

ILMU KOMPUTER

TOPIC 2 **PROCESS** MODELING, **PROCESS** IMPROVEMENT, IMPLEMENTATION

SISTEM SISTEM PERUSAHAAN
CSIM602262

## **Learning Objectives**

- Student can use basic flowcharting techniques to map a business process
- Student can develop an Event-driven Process Chain (EPC) diagram of a basic business process
- Student can evaluate the value added by each step in a business process
- Student can develop process improvement suggestions
- Student can explain key issues in managing an ERP implementation project
- Student can describe some of the key tools used in managing an ERP implementation project

2.1 PROCESS MODELING USING BASIC FLOWCHART

#### **Process Modeling**

- Tools that can be used to describe business processes
  - -Flowcharts,
  - Event-driven process chains
- Not specific to ERP
- It can help managers identify process elements that can be improved

#### **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**

- I. Individual processes
  - Carried out by a single individual

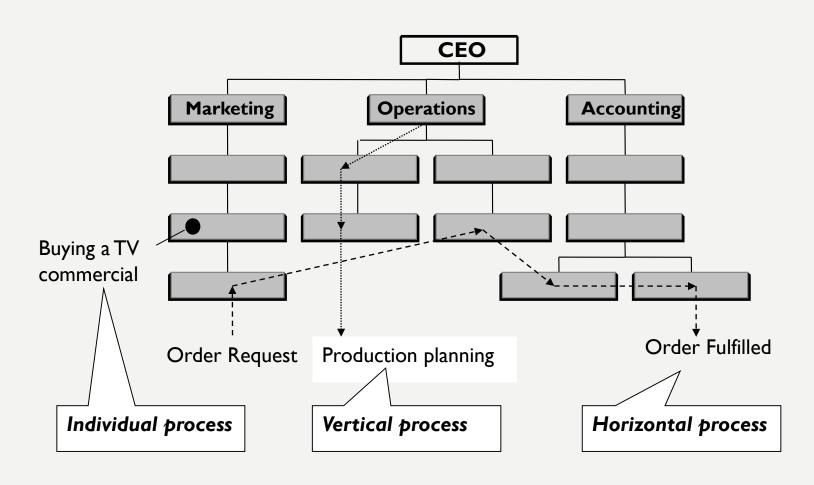


- 2. Vertical or Functional processes
  - Contained within one functional unit or department

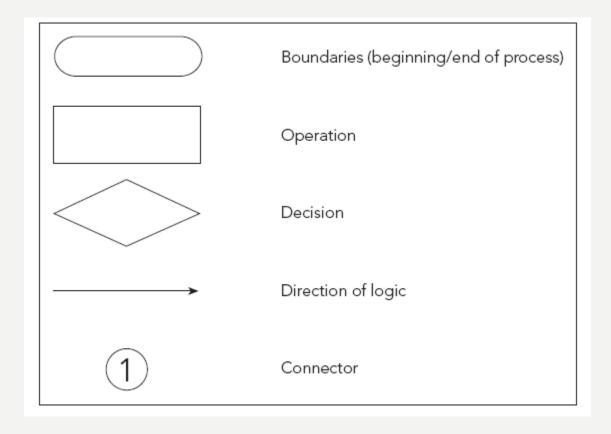


- 3. Horizontal or Cross Functional processes
  - Spans several functional units, departments or companies

## **Illustration: Process Types and Hierarchies**



# **Basic Flowcharting Symbols**



#### **Example: Case Fitter Expense-Reporting Process**

Maria is a Fitter salesperson who travels frequently for her job. After Maria incurs travel expenses on her personal credit card, she completes a paper expense report, makes a copy for her records, attaches receipts for any expenses over \$25, and mails the report to her zone manager at the branch office. The manager, Kevin, reviews the report and either approves it or mails it back to Maria with a note asking for an explanation, verification, or modification. Once Kevin approves the expense report, he mails it to the corporate office. After the administrative assistant sorts the mail at the corporate office, she forwards the expense report to the accounts payable (A/P) clerk, who performs a preliminary check of the report. The clerk contacts Kevin for any necessary clarification, then forwards the expense report to the expense report auditor, who reviews it. If there is a problem with the report, the auditor mails it back to Maria, who revises it and returns it. Then the auditor enters the report into Fitter's PC-based accounting system and files a hard copy with the receipts in a filing cabinet, organized by employee name.

#### **Example: Case Fitter Expense-Reporting 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

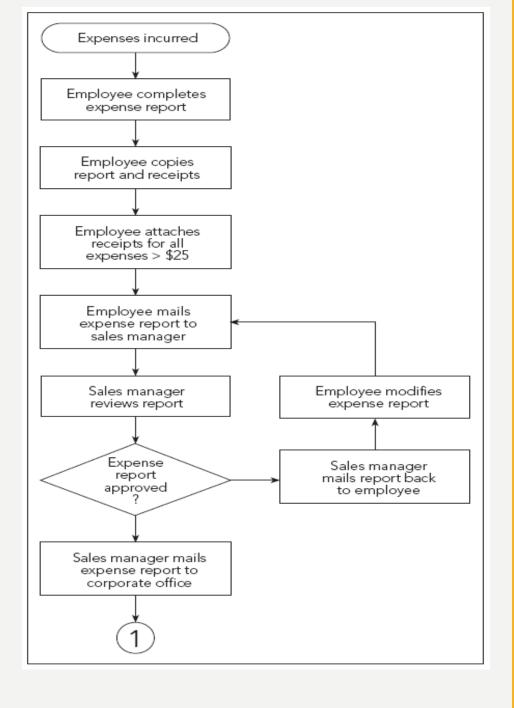
- Reviews expense report
- Approves report or mails it back to Maria asking for explanation, verification, or modification
- After approval, mails it to corporate office

#### Process at corporate office

Accounts payable (A/P) clerk

# **Example: Case Fitter Expense-Reporting Process**

• Partial process map for Fitter Snacker expense-reporting process



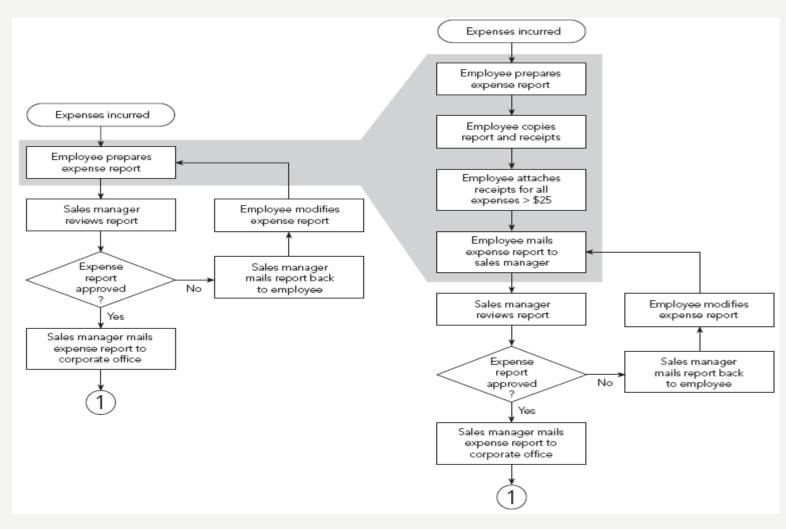
#### **Process Boundaries**

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

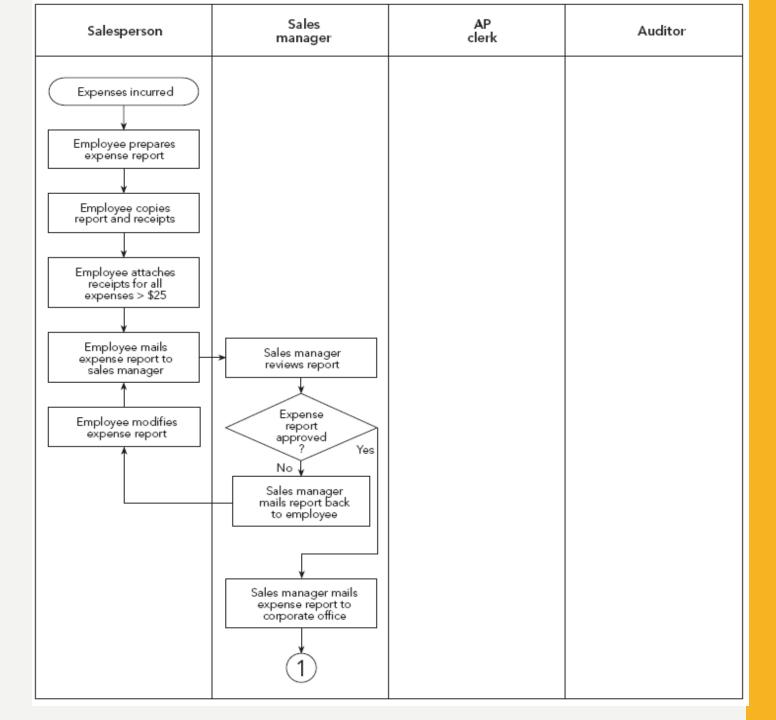
#### **Hierarchical modeling**



#### **Extensions of Process Mapping [2]**

- Deployment flowcharting
  - -Swim-lane 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 Swim- lane Flowchart**

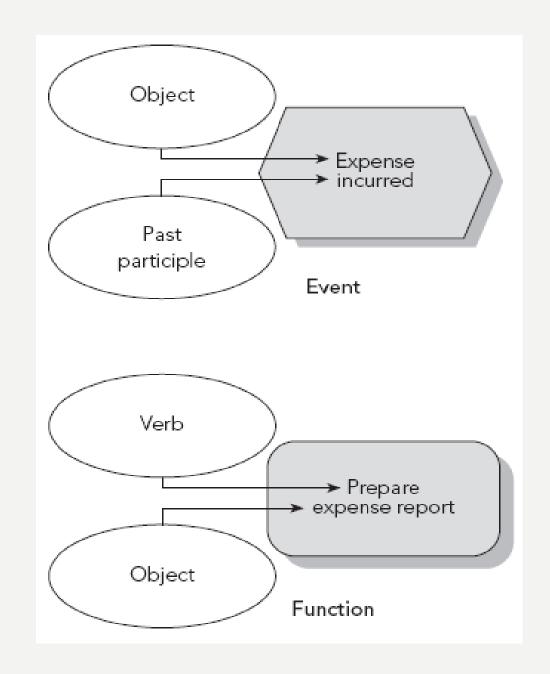


2.2 BUSINESS PROCESS MODELLING USING EPC

#### **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 diagram begin and end with events
  - -Events must be followed by functions and vice versa

# **EPC components**

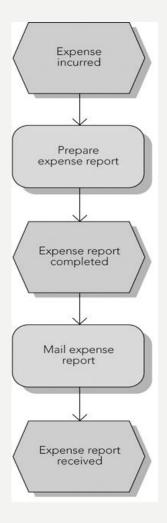


#### **Event-driven Process Chain (EPC) Diagrams**

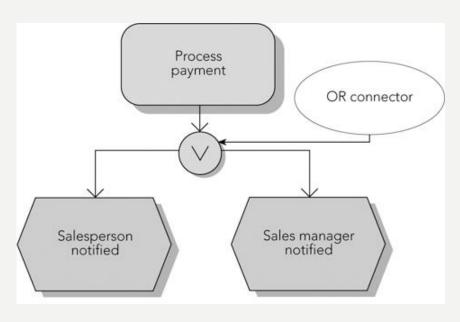
- EPC software
  - -Enforces an event-function-event structure
  - -Standardized naming convention for functions and events
- Three types of branching connectors
  - -AND
  - -OR
  - –Exclusive OR (XOR)
- Basic EPC diagram can be augmented with additional information

# **Types of Branching Connectors**

#### **❖ Basic EPC layout**

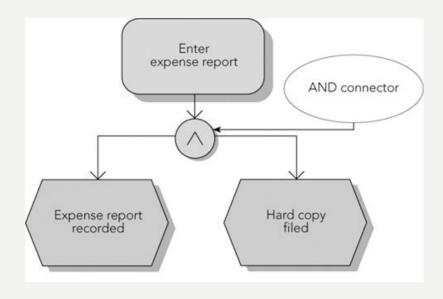


#### **❖** OR connector

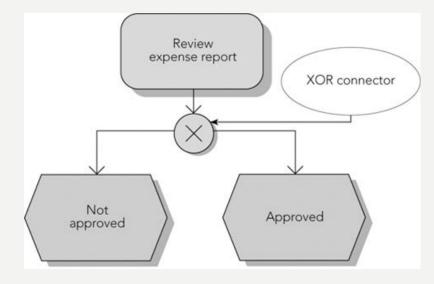


# **Types of Branching Connectors**

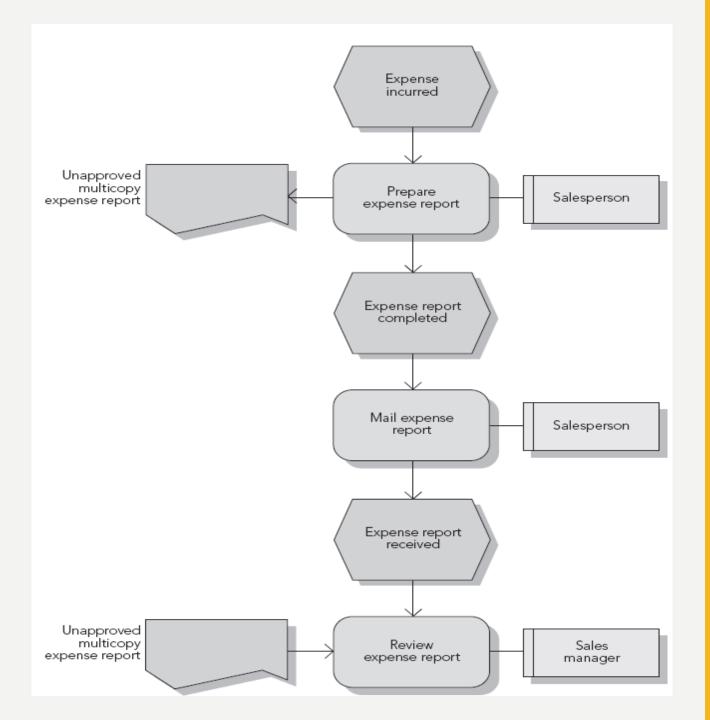
#### **AND** connector



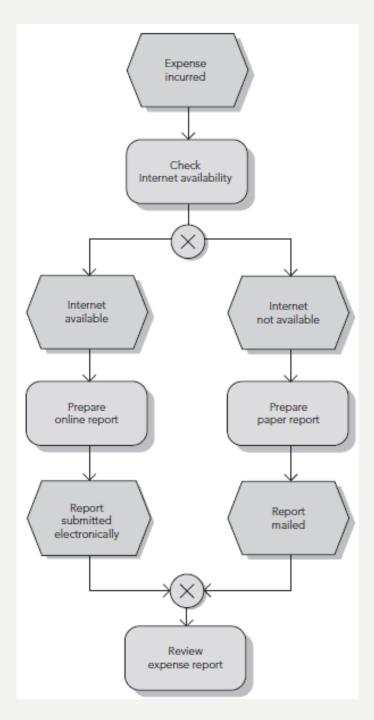
#### **\*** XOR connector



# EPC Diagram with Organizational and Data Elements



# EPC Diagram with Organizational and Data Elements



# 2.3 BUSINESS PROCESS IMPROVEMENT

#### **Process Improvement Techniques**

#### 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

### **Identifying Area for Improvement**

- I. Are there unnecessary checks and balances?
- 2. Does the activity inspect or approve someone else's work?
- 3. Does it require more than one signature?
- 4. Are multiple copies required?
- 5. Are copies stored for no apparent reason?
- 6. Are copies sent to people who do not need the information?
- 7. Is there unnecessary written correspondence?
- 8. Are there people or agencies involved that impede the effectiveness and efficiency of the process?
- 9. Do existing organizational procedures regularly impede the efficient, effective, and timely performance of duties?
- 10. Is someone approving something they already approved (for example, approving capital expenditures that were approved as part of a budget)?
- II. Is the same information being collected at more than one time or location?
- 12. Are duplicate databases being maintained?

# **Approches for Improving Process**

- I. Perform activities in parallel (for example, approvals).
- 2. Change the sequence of activities.
- 3. Reduce interruptions.
- 4. Avoid duplication or fragmentation of tasks.
- 5. Avoid complex flows and bottlenecks.
- 6. Combine similar activities
- 7. Reduce the amount of handling.
- 8. Eliminate unused data.
- 9. Eliminate copies.

#### **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

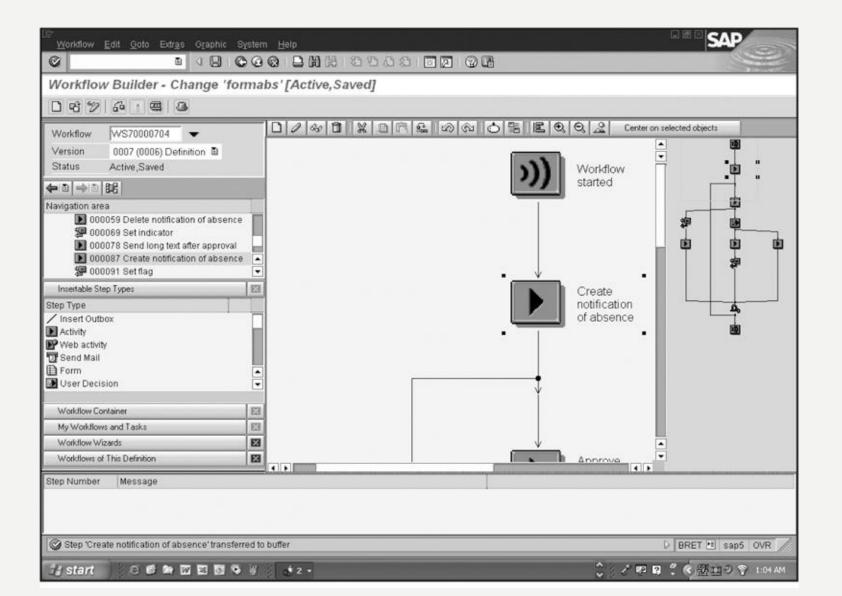
#### **ERP Workflow Tools**

- 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

#### **ERP Workflow Tools**

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

#### **SAP ERP Workflow Builder Screen**



# 2.4 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

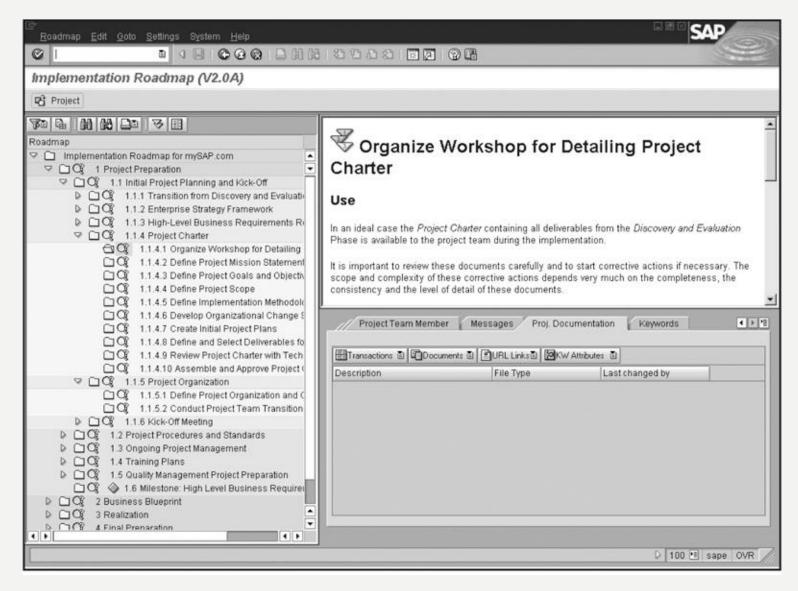
## **Implementation and Change Management**

- 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

# **Implementation and Change Management [2]**

- 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 Roadmap in Solution Manager**



#### **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 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]**

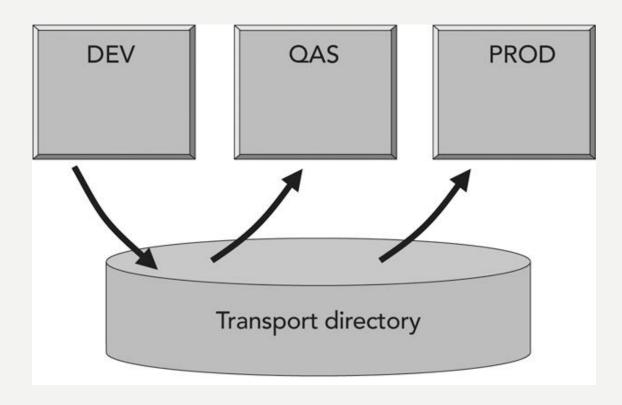
- Go Live and Support
  - Company begins using new ERP system
  - Monitoring of system is critical so that changes can be made quickly if performance of the system is not satisfactory
  - Important to set a date at which the project will be complete

# **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

#### **Summary**

- 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