of interest, not simply as computer files. Data is manipulated to provide information about a particular subject. **For example**, a retailer might have separate order entry systems and

databases for retail, catalogue, and outlet sales. Each system will support queries about the information it captures. But if somebody wants to find out details of all sales, then these "separate" systems are not adequate. To address this type of situation, your data warehouse database should be subject-oriented, organized into subject areas like sales, rather than around OLTP data sources.

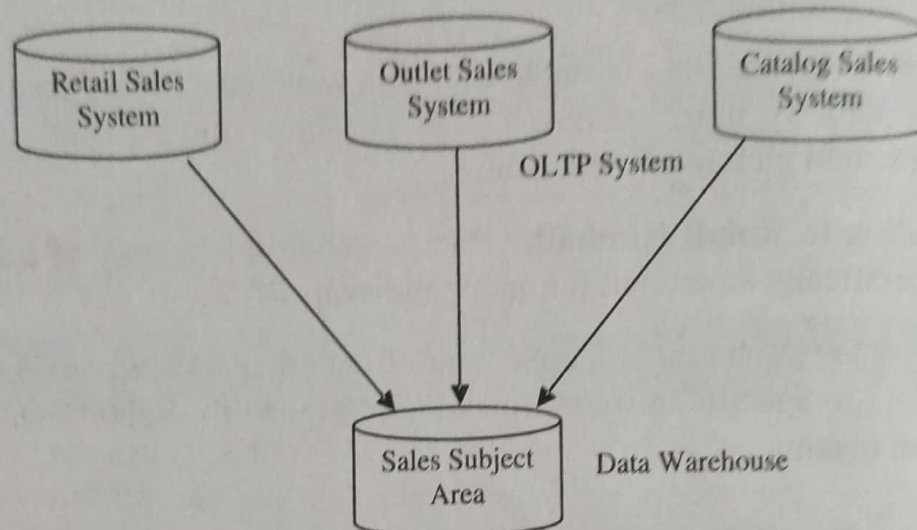


Figure 2.4: Subject-Oriented Sales Information

A data warehouse is organized around major subjects such as customer, products, sales, etc. Data are organized according to subject instead of application.

- 2) **Integrated:** A single source of information for and about understanding multiple areas of interest. The data warehouse provides one-stop shopping and contains information about a variety of subjects. Thus the OIRAP (Office of Institutional Research and Academic Planning) data warehouse has information on students, faculty and staff, instructional workload, and student outcomes.
- 3) **Non-Volatile:** Stable information that doesn't change each time an operational process is executed. Information is consistent regardless of when the warehouse is accessed.
- 4) **Time-Variant:** Containing a history of the subject, as well as current information. Historical information is an important component of a data warehouse.
- 5) **Accessible:** The primary purpose of a data warehouse is to provide readily accessible information to end-users.
- 6) **Process-Oriented:** It is important to view data warehousing as a process for delivery of information. The maintenance of a data warehouse is ongoing and iterative in nature.

2.4.5. Purposes of a Data Warehouse

- 1) **To Provide Business Users with Access to Data:** The data warehouse provides access to integrated enterprise data previously locked away in unfriendly, difficult-to-access environments. Business users can now establish a secured connection to the warehouse through their desktop PC with minimal effort. Security is enforced either by the warehouse front-end application, or by the server database, or by the both.
- 2) **To Provide One Version of the Truth:** The data in the data warehouse are consistent and quality assured before being released to business users. Since a common source of information is now used, the data warehouse puts to rest all debates about the veracity of data used or cited in meetings. The data warehouse becomes the common information resource for decisional purposes throughout the organization.
- 3) **To Record the Past Accurately:** Many of the figures and numbers that managers receive have little meaning unless compared to historical figures. **For example,** reports that compare the company's present performance with that of the last years are quite common.

Reports that show the company's performance for the same month over the past three years are likewise of interest to decision-makers. The operational systems will not be able to meet this kind of information need for a good reason. A data warehouse should be used to record the past accurately, leaving the OLTP systems free to focus on recording current transactions and balances.

- 4) **To Slice and Dice Through Data:** Dynamic reports allow users to view warehouse data from different angles, at different levels of detail business users with the means and the ability to slice and dice through warehouse data can actively meet their own information needs. The ready availability of different data views also improves business analysis by reducing the time and effort required to collect, format, and distil information from data.
- 5) **To Separate Analytical and Operational Processing:** Decisional processing and operational information processing have totally divergent architectural requirements. Attempts to meet both decisional and operational information needs through the same system or through the same system architecture merely increase the brittleness of the IT architecture and will create system maintenance nightmares. Data warehousing disentangles analytical from operational processing by providing separate system architecture for decisional implementations.

- 6) **To Support the Reengineering of Decisional Processes:** Although reengineering projects have traditionally focused on operational processes, data warehousing technologies make it possible to reengineer decisional business processes as well. Data warehouses, with their focus on meeting decisional business requirements, are the ideal systems for supporting reengineered decisional business processes.