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	▮ 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	▮ 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	▮ 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	▮ Inventory management ▮ Cost and quality tracking ▮ Materials and resource planning ▮ Customer service tracking ▮ Customer problem tracking ▮ Job costing ▮ Resource utilization

3

Functional Area Information Systems

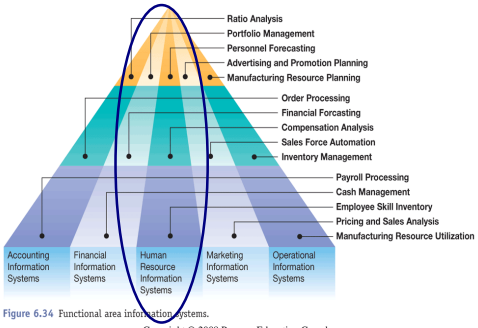


Figure 6.34 Functional area information systems.

4

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

5

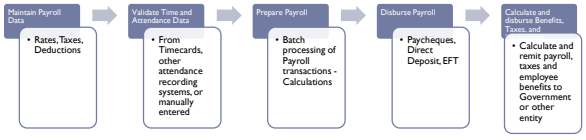
Operational Systems in HR

- 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

6

HR Transaction Processing

- Payroll:



7

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

8

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*

9

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

10

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

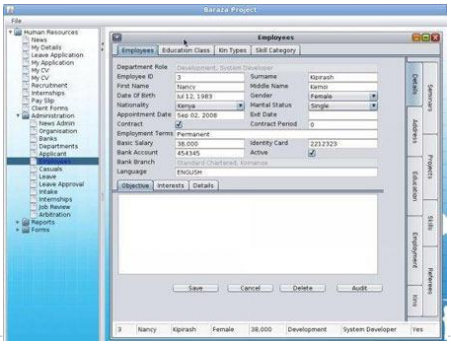
11

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

12

Human Resource Management System



13

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	▮ 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	▮ 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	▮ 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	▮ Inventory management ▮ Cost and quality tracking ▮ Materials and resource planning ▮ Customer service tracking ▮ Customer problem tracking ▮ Job costing ▮ Resource utilization

15

Functional Area Information Systems

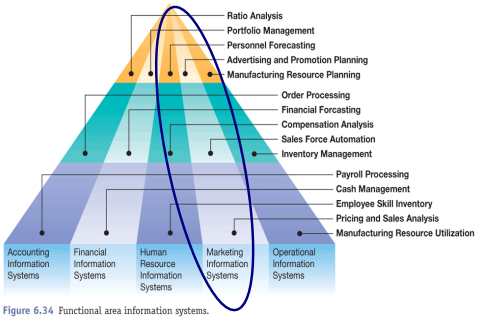


Figure 6.34 Functional area information systems.

16

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

17

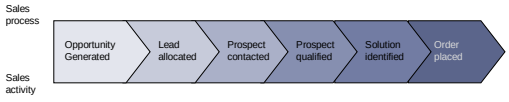
Operational Systems in Marketing

- **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

18

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



19

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

20

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

21

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

22

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

23

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

24

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	▮ 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	▮ 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	▮ 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	▮ Inventory management ▮ Cost and quality tracking ▮ Materials and resource planning ▮ Customer service tracking ▮ Customer problem tracking ▮ Job costing ▮ Resource utilization

26

Functional Area Information Systems

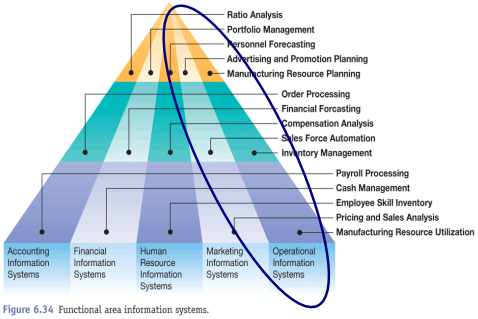


Figure 6.34 Functional area information systems.

27

Computers in Manufacturing

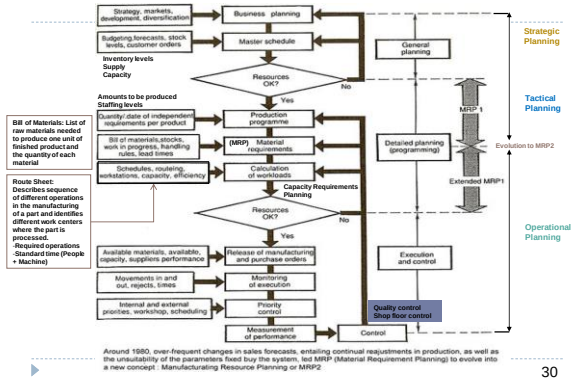
- In manufacturing, we have:
  - Raw materials inventory
  - Work-in-process inventory
  - Finished goods inventory
- Systems keep track of **quantities** and **costs** of each

28

Manufacturing Resource Planning (MRP)

29

MRP



30

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)

31

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

32

MRP (Strategic) Planning

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

33

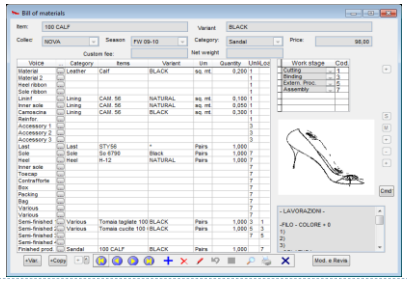
MRP (Tactical) - Materials Requirements Planning

- 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)

34

Bill of Materials

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



35

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

36

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

37

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.

38

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

39

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

40

Just-In-Time (JIT) Manufacturing

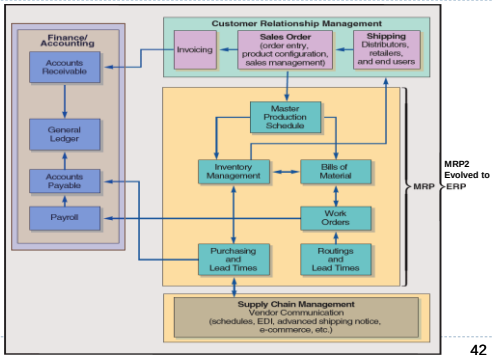
Raw materials arrive just when they are needed on the production floor

- Minimizes inventory
- Requires complex information systems (operational)
- May have ***vendor managed inventory***

(supplier's computers tap into our inventory systems)

41

MRP2 Evolution to ERP



42

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