Enterprise Resource Planning

Dr. Ebadati

Kharazmi University

Re-engineering and Enterprise Resource Planning Systems

Objectives

- **Recognize the factors** associated with the **evolution to enterprise systems**, including **business process re-engineering**, **client-server networking**, and the emergence of **integrated databases**
- Understand the **role of process modeling** in **re-designing business processes**

Re-Engineering

- The **definition of re-engineering** is “the **fundamental rethinking and radical redesign** of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed” (Hammer and Champy, 1993).

Today’s Re-Engineering

- In today’s economy, some of the major motivations for streamlining and re-engineering business processes are **customer sophistication, deregulation, and increasing competition** on a global level.
- What it needs?
  - **re-thinking existing** business practices
  - **using technology to create new** forms of work

BUSINESS PROCESS RE-ENGINEERING

Accounts Payable System, **Ford** Co.

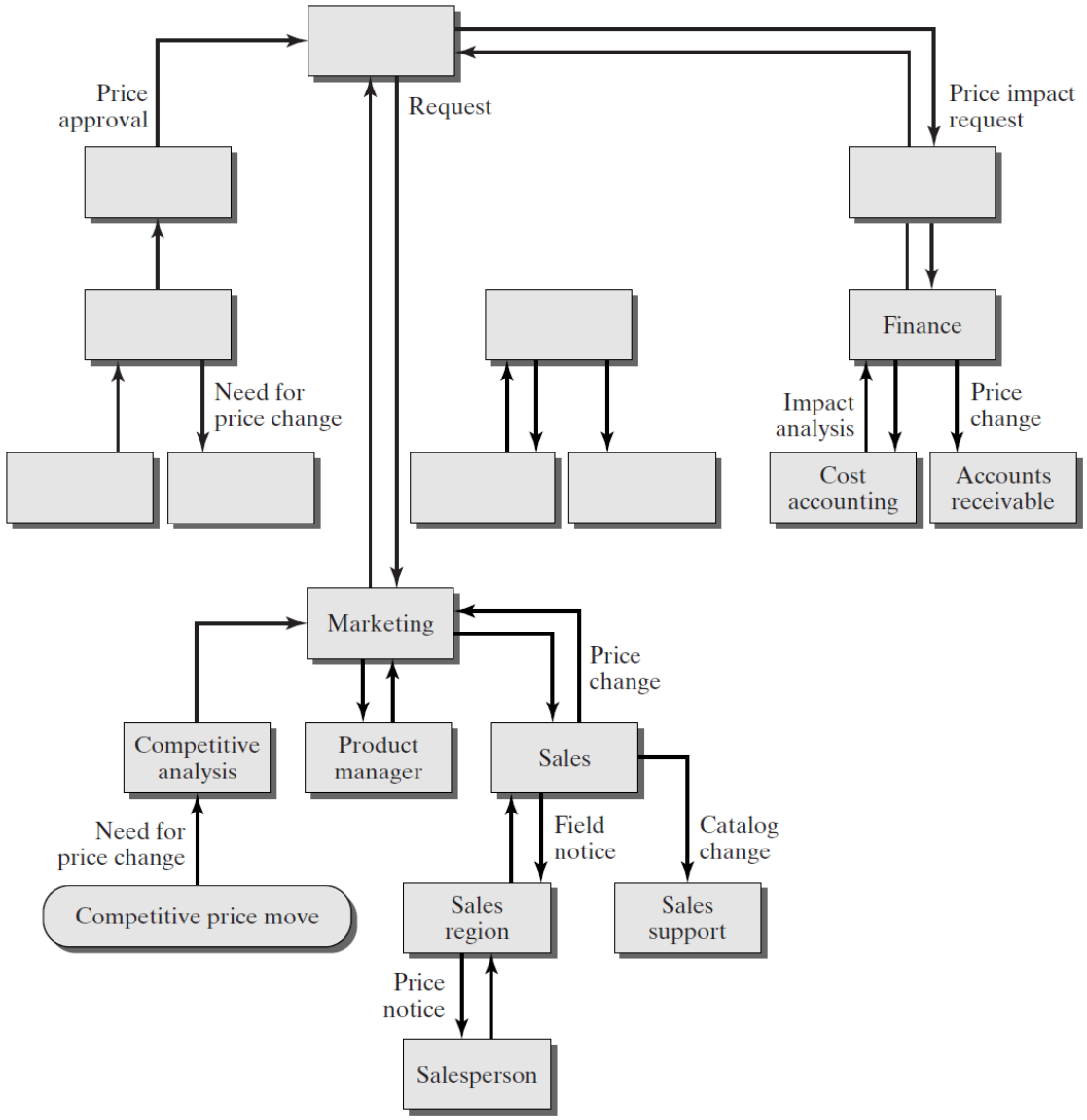
- **Before** re-engineering:
  - **Independent databases** were maintained by Purchasing, Receiving, and Accounts Payable
  - **When** items were **purchased**, **a record** was **set** up in the Purchasing database
  - **When** shipments from the Supplier were **received**, the **Receiving Department would update its database** with the amount received.

BUSINESS PROCESS RE-ENGINEERING

Accounts Payable System, **Ford** Co.

- **Before re-engineering:**
  - **If the shipments were partial shipments**, then the **record in the Purchasing** database **did not match up with the record in the Receiving database**
  - These inconsistencies **created problems** in Accounts Payable, which had its own database and was responsible for providing the vendor payments

- **Before Re-Engineering**



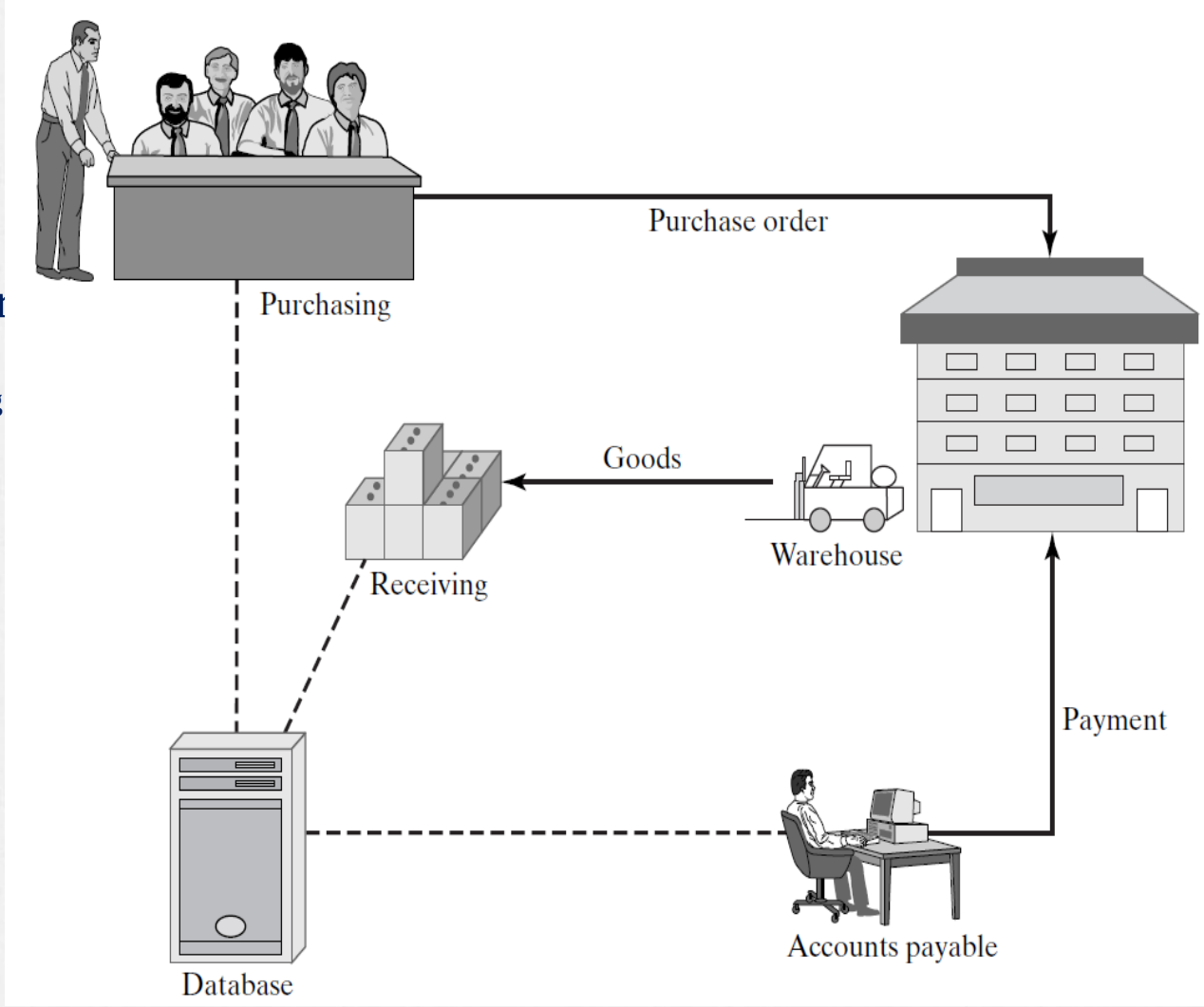
BUSINESS PROCESS RE-ENGINEERING

Accounts Payable System, Ford Co.

- **After re-engineering:**
  - An **integrated database supporting Purchasing, Receiving, and Accounts Payable included "common data"**

- **After**

Re-Engineering



Elements of Business Re-engineering

Elements	*Activities*
Business processes	Do not automate existing business processes; break away from outdated rules
Integration	Integrate business processes
Technology	Use technology to re-design business processes
Cross-functional coordination	Re-design business processes from a cross-functional view
Timing	Improve processes continuously
Objective	Implement market-driven strategies designed to provide a competitive edge

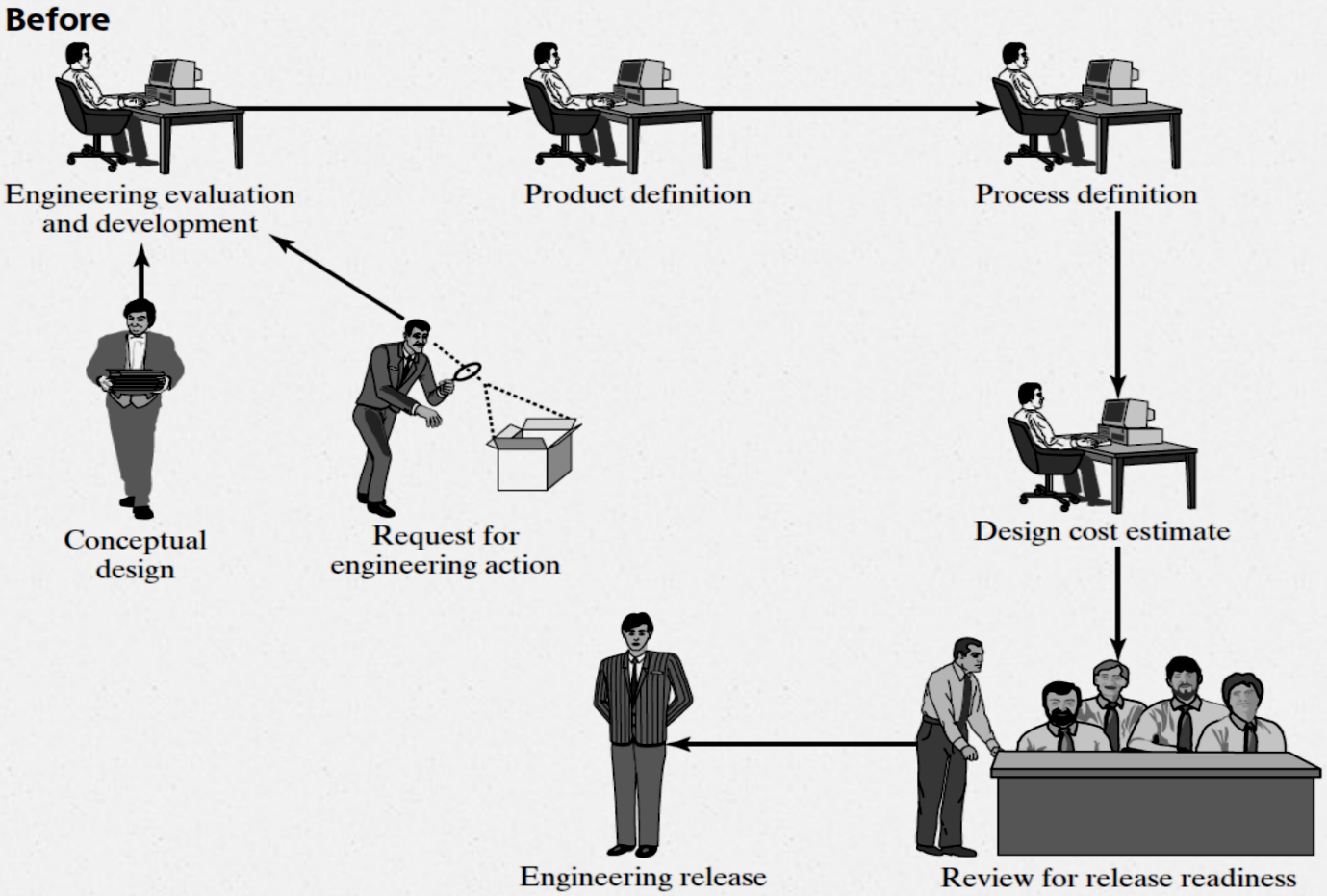
Re-engineering Case studies

	Before Re-engineering	*After Re-engineering*	*Business Impact*
Ford Motor Company Accounts Payable	Independent databases maintained by purchasing, receiving, and accounts payable	An integrated database supporting multiple functions (e.g., purchasing, receiving, accounts payable)	Fewer inconsistencies; reduction in clerical overhead; better responsiveness to customers
IBM Credit Authorization	Multi-step credit authorization process involving multiple departments and multiple individuals (e.g., a pricer, checker)	A "deal structurer" makes the credit authorization decision, using multiple databases	Timely decision making; more effective customer service; elimination of redundant tasks and bottlenecks
Xerox Product Development	Sequential product development process, which meant that workers had to wait until prior steps were completed	Concurrent engineering, using a common integrated database and a computer-assisted design system	Elimination of bottle-necks and delays; faster product development; responsiveness to market needs

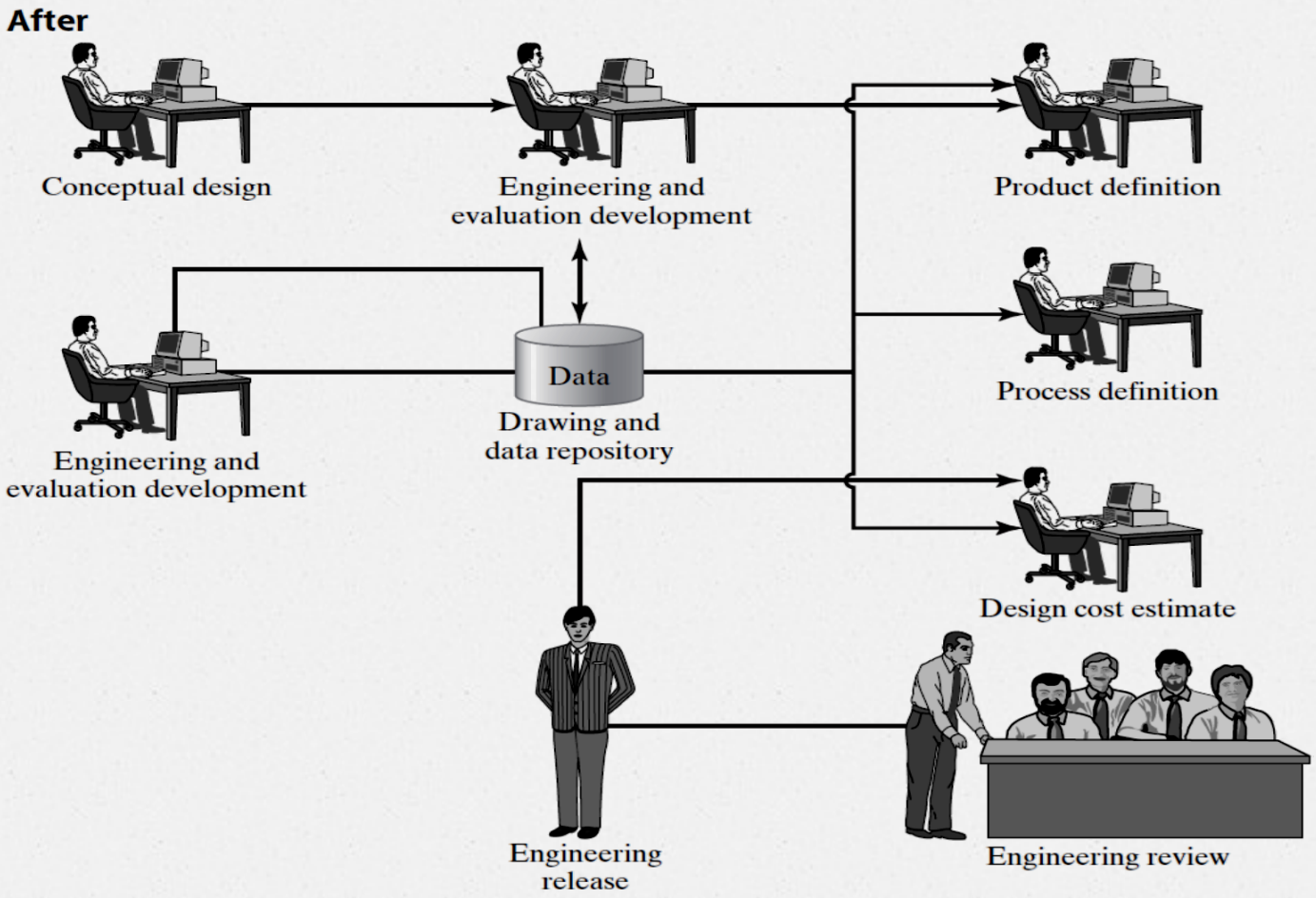
Re-engineering Case studies

	Before Re-engineering	*After Re-engineering*	*Business Impact*
Wal-Mart Inventory Management	Wal-Mart ordered its own stock of merchandise from vendors; dealt with excess inventory or insufficient inventory	Wal-Mart let its vendor, Proctor and Gamble, replenish its inventory according to market trends	Better inventory management; more effective inventory replenishment
Hewlett-Packard's Purchasing Process	Decentralized purchasing led to a loss of corporate-wide discounts	Central negotiation of corporate volume discounts and use of a shared database of negotiated prices	Cost savings through the use of centrally negotiated discounts

Re-engineering in Xerox Co.



Re-engineering in Xerox Co.



Principles of Re-engineering Applied

- **Decentralize decision** making to the decision maker to be **responsive to the customers'** needs
- This has the effect of **flattening organizational** layers because there is less need for mid-level management
- Another common theme is that the **use of information technology** (e.g., **shared databases, networking**) facilitates the **newly re-engineered** processes

PROCESS MODELING

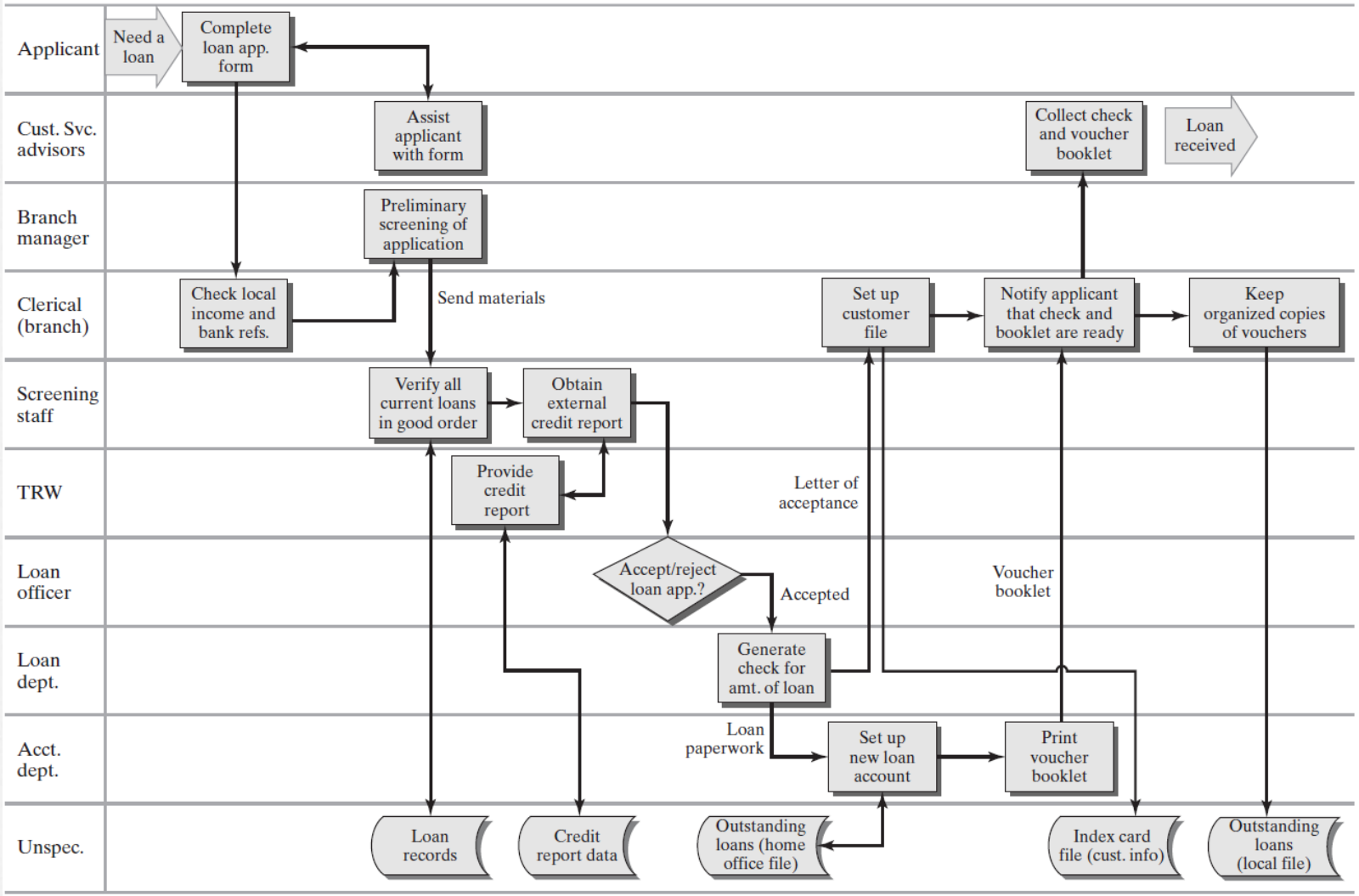
- **The business process:** The process **depicts the business activities** which are accomplished (e.g., check credit, mail invoice).
- **The data store:** The store depicts **data** that are **needed by the business processes**.
- **The data flow:** The flow depicts **data being transferred from a process to another process** or between a process and a data store.
- **The organizational unit:** The organizational unit depicts the units of the organization in which **these processes take place** (e.g., Accounts Receivable, Sales).
- **The event, including triggers and outcomes:** A trigger is an event which "triggers" a process, and an **outcome is an event which results from a process.**

Best practice of Re-engineering **within ERP systems**

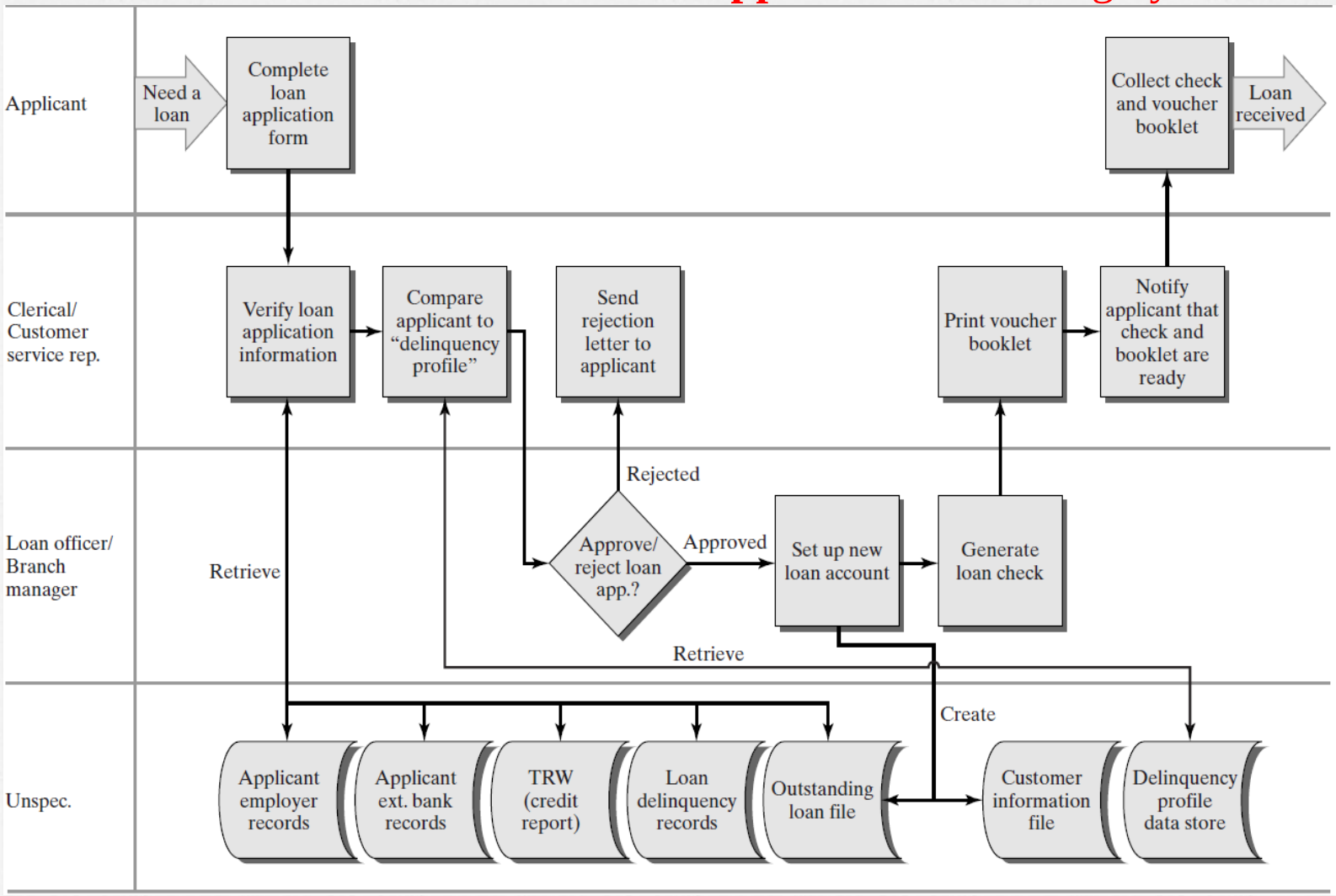
- re-engineered **process models**
- depict improved **process changes**
- **Integrated data**, which are shared by multiple processes
- **structural changes**, which streamline business functions and maximize productivity

- Ex: Reliable Finance Company Loan procedure, pp. 27

Process Model of the **Current Loan Application Screening** System



Process Model of the **New Loan Application** Screening System



Re-engineering that Works

Company	*Re-designed Processes*	*Before*	*After*
BAI	Branch customer service	64 activities, 9 forms, 14 accounts	25 activities, 2 forms, 2 accounts
AT&T	PBX sales	12 project handoffs	3 handoffs
Siemens Nixdorf	Field service	30 support centers; 1,800 headcount	5 support centers; 800 headcount

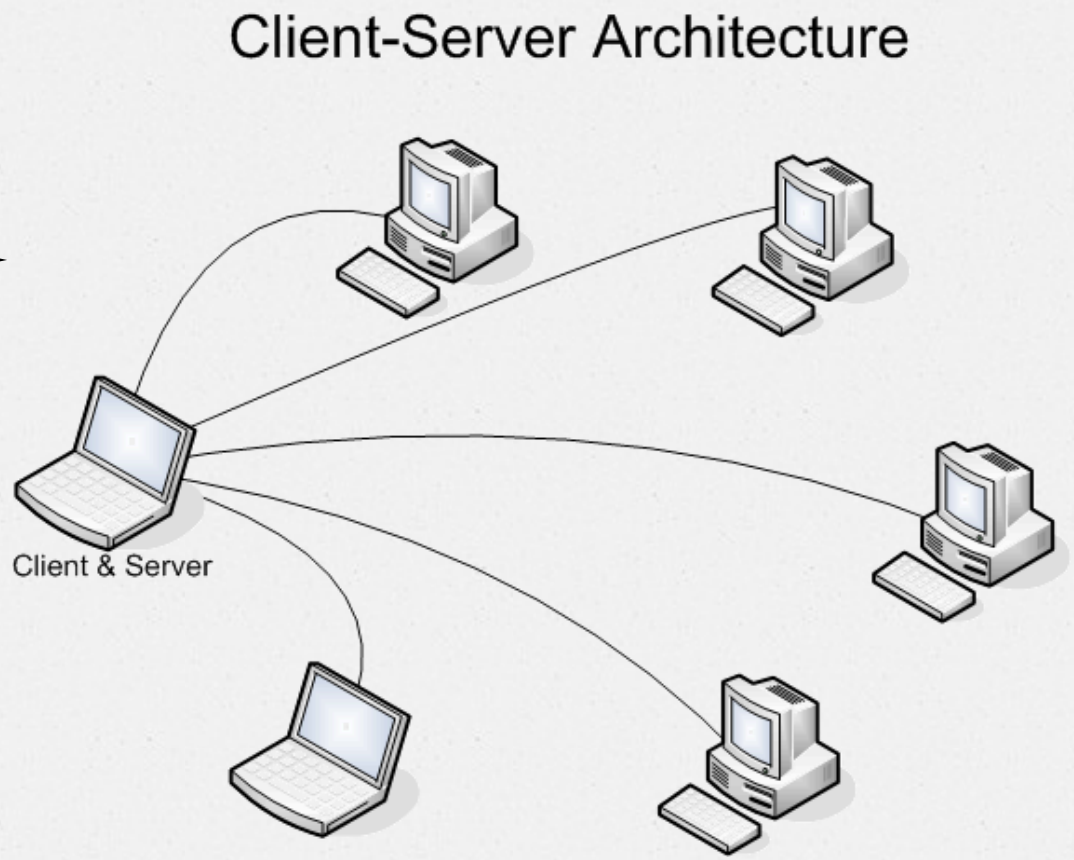
- **ERP relies upon the use of information technology, including client-server computing and shared databases.** Many of the changes in **business process design**, work reengineering, and **sharing of information** resources are facilitated through the implementation of information technology.

EMERGENCE OF CLIENT-SERVER COMPUTING

- Application use is divided between a **“client,”** which is usually a personal computer, and a **“server,” or multiple servers**.
  - **Relational database**
  - **Server or servers**
  - **Workstations**
  - **A network**
  - **Client software for the workstations**

Client Server Technology

Web Base



INTEGRATED DATABASES

- Emergence of **integrated databases is a foundation for ERP systems**
- Prior to integrated databases, **each functional unit within an organization created, maintained, and updated its own databases** (e.g., customer databases, supplier databases, employee databases)
- After the emergence of **integrated databases, organizational units shared common data maintained in central databases**

Advantages of **integrated databases**

- **Data sharing**
- **Reduced data redundancy**
- **Improved data consistency**
- **Data independence**
- **Improved data integrity**

Data Sharing

- Means a **common data resource supports functional units across the company**. This **reduces redundancy** and contributes to data consistency. For **example**, a customer number is consistent across modules, **including sales and marketing, financial accounting, and customer service.**
- If for some **reason a vendor number changes**, this change is **made anywhere** the vendor number is used across application modules.

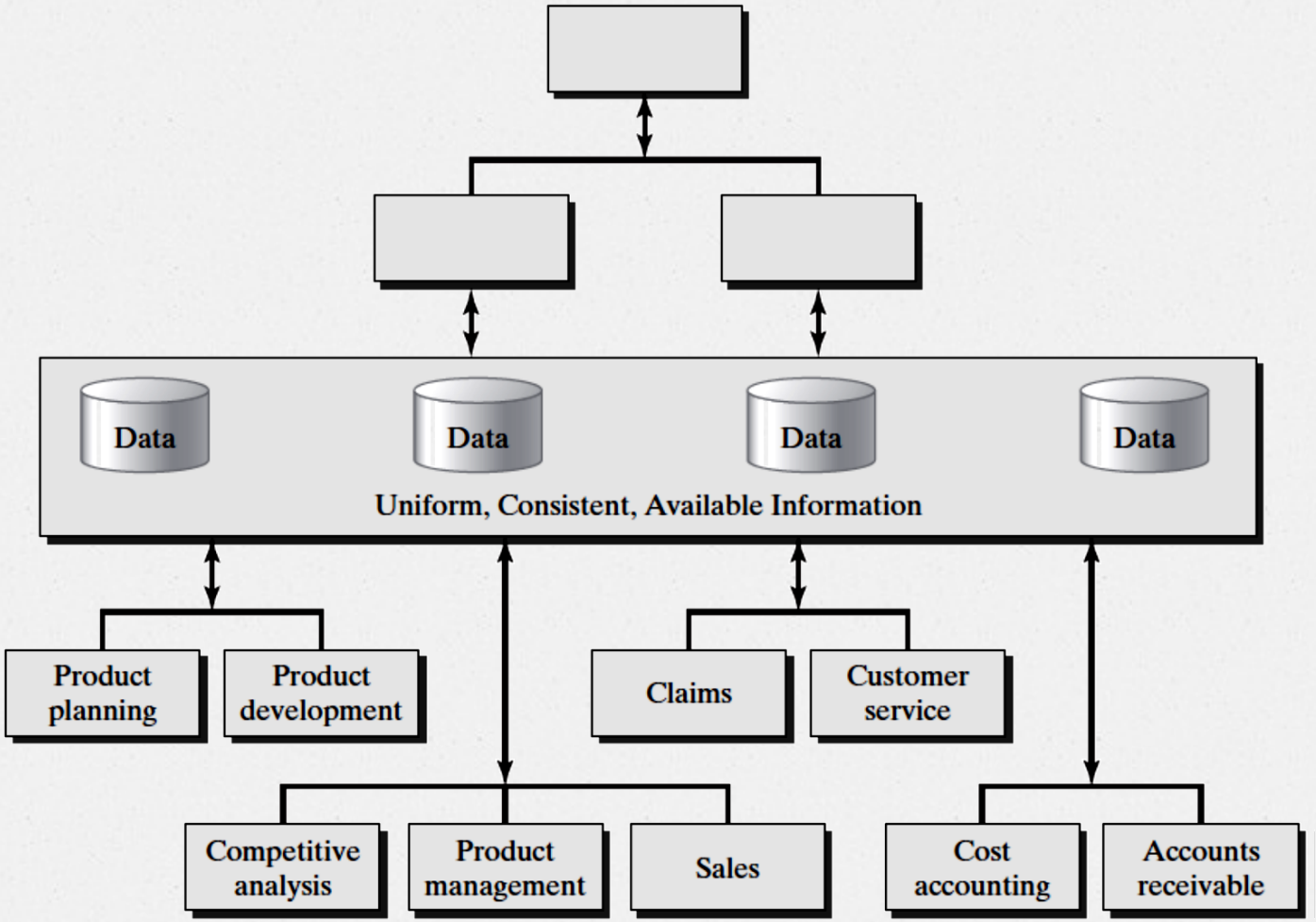
DBMS

- Database management system improves **data integrity** and provides **central data administration**. The database administrator can **control access to data**, **updates to the database, and security.**
- **Professional data administration procedures**, including **backup and recovery**, are assured. The security and integrity of the database are important for the management of information and the effective **use of information for decision making.**

ERP & DBMS

- ERP systems rely upon the use of an integrated database, in which data elements and their **relationships are defined to support multiple applications**. Integrated databases provide **concurrency control**, which enables multiple users to make updates to the database.
- In addition, the database administrator provides controls to assure that only **authorized personnel can add, delete, and update data in the database**. **Security procedures include login identification, account codes, and passwords**.

ERP & DBMS


Data
Data
Data
Data
Uniform, Consistent, Available Information
Product planning
Product development
Claims
Customer service
Competitive analysis
Product management
Sales
Cost accounting
Accounts receivable

THE EMERGENCE OF PROCESS ENTERPRISES

- As organizations **implement ERP**, they are **moving away from** the "**silos,**" or the specific units focused on products, regions, or functions.
  - **Team Work:** To emerge as a process enterprise, organizations need **to stress teamwork** over turf and **hierarchy** and to focus on **achieving "process goals."**
  - **Process Owners:** One of the ways of making the transition to process management is to **give authority over work and budgets to "process owners."**

SUMMARY

- **ERP provides an opportunity to re-design business processes**
- With **re-engineering**, business processes are **simplified** and business **rules are improved**
- In addition, redesigning processes provides the foundation for **new opportunities**, such as **eBusiness**
- Re-engineering with ERP enables organizations to be more **responsive to changing markets** and to shifts in **competitors' strategies**.

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