

ACS-1803

Introduction to Information Systems

Instructor: Kerry Augustine

**Functional Area Systems –
Human Resource, Marketing, Operations**

Lecture Outline 5

Human Resource Information System (HRIS)

Functional Area Systems

System Examples: Functional Area Info Systems

Functional Area	Information System	Examples of Typical Systems
Accounting and Finance	Systems used for managing, controlling, and auditing the financial resources of the organization	<ul style="list-style-type: none"> ■ Inventory management ■ Accounts payable ■ Expense accounts ■ Cash management ■ Payroll processing
Human Resources	Systems used for managing, controlling, and auditing the human resources of the organization	<ul style="list-style-type: none"> ■ Recruiting and hiring ■ Education and training ■ Benefits management ■ Employee termination ■ Workforce planning
Marketing	Systems used for managing new product development, distribution, pricing, promotional effectiveness, and sales forecasting of the products and services offered by the organization	<ul style="list-style-type: none"> ■ Market research and analysis ■ New product development ■ Promotion and advertising ■ Pricing and sales analysis ■ Product location analysis
Production and Operations	Systems used for managing, controlling, and auditing the production and operations resources of the organization	<ul style="list-style-type: none"> ■ Inventory management ■ Cost and quality tracking ■ Materials and resource planning ■ Customer service tracking ■ Customer problem tracking ■ Job costing ■ Resource utilization

Functional Area Information Systems

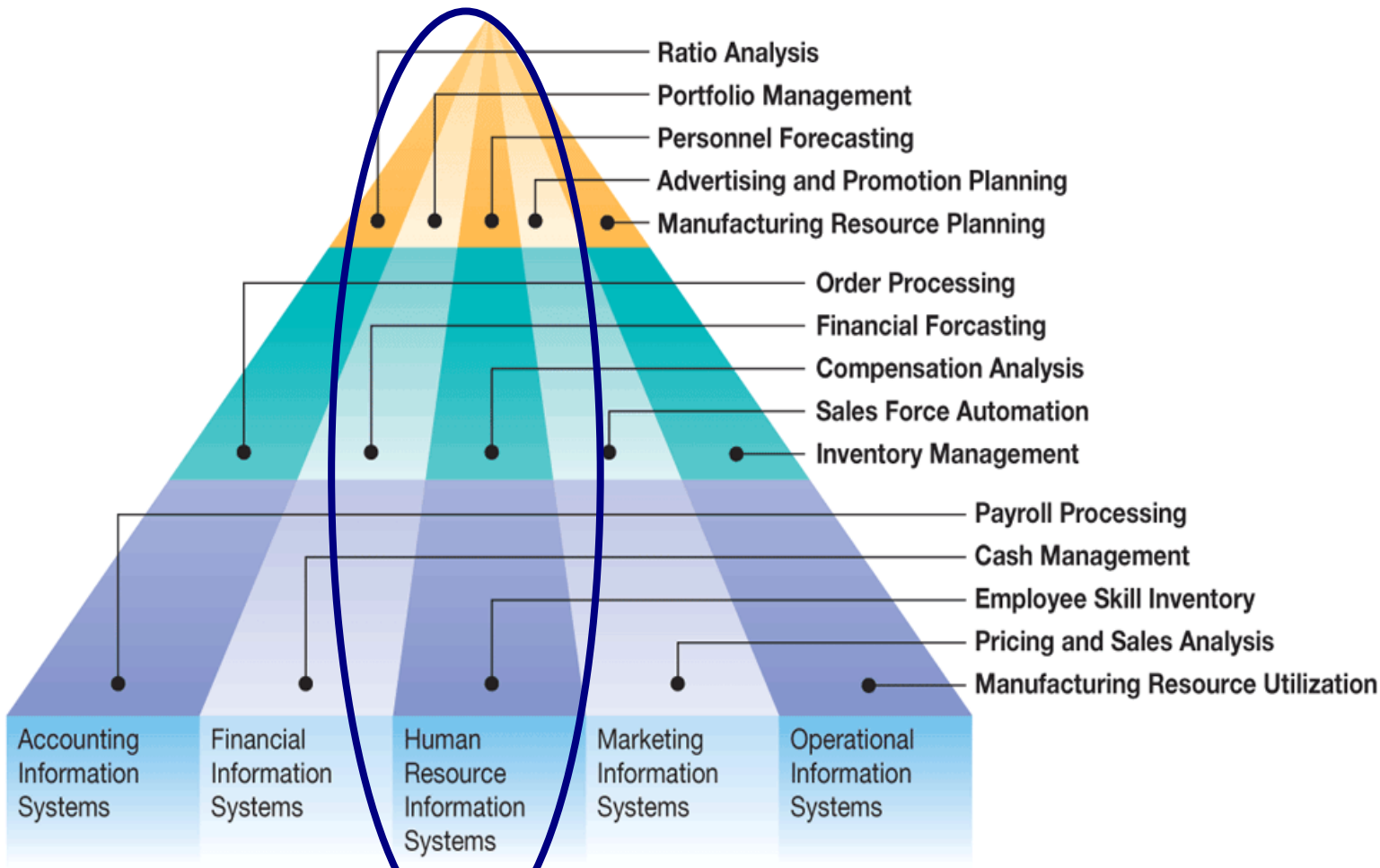


Figure 6.34 Functional area information systems.

Copyright © 2008 Pearson Education Canada

Human Resource Management Systems (HRMS)

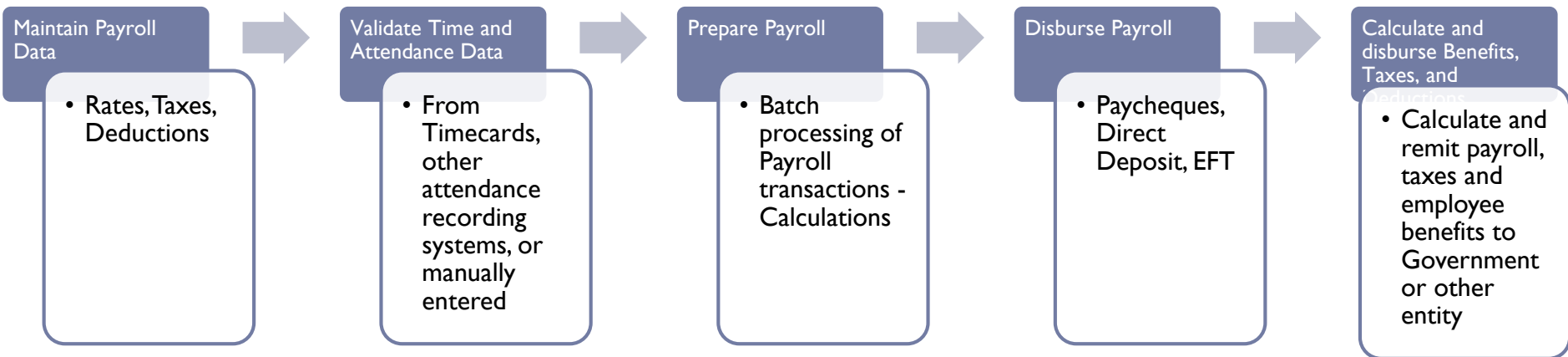
- ▶ Combination of systems and processes that connect human resource management and information technology through human resource management software/ hardware.
 - ▶ Managing payroll
 - ▶ Recruitment and onboarding
 - ▶ Gathering, storing, and accessing employee information
 - ▶ Keeping attendance records and tracking absenteeism
 - ▶ Performance evaluation
 - ▶ Benefits administration
 - ▶ Learning management
 - ▶ Employee self-service
 - ▶ Employee scheduling
 - ▶ Analytics and informed decision making

Operational Systems in HR

- ▶ Historically, **payroll** was the first
 - ▶ Now part of the AIS
 - ▶ Related to expenditure cycle
- ▶ **Employee Information Systems**
 - ▶ Maintain information on every employee for various reporting purposes
 - ▶ Employee profile: basic personal data, education, previous experience, employment history in org., preferred location for work
 - ▶ May contain skills inventory component
 - ▶ Employee's work experience, work preferences, test scores, interests, special skills
 - ▶ How could this be used

HR Transaction Processing

▶ Payroll:





Operational Systems in HR

- ▶ **Attendance Recording Systems**

- ▶ May use negative reporting (only when absent)
- ▶ Include overtime credits etc.

- ▶ **Employee Scheduling Systems**

- ▶ Can get complex with shift work (e.g, nurses)
- ▶ Must adhere to union regulations

Operational Systems in HR

▶ **Performance Management Systems**

- ▶ Collect and store textual data e.g., written comments of supervisor
- ▶ Appraisal data can be filled out on special screens
- ▶ Need careful documentation of employee performance and how performance was measured (e.g., for grievance hearings)
- ▶ May have tactical components
 - ▶ *Which supervisors give high number of poor evals.*
 - ▶ *Which labour sources provide unacceptable workers*

Tactical Systems in HR

▶ **Position Control Systems**

- ▶ Keep data on each job position in the org.
 - ▶ E.g. task content
- ▶ Can be useful for job redesign
 - ▶ Which job positions require data entry?
 - ▶ Which require statistical analysis

▶ **Recruiting Systems**

- ▶ Provide list of planned retirements
- ▶ List skills, preferences of current employees
- ▶ Analyze turnover rates among various classes of employees

Tactical Systems in HR

▶ **Compensation and Benefit Systems**

- ▶ “cafeteria style benefits” for employees to choose from
- ▶ Considerable data storage here
- ▶ Tactical:
 - ▶ how much to increase compensation plans to attract high quality employees
 - ▶ What kind of benefits are different categories of employees choosing?
- ▶ May be available on organizational intranet

Strategic Systems in HR

▶ **Long-term Workforce Planning**

- ▶ What are the HR needs to meet organization's strategic plan for next 5-10 years?
- ▶ Identify Current HR Requirements
- ▶ Identify Critical Jobs
- ▶ Identify Current and Future Workforce Gaps
- ▶ Identify drivers of workforce composition
- ▶ *Forecasting* supply and demand of required workforce
- ▶ Formulate Plans

▶ **Labour Negotiation Support Systems**

- ▶ Must be timely and have ad hoc capacity
- ▶ Assist in bargaining sessions with unions

Human Resource Management System

The screenshot displays a web-based Human Resource Management System interface. The main window is titled "Baraza Project" and contains a sub-window titled "Employees". The "Employees" window has several tabs: "Employees", "Education Class", "Kin Types", and "Skill Category". The "Employees" tab is active, showing a form for an employee record. The form fields are as follows:

Department Role	Development, System Developer		
Employee ID	3	Surname	Kipirash
First Name	Nancy	Middle Name	Kemol
Date Of Birth	Jul 12, 1983	Gender	Female
Nationality	Kenya	Marital Status	Single
Appointment Date	Sep 02, 2008	Exit Date	
Contract	<input checked="" type="checkbox"/>	Contract Period	0
Employment Terms	Permanent		
Basic Salary	38,000	Identity Card	2232323
Bank Account	454345	Active	<input checked="" type="checkbox"/>
Bank Branch	Standard Chartered, Koinange		
Language	ENGLISH		

Below the form, there are three tabs: "Objective", "Interests", and "Details". The "Details" tab is active, showing a large empty text area. At the bottom of the form, there are four buttons: "Save", "Cancel", "Delete", and "Audit".

On the left side of the interface, there is a navigation menu under the heading "Human Resources". The menu items are: News, My Details, Leave Application, My Application, My CV, My CV, Recruitment, Internships, Pay Slip, Client Forms, Administration, News Admin, Organisation, Banks, Departments, Applicant, Casuals, Leave, Leave Approval, Intake, Internships, Job Review, Arbitration, Reports, and Forms.

At the bottom of the screen, there is a data grid with the following columns: Employee ID, First Name, Surname, Gender, Basic Salary, Department, Role, and Yes/No. The data row is: 3, Nancy, Kipirash, Female, 38,000, Development, System Developer, Yes.

Marketing and Sales System

Functional Area Systems

System Examples: Functional Area Info Systems

Functional Area	Information System	Examples of Typical Systems
Accounting and Finance	Systems used for managing, controlling, and auditing the financial resources of the organization	<ul style="list-style-type: none"> ■ Inventory management ■ Accounts payable ■ Expense accounts ■ Cash management ■ Payroll processing
Human Resources	Systems used for managing, controlling, and auditing the human resources of the organization	<ul style="list-style-type: none"> ■ Recruiting and hiring ■ Education and training ■ Benefits management ■ Employee termination ■ Workforce planning
Marketing	Systems used for managing new product development, distribution, pricing, promotional effectiveness, and sales forecasting of the products and services offered by the organization	<ul style="list-style-type: none"> ■ Market research and analysis ■ New product development ■ Promotion and advertising ■ Pricing and sales analysis ■ Product location analysis
Production and Operations	Systems used for managing, controlling, and auditing the production and operations resources of the organization	<ul style="list-style-type: none"> ■ Inventory management ■ Cost and quality tracking ■ Materials and resource planning ■ Customer service tracking ■ Customer problem tracking ■ Job costing ■ Resource utilization

Functional Area Information Systems

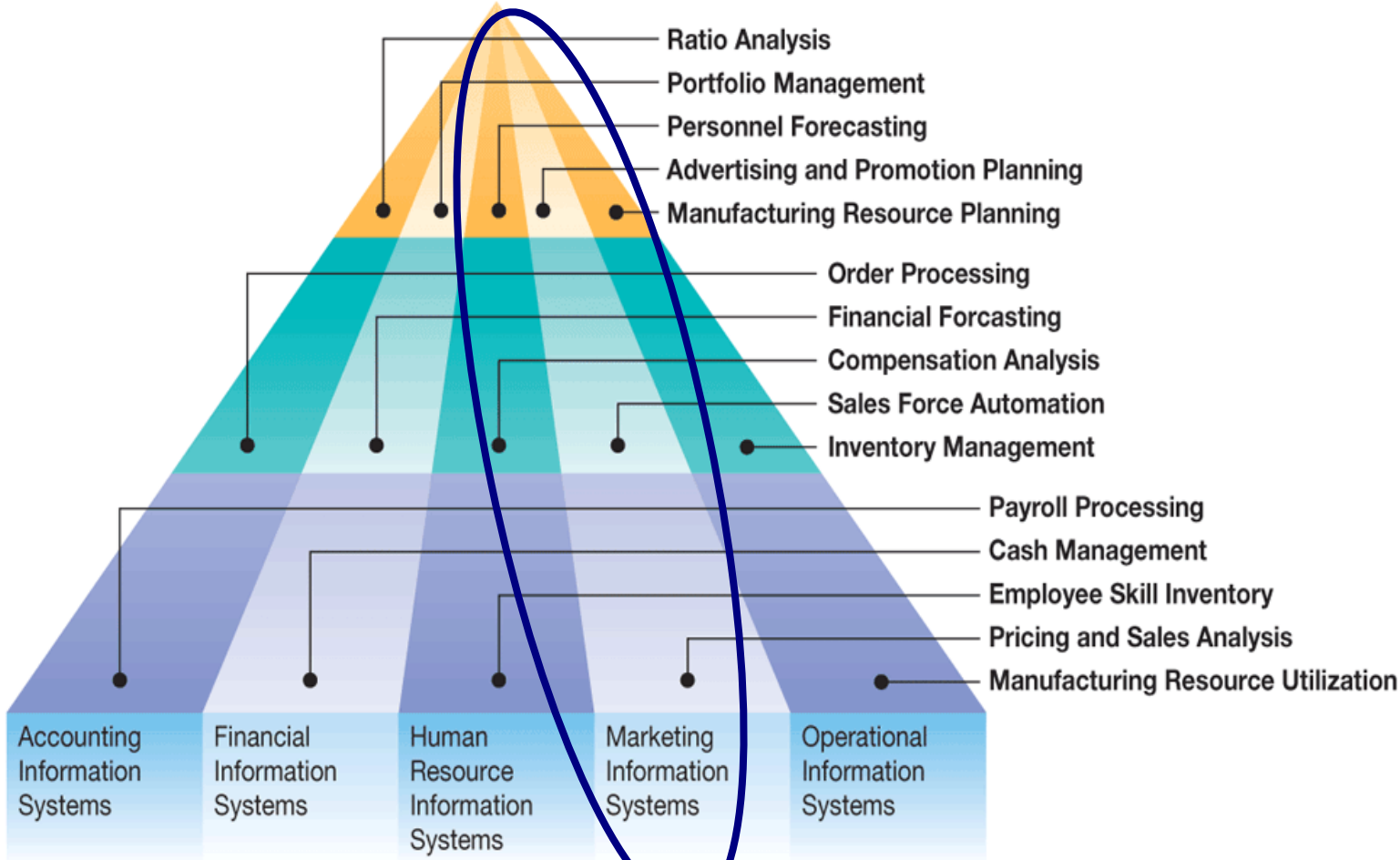


Figure 6.34 Functional area information systems.

The Marketing Function

- ▶ Process of planning and executing the **conception, pricing, promotion, sales and distribution** of ideas, goods and / or services to create exchanges that satisfy individual (customer) and organizational (business) goals.
- ▶ An Marketing Information System may be defined as a set of procedures and methods for the regular, planned collection, analysis, and presentation of information for use in making marketing decisions (Cox and Good, 1937).
- ▶ Ideal marketing systems must be coordinated with other organizational systems:
 - ▶ Order Entry
 - ▶ Manufacturing
 - ▶ Inventory
 - ▶ Credit management

Operational Systems in Marketing

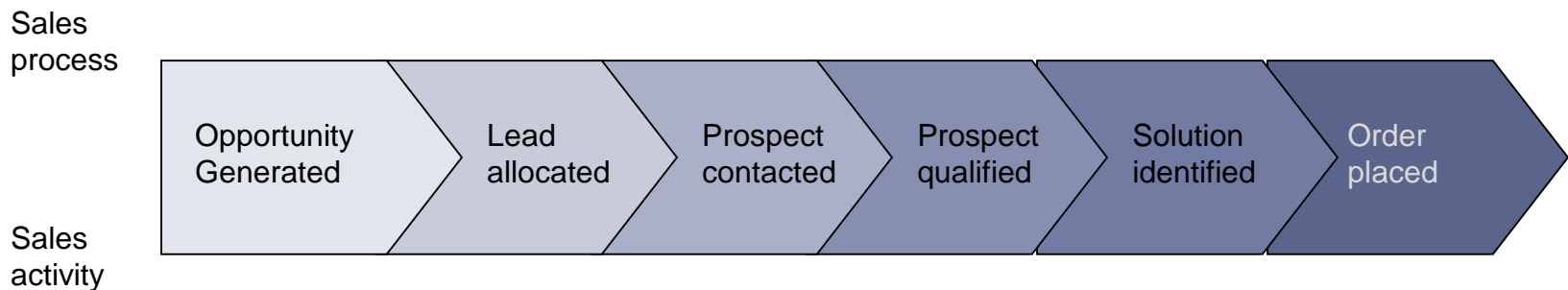
▶ **Customer Contact Management Systems**

- ▶ Provide information on past contacts with specific customers
- ▶ Output: *call report*:
 - ▶ No. of sales calls made by a salesperson
 - ▶ No. and dollar amount of sales made by this person

Operational Systems in Marketing

▶ **Sales Force Automation (SFA) Systems**

- ▶ Sales Process/Activity Management
 - ▶ Include a sequence of sales activities
 - ▶ Guide sales reps through each discrete step in the sales process
 - ▶ Helps increase productivity by focusing sales efforts on most profitable customers



Operational Systems in Marketing

▶ **Telemarketing systems**

- ▶ Identify customers and automatically call them
- ▶ Use electronic phone directories
- ▶ Can make notes about calls
- ▶ In a LAN-based system, 200 telemarketers can use the same system at the same time

▶ **Direct mail advertising systems**

- ▶ Create mailing labels

▶ **Delivery tracking and routing systems**

- ▶ Help plan optimal delivery routes

Tactical Systems in Marketing

- ▶ Objective of tactical marketing managers:
 - ▶ To reach the sales goals set by top marketing executives
 - ▶ They must make tactical decisions such as:
 - ▶ How sales territories should be shaped
 - ▶ How to allocate salespersons to territories
 - ▶ What products should be offered to what customers

Strategic Systems in Marketing

- ▶ May contain both strategic and tactical elements
- ▶ **Sales forecasting systems**
 - ▶ Forecast sales for entire industry
 - ▶ For entire organization
 - ▶ For each product
 - ▶ For market segments for a product
 - ▶ Employ sophisticated statistical models and may produce considerable graphic output



Strategic Systems in Marketing

▶ **Market research systems**

- ▶ Process results of surveys and interviews
- ▶ Provide analyses of statistical significance
- ▶ Use considerable data from outside the company



A Related Area

▶ **Customer Relationship Management**

- ▶ CRM systems examine customers from a multifaceted perspective.
- ▶ These systems use a set of integrated applications to address all aspects of the customer relationship, including customer service, sales, and marketing.
- ▶ Will be covered as part of Enterprise Resource Planning (ERP) Systems

Production (Manufacturing) System

Functional Area Systems

Examples: Functional Area Info Systems

Functional Area	Information System	Examples of Typical Systems
Accounting and Finance	Systems used for managing, controlling, and auditing the financial resources of the organization	<ul style="list-style-type: none"> ■ Inventory management ■ Accounts payable ■ Expense accounts ■ Cash management ■ Payroll processing
Human Resources	Systems used for managing, controlling, and auditing the human resources of the organization	<ul style="list-style-type: none"> ■ Recruiting and hiring ■ Education and training ■ Benefits management ■ Employee termination ■ Workforce planning
Marketing	Systems used for managing new product development, distribution, pricing, promotional effectiveness, and sales forecasting of the products and services offered by the organization	<ul style="list-style-type: none"> ■ Market research and analysis ■ New product development ■ Promotion and advertising ■ Pricing and sales analysis ■ Product location analysis
Production and Operations	Systems used for managing, controlling, and auditing the production and operations resources of the organization	<ul style="list-style-type: none"> ■ Inventory management ■ Cost and quality tracking ■ Materials and resource planning ■ Customer service tracking ■ Customer problem tracking ■ Job costing ■ Resource utilization

Functional Area Information Systems

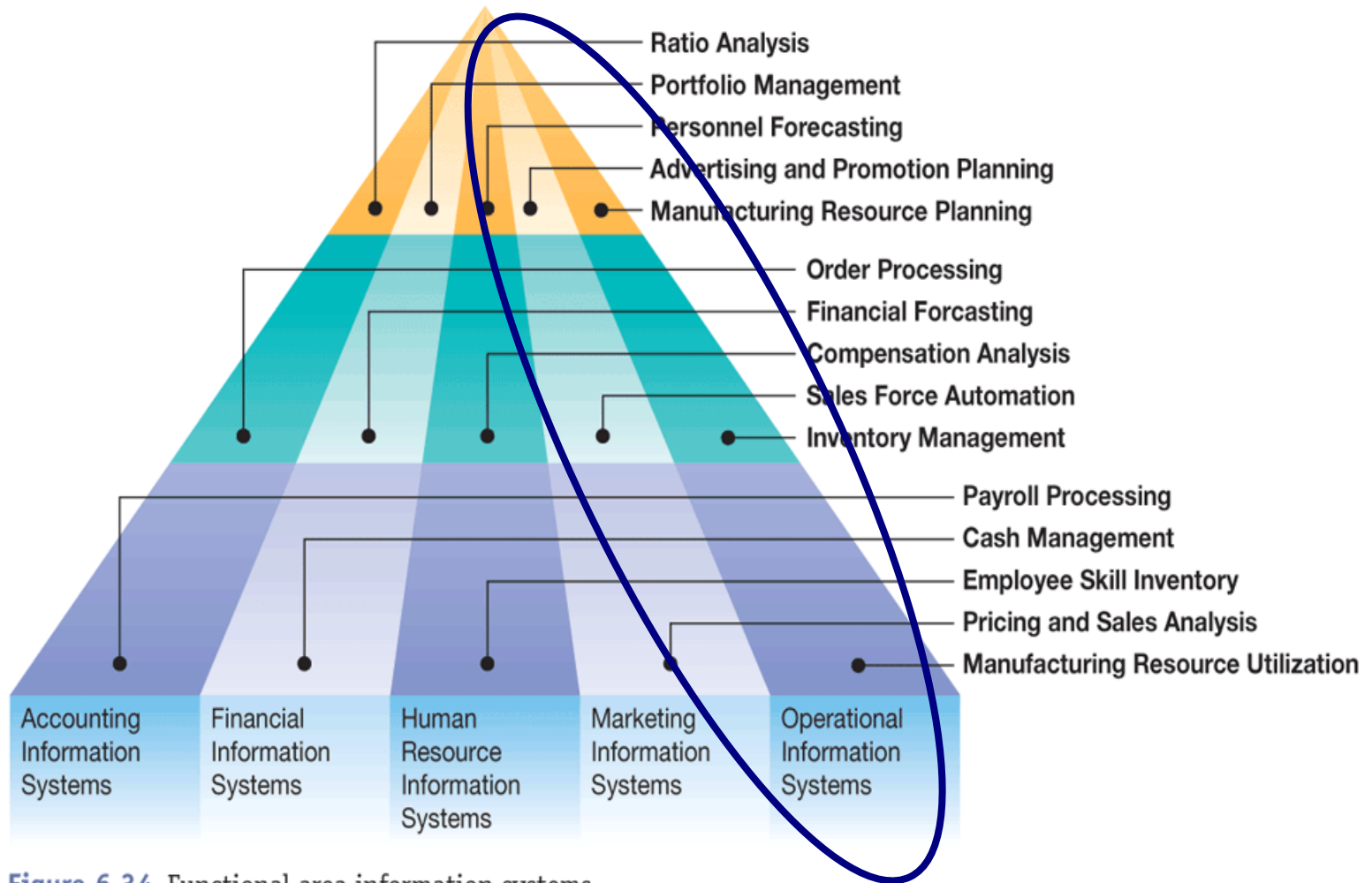


Figure 6.34 Functional area information systems.

Copyright © 2008 Pearson Education Canada

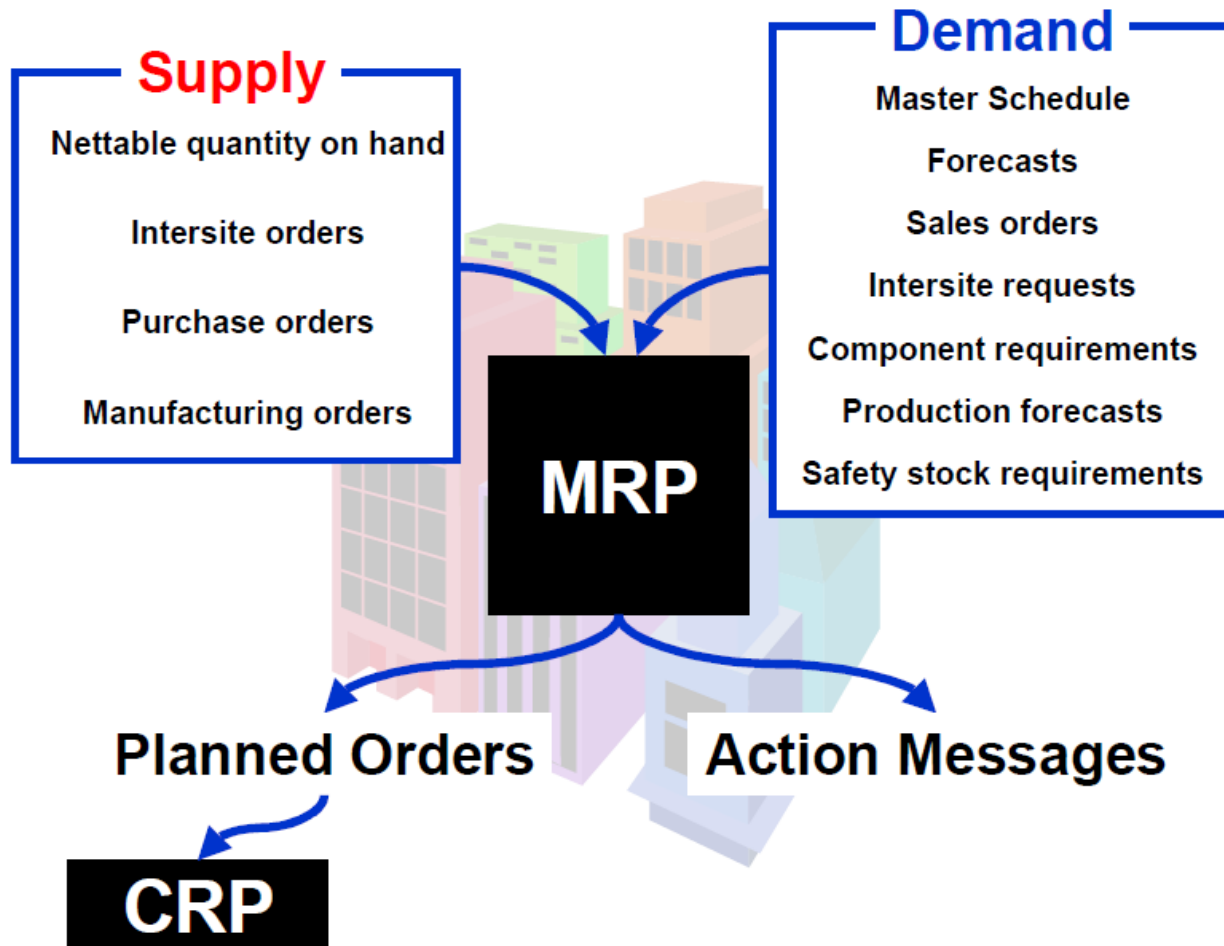


Computers in Manufacturing

- ▶ In manufacturing, we have:
 - ▶ Raw materials inventory
 - ▶ Work-in-process inventory
 - ▶ Finished goods inventory

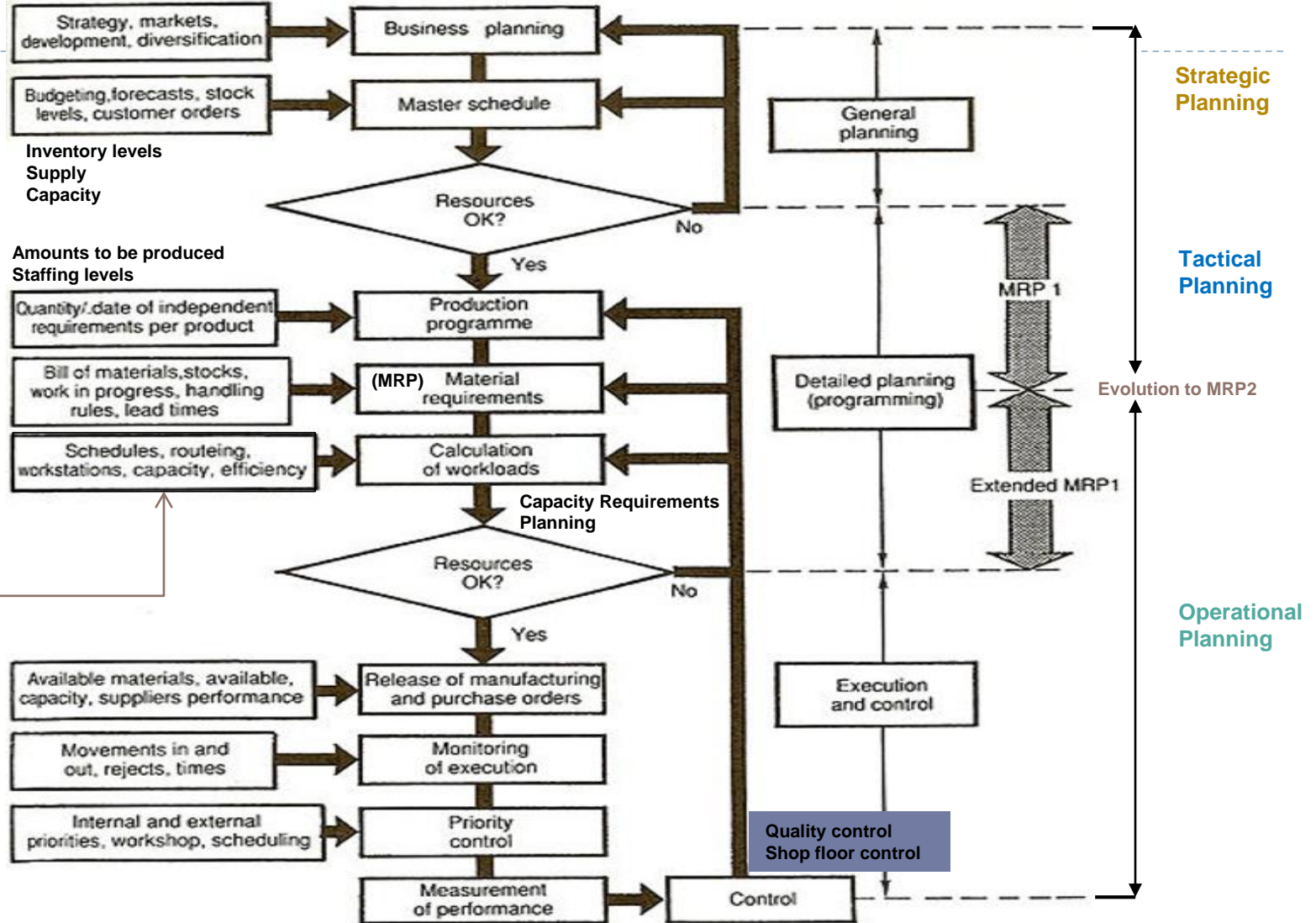
- ▶ Systems keep track of **quantities** and **costs** of each

Manufacturing Resource Planning (MRP)



eB-MRP-IN-080

MRP



Bill of Materials: List of raw materials needed to produce one unit of finished product and the quantity of each material

Route Sheet: Describes sequence of different operations in the manufacturing of a part and identifies different work centers where the part is processed.
 -Required operations
 -Standard time (People + Machine)

Around 1980, over-frequent changes in sales forecasts, entailing continual reajustments in production, as well as the unsuitability of the parameters fixed buy the system, led MRP (Material Requirement Planning) to evolve into a new concept : Manufacturing Resource Planning or MRP2

Strategic/Tactical/Operational Systems

- ▶ Master Production Scheduling system (Strategic)
- ▶ Material Requirements Planning system (Tactical)
 - ▶ Bill of Materials (BoM)
- ▶ Capacity Requirements Planning system (Tactical)
 - ▶ Route Sheet
- ▶ Detailed Production Schedule (Operational)
- ▶ Shop Floor Control (Operational)
- ▶ Quality Control (Operational)
- ▶ Inventory Control (Tactical) & (Operational)
- ▶ Cost Accounting (Tactical) & (Operational)

Strategic Manufacturing Systems

- ▶ Assist top management with
 - ▶ Selecting a plant site
 - ▶ Building a new plant
 - ▶ Designing and laying out a production facility
 - ▶ Assessing technologies to be used in production processes
- ▶ May use both internal and external data

MRP (Strategic) Planning

- ▶ Master Production Schedule
 - ▶ Based on
 - ▶ Accepted sales orders
 - ▶ Sales forecast
 - ▶ Current finished goods inventory
- ▶ Lists #units to be produced each week

MRP (**Tactical**) - Materials Requirements Planning

- ▶ A list of raw materials needed to produce one unit of finished product and the quantity of each material
- ▶ Material Requirements Planning (MRP)
 - ▶ With the Materials Planning & Scheduling (MPS) and Bill of Materials (BOM), a system can produce time-phased purchase orders for raw materials (main output of MRP)

Bill of Materials

- ▶ A list of raw materials needed to produce one unit of finished product and the quantity of each material

Bill of materials

Item: 100 CALF Variant: BLACK


Collec: NOVA Season: FW 09-10 Category: Sandal Price: 98,00

Custom fee: Net weight:

Voice	Category	Items	Variant	Um	Quantity	UniLoa
Material	Leather	Calf	BLACK	sq. mt.	0,200	1
Material 2						1
Heel ribbon						1
Sole ribbon						1
Lininf	Lining	CAM. 56	NATURAL	sq. mt.	0,100	1
Inner sole	Lining	CAM. 56	NATURAL	sq. mt.	0,050	1
Camoscina	Lining	CAM. 56	BLACK	sq. mt.	0,300	1
Reinfor.						1
Accessory 1						3
Accessory 2						3
Accessory 3						3
Last	Last	STY56	*	Pairs	1,000	
Sole	Sole	So 6790	Black	Pairs	1,000	7
Heel	Heel	H-12	NATURAL	Pairs	1,000	7
Inner sole						7
Toecap						7
Contrafforte						7
Box						7
Packing						7
Bag						7
Various						7
Various						7
Semi-finished 1	Various	Tomaia tagliate 100	BLACK	Pairs	1,000	3 1
Semi-finished 2	Various	Tomaia cucite 100	BLACK	Pairs	1,000	5 3
Semi-finished 3						7 5
Semi-finished 4						
Finished prod.	Sandal	100 CALF	BLACK	Pairs	1,000	7

Work stage Cod.

Cutting	1
Binding	3
Extern. Proc.	5
Assembly	7



- LAVORAZIONI -

-FILO - COLORE + 0

- 1)
- 2)
- 3)

+Var. +Copy + ^ [Navigation icons] Mod. e Revis

MRP (**Tactical**) - Capacity Requirements Planning (CRP)

- ▶ **Route Sheet** shows sequence of required operations and the standard time allowed for each operation (usually person + machine)
- ▶ How much machine time and worker time do we have?
 - ▶ May need to rent more floor space and / or machines
 - ▶ May need to hire temp workers
- ▶ CRP generates a **detailed production schedule**
- ▶ It releases **manufacturing orders** to the production floor

MRP (**Operational**) - Production Planning & Control

- ▶ Raw **materials** acquisition (when, how much)
- ▶ **Machine** and **worker** requirements
- ▶ Detailed **production schedules**
- ▶ Gathering **evaluation statistics**
 - ▶ Sensors, scanners, shop floor terminals
 - ▶ Quality control
 - ▶ Comparing performance data to plans
- ▶ **Cost accounting** for mfg. goods

IT Considerations in Manufacturing

- ▶ **Large databases** designed for varied and quick retrieval
- ▶ **Data capture in variety of ways** (incl. sensors, measurement devices, scanning)
- ▶ **Connectivity throughout** production facilities
- ▶ Both **operational and tactical** (e.g. Shop floor control)
- ▶ **Integration with system outside** mfg.

Supply Chain Management Software (SCM)

- ▶ Supply chain: flow of materials, services and information from suppliers of merchandise and raw materials through to the organization's customers
 - ▶ Now: supply network
- ▶ Supply chain management: processes and procedures used to ensure the delivery of goods and services to customers at the lowest cost while providing highest value to the customers



Vendor Managed Inventory

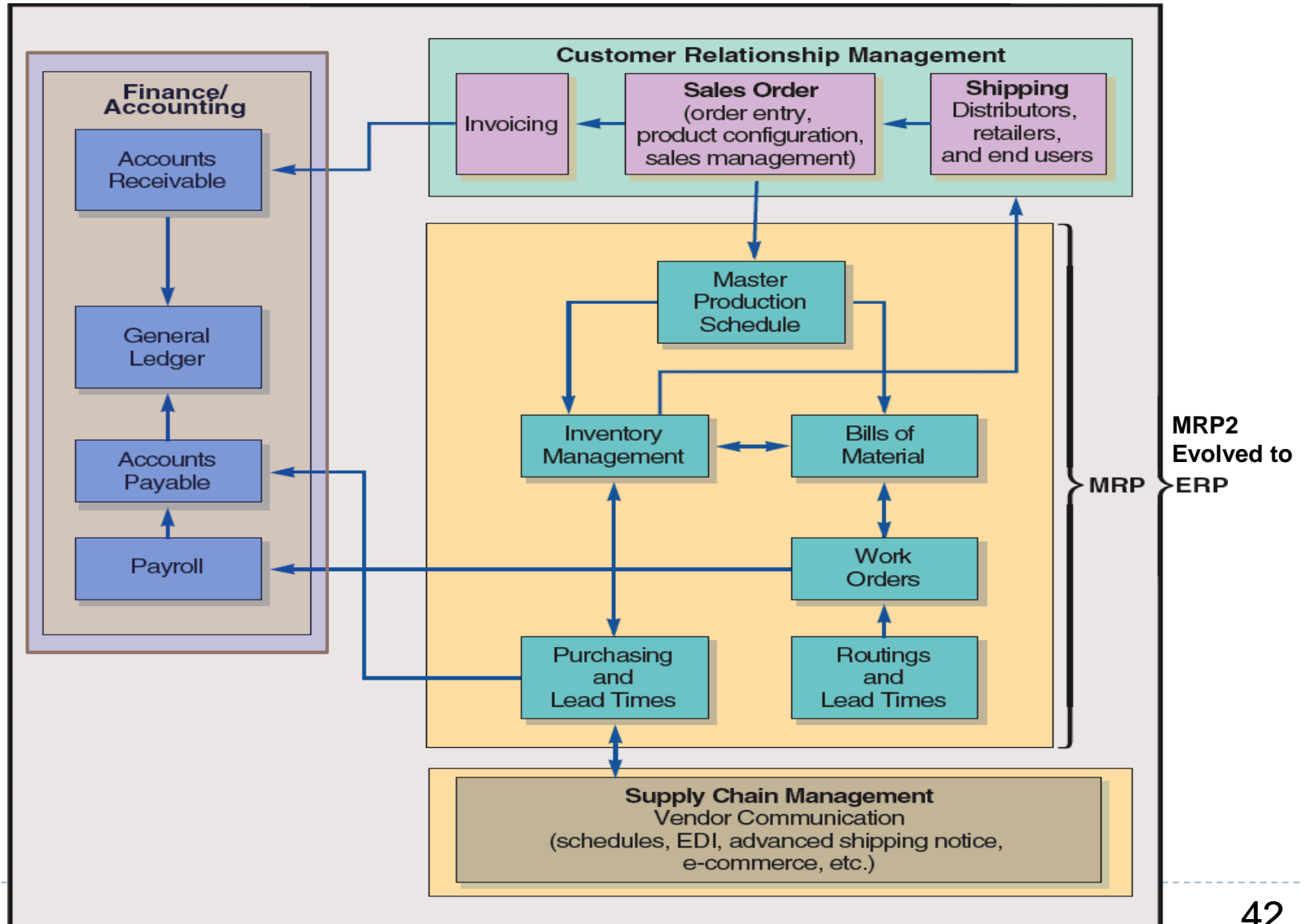
- ▶ **Vendor Managed Inventory**
 - ▶ suppliers are gaining access to an organization's production planning schedules to assure an ability to fulfill orders
 - ▶ producing organization is opening its systems to the customer to allow the customer to view inventory and production levels before placing orders

Just-In-Time (JIT) Manufacturing

Raw materials arrive just when they are needed on the production floor

- ▶ Minimizes inventory
- ▶ Requires complex information systems (operational)
- ▶ May have ***vendor managed inventory***
(supplier's computers tap into our inventory systems)

MRP2 Evolution to ERP



Summary

- ▶ **HR**
 - ▶ Payroll
 - ▶ Employee Information
 - ▶ Performance management
 - ▶ Position Control
 - ▶ Recruiting
 - ▶ Compensation and Benefits
- ▶ **Marketing**
 - ▶ Sales Automation
 - ▶ Contact Management
 - ▶ Market Research
 - ▶ Customer Loyalty Programs
- ▶ **Manufacturing**
 - ▶ Characteristics of IT in manufacturing
 - ▶ MRP→MRPII→ERP