Process Modeling, Process Improvement, and ERP Implementation

Learning Objectives

❖ Use basic flowcharting techniques to map a business process

❖ Develop an Event-driven Process Chain (EPC) diagram of a basic business process

❖ Evaluate the value added by each step in a business process

❖ Develop process improvement suggestions

❖ Discuss the key issues in managing an ERP implementation project

❖ Describe some of the key tools used in managing an ERP implementation project

Process Modeling

Introduction

❖ Tools that can be used to describe business processes

- Flowcharts, event process chains
- Not specific to ERP
- Can help managers identify process elements that can be improved

❖ Role of process-modeling tools in ERP implementation projects

Process Modeling

❖ Business processes can be quite complex

❖ **Process model**: any abstract representation of a process

❖ Process-modeling tools provide a way to describe a business process so that all participants can understand the process

❖ Advantages of process models

- Graphical representations are usually easier to understand than written descriptions

- Provide a good starting point for analyzing a process
  - Participants can design and implement improvements

- Document the business process
  - Easier to train employees to support the business process

Flowcharting Process Models

❖ **Flowchart**
- Any graphical representation of the movement or flow of concrete or abstract items
- Clear, graphical representation of a process from beginning to end
- Uses a standardized set of symbols

❖ **Process mapping**
- Often used interchangeably with flowcharting
- Specifically refers to activities occurring within an *existing* business process

Process Types and Hierarchies

1. Individual processes
   - Carried out by a single individual

Make up ⬇
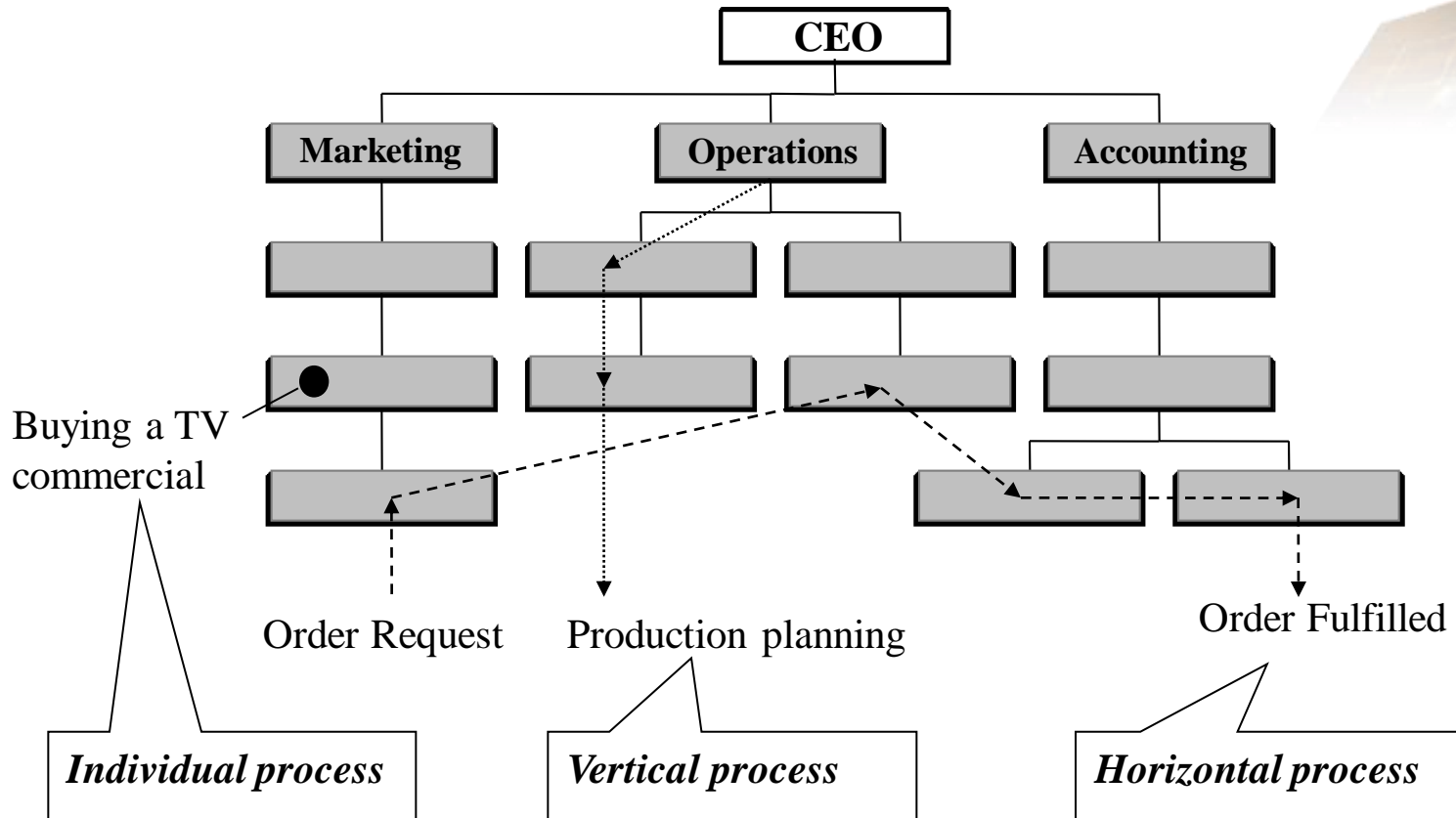
2. Vertical or Functional processes
   - Contained within one functional unit or department

Make up ⬇

3. Horizontal or Cross Functional processes
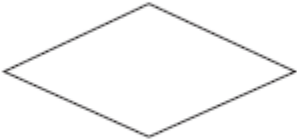   - Spans several functional units, departments or companies

Illustration: Process Types and Hierarchies

Buying a TV commercial

Order Request

Production planning

Order Fulfilled

Individual process

Vertical process

Horizontal process

Basic Flowcharting Symbols

Boundaries (beginning/end of process)

Operation

Decision

Direction of logic

① Connector

Example: Fitter Snacker Expense Report Process

❖ Maria, Fitter Snacker salesperson
- Completes a paper expense report after travel
- Makes a copy for her records
- Attaches receipts for any expenses over $25
- Mails it to her zone manager at the branch office

❖ Kevin, zone manager
- Reviews expense report
- Approves report or mails it back to Maria asking for explanation, verification, or modification
- After approval, mails it to corporate office

❖ Process at corporate office
- Accounts payable (A/P) clerk

❖ Partial process map for Fitter Snacker expense-reporting process
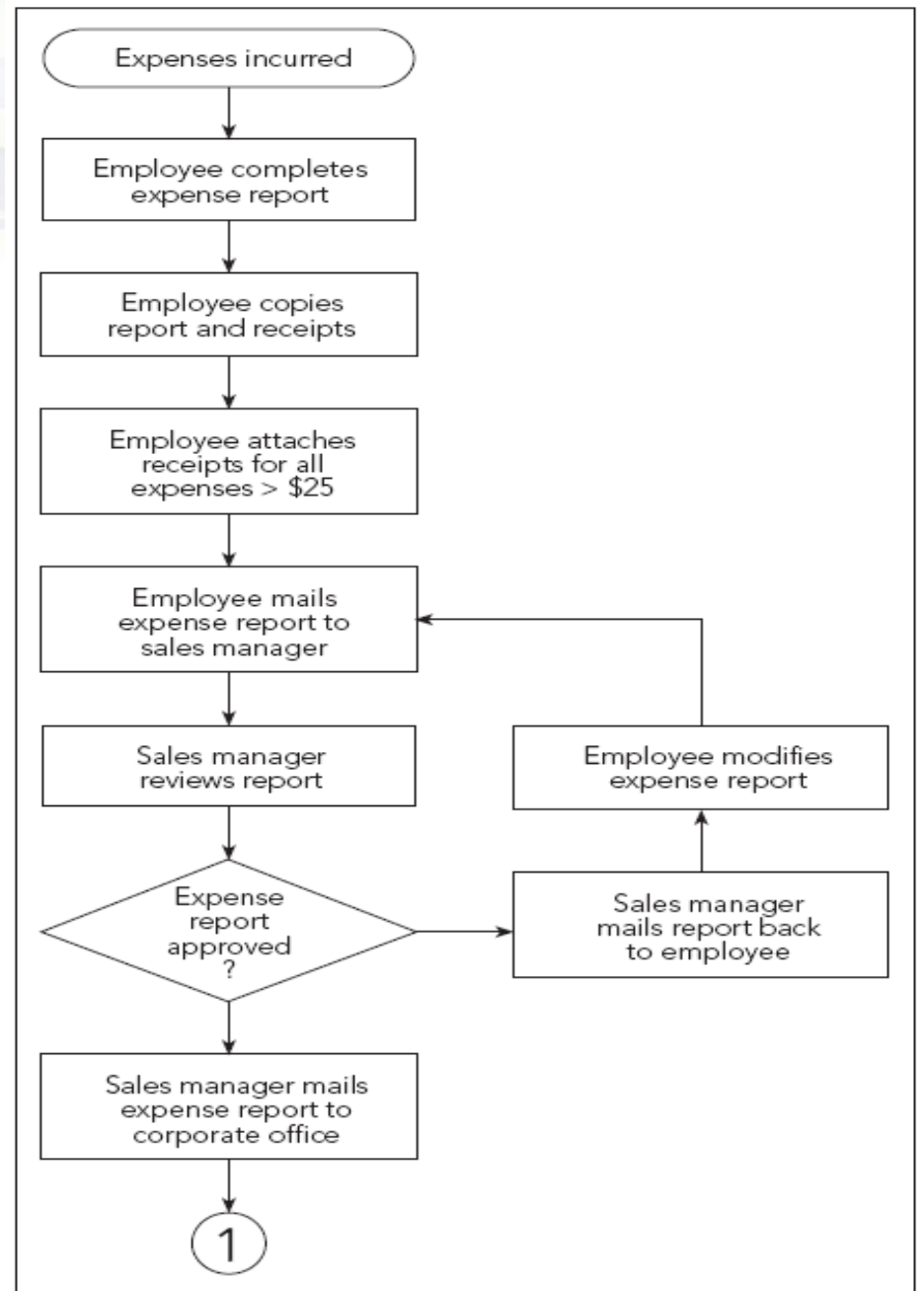
Process Boundaries

❖ **Process boundaries** define:
- Which activities are to be included in the process
- Which activities are considered part of environment—external to process

❖ All processes should have only one beginning point and one ending point

❖ Decision diamond asks a question that can be answered with "yes" or "no"

Extensions of Process Mapping

❖ **Hierarchical modeling**: ability to flexibly describe a business process in greater or less detail, depending on the task at hand

❖ Modeling software that supports hierarchical modeling

  ▪ Provides user the flexibility to move easily from higher-level, less detailed views to the lower-level, more detailed views
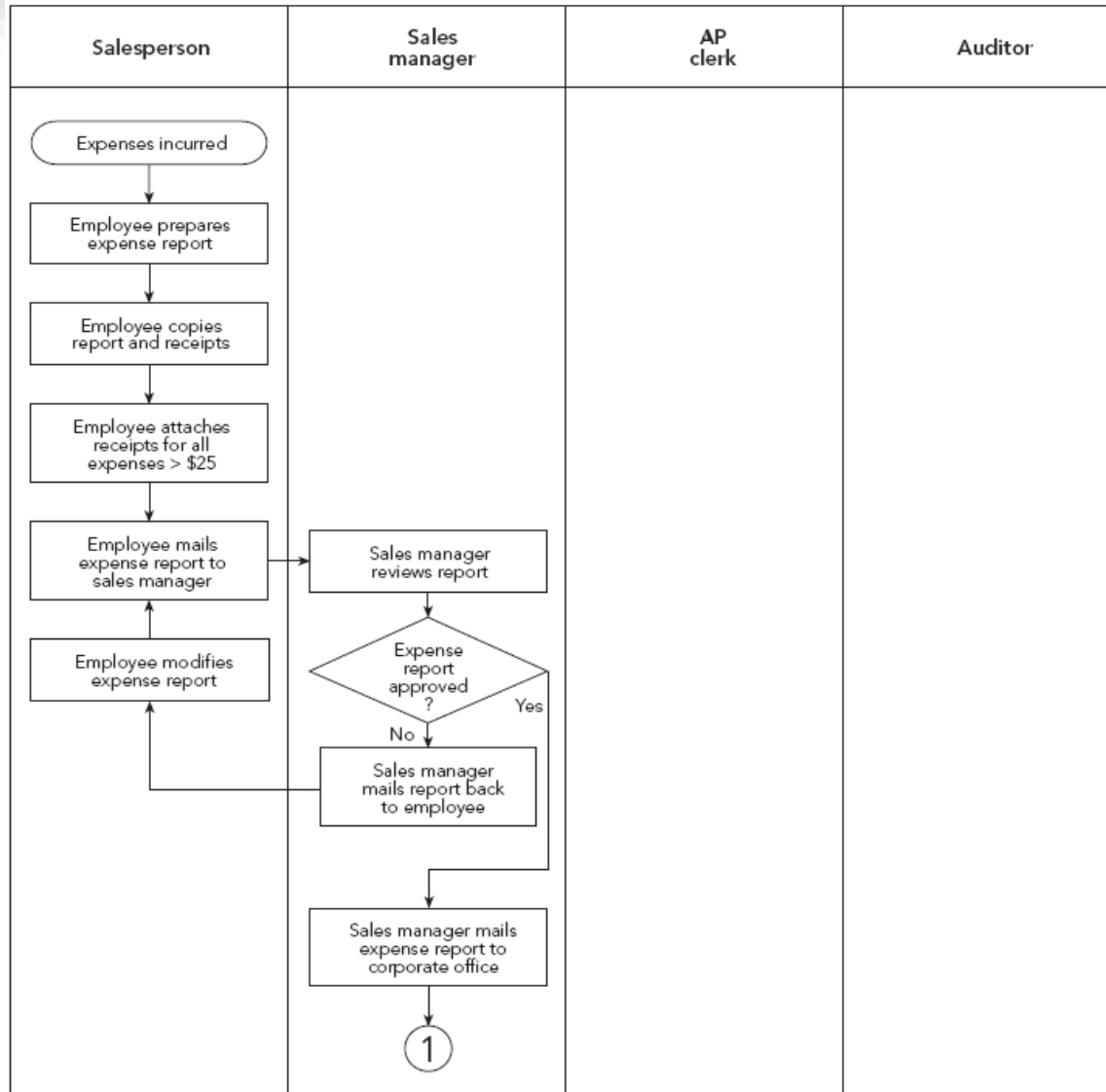
Hierarchical modeling
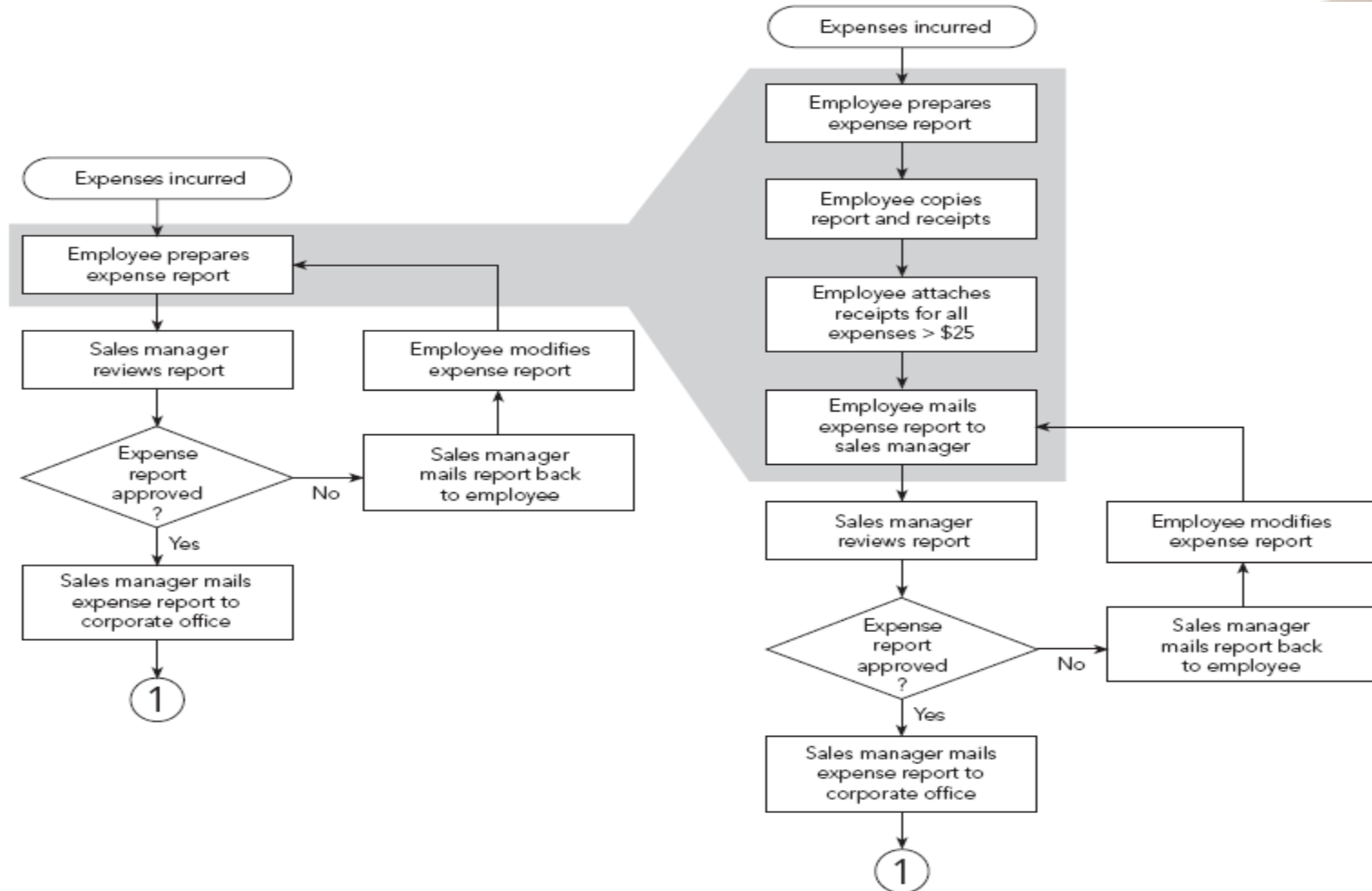
Extensions of Process Mapping [2]

❖ **Deployment flowcharting**

  ▪ **Swimlane flowchart**

  ▪ Depicts team members across the top

  ▪ Each step is aligned vertically under the appropriate employee or team

  ▪ Clearly identifies each person's tasks in the process

Example Swimlane Flowchart

Salesperson	Sales manager	AP clerk	Auditor

```
Salesperson lane:
( Expenses incurred )
        |
        v
[ Employee prepares expense report ]
        |
        v
[ Employee copies report and receipts ]
        |
        v
[ Employee attaches receipts for all expenses > $25 ]
        |
        v
[ Employee mails expense report to sales manager ]  -->  Sales manager lane
        ^
        |
[ Employee modifies expense report ]
        ^
        |
```

```
Sales manager lane:
[ Sales manager reviews report ]
        |
        v
< Expense report approved ? >   -- Yes -->
        | No
        v
[ Sales manager mails report back to employee ]
        |
        v
[ Sales manager mails expense report to corporate office ]
        |
        v
      ( 1 )
```
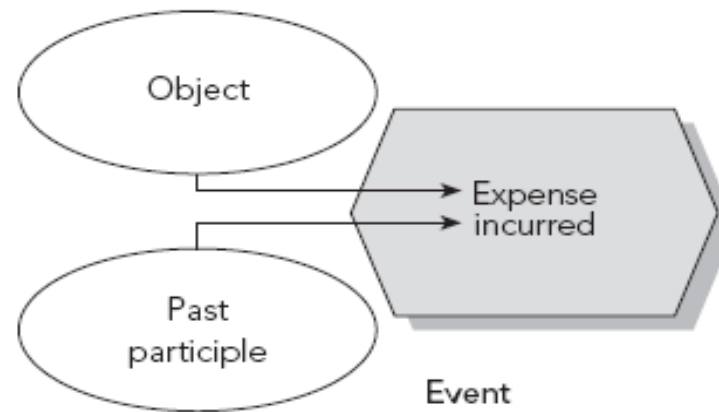
Event-driven Process Chain (EPC) Diagrams

❖ **Event-driven Process Chain (EPC)** format

- Uses only two symbols to represent a business process

- Matches the logic and structure of SAP's ERP software design

- Two structures: events and functions
  - Events: a state or status in the process
  - Functions: part of the process where change occurs

❖ EPC components
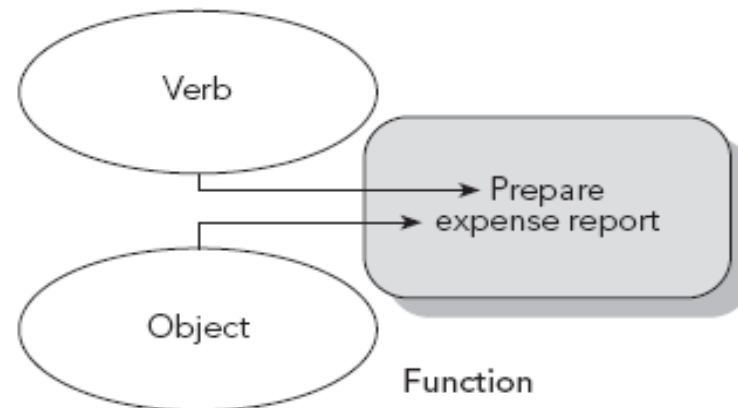
Event-driven Process Chain (EPC) Diagrams [3]

❖ EPC software
- ▪ Enforces an event-function-event structure
- ▪ Standardized naming convention for functions and events

❖ Three types of branching connectors
- ▪ AND
- ▪ OR
- ▪ Exclusive OR (XOR)

❖ Basic EPC diagram can be augmented with additional information
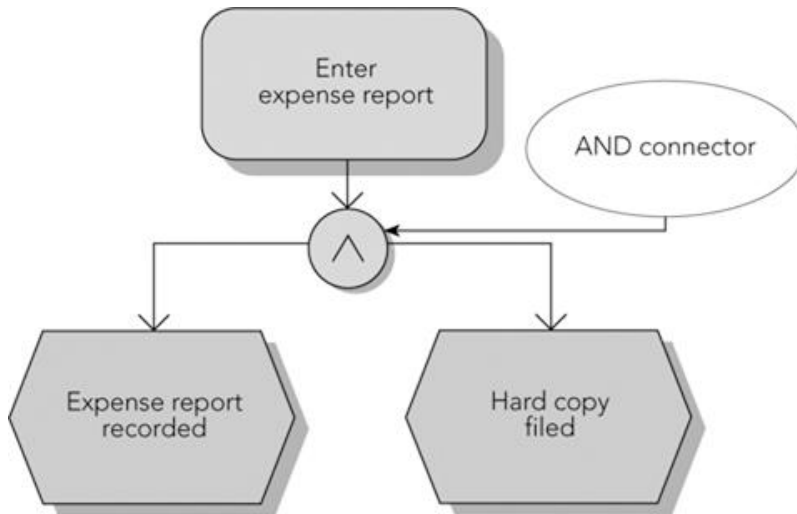
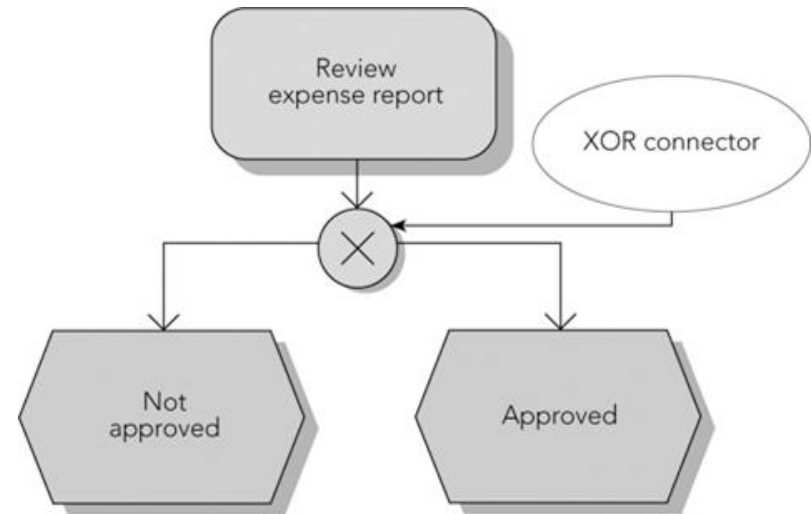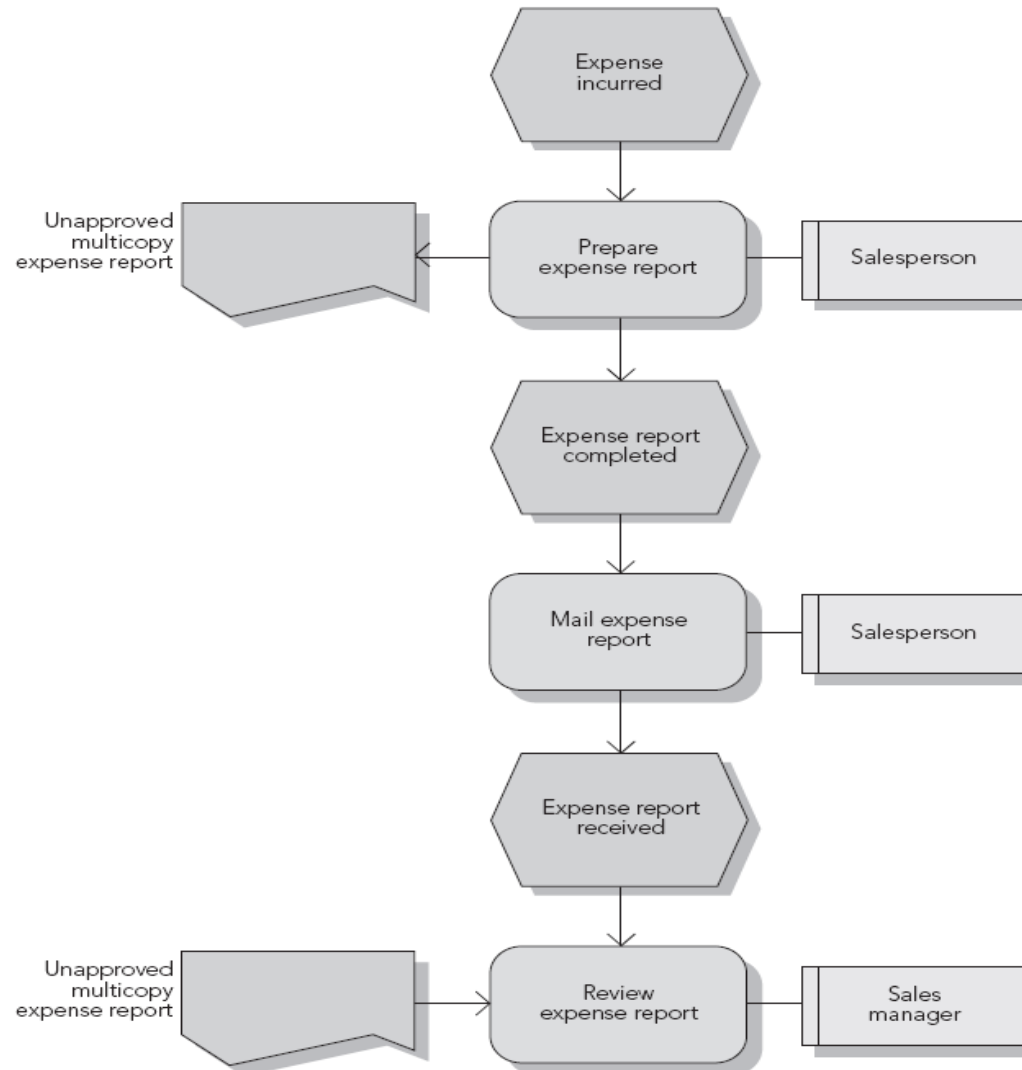# Types of Branching Connectors

❖ Basic EPC layout
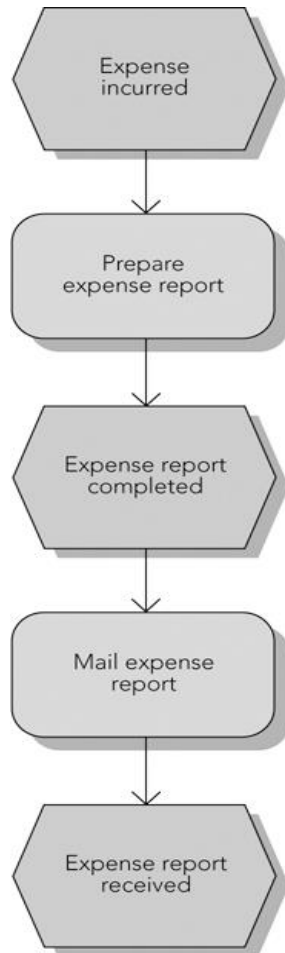
❖ OR connector
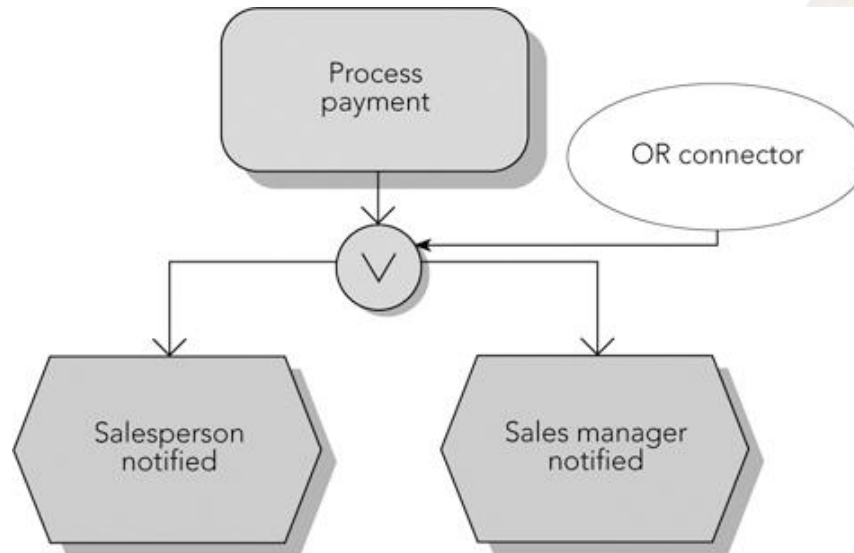
❖ AND connector

❖ XOR connector

EPC Diagram with Organizational and Data Elements

Process Improvement

Process Improvement

❖**Value analysis**

- ▪ Each activity in the process is analyzed for the value it adds to the product or service
- ▪ **Value added** is determined from the perspective of customer
- ▪ *Real value*: value for which the customer is willing to pay
- ▪ *Business value*: value that helps the company run its business
- ▪ *No value*: an activity that should be eliminated

Evaluating Process Improvement

❖ Disrupting the current process to make changes can be costly and time consuming

❖ **Dynamic process modeling** takes a basic process flowchart and puts it into motion

- Uses computer simulation techniques to facilitate the evaluation of proposed process changes

❖ Computer simulation

- Uses repeated generation of random variables that interact with a logical model of the process
- Predict performance of the actual system

ERP Workflow Tools

❖ **Workflow** tools
  ▪ Software programs that automate the execution of business processes and address all aspects of a process, including:
    • Process flow (logical steps in the business process)
    • People involved (the organization)
    • Effects (the process information)

❖ ERP software provides a workflow management system
  ▪ Supports and speeds up business processes

❖ **Workflow tasks**: links that can include basic information, notes, documents, and direct links to business transactions

❖ SAP system can:
  ▪ Monitor workflow tasks
  ▪ If the tasks are not completed on time, can automatically take various actions

SAP ERP Workflow Builder Screen

ERP Workflow Tools [2]

❖ Workflow provides a number of useful features

- Employees can track progress of workflow tasks
- System can be programmed to send reminders to employee(s) responsible for a task
- For sporadic processes, workflow tools are a powerful way to improve process efficiency and effectiveness

ERP Implementation

Implementing ERP Systems

❖ Late 1990s: many firms rushed to implement ERP systems to avoid the Y2K problem

❖ Since 2000: pace of implementations has slowed considerably

- Most Fortune 500 firms have implemented an ERP system

- Current growth is in the small to midsized business market

❖ Implementation of ERP is an ongoing process

Implementation and Change Management

❖ Key challenge is not in managing technology, but in managing people

❖ ERP system changes how people work

- To be effective, change may have to be dramatic

- Business processes that are more effective require fewer people

- Some employees may be eliminated from their current jobs

❖ **Organizational change management (OCM)**: managing the human behavior aspects of organizational change

❖ People do not mind change, they mind *being* changed

❖ If ERP implementation is a project that is being forced on employees, they will resist it

❖ When employees have contributed to a process change, they have a sense of ownership and will likely support the change

Implementation Tools

❖ Many tools are available to help manage implementation projects

- Example: process mapping

❖ SAP provides Solution Manager tool

- Helps companies manage implementation of SAP ERP

❖ In Solution Manager, ERP implementation project is presented in a five-phase Implementation Roadmap:

- Project Preparation (15 to 20 days)

- Business Blueprint (25 to 40 days)

- Realization (55 to 80 days)

- Final Preparation (35 to 55 days)

- Go Live and Support (20 to 24 days)

Implementation Roadmap in Solution Manager

Implementation Tools [2]

❖ Project Preparation

- Organizing technical team
- Defining system landscape
- Selecting hardware and database vendors
- Defining project's scope

❖ Business Blueprint

- Produces detailed documentation of business process requirements of the company

Implementation Tools [3]

❖ Realization

- Project team members work with consultants to configure the ERP software in development system

❖ Final Preparation

- Testing the system throughput for critical business processes
- Setting up help desk for end-users
- Setting up operation of the Production (PROD) system and transferring data from legacy systems
- Conducting end-user training
- Setting Go Live date

Implementation Tools [4]

❖ Go Live and Support

- ▪ Company begins using new ERP system
- ▪ Monitoring of system is critical so that changes can be made quickly if performance of the system is not satisfactory
- ▪ Important to set a date at which the project will be complete
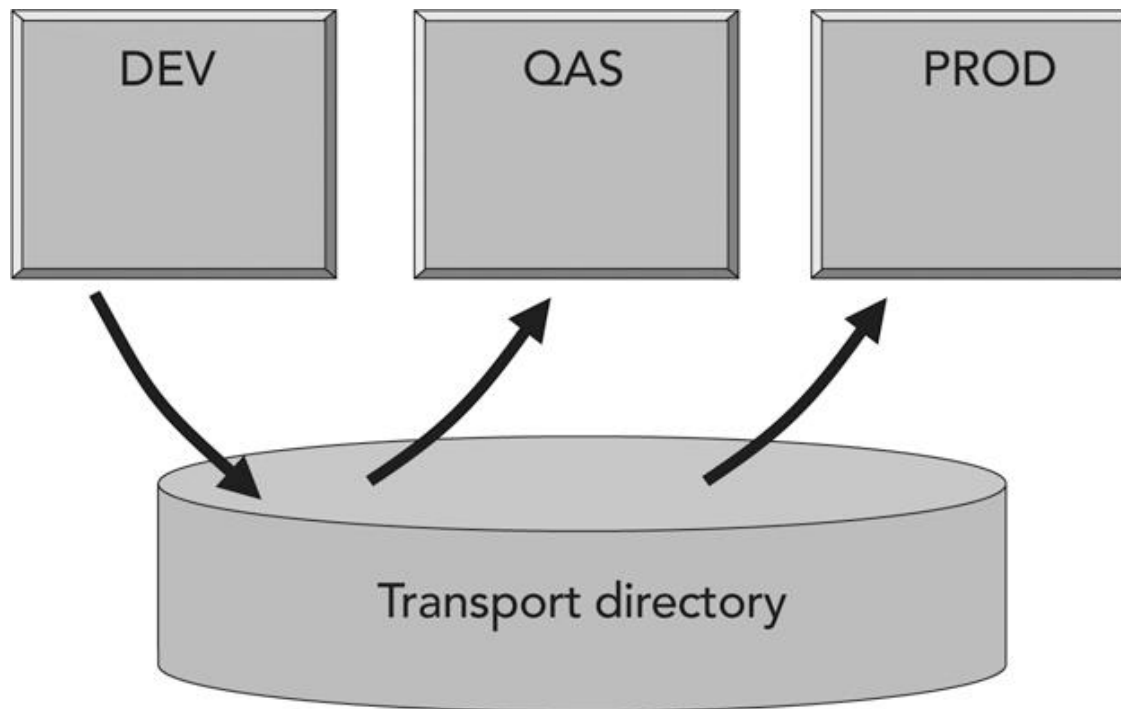
System Landscape Concept

❖ SAP recommends a system landscape for implementation

- Three completely separate SAP systems:
  - **Development (DEV)**
  - **Quality Assurance (QAS)**
  - **Production (PROD)**
- **Transport directory**: special data file location on DEV server

System Landscape Concept [2]

❖ System landscape for SAP ERP implementation

System Landscape Concept [3]

❖ Development (DEV) system used to develop configuration settings and special enhancements using ABAP code

❖ Changes recorded in transport directory

❖ Changes imported into QAS system

❖ QAS system: changes are tested

❖ All settings, programs, and changes that pass testing are transported to PROD system

❖ PROD system: used by company to run its business processes

Summary

❖ Business processes

  ▪ ERP systems are designed to provide the information, analysis tools, and communication abilities to support efficient and effective business processes

  ▪ Process modeling: fundamental tool in understanding and analyzing business processes

❖ Process mapping: process-modeling tool that uses graphical symbols to document business processes

❖ SAP's Solution Manager: set of tools and information that can be used to guide an implementation project

  • Included in SAP ERP to help manage the implementation of ERP software

❖ SAP's system landscape was introduced to show how changes to ERP system during implementation (and beyond) are managed

References

❖ E.F.Monk and B.J. Wagner. *Concepts in Enterprise Resource Planning,* 4th edition. Course Technology, 2013

❖ Magal and Word. *Integrated Business Processes with ERP Systems*. Wiley, 2012

❖ Sumner, Mary. *Enterprise Resource Planning*. Prentice Hall, 2005.

❖ Teaching Materials from SAP University Alliances

2nd Individual Assignment

❖ Submit the answers of these exersices below next week

- ▪ Answer the questions from the book "Concepts in the ERP 4th Ed" no. 2 & 3 (page 212 & 213)