



# Business Processes

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ERP

## 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

## Functional Areas and Business Processes

- ◆ To understand ERP, you must understand how a business works
  - Functional areas of operation
  - Business processes

## Functional Areas of Operation

- ◆ 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

## Functional Areas of Operation (cont'd.)

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		

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

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## 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

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## 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 organization 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

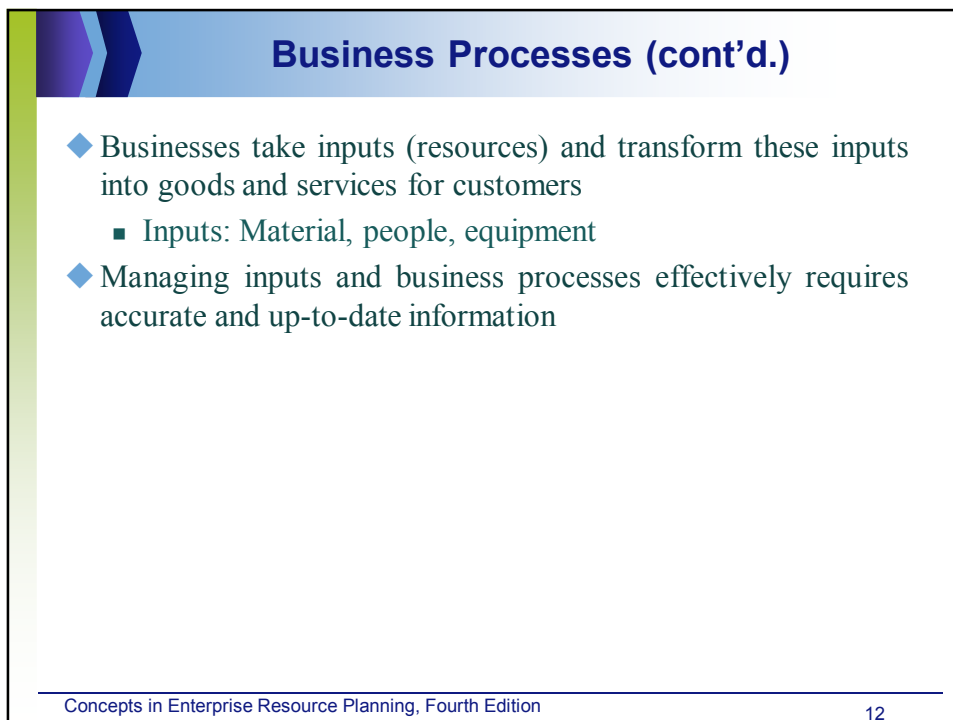
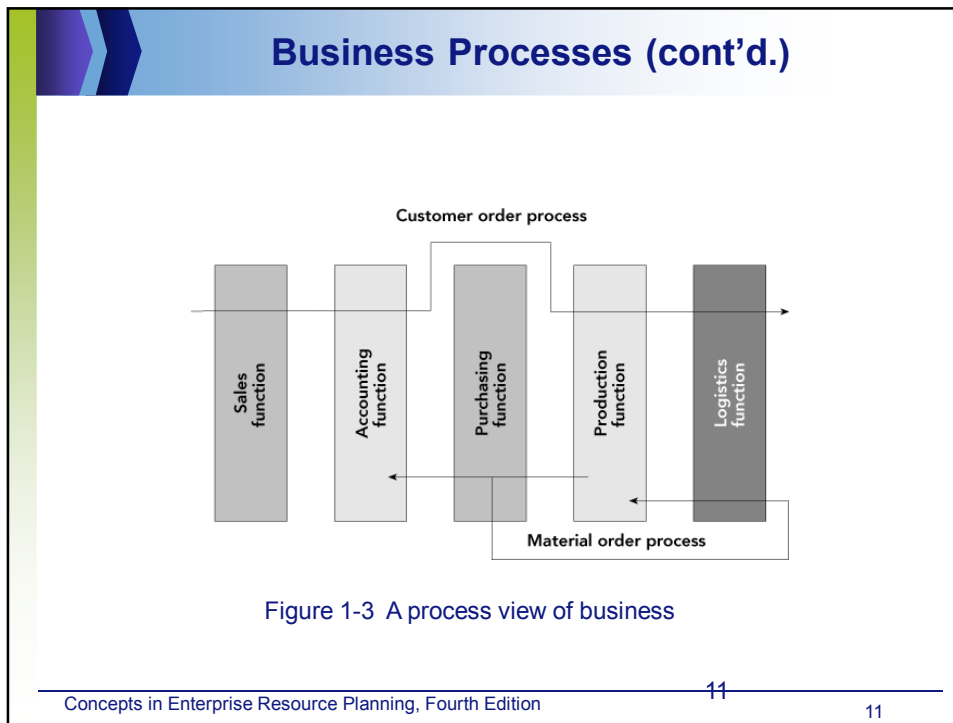
Figure 1-2 Sample business processes related to the sale of a personal smartphone

## 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



## 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 INFORMATION SYSTEMS AND THE SALES ORDER PROCESS*

## Marketing and Sales

- ◆ Functions of Marketing and Sales
  - Developing products
  - Determining pricing
  - Promoting products to customers
  - Taking customers' orders
  - Helping create a sales forecast

## Marketing and Sales (cont'd.)

- ◆ Marketing and Sales tasks for the coffee shop
  - Formal recordkeeping not required
  - Need to keep track of customers
  - Product development can be done informally
  - Good repeat customers allowed to charge purchases—up to a point
    - Records must show how much each customer owes and his or her available credit



## 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.)

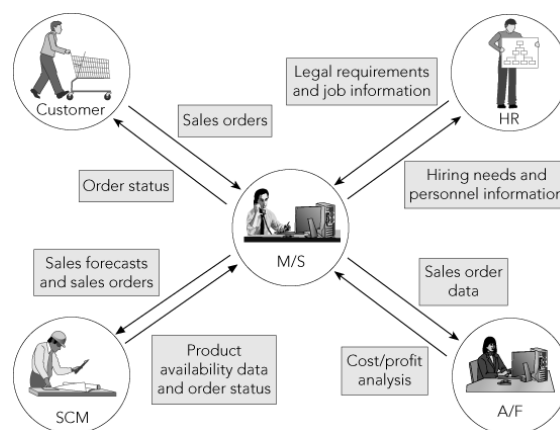


Figure 1-4 The Marketing and Sales functional area exchanges data with customers and with the Human Resources, Accounting and Finance, and Supply Chain Management functional areas

## 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

## Marketing and Sales (cont'd.)

- ◆ Outputs for M/S
  - Sales strategies
  - Product pricing
  - Employment needs

## Example

- ◆ Fitter Snacker (FS)
  - Fictitious company that makes healthy snack bars
  - Does not have an integrated information system
- ◆ Marketing and Sales (M/S) is the focal point of many of FS's activities
- ◆ FS's M/S information systems are not well integrated with company's other information systems
  - Company-wide use of transaction data is inefficient

## Overview of Fitter Snacker

- ◆ Manufactures and sells two types of nutritious snack bars:
  - NRG-A: "advanced energy"
  - NRG-B: "body building proteins"
- ◆ Has organized its sales force into two groups, known as divisions:
  - Wholesale Division
  - Direct Sales Division
- ◆ The two sales divisions differ in terms of quantities of orders and pricing terms
- ◆ Sells snack bars under the Fitter Snacker brand name
- ◆ Packages the bars in store-brand wrappers for some chain stores

## Problems with Fitter Snacker's Sales Process

- ◆ Many of Fitter Snacker's sales orders have problems, such as:
  - Incorrect pricing
  - Excessive calls to the customer for information
  - Delays in processing orders
  - Missed delivery dates

## Problems with Fitter Snacker's Sales Process (cont'd.)

- ◆ Reasons for problems:
  - FS has separate information systems throughout the company for three functional areas:
    - Sales order system
    - Warehouse system
    - Accounting system
  - High number of transactions that are handled manually
  - Information stored in the three systems is not available in real time

## Problems with Fitter Snacker's Sales Process (cont'd.)

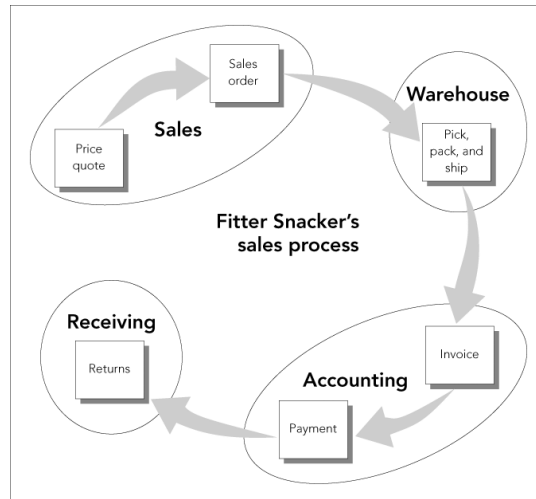


Figure 3-1 The sales process

## Sales Quotations and Orders

- ◆ Giving a customer a price quotation and then taking the customer's order at FS
  - Sales call: salesperson either telephones the customer or visits in person
  - At the end of sales call, salesperson prepares a handwritten quotation on a form that generates two copies
    - Original sheet goes to the customer
    - Middle copy is first faxed and then mailed to the sales office
    - Salesperson keeps the bottom copy for his or her records

## Sales Quotations and Orders (cont'd.)

- ◆ Giving a customer a price quotation and then taking the customer's order at FS (cont'd.)
  - Quotation form has an 800 number that the customer can call to place an order
- ◆ Problems can occur with this process
- ◆ Inefficiencies in the rest of the ordering process
  - Determining the delivery date
  - Checking customer's credit status
  - Entering customer's order into the current order entry system

## Order Filling

- ◆ Packing lists and shipping labels
  - Printed twice a day
  - Hand-carried to the warehouse
  - At warehouse, hand-sorted into small orders and large orders
- ◆ Warehouse
  - Small-order packing area
  - Large-order packing area
- ◆ FS uses a PC database program to manage inventory levels in the warehouse

## Order Filling (cont'd.)

- ◆ FS keeps inventory levels fairly low, and inventory levels change rapidly during the day
  - Picker might go to the shelves to pick an order and discover that there are not enough of the desired type of snack bars to fill the order
  - To determine what to do in this situation, order picker might have conversations with warehouse supervisor, production supervisor, and sales clerks

## Accounting and Invoicing

- ◆ Invoicing the customer is problematic
- ◆ Sales clerks send the Accounting department the sales order data for customer invoices
- ◆ Accounting department loads the data into PC-based accounting program
- ◆ Clerks manually make adjustments for partial shipments and any other changes
- ◆ Sometimes, order corrections are delayed and don't catch up to the invoicing process
  - Results in late or inaccurate invoices

## Payment and Returns

- ◆ Problems with procedure for processing payments
  - If any errors have occurred in the sales process, customer will receive an incorrect invoice
  - Many customers don't return a copy of the invoice with their payment; errors can result

## Payment and Returns (cont'd.)

- ◆ FS's returns processing is flawed
  - Many customers do not call for the RMA number, or fail to include it with their returned material
    - Makes it more difficult for Accounting department to credit the appropriate account
  - Poor penmanship on the returned material sheet can create problems for Accounting
- ◆ If a customer's account has not been properly credited, customer may receive a dunning letter in error



## Sales and Distribution in ERP

- ◆ ERP systems can minimize data entry errors and provide accurate information in real time to all users
- ◆ ERP systems can track all transactions (such as invoices, packing lists, RMA numbers, and payments) involved in the sales order

## Sales and Distribution in ERP (cont'd.)

- ◆ SAP ERP Sales and Distribution module treats the sales order process as a cycle of events:
  - Pre-sales activities
  - Sales order processing
  - Inventory sourcing
  - Delivery
  - Billing
  - Payment

## Pre-Sales Activities

- ◆ Customers can get pricing information about the company's products:
  - Through an inquiry or a price quotation
- ◆ Marketing activities such as tracking customer contacts, including sales calls, visits, and mailings
- ◆ Company can maintain data about customers and generate mailing lists based on specific customer characteristics

## Sales Order Processing

- ◆ Sales order processing: series of activities that must take place to record a sales order
- ◆ Sales order can start from a quotation or inquiry generated in the pre-sales step
- ◆ Information collected from the customer to support the quotation is immediately included in sales order
- ◆ Critical steps in sales order processing:
  - Recording the items to be purchased
  - Determining the selling price
  - Recording the order quantities

## Sales Order Processing (cont'd.)

- ◆ Users can define various pricing alternatives in the SAP ERP system
- ◆ SAP ERP system checks the Accounts Receivable tables in the SAP ERP database to confirm the customer's available credit
- ◆ If customer has sufficient credit available
  - Order is completed
- ◆ If customer does not have sufficient credit available
  - SAP ERP system prompts sales personnel to take one of the possible appropriate actions

## Inventory Sourcing

- ◆ Available-to-Promise (ATP) check
  - SAP ERP system checks company's inventory records and production planning records to see whether:
    - Requested material is available
    - Requested material can be delivered on the date the customer desires
  - Includes expected shipping time
- ◆ System can recommend an increase in planned production if a shortfall is expected

## Delivery

- ◆ **Delivery** in SAP ERP system
  - Releasing the documents that the warehouse uses to pick, pack, and ship orders
- ◆ Delivery process allows deliveries to be created so that the warehouse and shipping activities are carried out efficiently
- ◆ Once the system has created documents for picking, packing, and shipping, documents are transferred to Materials Management module

## Billing

- ◆ SAP ERP system creates an invoice by copying sales order data into the invoice document
- ◆ Accounting can print this document and mail it, fax it, or transmit it electronically to the customer
- ◆ Accounting records are updated at this point

## Payment

- ◆ When the customer sends in a payment, it is automatically processed by the SAP ERP system
  - Debits cash and credits (reduces) customer's account
- ◆ Timely recording of this transaction has an effect on the timeliness and accuracy of any subsequent credit checks for the customer

## Integration of Sales and Accounting

- ◆ ERP systems integrate Accounting with all business processes
- ◆ When a sales order is recorded, related accounting data are updated automatically

## Customer Relationship Management

- ◆ Companies without a good connection between their workers and their customers run the risk of losing business
- ◆ **Customer relationship management (CRM) software** can help companies streamline their interactions with customers
- ◆ **On-demand CRM**: software and computer equipment reside with CRM provider

## Core CRM Activities

- ◆ One-to-one marketing
- ◆ Sales force automation (SFA)
- ◆ Sales campaign management
- ◆ Marketing encyclopedias
- ◆ Call center automation

## SAP's CRM Software

- ◆ Examples of tools that provide CRM functionality within the SAP ERP system
  - Contact management tool
    - To make sure that information about sales contacts is available throughout the organization
  - Sales activity manager
    - Supports a strategic and organized approach to sales activity planning and can help make sure that follow-up activities are accomplished
- ◆ Employing a separate CRM system that communicates with the ERP system

## *PRODUCTION AND SUPPLY CHAIN MANAGEMENT INFORMATION SYSTEMS*

## Supply Chain Management

- ◆ Functions within Supply Chain Management
  - Making the coffee (manufacturing/production)
  - Buying raw materials (purchasing)
- ◆ Production planning requires sales forecasts from M/S functional area
  - **Sales forecasts:** Analyses that attempt to predict the future sales of a product

## Supply Chain Management (cont'd.)

- ◆ 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

- ◆ 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.)

- ◆ 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.)

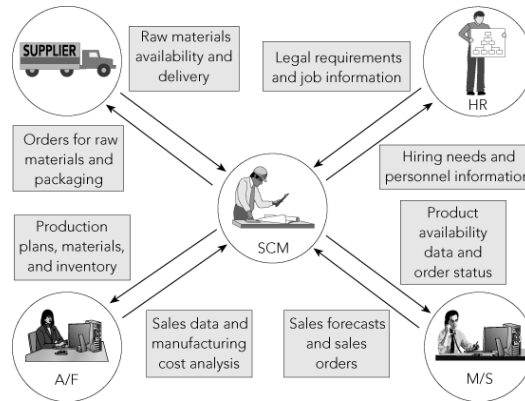


Figure 1-5 The Supply Chain Management functional area exchanges data with suppliers and with the Human Resources, Marketing and Sales, and Accounting and Finance functional areas

## Supply Chain Management (cont'd.)

- ◆ Inputs for SCM
  - Product sales data
  - Production plans
  - Inventory levels
  - Layoff and recall company policy

## Supply Chain Management (cont'd.)

- ◆ Outputs for SCM
  - Raw material orders
  - Packaging orders
  - Resource expenditure data
  - Production and inventory reports
  - Hiring information

## Production Overview

- ◆ To meet customer demand efficiently, Fitter Snacker must:
  - Develop a forecast of customer demand
  - Develop a production schedule to meet the estimated demand
- ◆ ERP system is a good tool for developing and executing production plans
- ◆ Goal of production planning is to schedule production economically

## Production Overview (cont'd.)

- ◆ Three general approaches to production
  - *Make-to-stock* items: made for inventory (the “stock”) in anticipation of sales orders
  - *Make-to-order* items: produced to fill specific customer orders
  - *Assemble-to-order* items: produced using a combination of make-to-stock and make-to-order processes

## Fitter Snacker's Manufacturing Process

- ◆ Fitter Snacker uses make-to-stock production

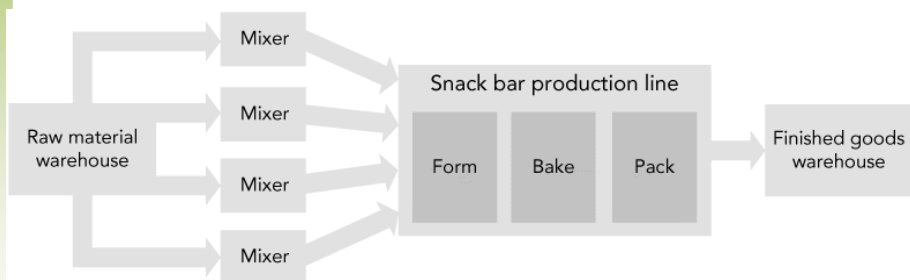


Figure 4-1 Fitter Snacker's manufacturing process

## Fitter Snacker's Manufacturing Process (cont'd.)

- ◆ Snack bar line can produce 200 bars a minute, or 12,000 bars per hour
- ◆ Each bar weighs four ounces
- ◆ Product 48,000 ounces/hour, or 3,000 lbs/hour
- ◆ Entire production line operates on one shift a day
- ◆ Fitter Snacker's production sequence
  - **Capacity:** number of bars that can be produced

## Fitter Snacker's Production Problems

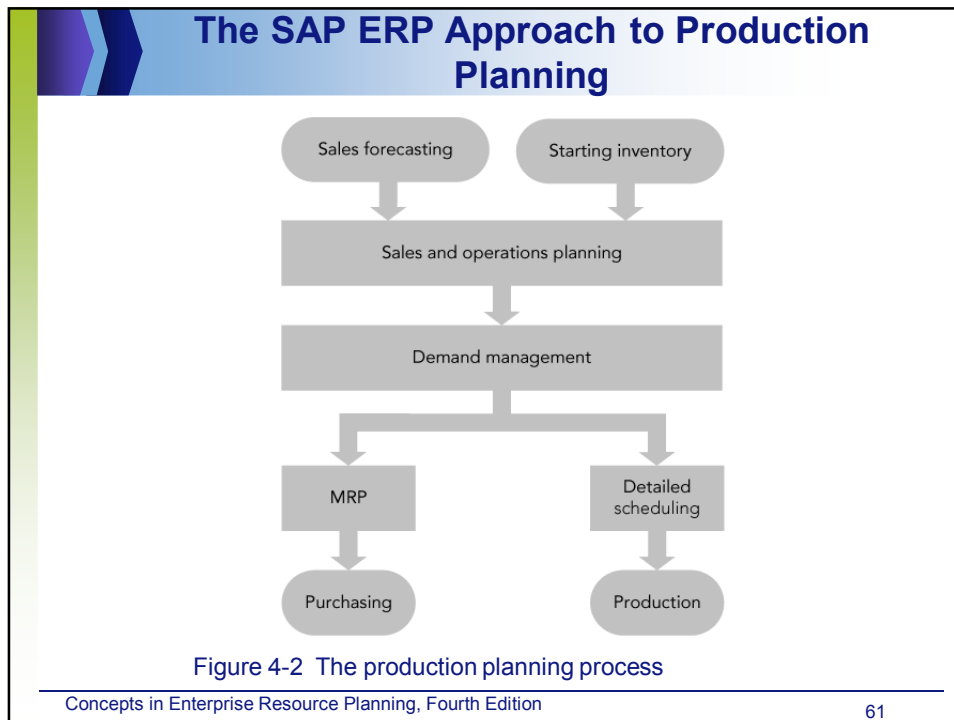
- ◆ Fitter Snacker has problems deciding *how many* bars to make and *when* to make them
- ◆ Communication problems
  - FS's Marketing and Sales personnel do not share information with Production personnel
  - Production personnel find it hard to deal with sudden increases in demand
    - Might cause shortages or stockout

## Fitter Snacker's Production Problems (cont'd.)

- ◆ Inventory problems
  - Production manager lacks systematic method for:
    - Meeting anticipated sales demand
    - Adjusting production to reflect actual sales
- ◆ Accounting and purchasing problems
  - **Standard costs:** normal costs of manufacturing a product
  - Production and Accounting must periodically compare standard costs with actual costs and then adjust the accounts for the inevitable differences

## The Production Planning Process

- ◆ Three important principles for production planning:
  - Work from sales forecast and current inventory levels to create an “aggregate” (“combined”) production plan for all products
  - Break down aggregate plan into more specific production plans for individual products and smaller time intervals
  - Use production plan to determine raw material requirements



### Sales Forecasting

- ◆ SAP's ERP system takes an integrated approach
  - Whenever a sale is recorded in Sales and Distribution (SD) module, quantity sold is recorded as a consumption value for that material
- ◆ Simple forecasting technique
  - Use a prior period's sales and then adjust those figures for current conditions
- ◆ To make a forecast for Fitter Snacker:
  - Use previous year's sales data in combination with marketing initiatives to increase sales

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## Sales Forecasting (cont'd.)

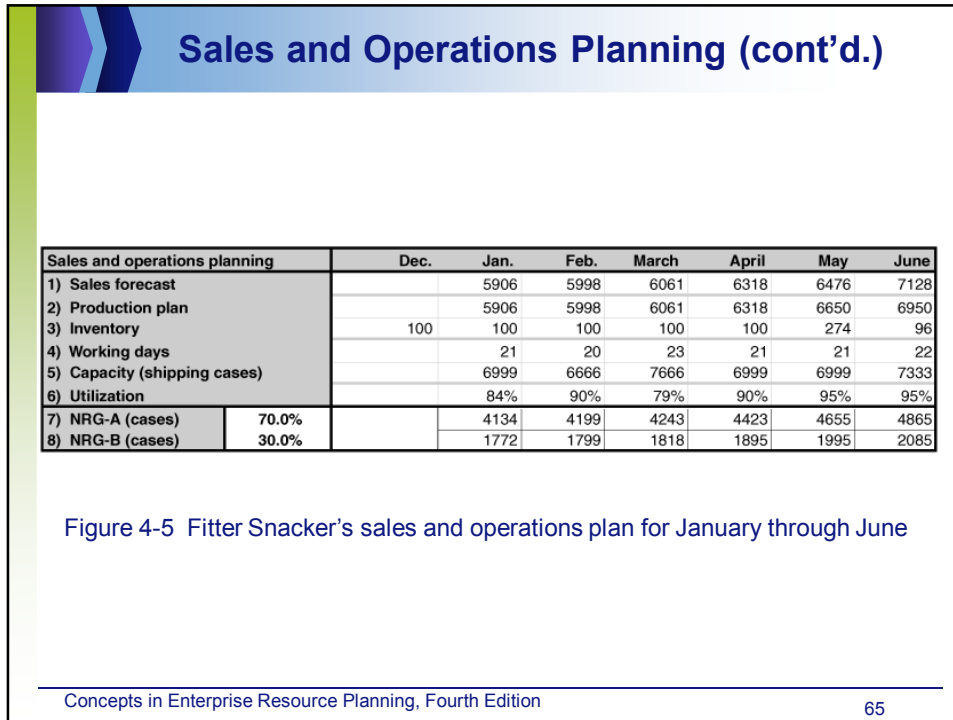
Sales forecasting		Jan.	Feb.	March	April	May	June
Previous year (cases)		5734	5823	5884	6134	6587	6735
Promotion sales (cases)						300	300
Previous year base (cases)		5734	5823	5884	6134	6287	6435
Growth:	3.0%	172	175	177	184	189	193
Base projection (cases)		5906	5998	6061	6318	6476	6628
Promotion (cases)							500
Sales forecast (cases)		5906	5998	6061	6318	6476	7128

Figure 4-3 Fitter Snacker's sales forecast for January through June

## Sales and Operations Planning

- ◆ Sales and operations planning (SOP)
  - Input: sales forecast provided by Marketing
  - Output: production plan designed to balance market demand with production capacity
    - Production plan is the input to the next step, demand management





### Sales and Operations Planning (cont'd.)

- ◆ In SAP ERP, sales forecast can be made using:
  - Historical sales data from the Sales and Distribution (SD) module
  - Input from plans developed in Controlling (CO) module
- ◆ CO module
  - Profit goals for company can be set
  - Sales levels needed to meet the profit goals can be estimated

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## Sales and Operations Planning (cont'd.)

- ◆ **Rough-cut planning:** common term in manufacturing for aggregate planning
  - Disaggregated to generate detailed production schedules
- ◆ Once SAP ERP system generates a forecast, the planner can view the results graphically
- ◆ Rough-cut capacity planning applies simple capacity-estimating techniques to the production plan to see if the techniques are feasible

## Sales and Operations Planning (cont'd.)

- ◆ Disaggregating the sales and operations plan
  - Companies typically develop sales and operations plans for product groups
  - SAP ERP system allows any number of products to be assigned to a product group
  - Sales and operation plan disaggregated
    - Production plan quantities specified for the group are transferred to the individual products that make up the group

## Demand Management

- ◆ Links the sales and operations planning process with detailed scheduling and materials requirements planning processes
- ◆ Output: **master production schedule (MPS)**
  - Production plan for all finished goods
- ◆ For Fitter Snacker, MPS is an input to detailed scheduling, which determines what bars to make and when to make them

## Demand Management (cont'd.)

	Week 1	Week 2	Week 3	Week 4	Week 5	
<b>Demand management</b>	1/3-1/7	1/10-1/14	1/17-1/21	1/24-1/28	1/31	2/1-2/4
<b>Monthly demand NRG-A</b>	4134	4134	4134	4134	4134	4199
<b>NRG-B</b>	1772	1772	1772	1772	1772	1799
<b>Working days in week</b>	5	5	5	5	1	4
<b>Working days in month</b>	21	21	21	21	21	20
<b>MPS NRG-A</b>	984	984	984	984	1037	
<b>Weekly demand NRG-B</b>	422	422	422	422	444	

	Jan 3	Jan 4	Jan 5	Jan 6	Jan 7
<b>Demand management</b>					
<b>Monthly Demand NRG-A</b>	4134	4134	4134	4134	4134
<b>NRG-B</b>	1772	1772	1772	1772	1772
<b>Working days in month</b>	21	21	21	21	21
<b>MPS NRG-A</b>	197	197	197	197	197
<b>Daily demand NRG-B</b>	84	84	84	84	84

Figure 4-14 Fitter Snacker's production plan for January: The first five weeks of production are followed by a day-by-day disaggregation of week 1

## Materials Requirements Planning (MRP)

- ◆ Determines required quantity and timing of the production or purchase of subassemblies and raw materials needed to support MPS
- ◆ **Bill of material (BOM)**: list of the materials (including quantities) needed to make a product

## Materials Requirements Planning (MRP) (cont'd.)

- ◆ Lead times and lot sizing
  - **Lead time**: cumulative time required for the supplier to receive and process the order, take the material out of stock, package it, load it on a truck, and deliver it to the manufacturer
  - **Lot sizing**: determining production quantities and order quantities
- ◆ **MRP record**: standard way of viewing the MRP process on paper

## Materials Requirements Planning in SAP ERP

- ◆ MRP list shows results of MRP calculations
- ◆ MRP process creates planned orders to meet dependent requirements
- ◆ Stock/Requirements List shows:
  - Planned orders
  - Purchase requisitions (PurRqs)
  - Purchase orders (POitem)
- ◆ Planner can convert a planned order to a purchase order from Stock/Requirements List by double-clicking the planned order line

## Materials Requirements Planning in SAP ERP (cont'd.)

- ◆ Integrated information system allows Purchasing to make the best decision on a vendor based on relevant, up-to-date information
- ◆ Once Purchasing employee decides which vendor to use, the purchase order is transmitted to vendor
  - System can be configured to fax order to vendor, transmit it electronically through EDI (electronic data interchange), or send it over the Internet

## Detailed Scheduling

- ◆ Detailed plan of what is to be produced, considering machine capacity and available labor
- ◆ One key decision in detailed production scheduling
  - How long to make the production runs for each product
  - Production run length requires a balance between setup costs and holding costs to minimize total costs to the company

## Detailed Scheduling (cont'd.)

- ◆ Fitter Snacker uses repetitive manufacturing
- ◆ **Repetitive manufacturing** environments usually involve production lines that are switched from one product to another similar product
  - Production lines are scheduled for a period of time, rather than for a specific number of items

### Detailed Scheduling (cont'd.)

- ◆ Production runs should be decided by evaluating the cost of equipment setup and holding inventory
- ◆ Integrated information system simplifies this analysis
  - Automatically collects accounting information that allows managers to better evaluate schedule trade-offs in terms of costs to company

### Providing Production Data to Accounting

- ◆ In the manufacturing plant, ERP packages do not directly connect with production machines
- ◆ Data can be entered into SAP ERP through a PC on the shop floor, scanned by a barcode reader or radio frequency identification (RFID) technology, or a mobile device
- ◆ In an integrated ERP system, the accounting impact of a material transaction can be recorded automatically

## ERP and Suppliers

- ◆ Fitter Snacker is part of a supply chain
  - Starts with farmers growing oats and wheat
  - Ends with a customer buying an NRG bar from a retail store
- ◆ ERP systems can play a key role in collaborative planning

## ERP and Suppliers (cont'd.)

- ◆ Working with suppliers in a collaborative fashion requires trust among all parties
  - Company opens its records to its suppliers
  - Suppliers can read company's data because of common data formats
- ◆ Advantages
  - Reductions in paperwork
  - Savings in time
  - Other efficiency improvements



## The Traditional Supply Chain

- ◆ **Supply chain:** all activities that occur between the growing or mining of raw materials and the appearance of finished products on the store shelf
- ◆ Traditional supply chain
  - Information is passed through the supply chain reactively as participants increase their product orders
  - Inherent time lags cause problems

## The Traditional Supply Chain (cont'd.)

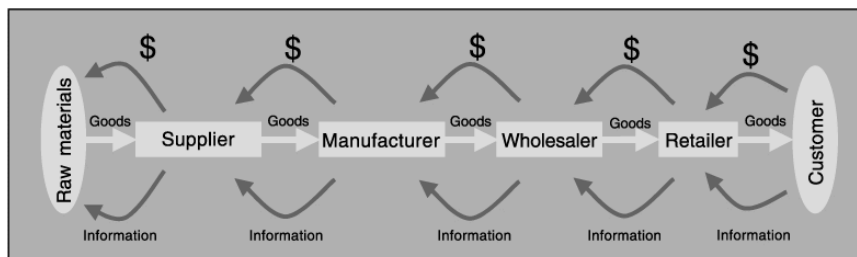


Figure 4-24 Supply chain management (SCM) from raw materials to consumer

## The Traditional Supply Chain (cont'd.)

- ◆ EDI and ERP
  - Before ERP systems were available, companies could be linked with customers and suppliers through electronic data interchange (EDI) systems
  - Well-developed ERP system can facilitate SCM
    - Needed production planning and purchasing systems already in place
  - With ERP system, sharing production plans along the supply chain can occur in real time

## The Measures of Success

- ◆ Performance measurements
  - **Metrics**
    - Show the effects of better supply chain management
- ◆ **Cash-to-cash cycle time**
  - Time between paying for raw materials and collecting cash from customer
- ◆ SCM costs
  - Include cost of buying and handling inventory, processing orders, and information systems support

## The Measures of Success (cont'd.)

- ◆ **Initial fill rate**
  - Percentage of the order that the supplier provided in the first shipment
- ◆ **Initial order lead time**
  - Time needed for the supplier to fill the order
- ◆ **On-time performance**
  - If supplier agreed to requested delivery dates, tracks how often supplier actually met those dates

## ACCOUNTING IN ERP SYSTEMS

## 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

- ◆ 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.)

- ◆ 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 (cont'd.)

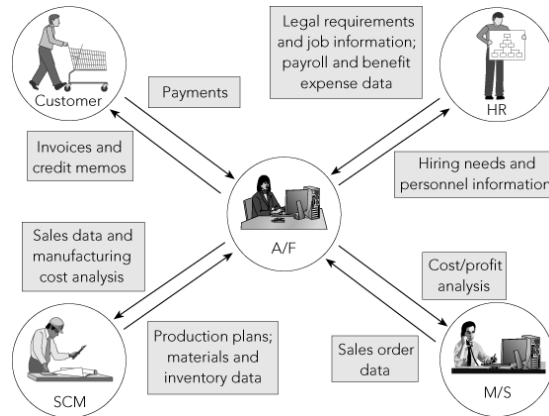


Figure 1-6 The Accounting and Finance functional area exchanges data with customers and with the Human Resources, Marketing and Sales, and Supply Chain Management functional areas

## 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

## Accounting and Finance (cont'd.)

- ◆ Outputs for A/F
  - Payments to suppliers
  - Financial reports
  - Customer credit data

## Accounting Activities

- ◆ Areas of accounting:
  - Financial accounting
  - Managerial accounting
- ◆ **Financial accounting**
  - Documenting all transactions of a company that have an impact on the financial state of the firm
  - Using documented transactions to create reports for external parties and agencies
  - Reports, or financial statements, must follow prescribed rules and guidelines of various agencies

## Accounting Activities (cont'd.)

- ◆ Common financial statements: balance sheets and income statements
- ◆ **Balance sheet**
  - Statement that shows account balances such as:
    - Cash held
    - Amounts owed to company by customers
    - Cost of raw materials and finished-goods inventory
    - Long-term assets such as buildings
    - Amounts owed to vendors, banks, and other creditors
    - Amounts owners have invested in company

## Accounting Activities (cont'd.)

- ◆ **Income statement**
  - **Profit and loss (P&L) statement**
    - Shows company's sales, cost of sales, and profit or loss for a period of time (typically a quarter or year)
- ◆ Integrated information system simplifies the process of closing the books and preparing financial statements
- ◆ **Managerial accounting:** determining costs and profitability of company's activities



## Accounting Activities (cont'd.)

- ◆ Quarterly financial statement
  - Close books
  - Closing entries to nominal accounts
  - Nominal accounts – zero balance to start next cycle
  - Ensure accounts accurate and up-to-date
  - “Adjusting” entries
- ◆ Integrated information system advantage
  - Simplifies process of closing books and preparing financial statements

## Accounting Activities (cont'd.)

- ◆ Managerial accounting
  - Determine costs and profitability of company's activities
  - Provide managers with detailed information
    - Informed decisions
    - Create budgets
    - Determine profitability
  - Information that managers use to control day-to-day activities, develop long-term plans

## Using ERP for Accounting Information

- ◆ Problems associated with unintegrated systems
  - Data sharing usually did not occur in real time
    - Accounting's data were often out of date
  - Accounting personnel had to do significant research
- ◆ ERP system, with its centralized database, avoids these problems
- ◆ In traditional accounting, company's accounts are kept in a record called a **general ledger**

## Using ERP for Accounting Information (cont'd.)

- ◆ In the SAP ERP system, input to general ledger occurs simultaneously with business transactions
- ◆ Many SAP ERP modules cause transaction data to be entered into general ledger, including:
  - Sales and Distribution (SD)
  - Materials Management (MM)
  - Financial Accounting (FI)
  - Controlling (CO)
  - Human Resources (HR)
  - Asset Management (AM)

## Operational Decision-Making Problem: Credit Management

- ◆ Unintegrated information system
  - Out-of-date or inaccurate accounting data can cause problems when a company is making operational decisions
- ◆ Industrial credit management
- ◆ Fitter Snacker's credit management procedures
- ◆ Credit management in SAP ERP

## Industrial Credit Management

- ◆ Credit management requires a good balance between:
  - Granting sufficient credit to support sales *and*
  - Making sure that the company does not lose too much money
- ◆ Setting a limit on how much money a customer can owe at any one time
  - Monitoring that limit as orders come in and payments are received

## Industrial Credit Management (cont'd.)

- ◆ Sales representative needs to be able to review an up-to-date accounts receivable balance when an order comes in
- ◆ Problems arise if Marketing and Accounting have unintegrated information systems
  - Less than full cooperation on updates
- ◆ Problems should not arise with an integrated information system
  - Accounts receivable is immediately updated

## Fitter Snacker's Credit Management Procedures

- ◆ FS sales clerk refers to a weekly printout of a customer's current balance and credit limit to see if credit should be granted
- ◆ Sales data are transferred to Accounting by disk three times a week
- ◆ Accounting clerk can use sales input to prepare a customer invoice
- ◆ Accounting must make any adjustments for partial shipments before preparing the invoice
- ◆ Accounting clerks process customer payments

## Credit Management in SAP ERP

- ◆ SAP ERP would allow FS to set a credit limit for each customer
- ◆ Company can configure any number of credit-check options in SAP ERP system
- ◆ Advantages of using SAP ERP to manage credit
  - Process is automated
  - Data are available in real time

## Product Profitability Analysis

- ◆ Business managers use accounting data to perform profitability analyses of a company and its products
- ◆ When data are inaccurate or incomplete, the analyses are flawed
- ◆ Main reasons for inaccurate or incomplete data
  - Inconsistent recordkeeping
  - Inaccurate inventory costing systems

## Inconsistent Recordkeeping

- ◆ Each of FS's marketing divisions maintains its own records and keeps track of sales data differently
- ◆ Paper records might be inaccurate or missing, making validity of the final report questionable
- ◆ Without integrated information systems, accounting and reporting to management requires:
  - Working around limitations of information systems to produce useful output
- ◆ ERP system minimizes or eliminates these problems

## Inaccurate Inventory Costing Systems

- ◆ Correctly calculating inventory costs
  - One of the most important and challenging accounting tasks in any manufacturing company
- ◆ Inventory cost accounting background
  - Manufactured item's cost has three elements:
    - Cost of raw materials
    - Cost of labor employed directly in production of item
    - **Overhead**: all other costs

## Inaccurate Inventory Costing Systems (cont'd.)

- ◆ Inventory cost accounting background (cont'd.)
  - **Direct costs:** materials and labor
    - Can be estimated fairly accurately
  - **Indirect costs:** overhead items
    - Difficult to associate with specific product(s)
  - **Standard costs** for a product are established by:
    - Studying historical direct and indirect cost patterns
    - Taking into account the effects of current manufacturing changes
  - **Cost variances:** differences between actual costs and standard costs

## Inaccurate Inventory Costing Systems (cont'd.)

- ◆ ERP and inventory cost accounting
  - Many companies with unintegrated accounting systems analyze their cost variances infrequently
    - Often, they do not know how much it actually costs to produce a unit of a product
  - If FS had an ERP system, employees throughout the company would have recorded costs in a company-wide database as they occurred
  - ERP system configurations allow analysts to track costs using many bases

## Inaccurate Inventory Costing Systems (cont'd.)

- ◆ Activity-based costing and ERP
  - **Activity-based costing (ABC)**
    - Accountants identify activities associated with overhead cost generation and then keep records on costs *and* on activities
    - ABC requires more bookkeeping than traditional costing methods

## Management Reporting with ERP Systems

- ◆ Generating the right reports for the right situation is often challenging
- ◆ Without an ERP system, the job of tracking all the numbers that need to go into a report is a monumental undertaking
- ◆ With ERP system, vast amount of information is available for reporting purposes



## Document Flow for Customer Service

- ◆ With an ERP system, all transactions in all areas of a company get posted in a centralized database
- ◆ Each transaction posted in SAP ERP gets its own unique document number
  - Allows quick access to the data
- ◆ In SAP ERP, document numbers for related transactions are associated in the database
  - Provides an electronic audit trail

## Built-In Management-Reporting and Analysis Tools

- ◆ Accounting records maintained in the common database
- ◆ Advantage of using a database is the ability to query the records to:
  - Produce standard reports
  - Answer ad hoc questions
- ◆ SAP provides a **data warehouse** within each major module
  - Data warehouse: repository for data from various sources

## Archiving

- ◆ SAP ERP software offers very few ways to delete items
- ◆ Data are removed from SAP ERP system only after they have been recorded to media (tape backup, DVD-R) for permanent storage
- ◆ **Archive:** permanent storage
- ◆ SAP ERP systems keep track of when data are created or changed
  - Change Record

## User Authorizations

- ◆ SAP ERP has sophisticated user administration tools that allow different levels of authorization management
  - Ensure that employees can perform only the transactions required for their jobs
- ◆ Profile Generator
  - Provides a simple method for selecting functions that a user should be allowed to perform

## Financial Transparency

- ◆ ERP systems provide the ability to drill down from a report to the source documents (transactions) that created it
  - Makes it easier for auditors to confirm the integrity of reports
- ◆ With a properly configured and managed ERP system, there are direct links between the company's financial statements and individual transactions that make up the statements
  - Fraud and abuse can be detected more easily

## Trends in Financial Reporting (XBRL)

- ◆ Extensible Business Reporting Language (XBRL)
  - Standards based language
  - Extensible Markup Language (XML) coded data directly from web page into database
  - Reports processed faster and validated easier
  - ERP systems accept data in XML and XBRL

## HUMAN RESOURCES PROCESSES WITH ERP

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### 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.)

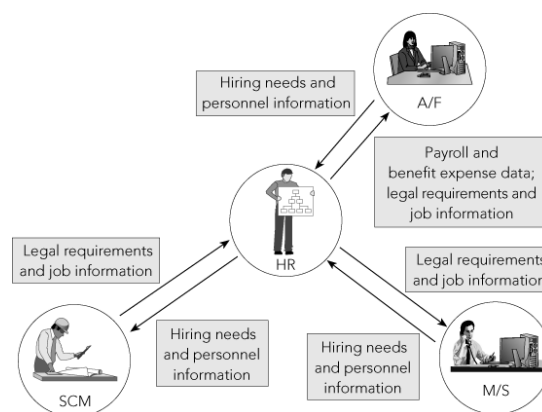


Figure 1-7 The Human Resources functional area exchanges data with the Accounting and Finance, Marketing and Sales, and Supply Chain Management functional areas

## Human Resources (cont'd.)

- ◆ Observing governmental regulations in recruiting, training, compensating, promoting, and terminating employees
- ◆ Inputs for HR
  - Personnel forecasts
  - Skills data

## Human Resources (cont'd.)

- ◆ 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

## Problems with Fitter Snacker's Human Resources Processes

- ◆ Personnel management relies on paper records and a manual filing system
  - Creates problems
  - Information is not readily accessible or easy to analyze

## Recruiting Process

- ◆ Fitter Snacker (FS) has three employees in its HR department
- ◆ Problems occur because of:
  - Large number of HR processes (from hiring and firing to managing health benefits)
  - Lack of integration among all departments
  - Number of people with whom HR interacts
  - Inaccurate, out-of-date, and inconsistent information

## Recruiting Process (cont'd.)

- ◆ Problems that can arise in the recruiting process:
  - Description of qualifications required for the job may be incomplete or inaccurate
  - Job vacancy form may be lost or not routed properly
    - Human Resources department will not know that the position is available
    - Supervisor will assume that paperwork is in process
- ◆ Filing and properly keeping track of resumes and applications is a challenge at Fitter Snacker
  - Due to applicant's data being kept on paper form



## The Interviewing and Hiring Process

- ◆ At FS, requesting department develops a short list of candidates based on data provided by HR
- ◆ Human Resources department:
  - Contacts candidates on the short list
  - Schedules interviews
  - Creates a file for each candidate
- ◆ If a candidate accepts an interview offer, HR makes arrangements for the interview
  - After the initial interview, HR updates candidate's file to indicate whether he or she is a possibility for hire

## The Interviewing and Hiring Process (cont'd.)

- ◆ Second interview may be scheduled
- ◆ HR representative and supervisor of requesting department decide which candidates are acceptable and rank them
- ◆ HR person makes the highest-ranking candidate a job offer
- ◆ Acceptance of job offer by candidate

## The Interviewing and Hiring Process (cont'd.)

- ◆ Many of Fitter Snacker's problems in interviewing and hiring process deal with information flow and communication
- ◆ After candidate accepts formal job offer, Fitter Snacker hires an HR consulting firm to perform a background check
- ◆ Fitter Snacker frequently has problems enrolling new employees in correct benefits plans and establishing proper payroll deductions

## Human Resources Duties after Hiring

- ◆ HR department should maintain good, continual communication with employee and supervisor to make sure the employee is performing well
- ◆ Fitter Snacker issues performance evaluations to new and current employees
  - Evaluation documents become part of employee's file; maintained by HR department

## Human Resources Duties after Hiring (cont'd.)

- ◆ Not having an effective information system makes it difficult for Fitter Snacker:
  - To manage all of the performance evaluation data
  - For HR department to identify problems with an employee and take corrective action
  - To maintain proper control of sensitive personal information

## Human Resources Duties after Hiring (cont'd.)

- ◆ Employee turnover can be a significant problem
  - Costs related to hiring and training new employees
  - Companies lose knowledge and skills that may be crucial to keeping them competitive
  - Employee turnover is strongly related to job satisfaction and compensation

## Human Resources with ERP Software

- ◆ A good information system allows all relevant information for an employee to be retrieved in a matter of seconds
- ◆ SAP ERP Human Resources (HR) module provides tools for:
  - Managing an organization's roles and responsibilities
  - Definitions
  - Personal employee information
  - Tasks related to time management, payroll, travel management, and employee training

## Human Resources with ERP Software (cont'd.)

- ◆ SAP ERP's Organization and Staffing Plan tool used to define:
  - Company's management structure
  - Positions within the organizational structure
- ◆ SAP ERP distinguishes between **task**, **job**, **position**, and **person**
- ◆ Manager's Desktop tool within SAP HR module
  - Provides access to all Human Resources data and transactions in one location

## Human Resources with ERP Software (cont'd.)



Figure 6-3 Relationships among positions, jobs, tasks, and persons who fill positions

## Advanced SAP ERP Human Resources Features

- ◆ Time management
- ◆ Payroll processing
- ◆ Travel management
- ◆ Training and development

## Time Management

- ◆ Hourly employees
  - Paid for each hour worked
  - Must record time that they work
- ◆ Salaried employees
  - Not paid based on hours worked
  - Their time worked usually must be tracked as well

## Time Management (cont'd.)

- ◆ SAP ERP system uses Cross Application Time Sheets (CATS) to:
  - Record employee working times
  - Provide the data to applications including:
    - SAP Controlling module
    - SAP Payroll module
    - SAP Production Planning module

## Payroll

- ◆ **Remuneration elements** of an employee's pay
  - Base pay, bonuses, gratuities, overtime, sick pay, and vacation allowances
- ◆ **Statutory and voluntary deductions**
  - Taxes (federal, state, local, Social Security, and Medicare), company loans, and benefit contributions
- ◆ **Payroll run:** process of determining each employee's pay
  - SAP ERP system evaluates input data and notes any discrepancies in **error log**

## Travel Management

- ◆ Travel request may originate with employee or employee's manager
- ◆ Travel requests usually require management approval
- ◆ Once travel request is approved, travel reservations must be made

## Travel Management (cont'd.)

- ◆ SAP ERP Travel Management system
  - Maintains travel data for each employee, including flight, hotel, and car preferences
  - Integrates travel data with:
    - Payroll module for reimbursements
    - Financial Accounting and Controlling modules to properly record travel expenses

## Training and Development

- ◆ In SAP ERP system, employee development is driven by qualifications and requirements
  - **Requirements:** skills or abilities associated with a position
  - **Qualifications:** skills or abilities associated with a specific employee
- ◆ One of the most important reasons for managing the development and training of employees is **succession planning**



## Training and Development (cont'd.)

- ◆ Succession plan outlines strategy for replacing key employees when they leave the company
- ◆ Career and Succession Planning components of SAP ERP Human Resources module
  - Allow HR professionals to create, implement, and evaluate succession planning scenarios

## Additional Human Resources Features of SAP ERP

- ◆ Mobile time management
- ◆ Management of family and medical leave
- ◆ Domestic partner handling
- ◆ Administration of long-term incentives
- ◆ Personnel cost planning
- ◆ Management and payroll for global employees
- ◆ Management by objectives

## Mobile Time Management

- ◆ Many employees may not have regular access to a PC
- ◆ Mobile Time Management allows employees to use cellular phones to:
  - Record their working times
  - Record absences
  - Enter a leave request
  - Check their time charge data

## Management of Family and Medical Leave

- ◆ Human Resources module reduces administrative burden imposed by Family and Medical Leave Act (FMLA) of 1993
- ◆ HR system can:
  - Determine whether an employee is eligible to take FMLA absences
  - Automatically deducts those absences from the days the employee takes from allowable leave

## Domestic Partner Handling

- ◆ Human Resources module now supports the management of benefits for domestic partners and their children
- ◆ Provides more flexibility in:
  - Customizing dependent coverage options for health plans
  - Eligibility for enrollment of dependents
  - Designation of beneficiaries

## Administration of Long-Term Incentives

- ◆ Companies must account for expected costs that occur as a result of long-term incentives such as the exercising of stock options
- ◆ Human Resources module now provides more options for processing long-term incentives
  - Integration with SAP Payroll module
    - Can calculate taxes accurately when employees exercise incentives and sell their shares in the company
  - SAP can share incentive data with Accounting

## Personnel Cost Planning

- ◆ Personnel Cost Planning tool
  - Allows HR personnel to define and evaluate planning scenarios to generate cost estimates
- ◆ Performing cost planning and simulation
  - Allows HR to forecast cost estimates by integrating data with other SAP ERP modules

## Management by Objectives

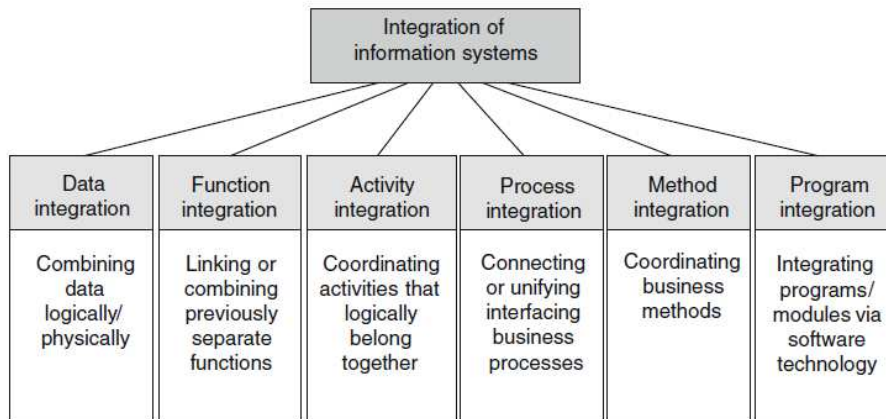
- ◆ Management by objectives (MBO)
  - 1954: first outlined by Peter Drucker in *The Practice of Management*
  - Managers encouraged to focus on results, not activities, and to “negotiate a contract of goals” with their subordinates without dictating the exact methods for achieving them

## Management by Objectives (cont'd.)

- ◆ SAP ERP provides a comprehensive process to support the MBO approach
  - Performance appraisals
    - Appraisal results can affect employee's compensation
  - Managers can include results of achieved objectives in the employee's qualifications profile

## INTEGRATION

## Integration: the key in ERP



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## Integration: the key in ERP

- ◆ Data integration:
  - Data models and databases are combined on a conceptual, logical, and/or physical level, so that all departments and/or business processes use the same data entities with the same values.
- ◆ Function integration:
  - Separate related functions are linked together or combined into one function. An example is connecting computer-aided design (CAD) with product costing, enabling the designer to immediately see the impact of design decisions on the product cost.

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## Integration: the key in ERP

- ◆ Activity integration:
  - Activities that logically belong together are connected or synchronized.
  - This is the case, for example, when one activity triggers the next one, passing all relevant data on to the second activity.
- ◆ Process integration:
  - Different business processes or subprocesses that interface each other are connected or unified (e.g., order fulfillment and production).

## Integration: the key in ERP

- ◆ Method integration:
  - Planning methods are coordinated. For example, the method used for calculating order quantities should match the method used for forecasting in order to avoid unnecessary stock and inventory cost.
- ◆ Program integration:
  - Different programs or modules can work together. This requires the programs to be based on the same software technology or to use an interfacing technology (middleware) that allows them to collaborate.



Questions?