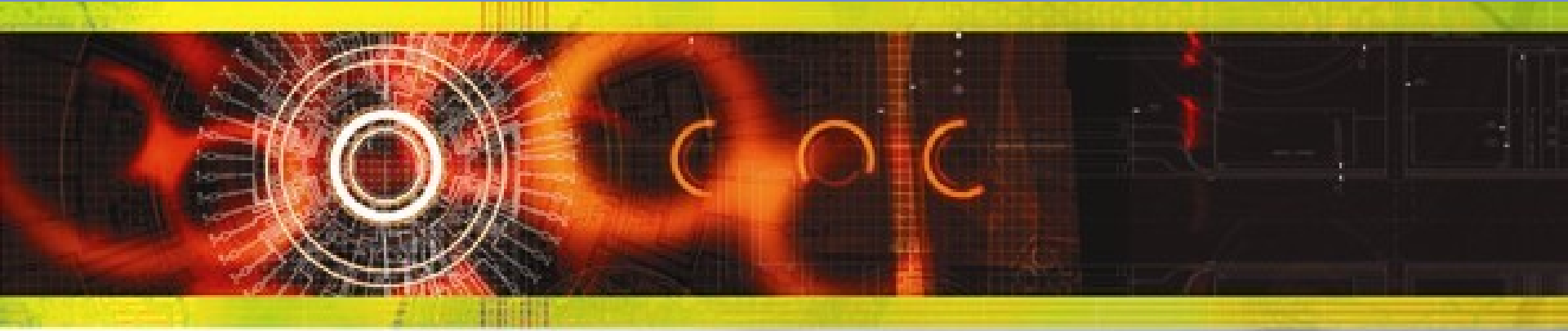# CHAPTER 7- ENTERPRISE RESOURCE PLANNING SYSTEMS

Principles of Supply Chain Management:

A Balanced Approach

Learning Objectives

You should be able to:

- Describe an ERP system
- Understand the limitations of legacy MRP systems
- Understand why firms are migrating from legacy MRP systems to integrated ERP systems
- Understand the advantages & disadvantages of ERP systems
- Describe the various modules of an ERP system,
- Compare best-of-breed vs. single integrator ERP implementation
- Understand why many ERP implementations fail
- Understand how an integrated ERP system works

Chapter Seven Outline

Development of Legacy MRP Systems

– Materials Requirement Planning

– Manufacturing Resource Planning

Development of Enterprise Resource Planning (ERP) Systems

Rapid Growth of ERP Systems

Implementing ERP Systems

Advantages & Disadvantages of ERP

ERP Software Applications

ERP Software Providers

Introduction

Materials Requirement Planning (MRP) **systems**- first choice in the U.S. for planning & managing purchasing, production, & inventories.

By end of the 20th century, U.S. business was changing.
- Firms were building multiplant international sites,
- Executives spent more time dealing with international subcontractors, currencies, & languages.
- Existing MRP systems could not handle added tasks.

Enterprise resource planning (ERP) systems were made to replace legacy MRP systems & coordinate information requirements for purchasing, planning, scheduling & distribution in a complex global environment.

Development of Legacy MRP Systems

Legacy MRP systems which were implemented in the 1960s, 1970s & 1980s, describe an older information system at a production scheduling operational level within an organization.

- MRP systems lasted beyond their intended life span.
- Communication between legacy systems is limited.
- Visibility across functional areas is restricted.
- Lack analytical capabilities.

Development of Legacy MRP Systems-Cont.

Materials Requirement Planning (MRP) Process

- Uses information from bills of material, master production schedules, & inventories to compute planned order releases of dependent demand items.
- Links the internal operations of an organization, such as purchasing, production, inventory control & material planning.
- Does not, however, provide production or capabilities analysis, nor does it probe the impact of changes in production levels on financial results.
- *Closed-Loop MRP-* An attempt to further develop MRP into a more formal planning & control system, & was a natural extension of the MRP system.

Development of Legacy MRP Systems- Cont.

Manufacturing Resource Planning MRP II-

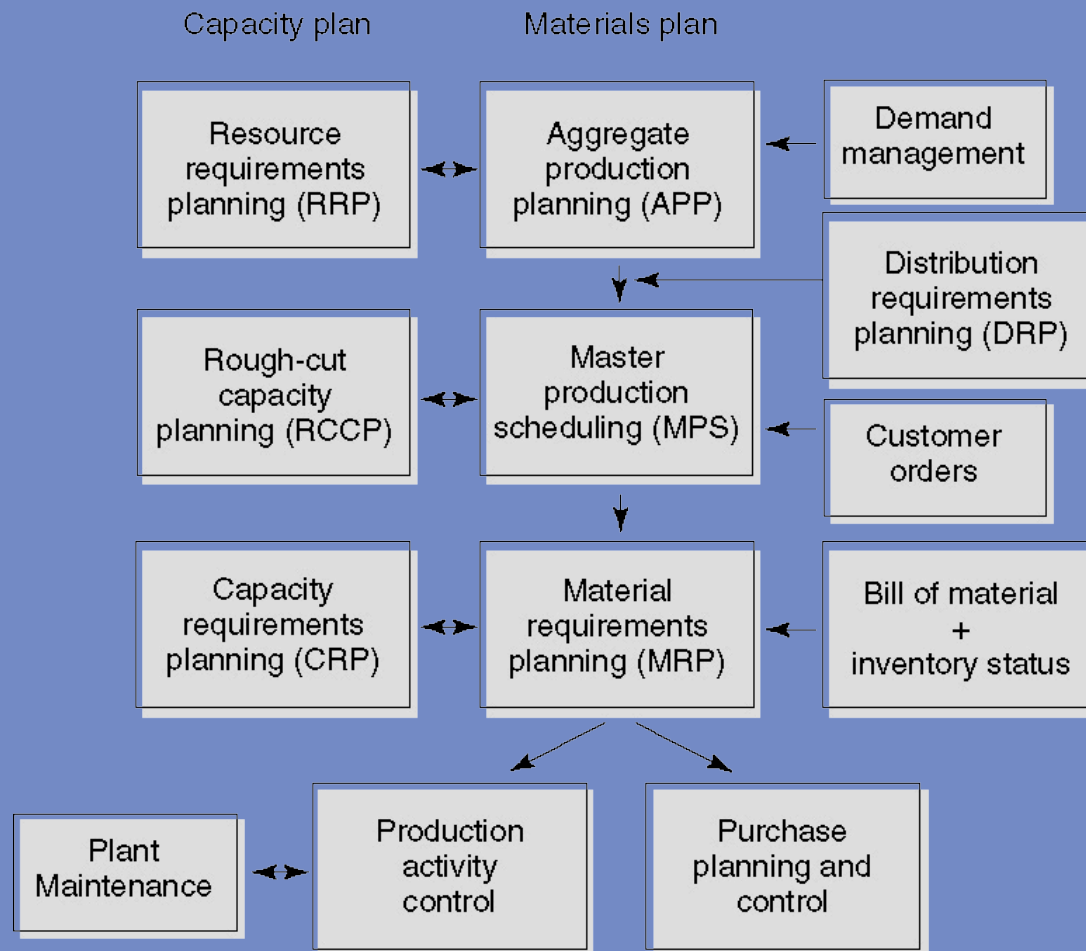Was the next development of the closed-loop MRP system in which:

- – Business & sales plans were incorporated.
- – A financial function was added to link financial management to operations, marketing, & other functional areas.

MRP II now includes other functions of the organization.

Problems with MRP II:

- – Primarily focuses on one unit's internal operations.
- – Lacks capability to link the operations of firm's foreign branches.
- – Lacks capability to deal directly w/supply chain members.

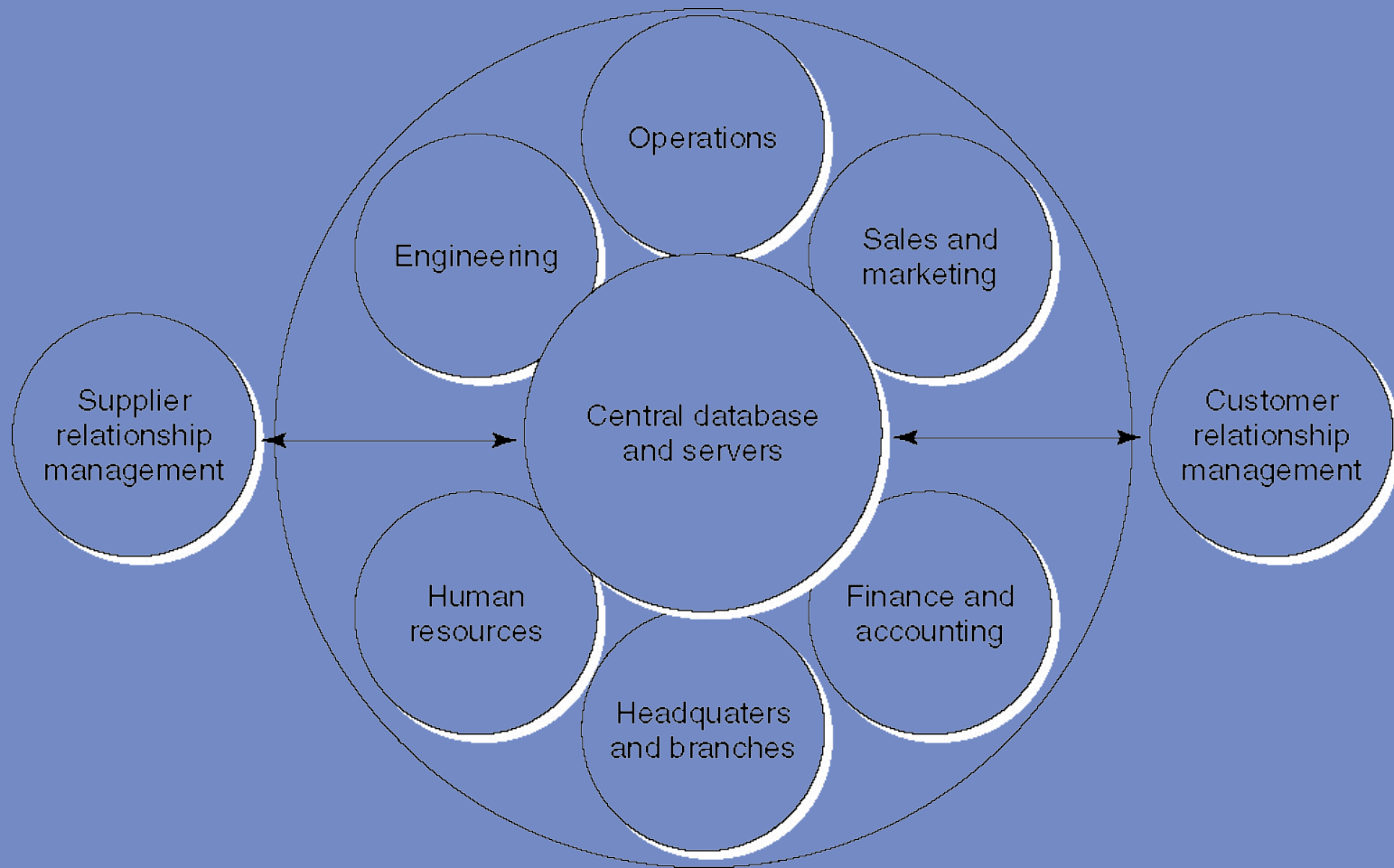# Development of Legacy MRP Systems-Cont.

Development of Enterprise Resource Planning

What is ERP and how did it come about?

- ERP system is an umbrella system tying a variety of specialized systems, (i.e., production & inventory, purchasing, logistics, HR, finance, accounting, customer relationship, & supplier relationship management).

- ERP utilizes a centralized & shared database system to tie the entire organization together in which information is entered once at the source & made available to all users.

- The emergence & growth of supply chain management, e-commerce, & global operations have created the need to exchange information directly with suppliers, customers, & foreign branches of organizations.

Development of Enterprise Resource Planning- Cont.

The Rapid Growth of ERP

The use of ERP has gradually spread from manufacturing to the service sector & has become commonly used in many university classrooms.

Contributing factors of rapid ERP growth:
- Firms replaced legacy MRP systems with efficient ERP systems to reduce costs & deal w/Y2K problem.
- Information systems that were previously off limits are now accessible to smaller organizations.

Implementing ERP Systems

Research analysts & industrial practitioners are still debating the usefulness of ERP, as well as the advantages & disadvantages of using **best-of-breed solution** and **single integrator solution**.

Best-of-breed- use best application for each supply chain function

- – *Problem:* multiple databases may have to be used to link the multiple applications from different vendors.

Single integrator- applications from one vendor.

- – *Problem:* A user's processes must conform to the approaches used in the software logic. Conforming a company's process to a software program is a radical departure from conventional practice.

Implementing ERP Systems- Cont.

Some observations on ERP Implementation

Some firms only implement modules deemed absolutely critical- Additional modules are added in a second phase.

Many implementations have failed due to:
- Lack of top management commitment
- Inaccurate & unrealistic inputs
- Lack of adequate resources
- Lack of proper training
- Lack of communication
- Incompatible system environment

Advantages & Disadvantages of ERP

Advantages

- Uses single database & common software infrastructure
- Communicates with supply chain members
- Helps reduce supply chain inventories. Supply chain visibility leads to reductions of the *bullwhip effect* (buildup of supply chain safety stock inventories)
- Standardizes processes & eliminates redundant resources while increasing productivity
- Tracks employees' time & performance
- Integrates financial, production, supply,
- & customer information.

Advantages & Disadvantages of ERP-Cont.

Disadvantages

- Substantial capital investment is needed to implement the system. The average total cost of ERP ownership was $15 million.
- Software is designed around a specific business model based on specific business processes. The adopting firm must change its business model & associated processes to fit the built-in business model designed into the ERP system.

ERP Software Applications

ERP consists of many modules that are linked together to access & share the same database.

Most ERP software providers design their products to be compatible with their competitors' products. The most common ERP modules are:

- *Accounting & finance*
- *Customer relationship management*
- *Human resource management*
- *Manufacturing*
- *Supplier relationship management*
- *Supply chain management*

ERP Software Providers

SAP

- **SAP AG**, a German firm, is the world's leading ERP software provider & the world's third-largest software provider.
- Flagship product is known as R/3
- Used in more than 17,500 firms in 120 countries and employs about 28,000 people in more than fifty countries.
- In 1973 SAP launched R/1 software, R/2 in 1979, and R/3 in 1992. R/3 has been dominant ERP product for almost a decade.
- In early 2003, SAP introduced my SAP ERP which includes support for corporate services, such as real estate & travel management.

ERP Software Providers- Cont.

ORACLE

- **Oracle** is the world's leading supplier of information management software, world's 2nd largest software company, & serves over 13,000 customers.

- Oracle's strategy focuses on five principles: globalization, simplification, standardization, automation, innovation.

- Five comprehensive product lines: Oracle9i Database, Oracle9i e-Business Suite, Oracle9i Application Server, Oracle9i Collaboration Suite, & Oracle9i Developer Suite.

ERP Software Providers- Cont.

PeopleSoft.

- **People Soft-**. Primary focus of the company has been to build client/server business applications. First product made in 1988 was an HR application.

- Leader in the human resources application market serves customer around the globe.

- **J.D. Edwards-** world's leading developer of agile software. Has over 6,500 customer worldwide. Designs all of its software solutions to be open, scalable, & flexible.

- *In August 2003, J.D. Edwards was acquired by PeopleSoft.*

ERP Software Providers- Cont.

- **Baan (of SSA)-** possesses a workforce of approximately 2,800 employees. It is part of the Production Management division of Invensys PLC, Its ERP product consists of a framework of open, flexible, & easy-to-configure components that allow individual applications to be configured to different industry processes.

- Baan provides application solutions to more than 15,000 customer sites worldwide.

- iBaan solutions, includes Enterprise, Customer Relationship Management, Product Life Cycle Management, Supply chain Management, Business Intelligence, OpenWorldX, & Dynamic Enterprise Modeling.