Information Technology

FIT 3138
Real-Time Enterprise Systems

Lecture 2

Systems Integration - Role of ERP in Business Functions and Processes

Unit Outline

Week	W/C	Topic	Deadline:
1	25/07	Introduction to FIT3138; Introduction to Enterprise Systems	
2	01/08	Systems Integration - Role of ERP in Business Functions and Processes	Assignment 1 handed out
3	08/08	The Development of ERP Systems	
4	15/08	ERP in Sales and Marketing & CRM	
5	22/08	ERP in Production and Supply Chain Management	
6	29/08	Accounting in ERP Systems	
7	05/09	Process Modelling & Improvement	Assignment 1 due Assignment 2 handed out
8	12/09	ERP Implementation – Risk Management	
9	19/09	ERP Implementation – Data and System Integration and Configuration	
Mid-semester Break (26 Sep – 30 Sep 2022)			
10	03/10	ERP Implementation Issues: Managing Change	
11	10/10	Technologies supporting real-time enterprise	
12	17/10	Exam Review	Assignment 2 due

Objectives

After completing this lecture, you will be able to:

- Name the main functional areas of operation used in business

- Differentiate between a business process and a business function

- Identify the kinds of data each main functional area produces

- Identify the kinds of data each main functional area needs

- Define integrated information systems, and explain why they are essential in today's globally competitive business environment

Introduction

Enterprise Resource Planning (ERP) programs:

- Core software used by companies to coordinate information in every area of business

  – Help manage companywide business processes
  – Use common database and shared management reporting tools
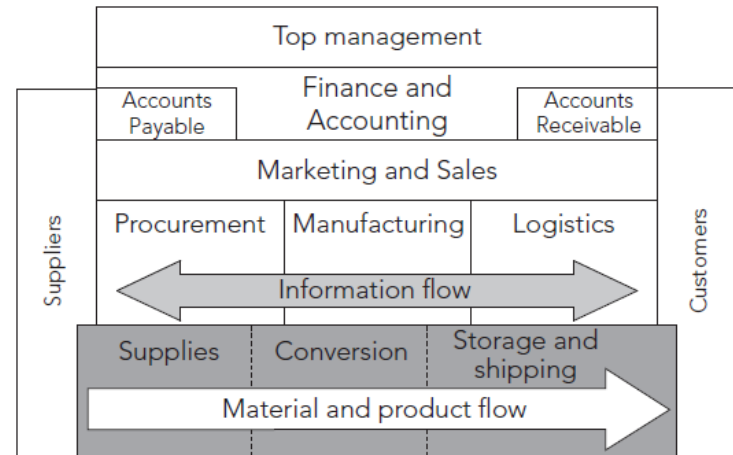
Business process:

- Collection of activities that takes some input and creates an output that is of value to the customer

From functional silos to business process
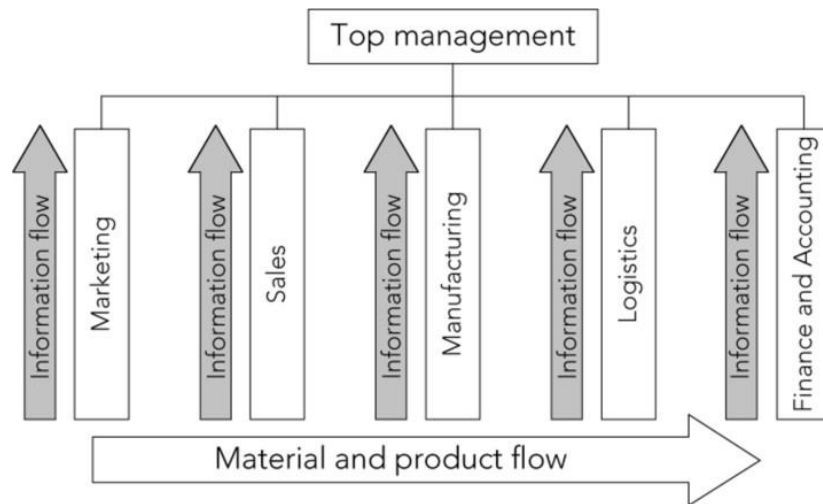
Functional business model

Process business model

- The functional silo often leads to a short-sighted view of improving the division or department rather than the entire organisation.
- Having a business process focus improves organisation's efficiency and effectiveness.
- This business process focus has moved management thinking away from a functional department to business process view.

Monk Chap 2

Functional Areas, Business Functions and Processes

Functional Areas of Operation

- Broad categories of business activities

- Marketing and Sales (M/S)

- Supply Chain Management (SCM)

- Accounting and Finance (A/F)

- Human Resources (HR)

Business Functions:

- Activities specific to a functional area of operation.
  e.g. Customer Relationship Management

Figure 1-1
Examples of functional areas of operation and their business functions

Functional area of operation	Marketing and Sales	Supply Chain Management	Accounting and Finance	Human Resources
Business functions	Marketing a product	Purchasing goods and raw materials	Financial accounting of payments from customers and to suppliers	Recruiting and hiring
	Taking sales orders	Receiving goods and raw materials	Cost allocation and control	Training
	Customer support	Transportation and logistics	Planning and budgeting	Payroll
	Customer relationship management	Scheduling production runs	Cash-flow management	Benefits
	Sales forecasting	Manufacturing goods		Government compliance
	Advertising	Plant maintenance		

Marketing and Sales

Supply Chain Management

Accounting and Finance

Human Resources

Functional Areas of Operation (cont'd.)

- Functional areas are interdependent

  - Each requires data from the others

- Better integration of functional areas leads to improvements in communication, workflow, and success of company

- **Information system (IS)**: Computers, people, procedures, and software that store, organize, and deliver information
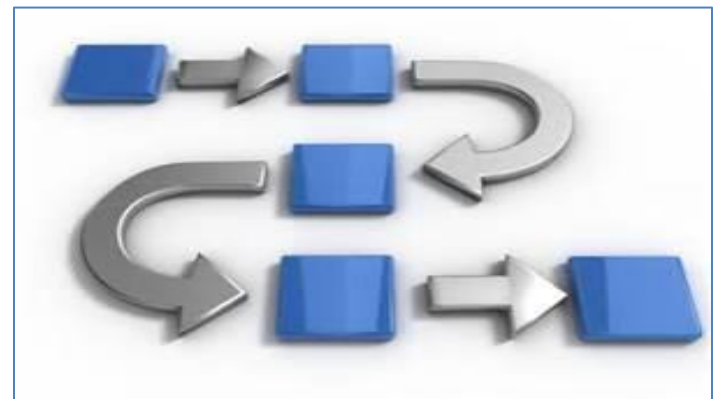
What is a business process ?
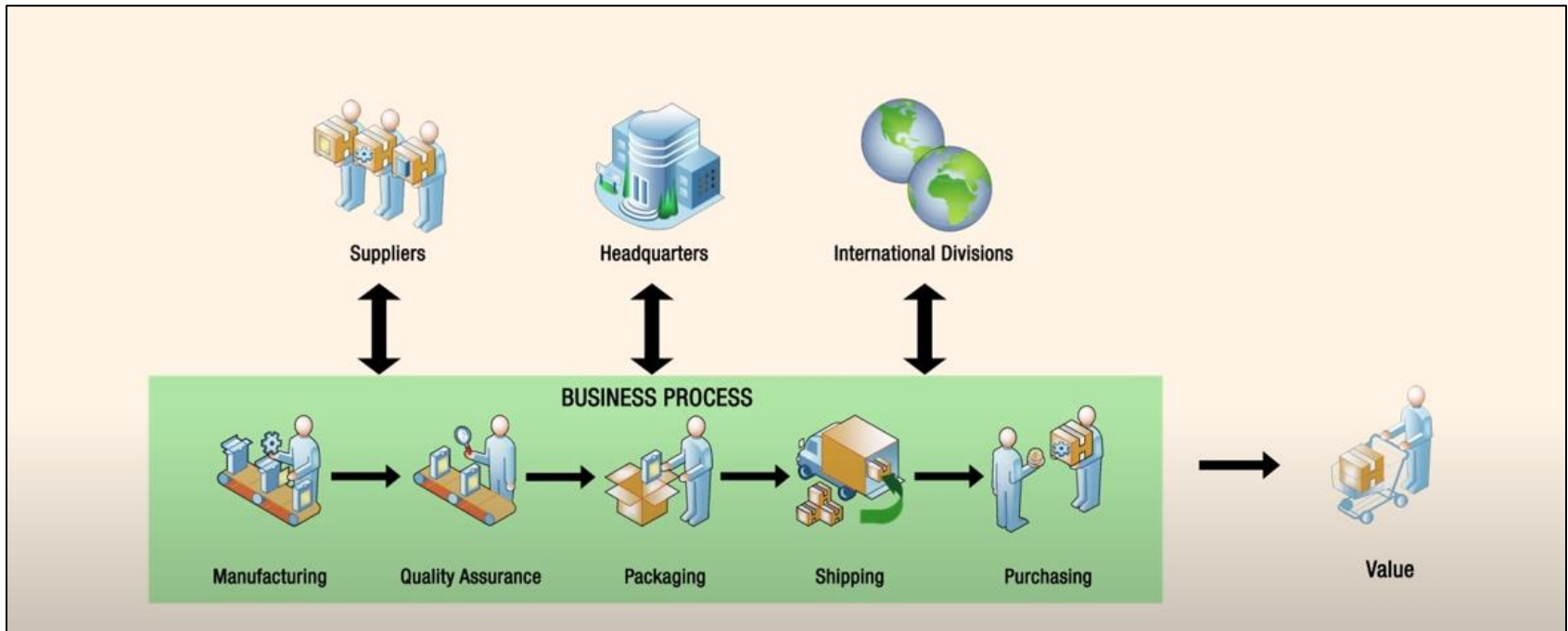
Business Processes

- Collection of activities that takes one or more kinds of input and creates an output that is of value to customer

    - Customer can be traditional external customer or internal customer

- Thinking in terms of business processes helps managers to look at their organisation from the customer's perspective

Business Processes (cont'd.)

Input	Functional area responsible for input	Process	Output
Request to purchase smartphone	Marketing and Sales	Sales order	Order is generated
Financial help for purchase	Accounting and Finance	Arranging financing in-house	Customer finances through the smartphone company
Fulfillment of order	Supply Chain Management	Shipping and delivery	Customer receives smartphone
Technical support	Marketing and Sales	24-hour help line available	Customer's technical query is resolved

Figure 1-2 **Sample business processes related to the sale of a personal smartphone**
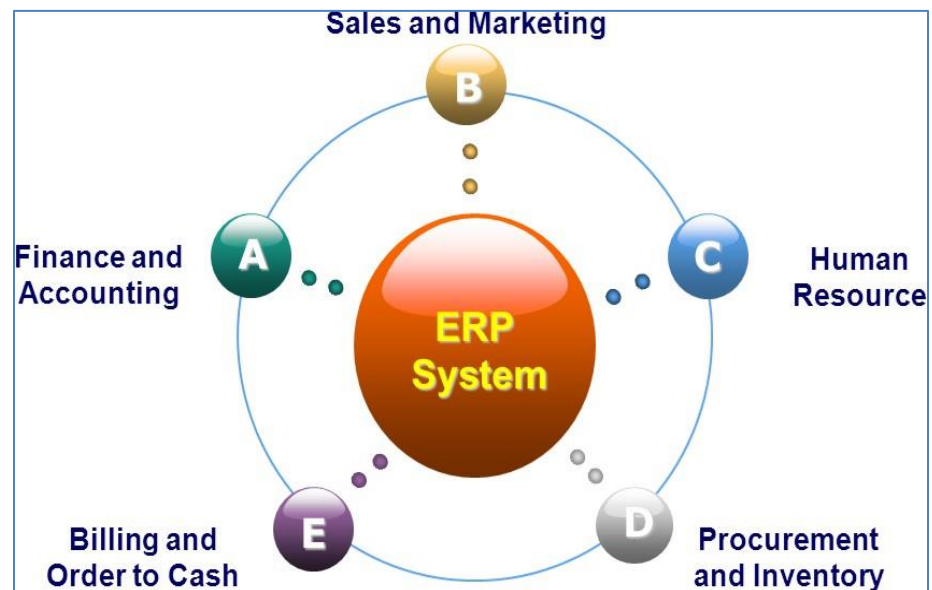
Business Processes (cont'd.)

- Businesses must always consider customer's viewpoint in any transaction

- Successful customer interaction

  - Customer (either internal or external) is not required to interact with each business function involved in the process

- Successful business managers view business operations from the perspective of a satisfied customer
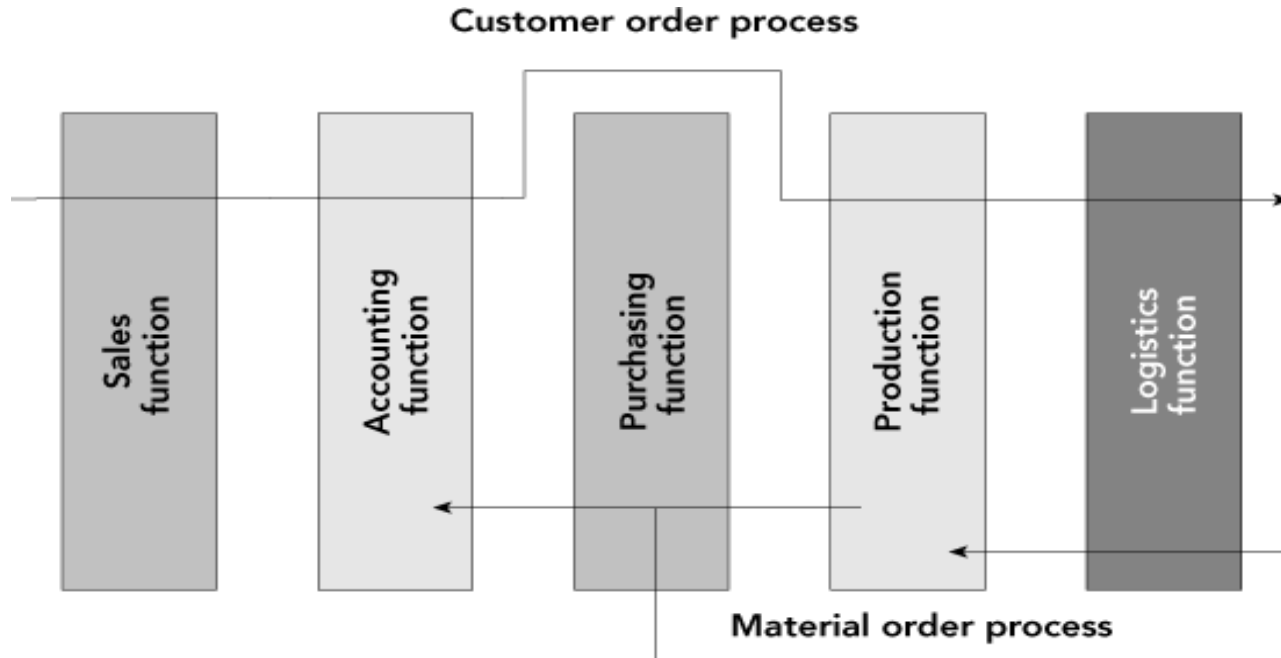
Business Processes (cont'd.)

- Sharing data effectively and efficiently between and within functional areas leads to more efficient business processes

- **Integrated information systems**: Systems in which functional areas share data

Business Processes (cont'd.)

Figure 1-3 A process view of business

Integrating the information systems results in a more effective organization, and therefore more efficient business processes.

Business Processes (cont'd.)

- Businesses take inputs (resources) and transform these inputs into goods and services for customers

  – Inputs: Material, people, equipment

- Managing inputs and business processes effectively requires accurate and up-to-date information

Functional Areas and Business Processes of a Very Small Business

- Example: A fictitious coffee shop

  – Examine business processes of the coffee shop

  – See why coordination of functional areas helps achieve efficient and effective business processes

  – Look at how integration of the information system improves the business

Marketing and Sales

- Functions of Marketing and Sales

  - Developing products

  - Determining pricing

  - Promoting products to customers

- Taking customers' orders

  - Helping create a sales forecast

Sales + Marketing = Alignment: for optimal results

Marketing and Sales

- Needs information from all other functional areas

- Customers communicate orders to M/S in person or by telephone, e-mail, fax, the Web, etc.

- M/S has a role in determining product prices

    - Pricing might be determined based on a product's unit cost, plus some percentage markup

    - Requires information from Accounting and Finance, and Supply Chain Management data

Marketing and Sales (cont'd.)

- M/S needs to interact with Human Resources to exchange information on hiring needs, legal requirements, etc.

- Inputs for M/S

  - Customer data
  - Order data
  - Sales trend data
  - Per-unit cost
  - Company travel expense policy

- Outputs for M/S

  - Sales strategies
  - Product pricing
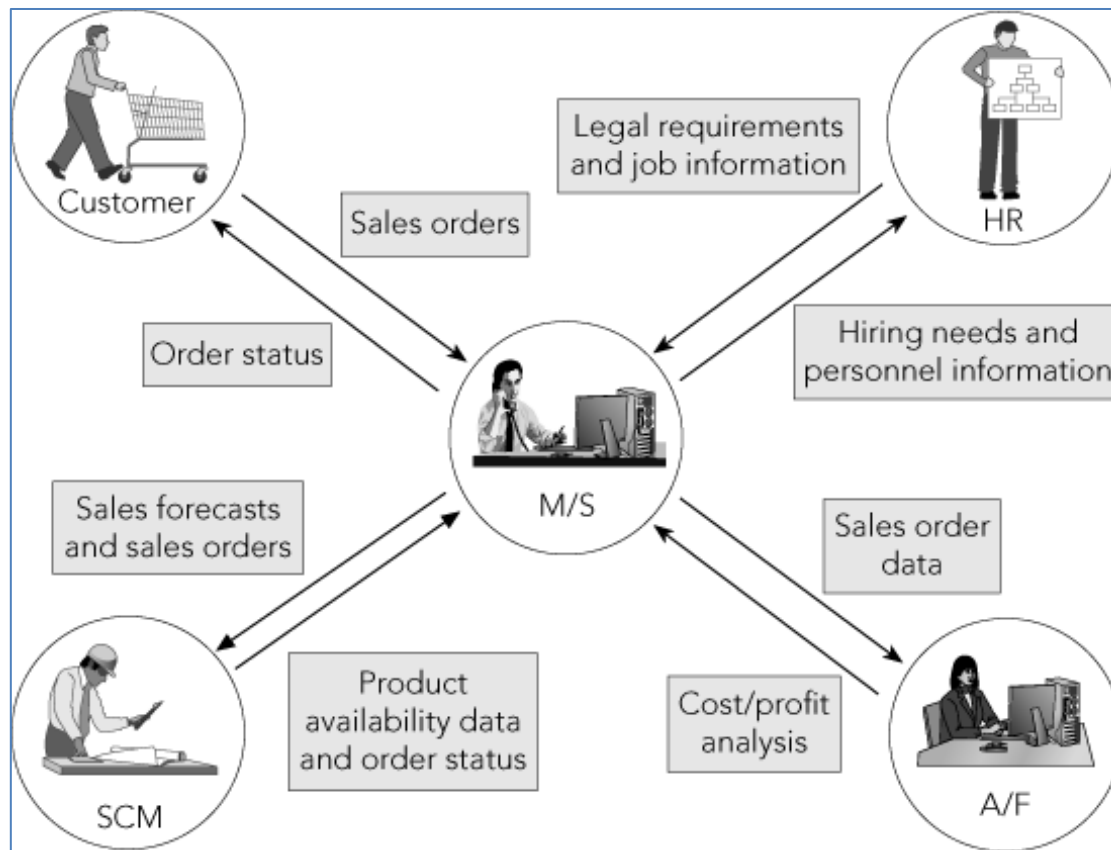 - Employment needs

Figure 1-4 The Marketing and Sales functional area exchanges data with customers and with the Human Resources, Accounting and Finance, and Supply Chain Management functional areas

Supply Chain Management

- Needs information from various functional areas

- Production plans based on information about product sales (actual and projected) that comes from Marketing and Sales

- With accurate data about required production levels:

    - Raw material and packaging can be ordered as needed

    - Inventory levels can be kept low, saving money

Supply Chain Management (cont'd.)

- Production planning requires sales forecasts from M/S functional area

  - **Sales forecasts**: Analyses that attempt to predict the future sales

- Production plans used to develop requirements for raw materials and packaging

  - Raw materials: Bottled spring water, fresh lemons, artificial sweetener, raw sugar

  - Packaging: Cups, straws, napkins

- SCM and M/S must choose a recipe for each coffee product sold

Supply Chain Management (cont'd.)

- Supply Chain Management data and records can:

  - Provide data needed by Accounting and Finance to determine how much of each resource was used

  - Support the M/S function by providing information about what has been produced and shipped

- Supply Chain Management interacts in some ways with Human Resources

Supply Chain Management (cont'd.)

- Inputs for SCM

  - Product sales data
  - Production plans
  - Inventory levels
  - Layoff and recall company policy

- Outputs for SCM

  - Raw material orders
  - Packaging orders
  - Resource expenditure data
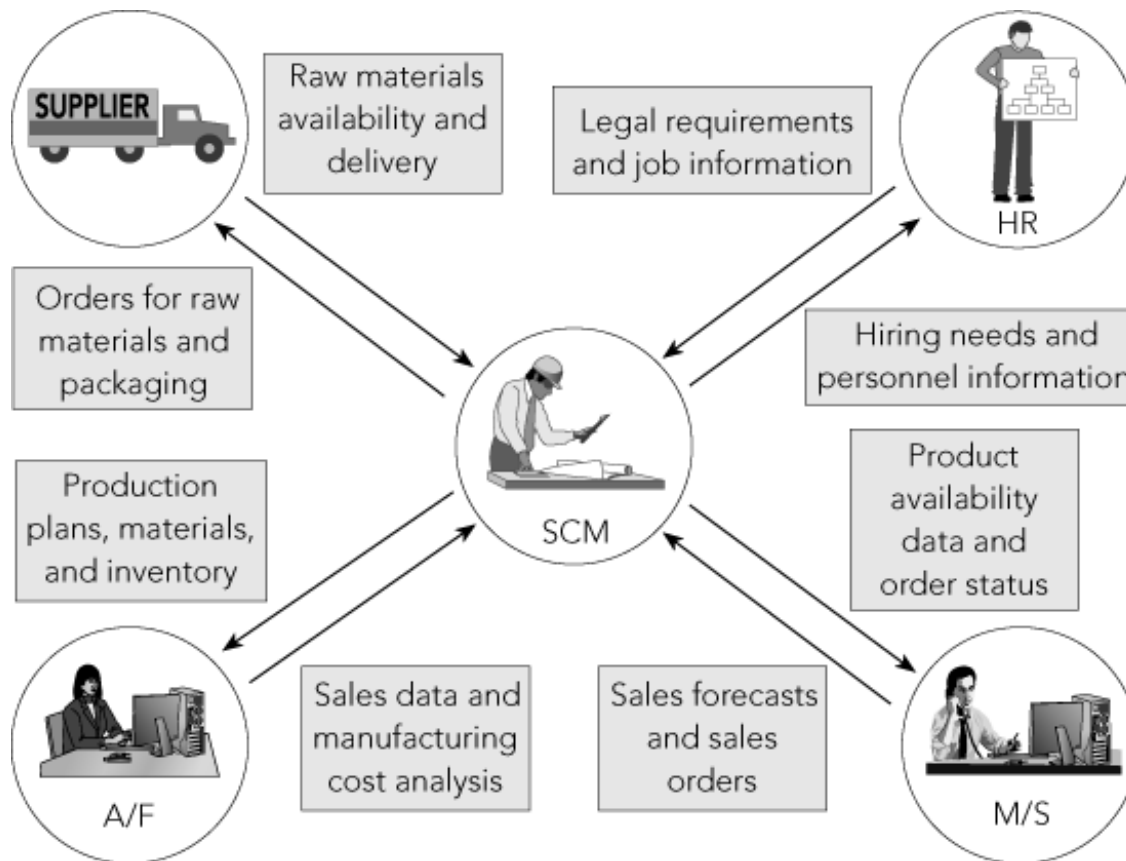 - Production and inventory reports
  - Hiring information

Figure 1-5 The Supply Chain Management functional area exchanges data with suppliers and with the Human Resources, Marketing and Sales, and Accounting and Finance functional areas

Accounting and Finance

- Functions within Accounting and Finance

  - Recording raw data about transactions (including sales), raw material purchases, payroll, and receipt of cash from customers

- **Raw data**: Numbers collected from sales, manufacturing and other operations, without any manipulation, calculation, or arrangement for presentation

Accounting and Finance (cont'd.)

- Data from Accounting and Finance used by Marketing and Sales and Supply Chain Management

  - Sales records are important component of sales forecast

  - Sales forecast is used in making staffing decisions and in production planning

  - Records from accounts receivable used to monitor the overall credit-granting policy of the coffee shop

Accounting and Finance (cont'd.)

- People in other functional areas provide data to A/F

  - M/S provides sales data

  - SCM provides production and inventory data

  - HR provides payroll and benefit expense data

- M/S personnel require data from A/F to evaluate customer credit

Accounting and Finance

- Needs information from all other functional areas

- A/F personnel:

  - Record company's transactions in the books of account

  - Record accounts payable when raw materials are purchased and cash outflows when they pay for materials

  - Summarize transaction data to prepare reports about company's financial position and profitability

Accounting and Finance (cont'd.)

- Inputs for A/F

  - Payments from customers
  - Accounts receivable data
  - Accounts payable data
  - Sales data
  - Production and inventory data
  - Payroll and expense data

- Outputs for A/F

  - Payments to suppliers
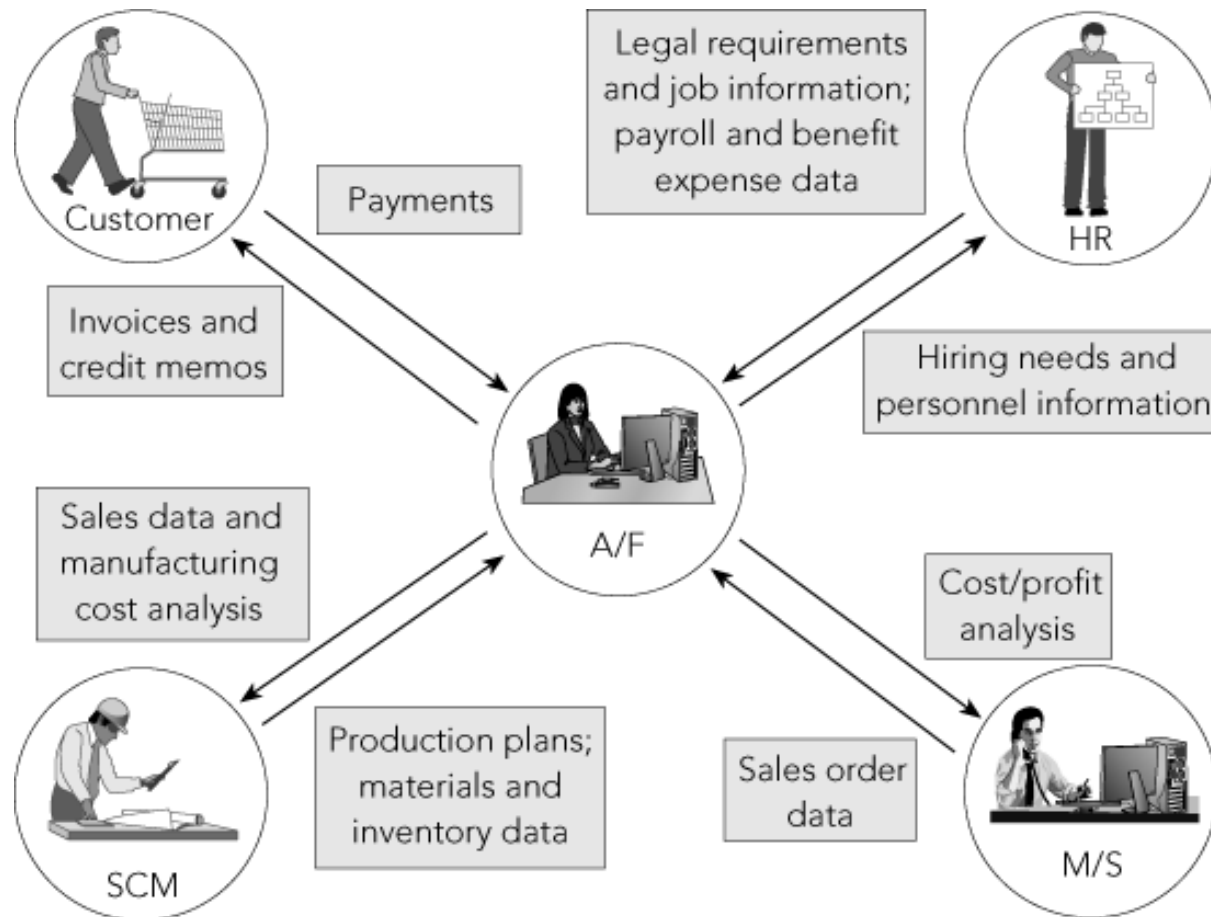 - Financial reports
  - Customer credit data

Figure 1-6 The Accounting and Finance functional area exchanges data with customers and with the Human Resources, Marketing and Sales, and Supply Chain Management functional areas

Human Resources

- Functions of Human Resources

    - Recruit, train, evaluate, and compensate employees

- HR uses sales forecasts developed by the individual departments to plan personnel needs

- Systems integrated using ERP software provide the data sharing necessary between functional areas

Human Resources

- HR needs information from the other departments

- Tasks related to employee hiring, benefits, training, and government compliance are all responsibilities of HR

- HR needs accurate forecasts of personnel needs from all functional units

- HR needs to know what skills are needed to perform a particular job and how much the company can afford to pay employees

Human Resources (cont'd.)

- Observing governmental regulations in recruiting, training, compensating, promoting, and terminating employees

- Inputs for HR

  - Personnel forecasts
  - Skills data

- Outputs for HR

  - Regulation compliance
  - Employee training and certification
  - Skills database
  - Employee evaluation and compensation

Human Resources (cont'd.)

- Significant amount of data is maintained by and shared among the functional areas

- Timeliness and accuracy of these data critical to each area's success and to company's ability to make a profit and generate future growth

- ERP software allows all functional areas to share a common database

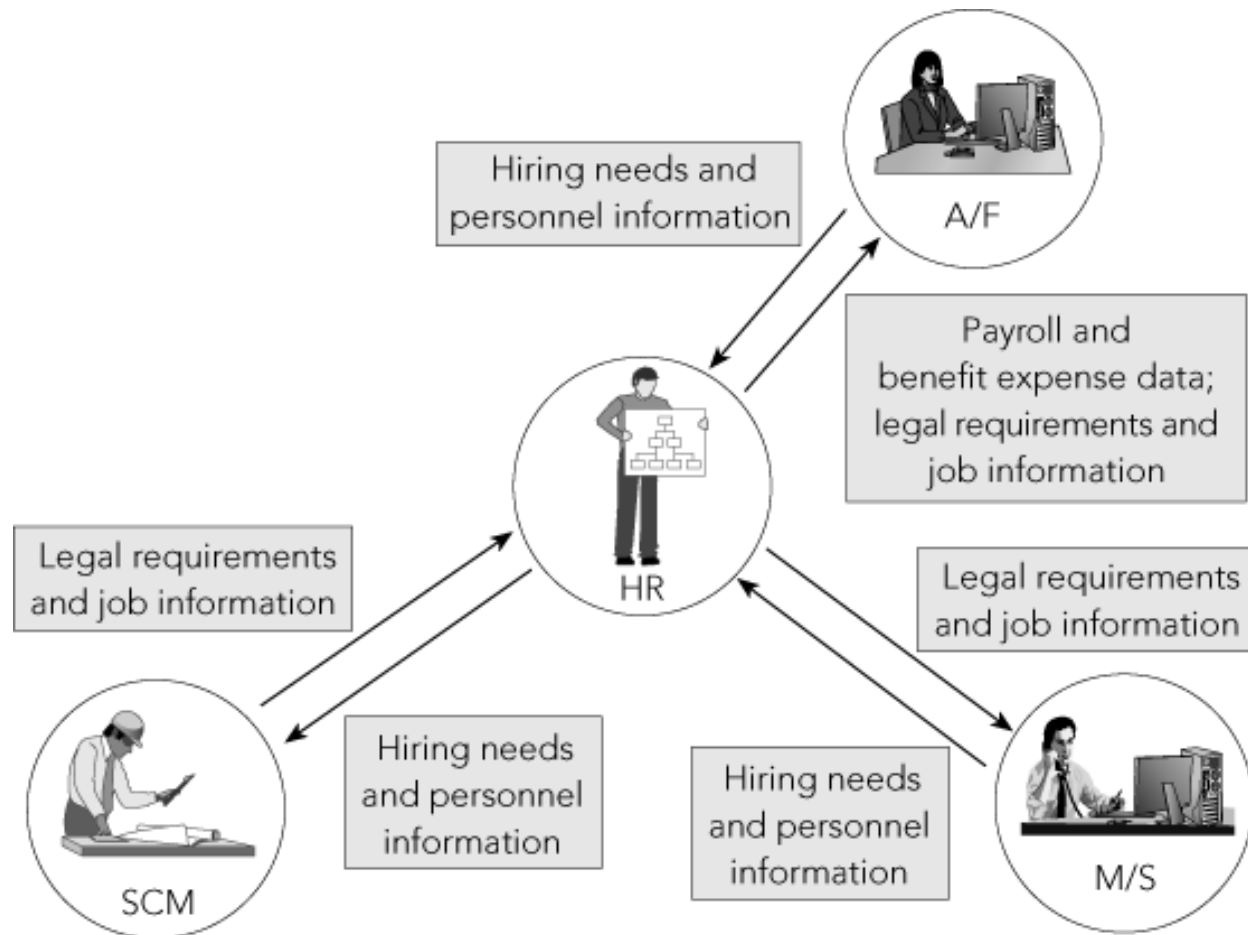 - Allows accurate, real-time information to be available

Figure 1-7 The Human Resources functional area exchanges data with the Accounting and Finance, Marketing and Sales, and Supply Chain Management functional areas

ERP and Systems Integration

- Enterprise resource planning (ERP) systems are integrated, multi-module application software packages designed to serve and support several business functions across an organisation.

- ERP systems play a very crucial role in enabling systems integration at various levels of the application architecture.

ERP and Systems Integration

- At the logical level, ERP systems require organisations to focus on business process rather than on functions. ERP systems implements the best practices for its industry – it comes with built-in processes for a wide variety of common business functions.

- At the physical level, to install an ERP system the organisation may have to upgrade or install middleware to integrate with their existing system.

- Integration is required at the data level, client level and application level (which will be discussed in future lectures)

Systems Integration

- Integrated systems allow companies the ability to respond quickly to market conditions – e.g. the linking of demand and supply in a way that enables a quick and flexible response to changes in demand.

- At the logical level, systems integration means developing information systems that allow organisations to share data with all of its stakeholders based on their need and authorisation.

- At the physical (or technical) level, systems integration means providing seamless connectivity between heterogeneous application systems.

Benefits of System Integration	Limitations of Systems Integration
Increased revenue and growth	High initial setup costs
Levelling the competitive environment	Power and interdepartmental conflicts
Enhanced information visibility	Long-term and intangible ROIs
Increased standardization	Creativity limitations

Business Process Integration in ERP
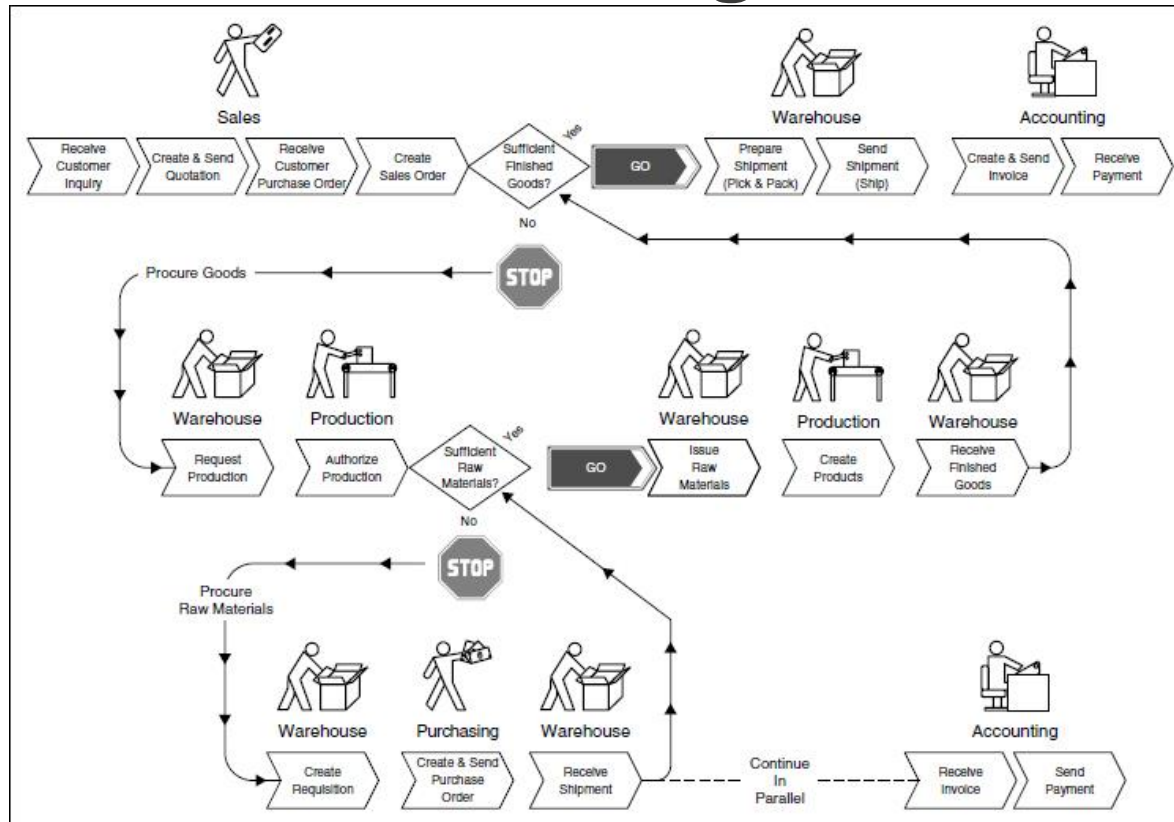
The integration of procurement, fulfillment & production. Note the decision points where there is a branch to another process.

Summary

- Basic functional areas: Marketing and Sales, Supply Chain Management, Accounting and Finance, and Human Resources

- Marketing and Sales: Sets product prices, promotes products through advertising and marketing, takes customer orders, supports customers, and creates sales forecasts

- Supply Chain Management: Develops production plans, orders raw materials from suppliers, receives raw material, manufactures products, maintains facilities, and ships products to customers

Summary (cont'd.)

- Accounting and Finance: Financial accounting to provide summaries of operational data in managerial reports, controlling accounts, planning and budgeting, and cash-flow management

- Human Resources: Recruits, hires, trains, and compensates employees, ensures compliance with government regulations, and oversees the evaluation of employees

- Information systems capture, process, and store data to provide information needed for decision making

Summary (cont'd.)

- Employees working in one functional area need data from employees in other functional areas

    - Functional area information systems should be integrated, so shared data are accurate and timely

- Managers think in terms of business processes that integrate the functional areas

    - Need to share information between functions and functional areas

    - ERP software provides this capability by means of a single common database

End of Lecture 2

References:

- Ellen Monk, Bret Wagner. (2013). Concepts in Enterprise Resource Planning. (4e) Course Technology, Cengage Learning. Chapter 1

- Motiwalla, L. & Thompson, J. (2015). Enterprise systems for management. (2e) Pearson. Chapter 2