**Informatics in Logistics Management**

# Lecture 4. Information Systems in Logistics

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# Lecture Overview

o **Logistics Information Technologies**

o **Logistics Information Systems**

  o *Concept*

  o *Structure*

  o *Components*

  o *Traits*

o **Adapting to New Information Technologies**

# IT in Logistics

○ **New Logistics Technologies based on informatics are developing rapidly for the last decade**
  - ○ **Service of customers**
  - ○ **Marketing channel**
  - ○ **Information correction**
  - ○ **Financial operations**
  - ○ **Strategic alliances**
  - ○ **Electronic procurement**
  - ○ **Internal and external communications**
  - ○ **Human resources and personnel management**
  - ○ **Computerization of trade personnel work**

# Logistics Information Technologies

○ **Bar coding**

- ○ **Most commonly used automatic identification technology**

- ○ **Consistency of this technology important factor in efficiency and effectiveness.**

○ **Electronic Data Interchange (EDI)**

- ○ **B2B, computer-to-computer exchange of business data in a structured, machine-processable format – see *next slide***

# *EDI versus Traditional Methods*
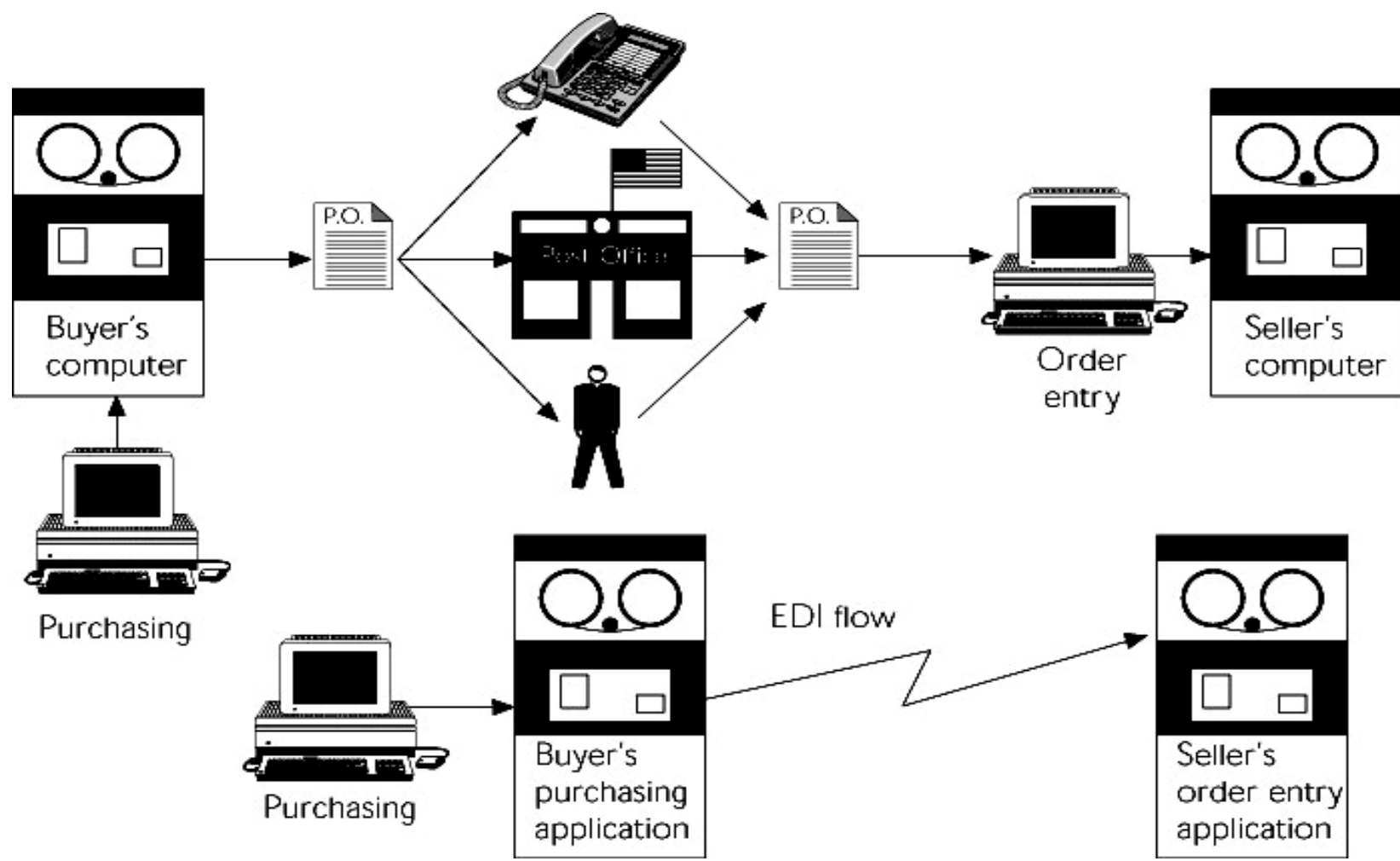
# Logistics Information Technologies

- **Extensible Markup Language (XML)**
  - **Method of packing information for movement on the Internet.**
  - **May replace EDI in the future.**
- **Data management**
  - **Handheld input devices and optical scanning popular in data management.**
  - **CD-ROMs are another data management tool seeing increasing use.**

# Logistics Information Technologies

o **Imaging**

  o **Both photographic and facsimile processes are being used to image documents.**

o **Artificial intelligence/expert systems**

  o **Attempts to transfer human intelligence to a machine.**

  o **Expert systems replicate "best practices" of humans to a computer-based system**.

# Logistics Information Technologies

o **RF technology**

  o **Uses radio frequency to transmit computer outputs, possibly from an expert system to human operated devices, such as, a forklift.**

  o **Optimizes quality, efficiency, and accuracy.**

o **Onboard computers and satellite tracking**

  o **Uses systems such as GPS to track and communicate with mobile and/or remote vehicles.**

# Logistics Information System - *Definition*

- *Logistics Information System* keep a prime position in Logistics Information Technologies

- *Logistics Information System* is an interacting structure of people, equipment, and procedures

  - that together make relevant information available to the logistics manager for the purposes of *planning, implementation, and control*
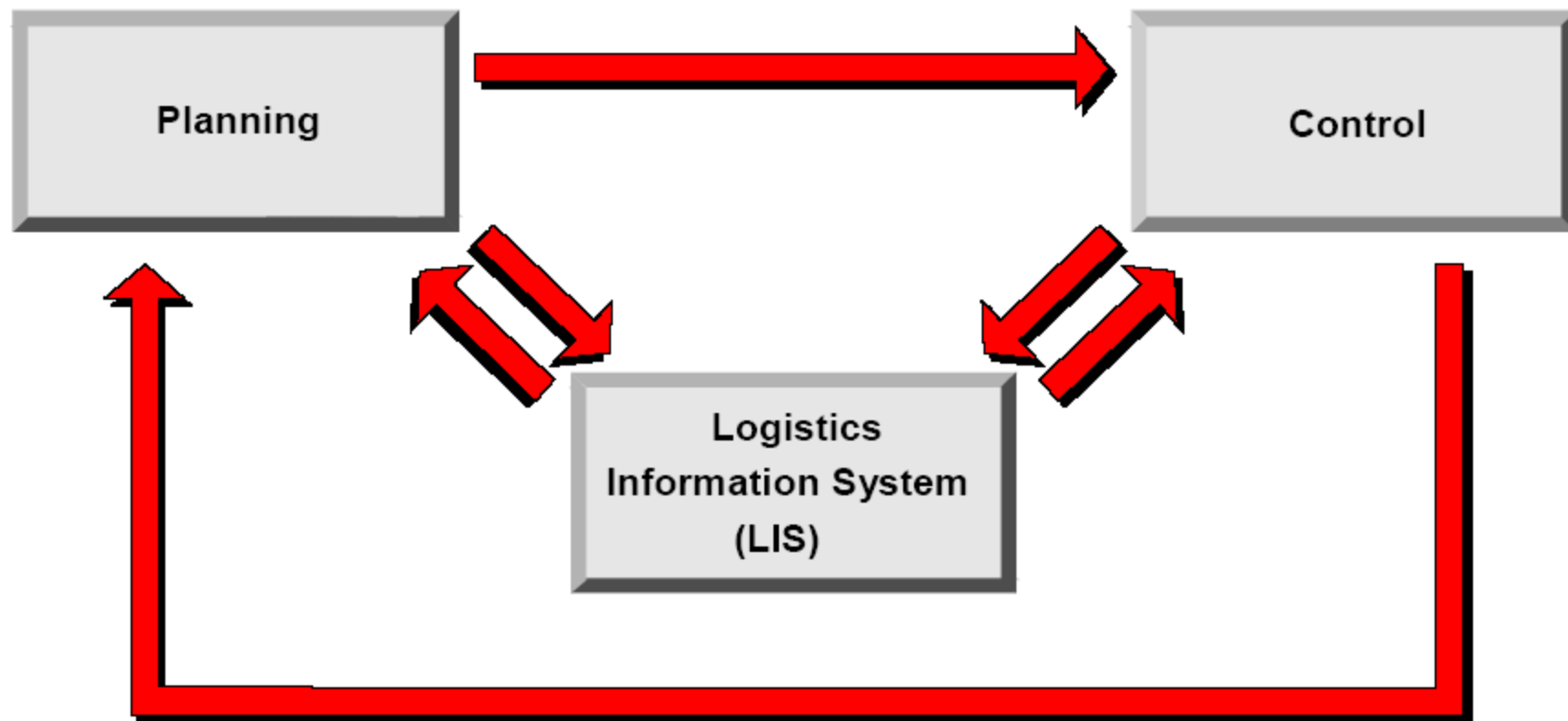
# LIS Concept – *Main Principles*

o **Hierarchy (governance of tasks and data sources)**

o **Building-block principle of data**

o **Redundancy(design with glance of current and future tasks as well)**

o **Confidentiality**

o **Adapting to changing demands**

o **Coordination and information unity**
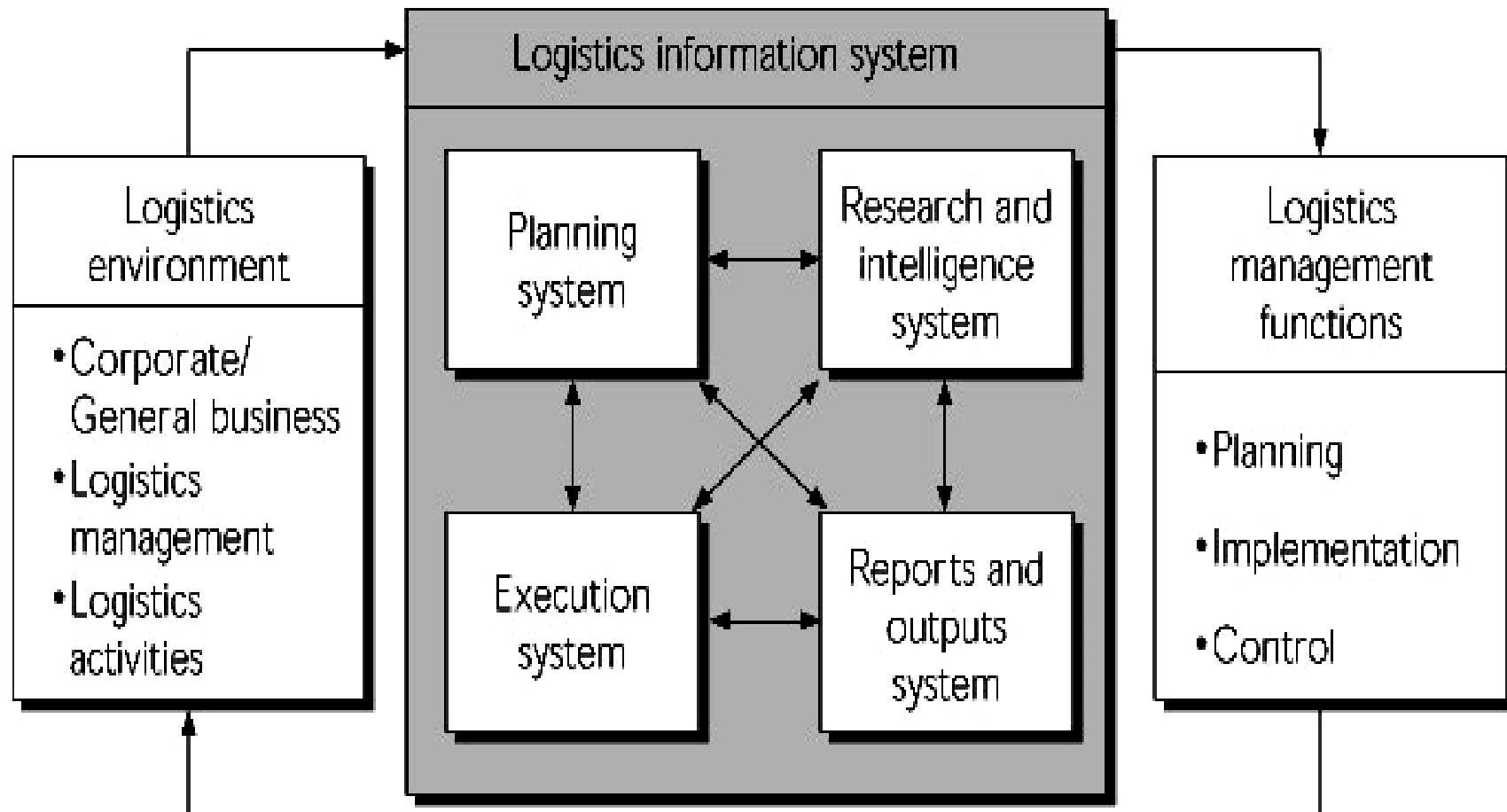
o **System openness**

# *LIS Functions*

○ **Data Bases**
  ○ **customers applications**
  ○ **production and reserves**
○ **Planning**
  ○ **inventory management**
  ○ **demand forecasting**
○ **Coordination**
  ○ **scheduling of production**
  ○ **material requirements planning**
○ **Communication**
  ○ **customer's request status**
  ○ **availability of reserves**
○ **Control -level of customer service**

# Logistics Information System – *General Structure*

# Logistics Information System: *Structure*



Logistics information system

| Planning system | Research and intelligence system |
| Execution system | Reports and outputs system |

**Logistics environment**
- Corporate/ General business
- Logistics management
- Logistics activities

**Logistics management functions**
- Planning
- Implementation
- Control

# Logistics Information Systems: *Planning System*

❍**Illustrated in *next slide***

❍**Provides decision support for logistics managers**

   ❍**Logistics functional databases**

      ❍**Comprehensive relational database that contains the type of information needed to make effective decisions**

      ❍**Greatest use in the transportation, inventory, and product areas with warehousing and customer areas showing less progress**

# *Supply Chain Functional Scope: Planning and Execution*
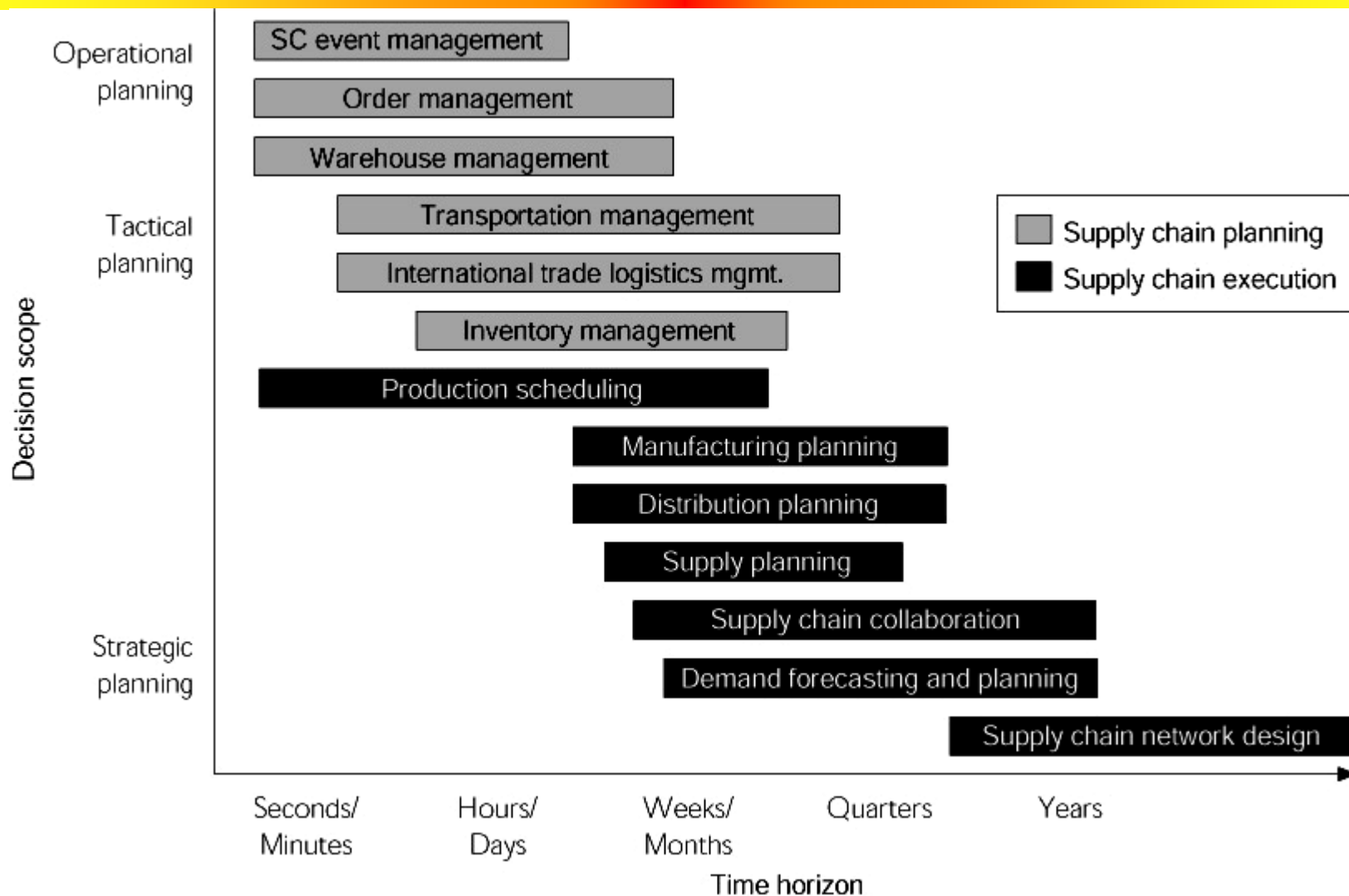
# *Modeling Approaches*

○ **Types of modeling approaches**

  ○ **Optimization**

    ○ **Searches for "best" solution**

  ○ **Simulation**

    ○ **Replicates the logistics network**

  ○ **Heuristic**

    ○ **Used for broader, non-optimum solutions**

# Logistics Information Systems: *Execution System*

o **Examine Figure in *next slide* (EDI – Electronic Data Interchange)**

  o **Responsible for short-term, day-to-day functioning of the logistics system.**

  o **Include technologies that help manage warehousing, transportation, international trade, and inventory.**

  o **Many recent advances in technology and these advances will most likely continue to evolve and impact logistics management in the future.**

# *Direct Materials Purchasing Moves Online*



"Through what mechanisms do you purchase your direct materials today? In 2002?"
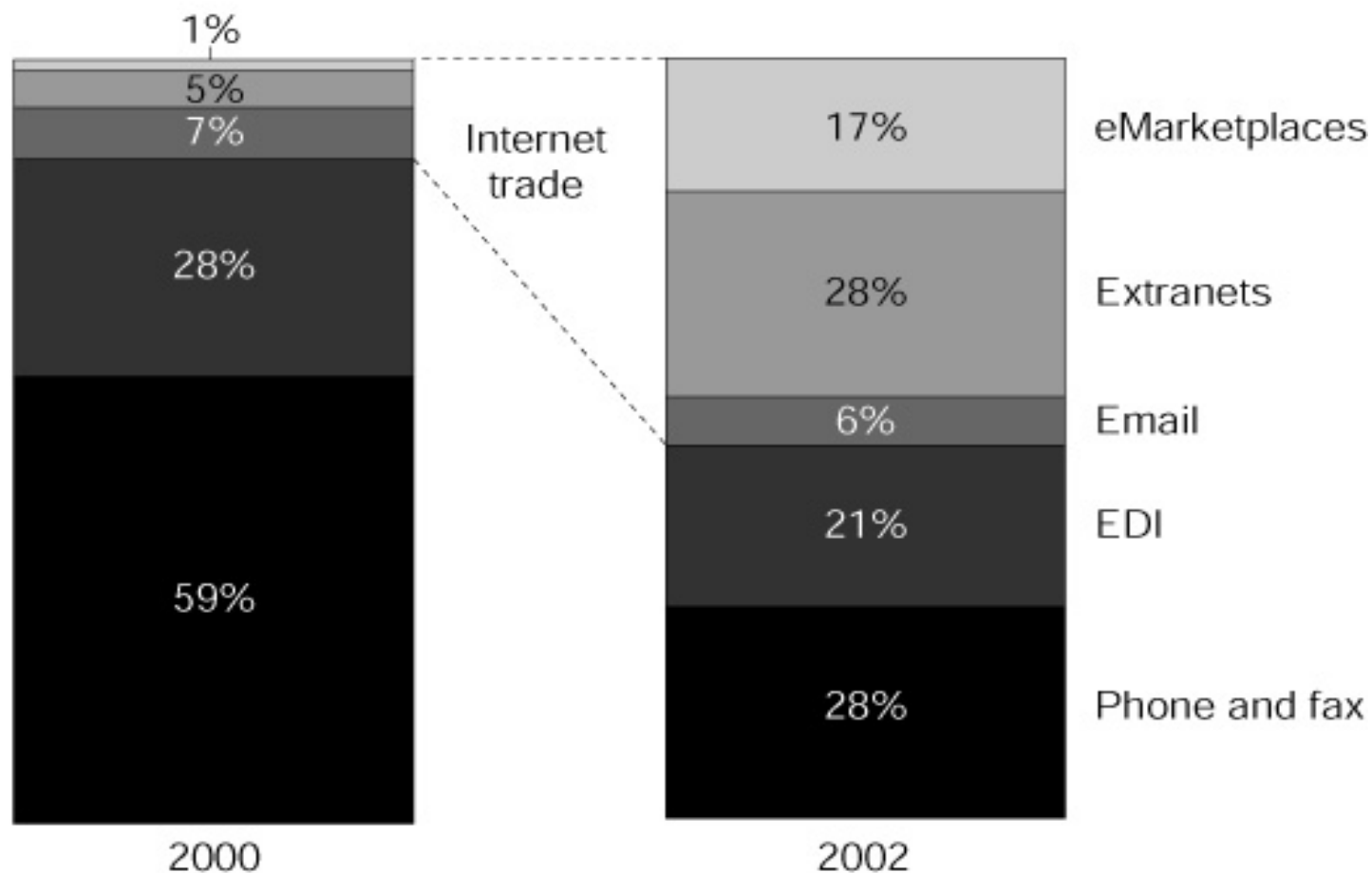
Based on 50 companies responding
(multiple responses accepted)

# Logistics Information Systems: *Research and Intelligence System*

o **Environmental scanning**
  o **Undirected viewing**
    o **General exposure to information**
  o **Conditioned viewing**
    o **Directed exposure to information**
  o **Informal search**
    o **Limited and unstructured effort to find information**
  o **Formal search**
    o **Deliberate effort to find information relating to a specific issue**

# Logistics Information Systems: *Knowledge Management*

○ **To maximize the results of an environmental scan, the logistics manager needs to consult:**

  ○ **Logistics area employees**

  ○ **Channel partners**

  ○ **Internal audit or external consultant**

  ○ **Other internal logistics initiatives**

○ **It is increasingly popular to dedicate a web site to hold information from the scan**

# Logistics Information Systems: *Reports and Outputs System*

o **Many logistics managers do not believe that reports communicate effectively.**

o **Communication occurs only if the message keys into the receiver's values and responds directly to the needs of the recipient.**

o **Types of reports**

  o **Planning reports**

  o **Operating reports**

  o **Control reports**

# Logistics Information Systems - *Traits*

⭕ **The information systems that belong to LIS have a modular structure, yet have a variety of techniques that allow you to evaluate data**

⭕ **This type of structure also allows the individual information systems to retain their special features.**

⭕ **The Logistics Information System allows you not only to evaluate actual data, but also to create planning data**

⭕ **The information systems provide an easy-to-use planning functions that are also supported by a forecasting function.**

# Logistics Information Systems - *Example*
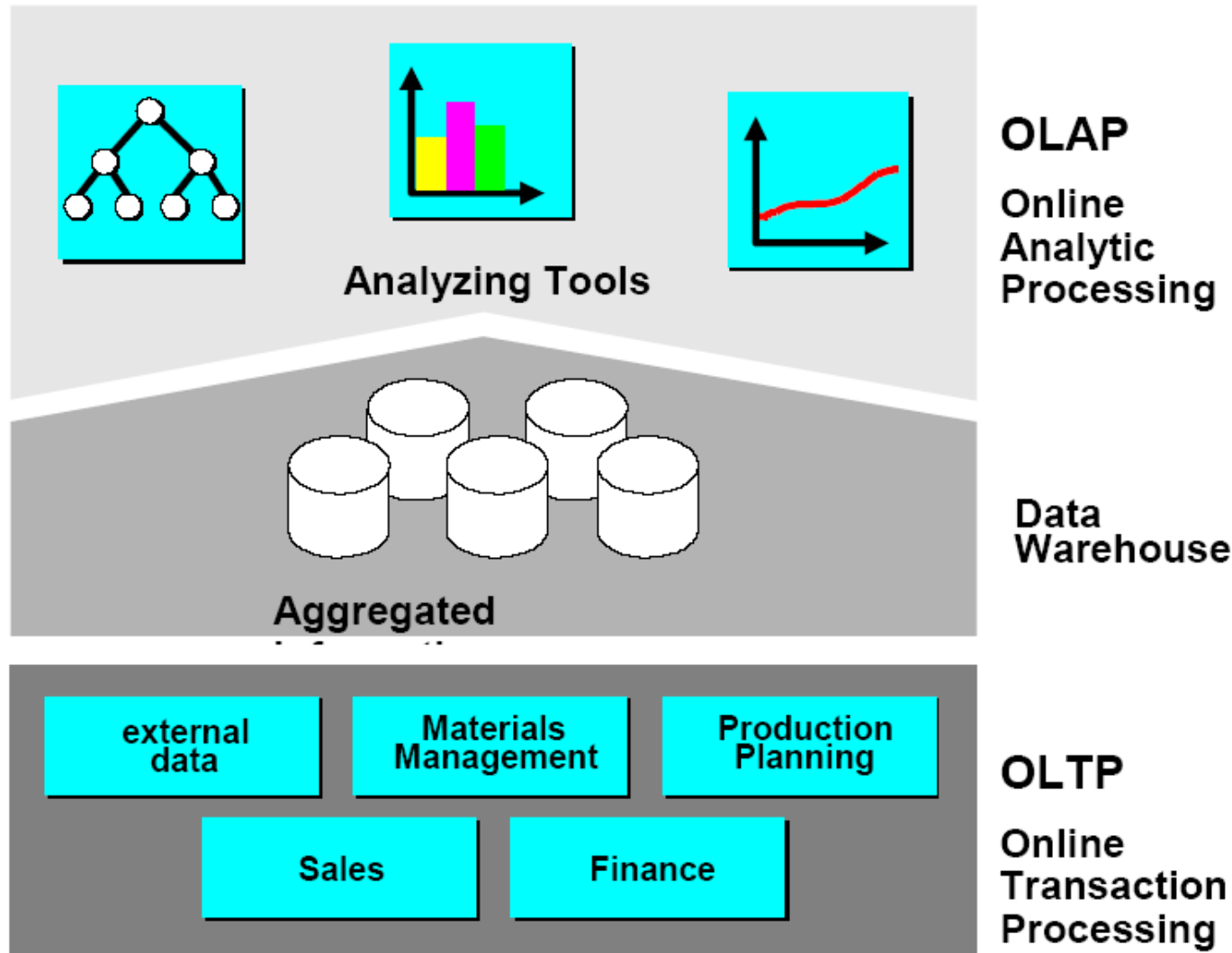
# Adapting to New Information Technologies

o **Relevant issues in the search for new technologies**

  o **Firms must have a scientific and intuitive knowledge of customer and supplier information requirements.**

  o **Lack of coordination and integration among key logistics and supply chain processes.**

  o **See that logistics organizational strategies move from a functional to a process orientation.**

  o **Early implementation efforts may suffer due to poor data or the non-availability or non-sharing of future data.**

# Adapting to New Information Technologies

o **Relevant issues in the search for new technologies**

  o **The organization must have the financial resources needed to assure a smooth, full implementation, and the people willing to accept and use new technologies.**

  o **Firms must create opportunities for interaction and team efforts among logistics managers and those others most knowledgeable about information technologies.**

# *Critical Emerging Technologies*