PRELUDE

- Electronic commerce, commonly known as e-commerce or eCommerce, consists of the buying and selling of products or services over electronic systems such as the Internet and other computer networks.
- The amount of trade conducted electronically has grown extraordinarily since the spread of the Internet. A wide variety of commerce is conducted in this way, spurring and drawing on innovations in electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems.
- Modern electronic commerce typically uses the World Wide Web at least at some point in the transaction's lifecycle, although it can encompass a wider range of technologies such as e-mail as well.
- A large percentage of electronic commerce is conducted entirely electronically for virtual items such as access to premium content on a website, but most electronic commerce involves the transportation of physical items in some way. Online retailers are sometimes known as e-tailers and online retail is sometimes known as e-tail. Almost all big retailers have electronic commerce presence on the World Wide Web.
- Electronic commerce that is conducted between businesses is referred to as business-to-business or B2B. B2B can be open to all interested parties (e.g. commodity exchange) or limited to specific, pre-qualified participants (private electronic market). Electronic commerce that is conducted between businesses and consumers, on the other hand, is referred to as business-to-consumer or B2C. This is the type of electronic commerce conducted by companies such as Amazon.com.
- Electronic commerce is generally considered to be the sales aspect of e-business. It also consists of the exchange of data to facilitate the financing and payment aspects of the business transactions.

TYPES OF E-COMMERCE
1. Business to Business
2. Business to Customer
3. Digital Middleman

B2B- BUSINESS TO BUSINESS
- B2B is the selling or buying between companies, wholesale rather than retail.
- B2B involves widening the circle of suppliers (for safety and competition), and of centralizing control (for records and discounts).
- B2B ecommerce is an important part of any online business. Leaving aside the simple transfer of funds, many businesses need some combination of:
  - Credit worthiness assessment.
  - Guarantee of quality and delivery of goods (escrow services).
  - Safeguards against fraud.
  - Fast collection of funds, with ability to vary the collection period.
  - Reporting: approval of sale, invoicing, delivery, payment.
  - Procedures to handle disputes.

B2C - BUSINESS TO CONSUMER

- B2C refers to a business communicating with or selling to an individual rather than a company. B2C e-commerce jumped from $11.2 billion in 1998 to $31.2 billion in 1999.
- Doing business online no longer requires a huge investment by retailers as it is through template-based online stores and is delivered over the internet.
- As nearly all online stores require the same functions: catalogues, order baskets, payment processing, content management and member management, it makes sense for those components to be created once and shared by all stores, with each store effectively 'renting' its own copy of the applications.
- Using the latest internet application technology, individual sites can be created within minutes of the retailer selecting a template and supplying graphics such as logos. Typically, retailers will pay only a modest monthly rental charge – and retailers require no specialist hardware or software, other than internet access.
- Anyone who wants to sell products and services over the internet, or who wants customers to be able to research their purchases on the internet, should consider an online store.
- These days, a web site should be a standard part of the promotional and advertising mix for every business, along with other tools such as Yellow Pages, newspaper advertising and signage.

Advantages of B2C E-commerce

- Shopping can be faster and more convenient.
- Offerings and prices can change instantaneously.
- Call centers can be integrated with the website.
- Broadband telecommunications will enhance the buying experience.

Challenges faced by B2C e-commerce

- The two main challenges faced by B2C e-commerce are building traffic and sustaining customer loyalty. Due to the winner-take-all nature of the B2C structure, many smaller firms find it difficult to enter a market and remain competitive. In addition, online shoppers are very price-sensitive and are easily lured away, so acquiring and keeping new customers is difficult.

DIGITAL MIDDLEMAN

- The digital middleman in e-commerce could be a company that creates a virtual community or portal on the Internet and then gathers several companies together into this community.
- The middleman this promotes this new virtual community to the public.
- Some of these communities are service or product specific and all the companies in the community provide only a specific type of service or product to the visitors.
- The virtual community provides information of the products and services of each company to the visitors allowing them to do comparisons and select the best deal.
- The middleman takes a fee from the companies for each Internet referral.
- Some digital middleman act as **auction houses or flea markets** where sellers put up their advertisements and buyers bid for the items. The digital middleman takes a small commission from each transaction.

ADVANTAGES OF E-BUSINESS APPLICATIONS

Catalog flexibility and Online fast updating
- Direct "link" capabilities to content information and visual displays already existing on other client web site. You can update your E-Catalog anytime, whether it's adding new products, or adjusting prices, without the expense and time of a traditional print catalog.
- Extensive search capabilities by item, corporate name, division name, location, manufacturer, partner, price or any other specified need.

Shrinks the Competition Gap
- Reduced marketing/advertising expenses compete on equal footing with much bigger companies; easily compete on quality, price, and availability.

Unlimited Market Place and Business Access Which Extend Customer Base
- The Internet gives customers the opportunity to browse and shop at their convenience and at their place. They can access your services from home, office, or on the road, 24 hours a day, 7 days a week.
- The Internet allows you to reach people around the world, offering your products to a global customer base.

A 24 Hour Store Reduced Sale Cycle
- Reduce unnecessary phone calls and mailings.

Lower Cost of Doing Business
- Reduce inventory, employees, purchasing costs, order processing costs associated with faxing, phone calls, and data entry, and even eliminate physical stores. Reduce transaction costs.

Eliminate Middlemen
- Sell directly to your customers.

Easier Business Administration
- With right software, store inventory levels, shipping and receiving logs, and other business administration tasks can be automatically stored, categorized and updated in real-time, and accessed on demand.

Frees Your Staff
- Reduce customer service and sales support.

Customers will love it
- Gives customers control of sales process. Builds loyalty.

More Efficient Business Relationships
- Better way to deal with dealers and suppliers.

Workflow automation
- Shipping, real time inventory accounting system which adjusts stock levels and site, location availability instantaneously
- Secured, automated registration verification, account entry and transaction authorization features
- Automated RFP and RTQ features for vendor bid development and selection.
- Banking and accounting features customized for pre-approved third party direct sales, vendor, consignment or internal transfer transactions.

Secure Payment Systems
- Recent advancements in payment technologies allow encrypted, secure payment online.

PRELUDE

- ✓ Hypermedia is used as a logical extension of the term hypertext in which graphics, audio, video, plain text and hyperlinks intertwine to create a generally non-linear medium of information.
- ✓ It is a network containing several interlinked information units called nodes and the connection between the nodes are called links.
- ✓ It contrasts with the broader term multimedia, which may be used to describe non-interactive linear presentations as well as hypermedia.
- ✓ The World Wide Web is a classic example of hypermedia, whereas a non-interactive cinema presentation is an example of standard multimedia due to the absence of hyperlinks.
- ✓ Most modern hypermedia is delivered via electronic pages from a variety of systems including Media players, web browsers, and stand-alone applications. Audio hypermedia is emerging with voice command devices and voice browsing.
- ✓ Multimedia development software such as Adobe Flash, Adobe Director, Macromedia Authorware, and MatchWare Mediator may be used to create stand-alone hypermedia applications, with emphasis on entertainment content.
- ✓ Some database software such as Visual FoxPro and FileMaker Developer may be used to develop stand-alone hypermedia applications, with emphasis on educational and business content management.
- ✓ Hypermedia applications may also be developed on embedded devices for the mobile using the specification from W3C (World Wide Web Consortium).

CHARACTERISTICS

- ✓ It must be possible to use hypermedia both for writing and reading information.
- ✓ The information comprises non sequential structures and may thus be followed along alternative paths.
- ✓ The information must follow natural association from one information unit to another.
- ✓ The information may be hierarchically structured.
- ✓ Each information unit is presented in a separate on screen window.
- ✓ It must possible to share the information or parts of it among several users.
- ✓ It must be possible to have several people working against the database at the same time.
- ✓ The information resides in a database.

COMPONENTS OF HYPERMEDIA

- ✓ the different components of a hypermedia consists of nodes, links, hyperdocuments, database diagrams, a search engine and a programming interface.
- ✓ The information itself in hypermedia consists of a number of hyperdocuments shown in dotted areas in the figure. The hyperdocuments again are built by a collection of nodes and links. Each hyperdocument comprises an independent, limited topic and each node is an independent information unit. Links handle a natural switch from one node to another thus structuring the hyperdocument.
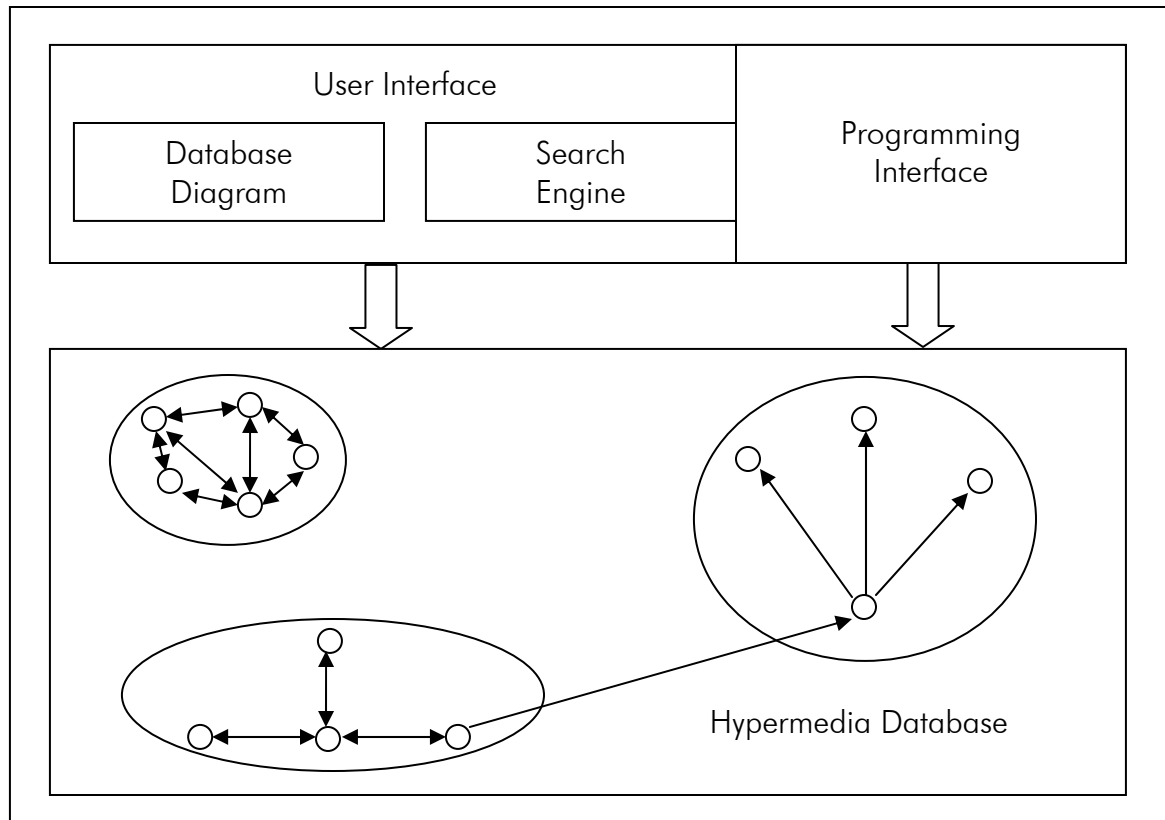
The user's access to information occurs through the user interface which directly goes to the hypermedia base. The user then follows the links from node to node based on the information contained in each node.

A database diagram is a graphic overview of the hyperdocument. It allows the user to navigate directly between nodes in the hyperdocument, without following the links.

A search engine is a mechanism that allows a user to search directly for information in the hypermedia database. Search engines may find nodes of a certain type or names or nodes containing specific information. Advanced hypermedia systems may have search engines which allow the formulation of direct query in the hyperbase.

The programming interface enables the creation of special applications for the existing hypermedia systems. It may also be used to add new features to the system. It may, for example, be used to connect the hypermedia database to more advanced search routines or to link to other applications allowing these to access the information in the hypermedia database.

APPLICATION AREAS OF HYPERMEDIA

- ✓ **Literature Systems:** Different types of literature require organizing the material, as well as references to other liteture. Literature systems lend themselves well to the rich ways of structuring information afforded by hypermedia. Documents are kept together by mean of organization links. This structure may be created by the author,or it may be the original structure of a document which has been converted from printed text to hypermedia. References to other parts of the document and to other documents are handled by reference links. This allows direct references to other documents, if the other document are in the hyperbase.

- ✓ **Publishing:** Compared to traditional printed information media, hypermedia has the advantage of being able to present other information that text and pictures. Information objects such as audio and film may be included in a document. As this publishing is electronic, it will be easier to distribute than traditional printed matter.

- ✓ **Instruction System:** Hypermedia is often employed in interactive instrution systems. The student may move around at will in the information, hopefully learning while jumping from node to node. Instruction systems require the ability to guide the student through the material, creating recommended paths to follow. A simple way to add comments is also required.

- ✓ **Problem Solving Systems:** This types of system is used for inter-group communication. When using hypermedia's opportunites for allowing a number of users to access the same information set, a work group may seek solutions to different issues. Discussions, document sharing, and the ability to let work group members comment on the work of other members are typical features of such systems.

- ✓ **Idea Tools:** A number of experts have argued that the linear structure of traditional documents is inadequate for representing thoughts and ideas. As hypermedia offers a non-linear structure, it may well be an appropriate tool for structuring thoughts and ideas.

PRELUDE

✓ Data warehouse is a repository of an organization's electronically stored data and are designed to facilitate reporting and analysis

✓ Also emphasizes on the means to retrieve and analyze data, to extract, transform and load data, and to manage the data dictionary.

✓ An expanded definition for data warehousing includes business intelligence tools, tools to extract, transform, and load data into the repository, and tools to manage and retrieve metadata (data about data).

✓ In contrast to data, warehouses are operational systems that perform day-to-day transaction processing.

✓ A data warehouse is a collection of computer-based information that is critical to successful execution of enterprise initiatives

✓ It provides a tool to satisfy the information needs of the employee's at all organizational levels-not just for complex data queries but as a general facility for getting quick, accurate and often insightful information.

✓ It is designed so that its users can recognize the information they want and access that information using simple tools.

✓ One of the principal reasons for developing a Data Warehouse is to integrate operational data from various sources into a single and consistent architecture that supports analysis and decision making with the enterprise.

✓ Some of the applications data warehousing can be used for are:
  o Credit card churn analysis
  o Insurance fraud analysis
  o Call record analysis
  o Logistics management (part of Supply Chain Management that plans, implements, and controls the efficient, effective, forward, and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements)

ADVANTAGES

▪ **More cost effective decision making:** A data warehouse allows reduction of staff and computer resources required to support queries and reports against operational and production database. This typically offers significant savings.

▪ **Better enterprise intelligence:** Increased quality and flexibility of enterprise analysis arises from the multi-level data structure which guarantees data accuracy and reliability ensuring that a Data Warehouse contains only "trusted" data.

▪ **Enhanced customer service:** An enterprise can maintain better customer relationships by correlating all customer data via a single Data Warehouse Architecture.

▪ **Business reengineering:** Allowing unlimited analysis of enterprise information often provides insights to enterprise processes that may yield breakthrough ideas for engineering those processes. Knowing what information is important to an enterprise will provide direction and priority for reengineering efforts.

▪ A data warehouse provides a common data model for all data of interest regardless of the data's source. This makes it easier to report and analyze information than it would be if

multiple data models were used to retrieve information such as sales invoices, order receipts, general ledger charges, etc.

- Prior to loading data into the data warehouse, inconsistencies are identified and resolved. This greatly simplifies reporting and analysis.
- Information in the data warehouse is under the control of data warehouse users so that, even if the source system data is purged (washed out) over time, the information in the warehouse can be stored safely for extended periods of time.
- Because they are separate from operational systems, data warehouses provide retrieval of data without slowing down operational systems.
- Data warehouses can work in conjunction with and, hence, enhance the value of operational business applications, notably customer relationship management (CRM) systems.
- Data warehouses facilitate decision support system applications such as trend reports (e.g., the items with the most sales in a particular area within the last two years), exception reports, and reports that show actual performance versus goals.

DATA WAREHOUSE COMPONENTS
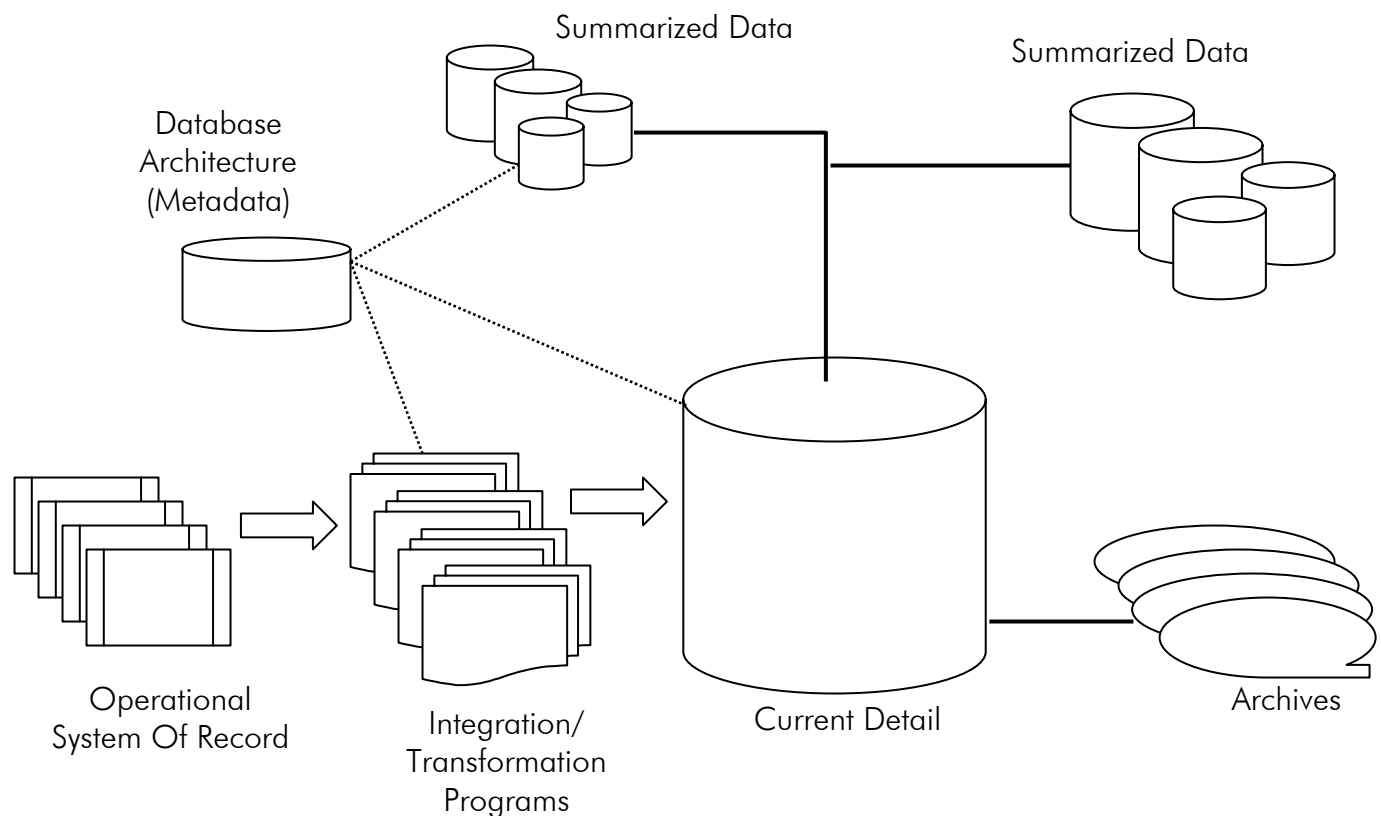
Components Of A Data Warehouse

The major components of data warehouse are:
- ❖ Summarized Data
- ❖ Current Details
- ❖ Operational System of Record
- ❖ Integration/Transformation Programs
- ❖ Archives
- ❖ Data Warehouse Architecture or Metadata

Summarized Data:
- ✓ Classified into two categories: **lightly summarized** and **highly summarized**
- ✓ Lightly summarized data are the hallmark (trademark) of data warehouse as all enterprise elements do not have the same information requirement. They include less data than the total data stored in current detail.
- ✓ Highly summarized data are primarily for enterprise executives. They come from either the lightly summarized data used by enterprise elements or from current detail. Data volume at this level is much less than other levels.

Current Detail:
- ✓ It is the heart of the data warehouse where the whole bulk of data resides.
- ✓ Comes directly from operational systems of records and may be stored as raw data or as aggregations of raw data.
- ✓ It is the lowest level of data granularity which is typically two to five years old.

Operational System of Record:
- ✓ It is a source of the data that feeds the Data Warehouse.
- ✓ It is necessary for a Data Warehouse to be populated with the highest quality of data that is most timely, accurate, and complete and has the best structural conformance to the Data Warehouse.
- ✓ Often, these data are closest to the source of entry into the production environment. In other cases, a system of record may be containing already summarized data.

Integration/Transformation Programs
- ✓ As operational data items pass from their systems of record to a data warehouse, integration and transformation programs convert them from application-specific data into enterprise data. These integration and transformation programs functions such as:
  - o Reformatting, recalculating or modifying key structures
  - o Adding time elements
  - o Identifying default values
  - o Supplying logic to choose between multiple data sources
  - o Summarizing, tallying and merging data from multiple sources

Archives
- ✓ Contains old data (normally over two years old) of significant, continuing interest and value to the enterprise.

- ✓ There is usually a massive amount of data stored in the Data Warehouse archives, with a low rate of access.
- ✓ Archives data are most often used for forecasting and trend analysis.
- ✓ Archives not only include old data, they also include the metadata that describes the old data's characteristic.

Metadata:

- ✓ Metadata is "data about other data", of any sort in any media.
- ✓ An item of metadata may describe an individual datum, or content item, or a collection of data including multiple content items and hierarchical levels.
- ✓ Metadata is definitional data that provides information about or documentation of other data managed within an application or environment.
- ✓ Metadata may include descriptive information about the context, quality and condition, or characteristics of the data. It may be recorded with high or low granularity.
- ✓ Data Warehouse developers use it to manage and control Data Warehouse creation and maintenance.
- ✓ For example, metadata would document data about data elements or attributes, (name, size, data type, etc) and data about records or data structures (length, fields, columns, etc) and data about data (where it is located, how it is associated, ownership, etc.).
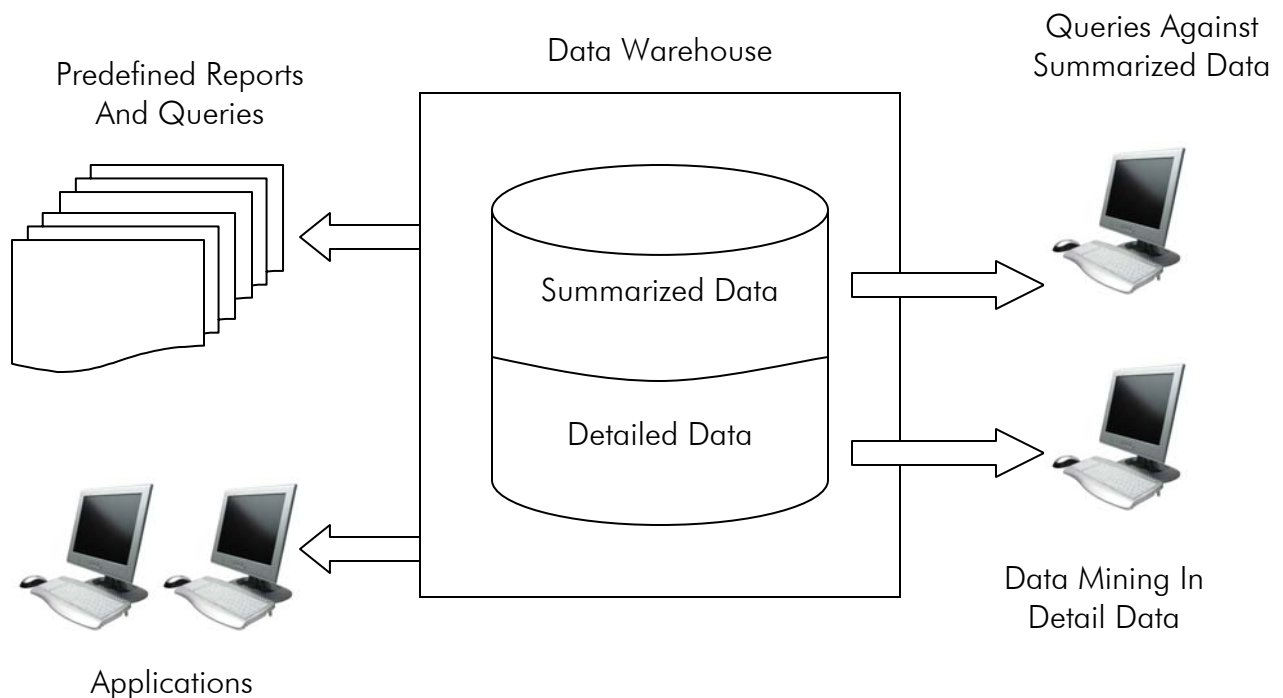
STRUCTURE OF A DATA WAREHOUSE
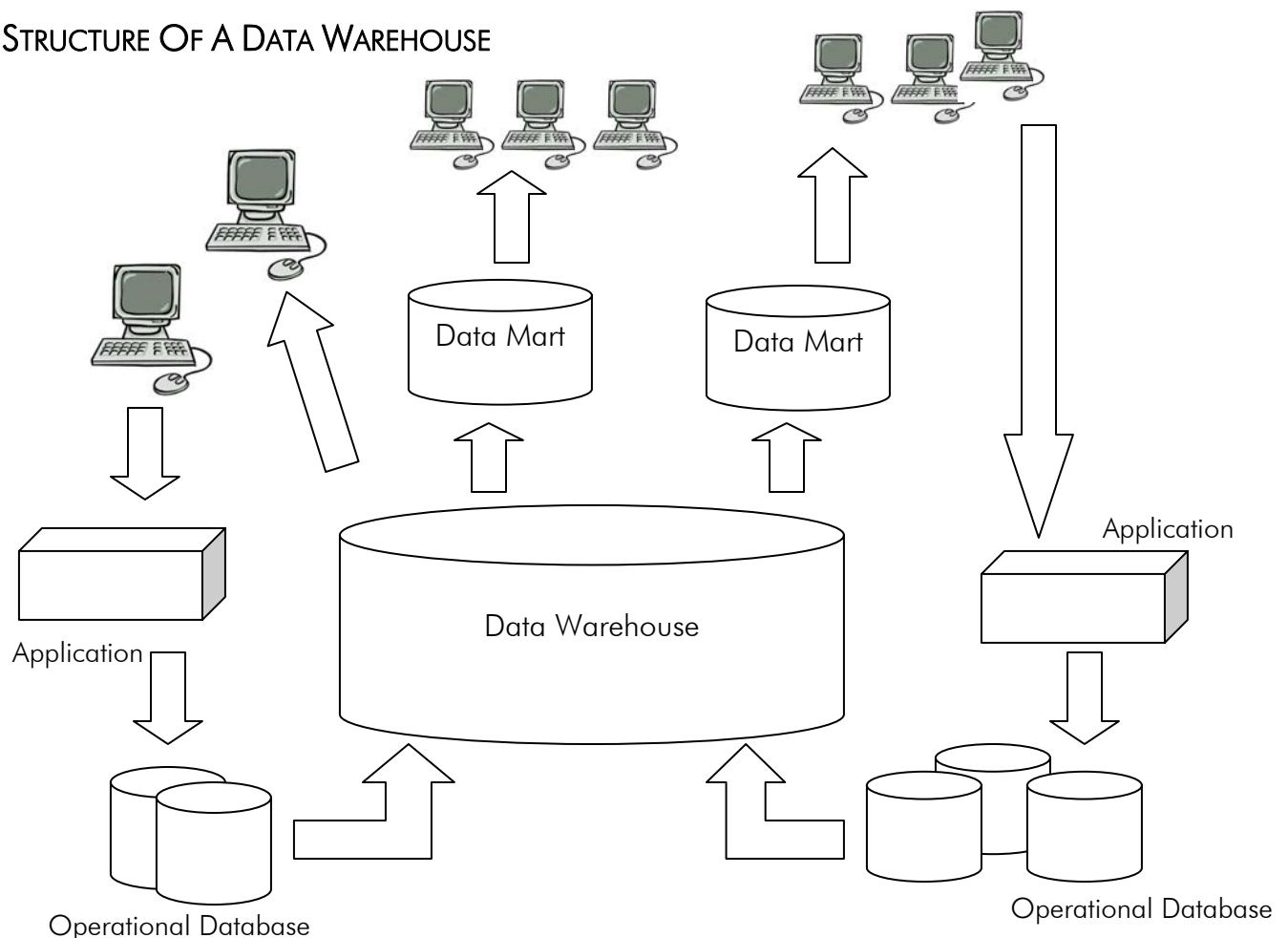
The structure of Data Warehouse consists of:
- **Physical Data Warehouse:**
  - ✓ Physical database in which all the data for the Data Warehouse is stored, along with metadata and processing logic for scrubbing, organizing, packaging and processing the detail data.
- **Logical Data Warehouse:**
  - ✓ It also contains metadata, including enterprise rules and processing logic for scrubbing, organizing, packaging and processing the data but does not contain actual data.
  - ✓ Instead it contains the information necessary to access the data wherever they reside.
  - ✓ This structure is effective only when there is a single source for the data and they are known to be accurate and timely.
- **Data Marts:**
  - ✓ Data Mart is a subset if an enterprise-wide Data Warehouse, which typically supports an enterprise element (department, region).
  - ✓ As part of an iterative Data Warehouse development process, an enterprise builds a series of physical (or logical) data marts over time and links them via an enterprise-wide logical data warehouse or feeds them from a single physical warehouse.
  - ✓ The data mart is directed at a partition of data (often called a subject area) that is created for the use of a dedicated group of users.
  - ✓ A data mart might, in fact, be a set of denormalized, summarized, or aggregated data.
  - ✓ In most instances, however, the data mart is a physically separate store of data and is resident on separate database server, often a local area network serving a dedicated user group.

USES OF A DATA WAREHOUSE

Data Warehouse

Predefined Reports And Queries

Queries Against Summarized Data

Summarized Data

Detailed Data

Data Mining In Detail Data

Applications

Standard Reports and Queries

Many users of the data warehouse need to access a set of standard reports and queries and hence it is desirable to periodically produce a set of standard reports that are required by many different users. When these users need a particular report, they can just view the report that has already run the data warehouse system rather than running it themselves. This facility can be particularly useful for reports that take a long time to run.

Queries Against Summarized Data

The summary views in the data warehouse can be object of a large majority of analysis in a data warehouse. These views contain predefined standard business analysis.

Data Mining

Data mining is the process of extracting hidden patterns from data. As more data are gathered, with the amount of data doubling every year, data mining is becoming an increasingly important tool to transform this data into information. It is commonly used in a wide range of profiling practices, such as marketing, fraud detection and scientific discovery. Data mining can be applied to data sets of any size.