**Components of Data Warehouse:**

**Source Data Component in Data Warehousing**

1. **Production Data:**
   * Originates from the organization's operational systems.
   * Specific data segments are selected based on the data requirements of the data warehouse.
2. **Internal Data:**
   * Includes private spreadsheets, reports, customer profiles, and departmental databases maintained within the organization.
   * Some of this data can be valuable for analysis and integration into the data warehouse.
3. **Archived Data:**
   * Historical data extracted from operational systems is periodically archived.
   * These archives store older data no longer actively used in day-to-day operations.
4. **External Data:**
   * Comes from sources outside the organization, such as industry reports, market statistics, and third-party data providers.
   * Executives often rely on this data for strategic decision-making.

**Data Staging Component in Data Warehousing**

1. **Data Extraction:**
   * Data is collected from multiple sources using appropriate techniques for each source.
2. **Data Transformation:**
   * Extracted data is cleaned, standardized, and integrated.
   * Tasks include correcting errors, filling missing values, removing duplicates, and standardizing formats.
   * Data from different sources is combined, sorted, and merged.
   * Irrelevant data is purged, and meaningful data is reorganized for analysis.
3. **Data Loading:**
   * During the initial setup, large volumes of data are loaded into the warehouse, which is time-intensive.
   * Subsequent loads involve updating and maintaining the data efficiently.

**Data Warehouse Components**

1. **Data Storage Component:**
   * Data storage in a data warehouse is separate from operational data repositories.
   * Operational systems store only current, highly normalized data optimized for fast transaction processing.
   * Data warehouses, in contrast, store historical and aggregated data optimized for analysis and reporting.
2. **Metadata Component:**
   * Acts as a data dictionary or catalog for the data warehouse.
   * Stores information about data structures, records, addresses, indexes, and relationships.
   * Helps users and systems understand and manage the stored data effectively.
3. **Data Marts:**
   * Subsets of the data warehouse designed for specific business units or user groups.
   * Focused on particular subjects, offering quicker access and simplified querying.
   * While data warehouses handle broad organizational data, data marts address specialized analytical needs.
   * Modern approaches often involve building data warehouses with multiple interconnected data marts.
4. **Management and Control Component:**
   * The management and control component oversees data warehouse operations, ensuring smooth data transformation, transfer, storage, and delivery.
   * It works with database management systems to securely store data, monitors data movement through staging, and regulates data delivery to users, maintaining consistency and efficiency across all processes.