MONASH University

Information Technology

FIT 3138
Real-Time Enterprise Systems

Lecture 7

Process Modelling and Improvement and ERP Implementation

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

- Discuss business process and process mapping
- Develop an event process chain (EPC) diagram of a basic business process
- Evaluate value added activities and develop process improvement strategies
- Discuss the key issues in managing an ERP implementation project
- Describe some of the key tools used in managing an ERP implementation project

Introduction

Business Process

- What is Business Process Management?
- Business Improvement, Optimisation or Re-engineering?

Process Modelling

- Process mapping
- Tools that can be used to describe business processes – flowcharts, event process chains
- Can help managers identify process elements that can be improved

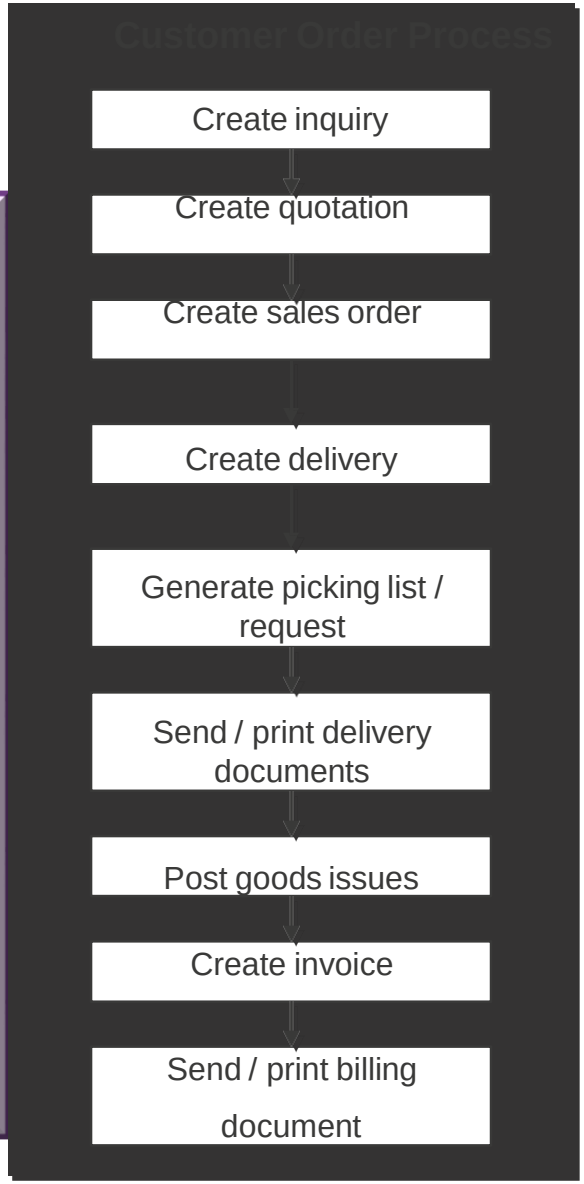
ERP implementation

- Role of process-modeling tools in ERP implementation projects

What is Business Process?

Business Process:

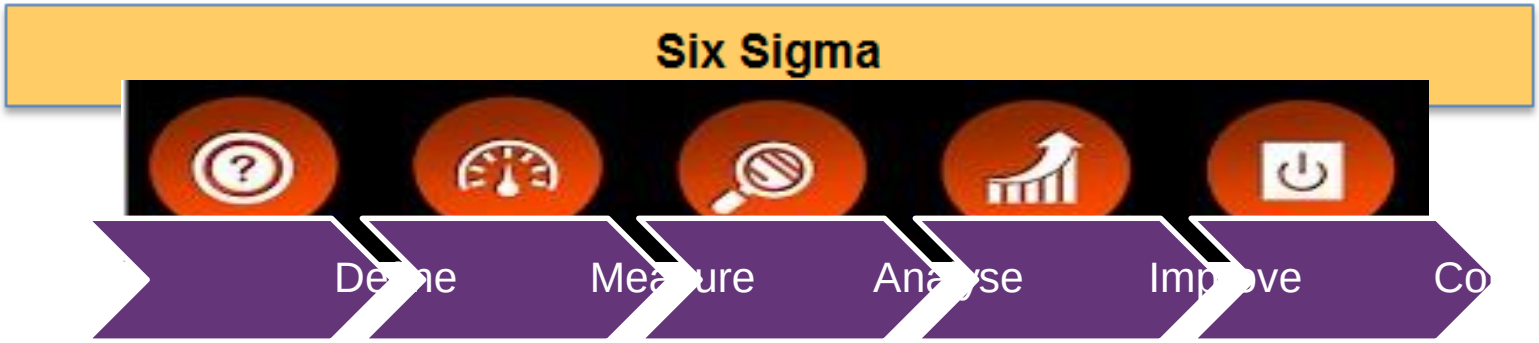
- A business process describes a logical sequence of activities or tasks for the creation of goods and services to achieve a defined business outcome and is driven by a transaction
- A process is “a structured, measured set of activities designed to produce a specified output for a particular customer or market. It implies a strong emphasis on how work is done within an organization.”(Davenport,1993)
- In a company there are several individual processes that are typically interdependent



This is what drives ERP systems

Improvement/Optimisation/Re-engineering?

Business Process Improvement	Business Process Optimization	Business Process Reengineering
Improve Process	Ultimate Efficiency	Radical Change
Remove Waste	Greater Business Value	Start Over from Scratch

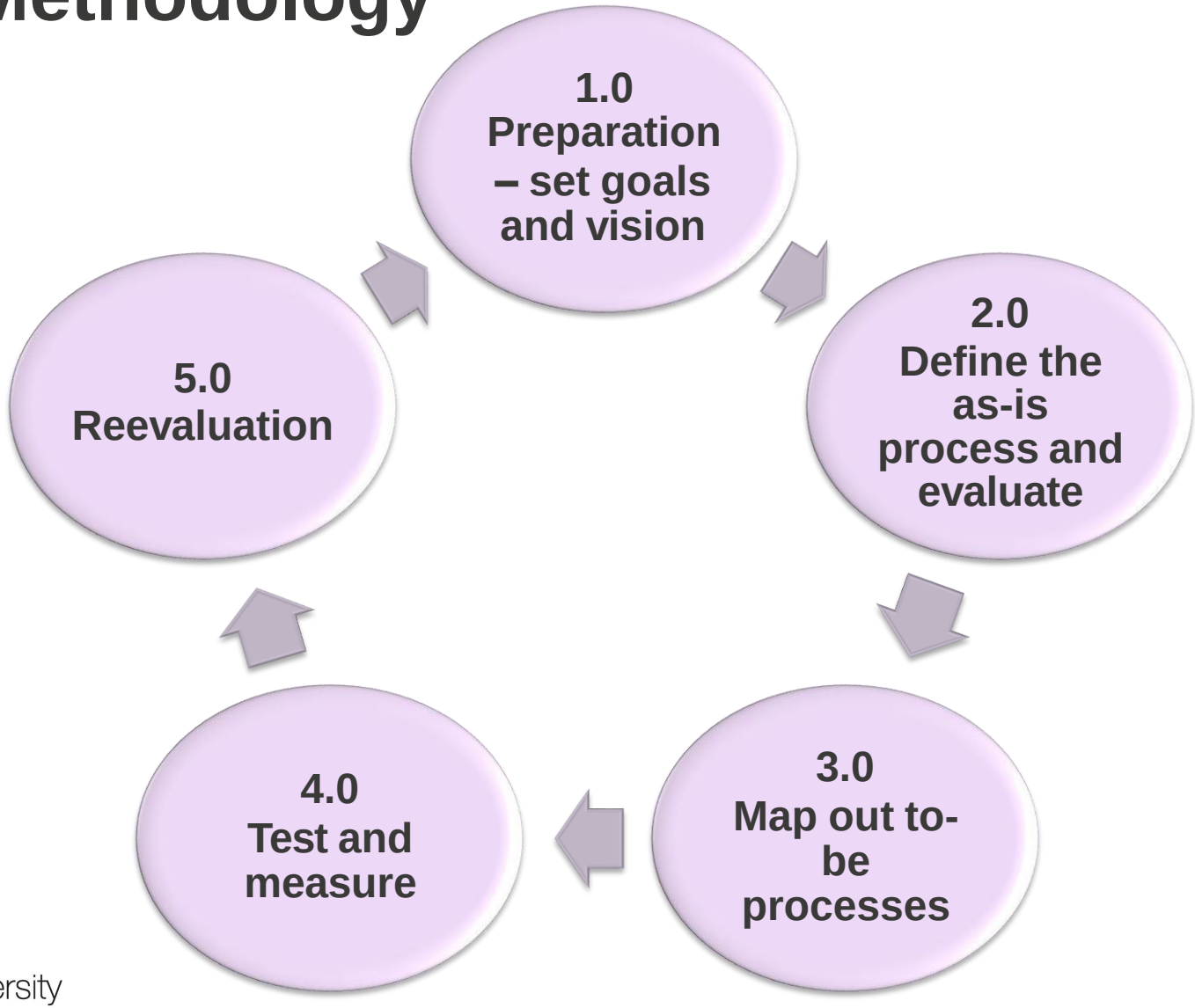


http://panorama-consulting.com/services/business-process-reengineering/

What is Business Process Re-engineering?

- Business process reengineering (BPR) is the analysis and redesign of workflows within and between enterprises in order to optimize end-to-end processes and automate non-value-added tasks.
- Michael Hammer, is one of the BPR gurus and founder of the term itself, BPR is… "*the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed.*"

BPR Methodology



Case - BPR at Ford Motor Company

Ford Motor Company reengineered its procurement and purchasing process

- purchasing
- receiving goods
- accounts payable activities

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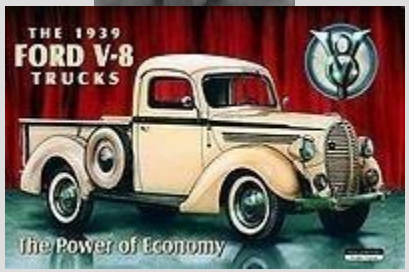


SUMMARY: Ford Accounts Payable example

- …. to save money, Ford had to shift from functional thinking, i.e., improving the efficiency of the Accounts Payable dept., to process thinking.
- "Reengineering is the radical redesign of business processes for dramatic improvement." (Hammer, 1996)
- radical: 500 staff dropped to 130
- process: cross-functional
- computer technology: enable integration

Another case: Hewlett-Packard (HP)

Spent $50m to $100m each year on raw material purchases

Reason:

decentralised system

Problem:

Could not take advantage of high-volume discounts available from suppliers

Did not know who the main suppliers were – used a variety of suppliers

Outcome:

- Re-engineer the system
- one corporate procurement database centrally located
- each division decides their purchasing requirements and sends this to the corporate centre
- the company saved millions of dollars each year

Process Modeling

Process model:

- **any abstract representation of a process**

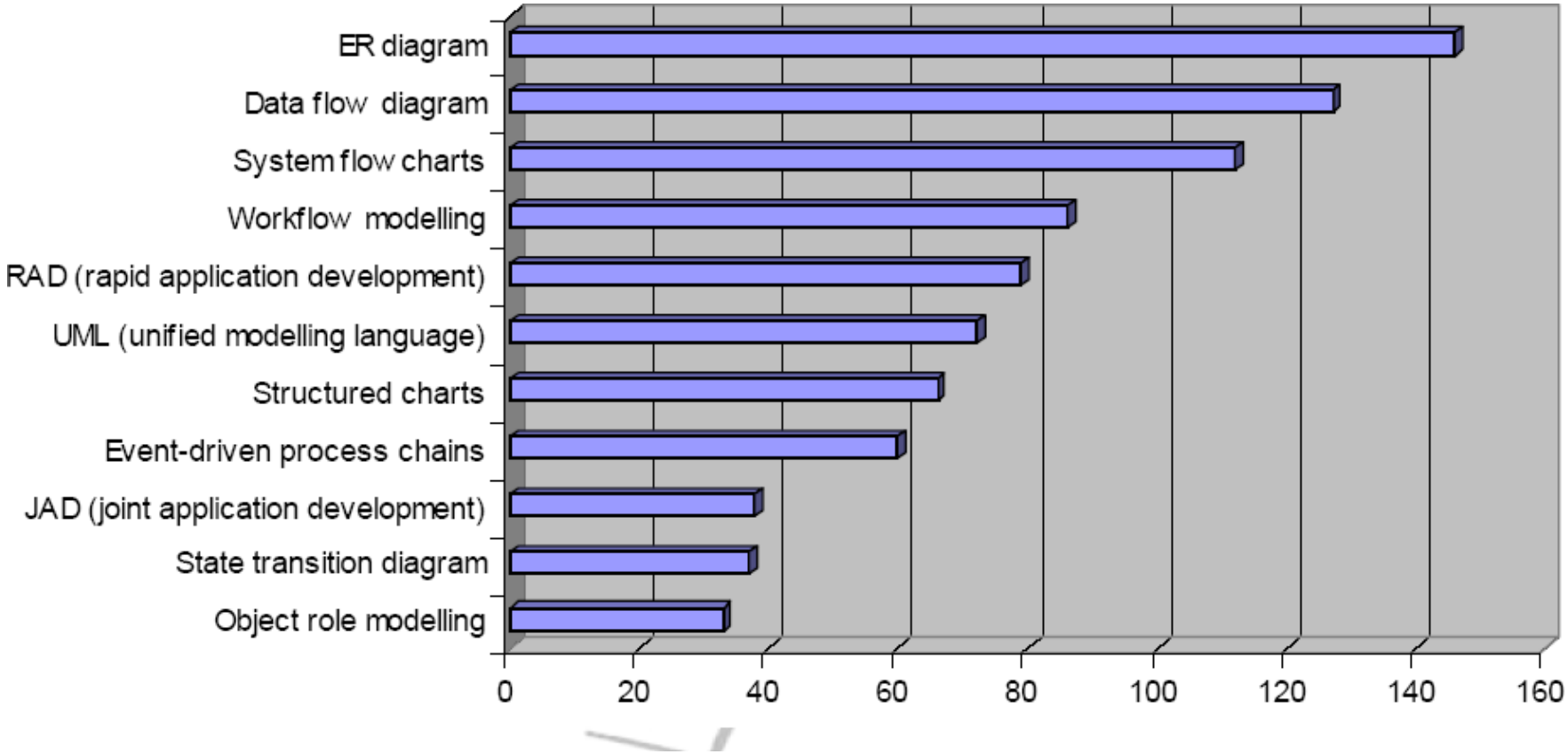
Process-modeling tools

- **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

Current modelling techniques



Process Modelling: Flowcharting Process Models

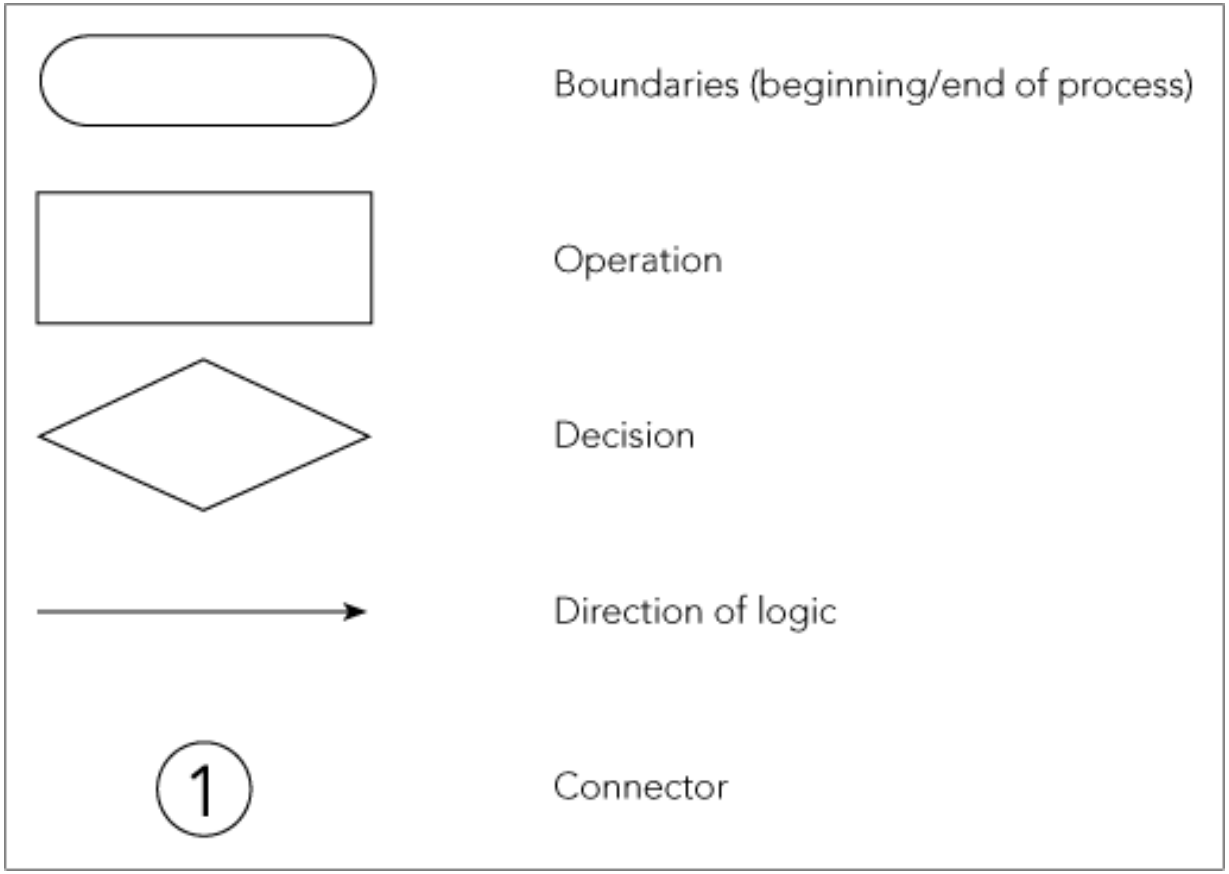
Flowchart

- 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

Flowcharting Process Models – Basic flowcharting symbols



Eg: Fitter Snacker Expense Report Process

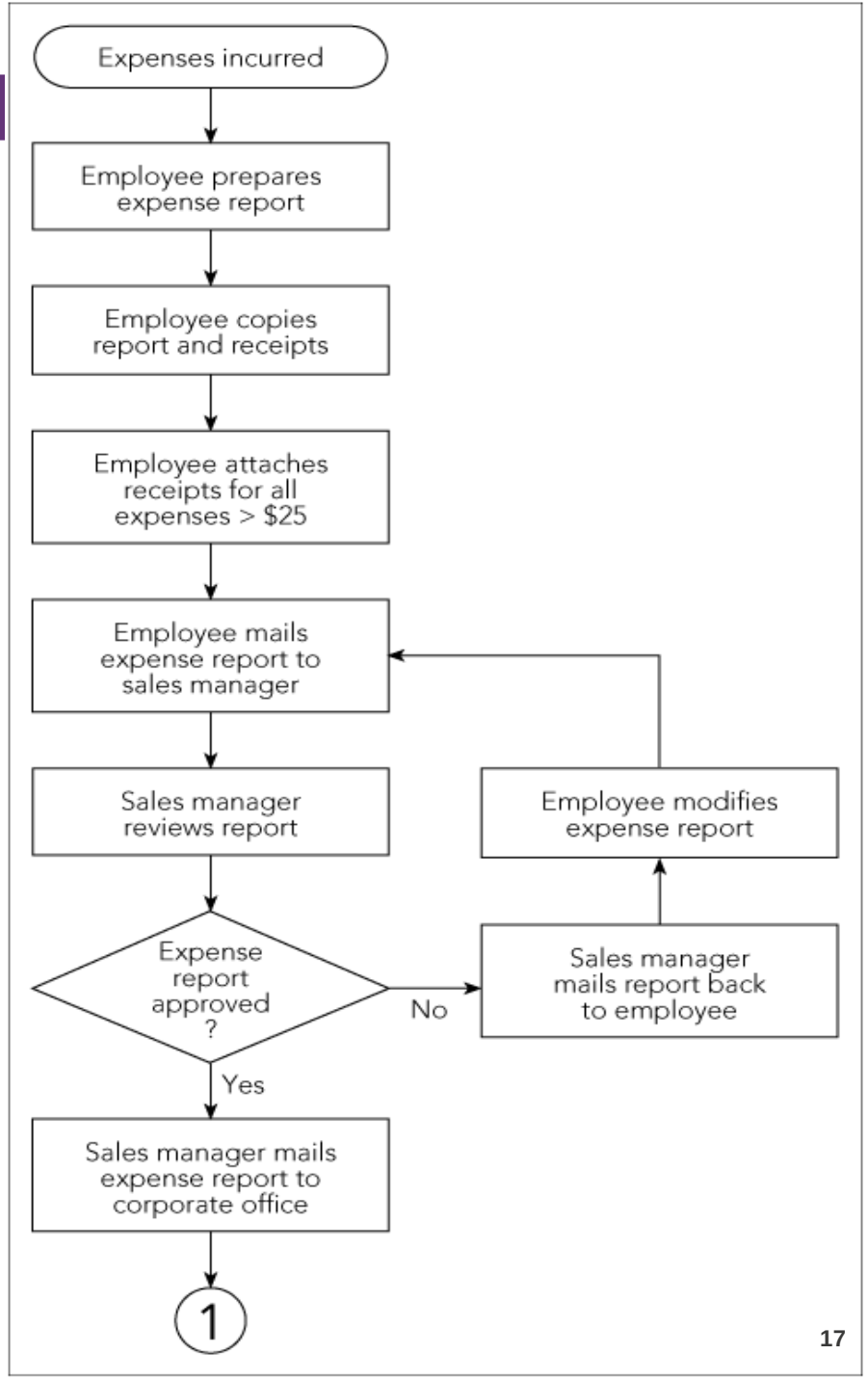
Maria, salesperson

- 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

Partial process map for Fitter Snacker expense-reporting process



FS Expense Report Process – Points to note

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 modelling

- Aid in process mapping by allowing a user to create a broad, high-level view of a process and then add more detail as
- the process is analyzed.
- Provides user the flexibility to move easily from higher-level, less detailed views to the lower-level, more detailed views

Deployment flowcharting

- Also known as **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

Hierarchical modelling

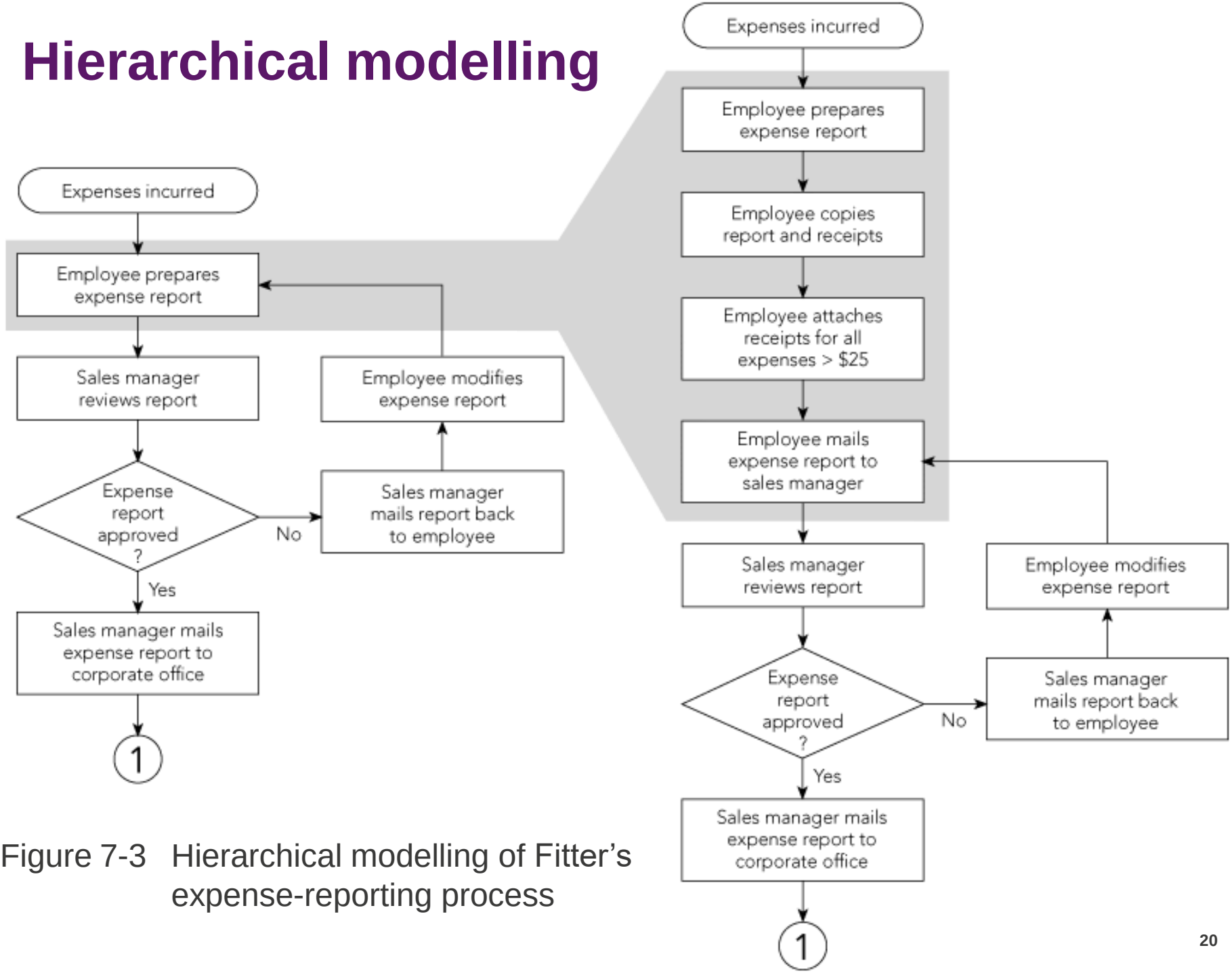
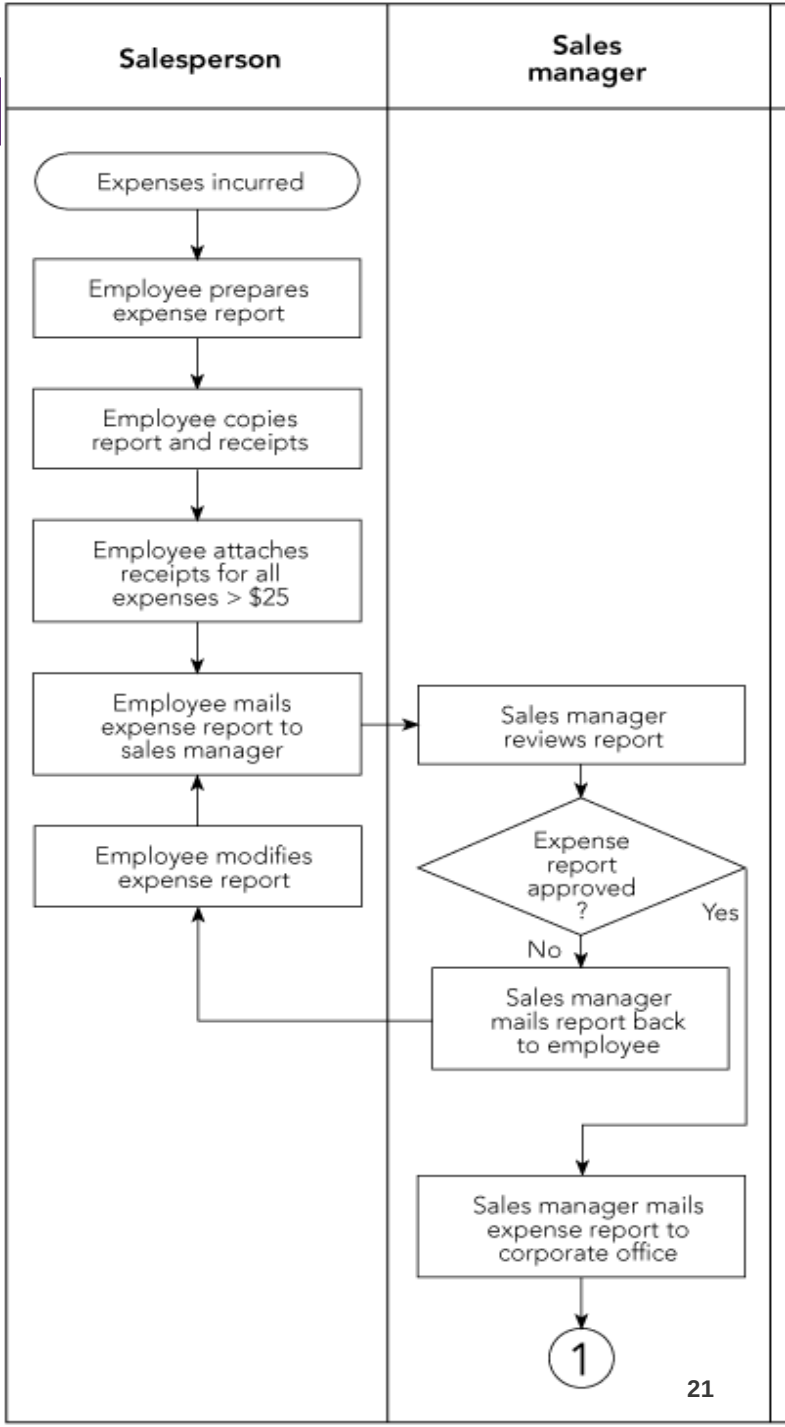


Figure 7-3 Hierarchical modelling of Fitter's expense-reporting process

Deployment flowcharting

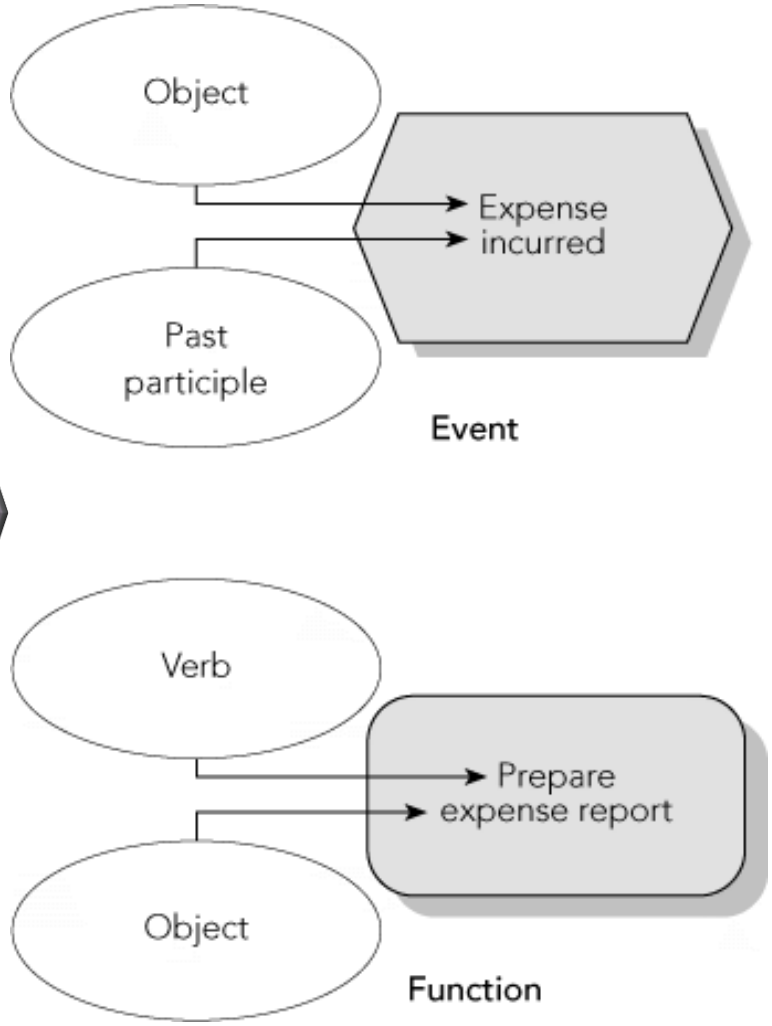


Deployment, or swimlane, flowcharting of the Fitter's expense report process

Event Process Chain (EPC) Diagrams

Event 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 Process Chain (EPC) Diagrams (cont'd.)

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

- This additional information is called a data element

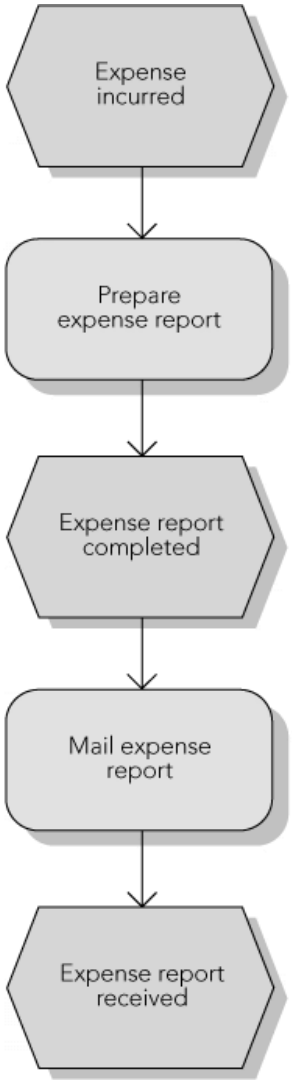


Figure 7-6 Basic EPC layout

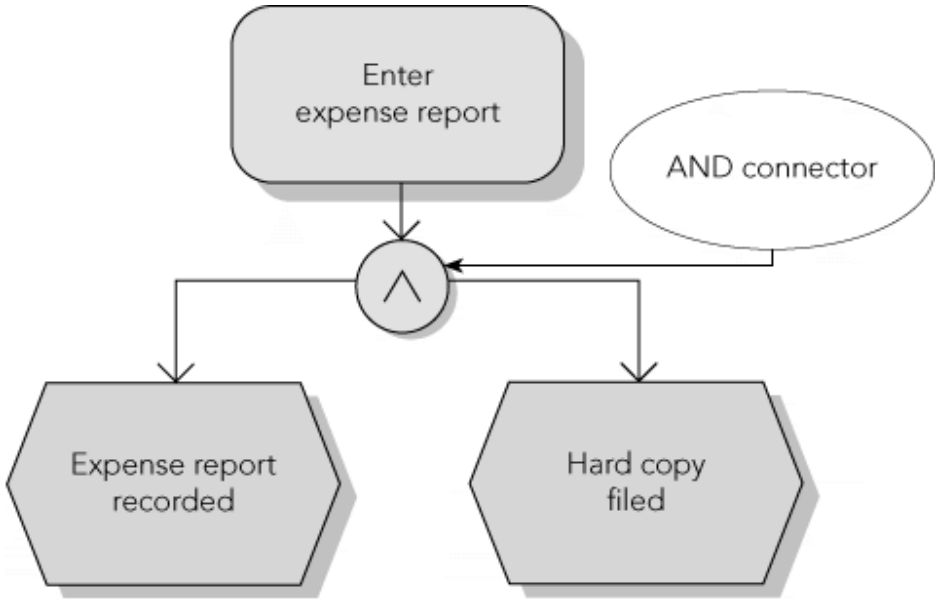


Figure 7-7 AND connector

Event Process Chain (EPC) Diagrams (cont'd.)

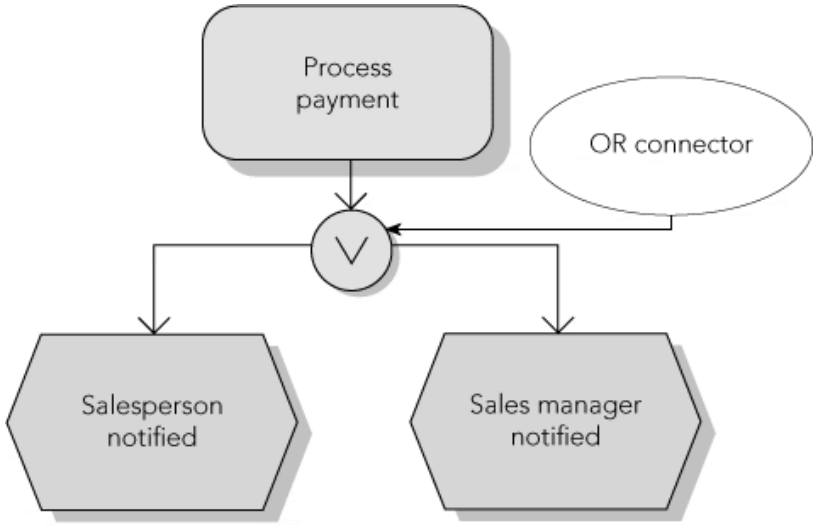


Figure 7-8 OR connector

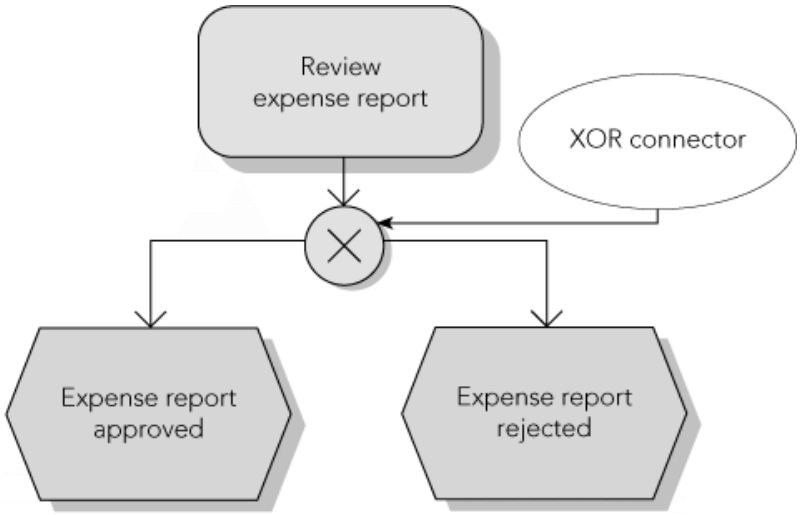
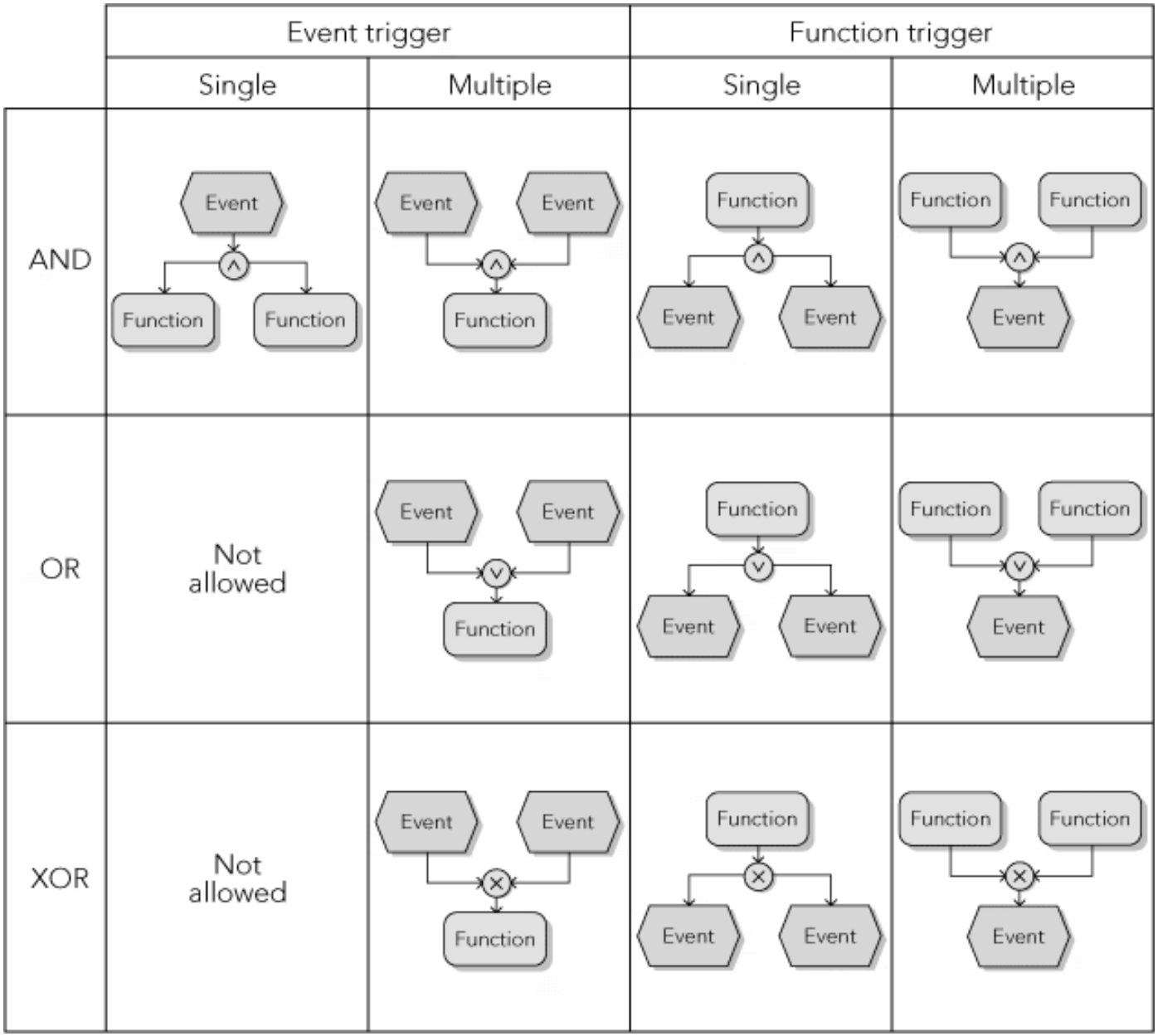


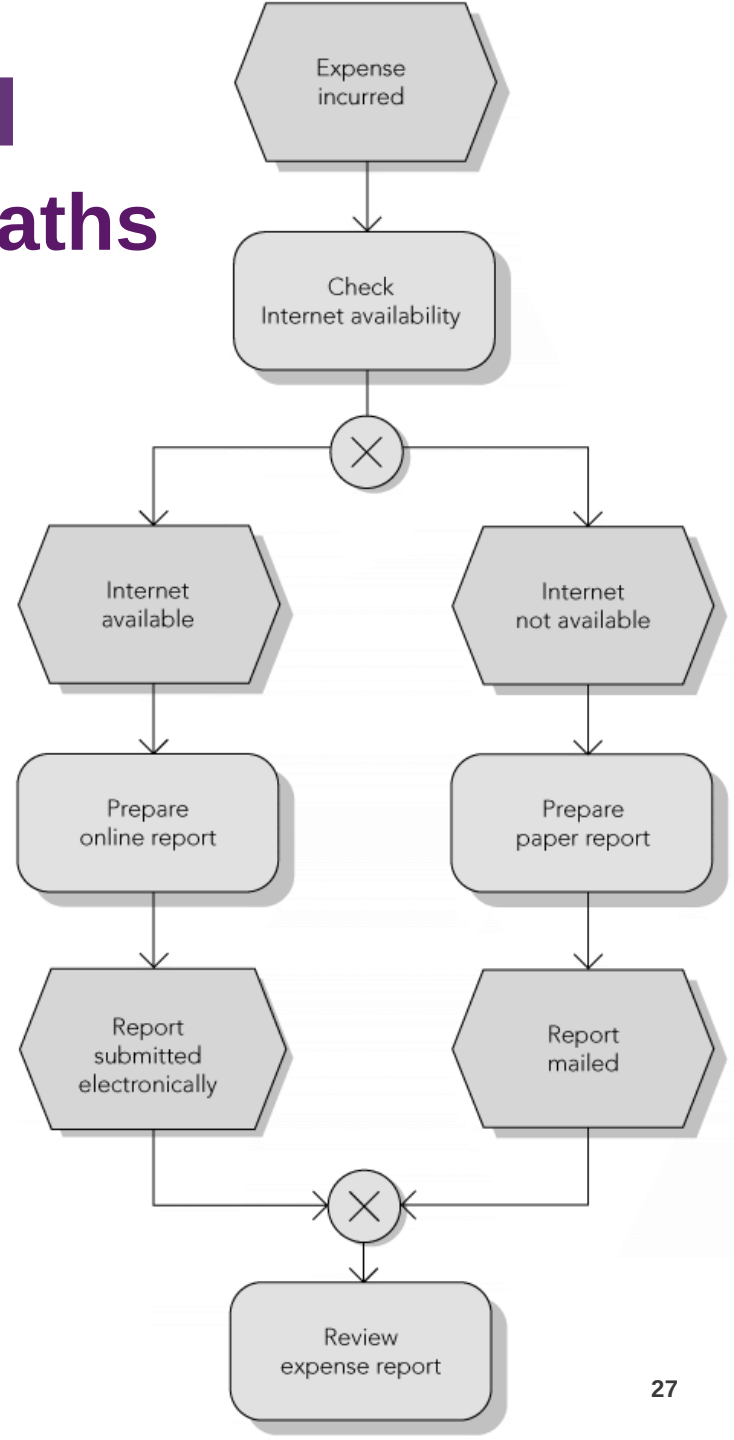
Figure 7-9 XOR connector



Possible connector and triggering combinations

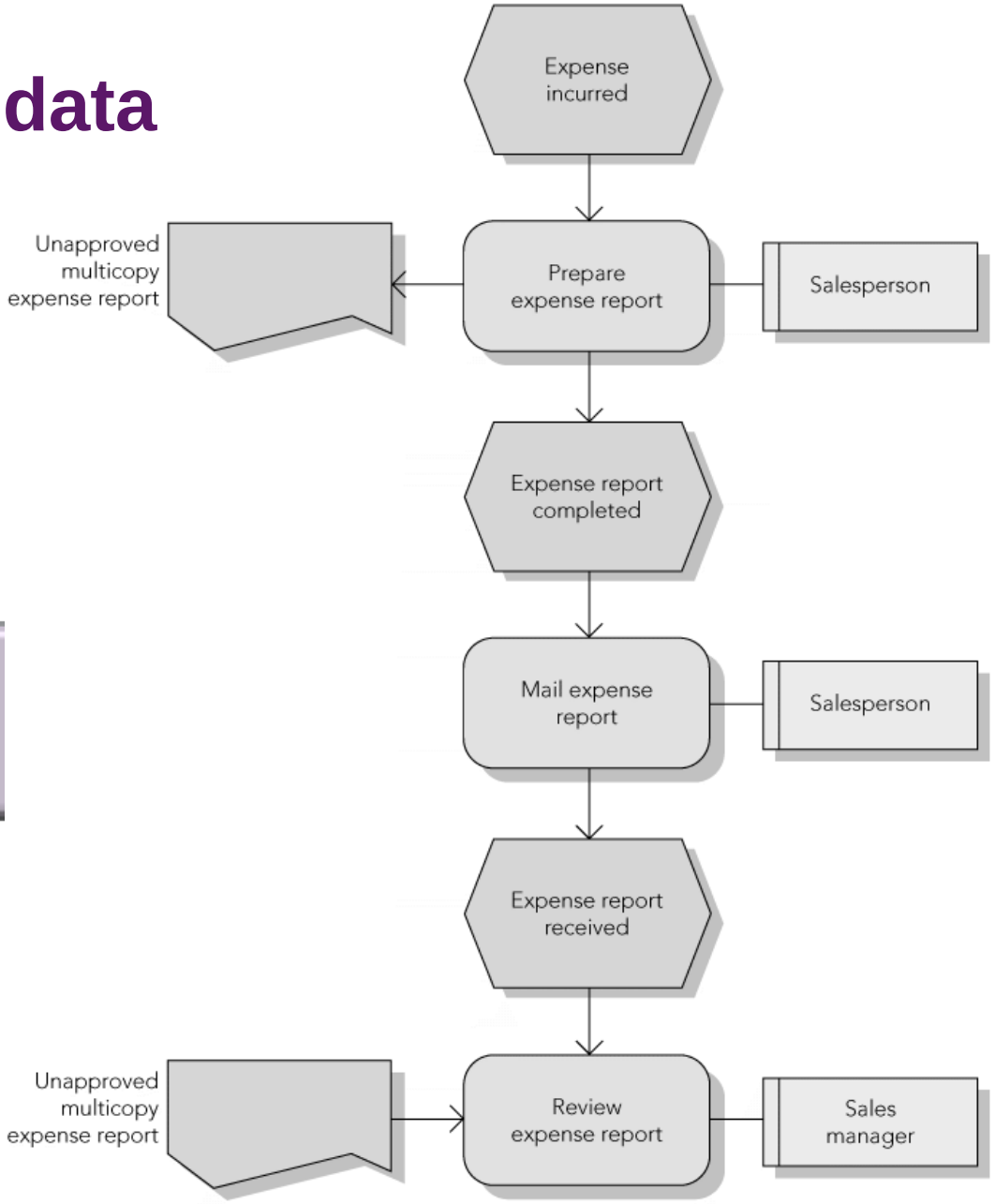
Splitting and consolidating paths

- The following figure shows the splitting and consolidating of a path through the process.
- In this case, the Fitter salesperson can submit her expense report online if she has Internet access; otherwise, she must send in a paper report.
- Note the same type of connector that is used to split the path must be used to consolidate it.



EPC diagram with organizational and data elements

- The following figure shows an EPC augmented with:
  - **data elements** – Unapproved multi-copy expense report and
  - **organisational elements** – Salesperson, Sales manager
- This provides a more complete description of the process, documenting the "who" and "what" aspects of the process.



Process Improvement

- Hammer et al. argued that many things were done in organizations because "*that was the way they had always been done", not because they added value.*
- **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)

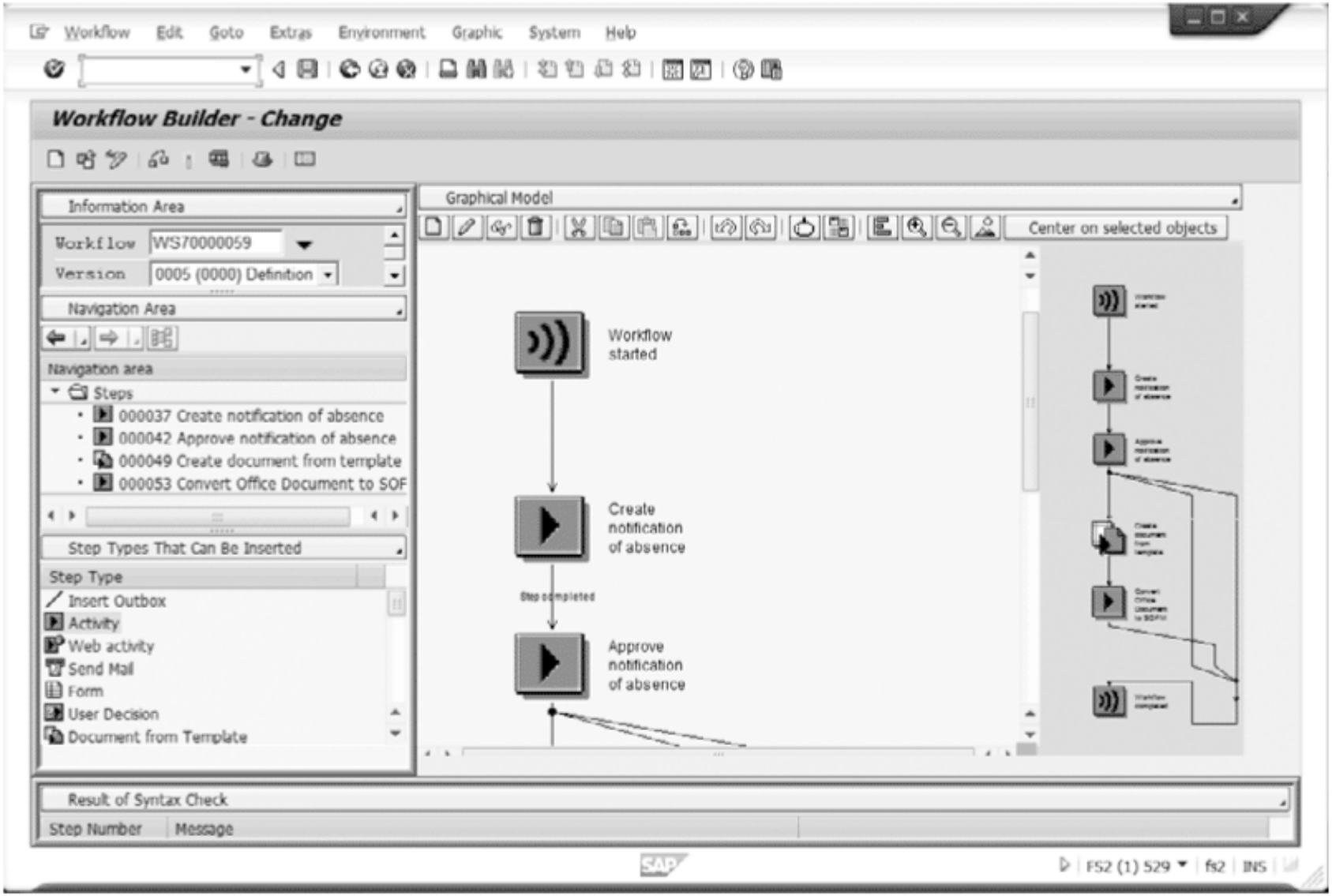
ERP software provides a workflow management system

- Supports and speeds up business processes
- Enables employees to carry out complex business processes and track the current status of a process at any time.

ERP Workflow Tools

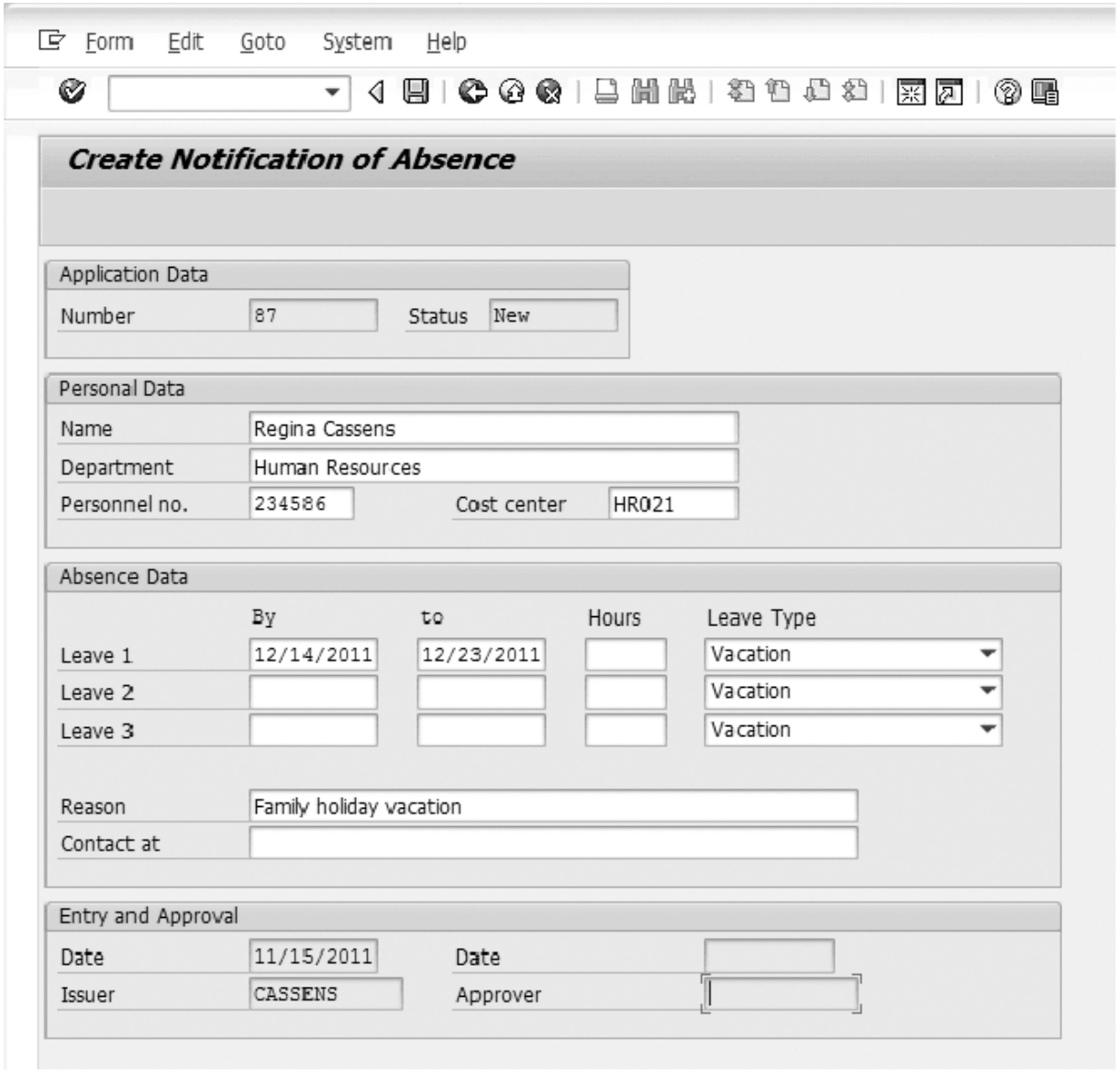
Features and Benefits

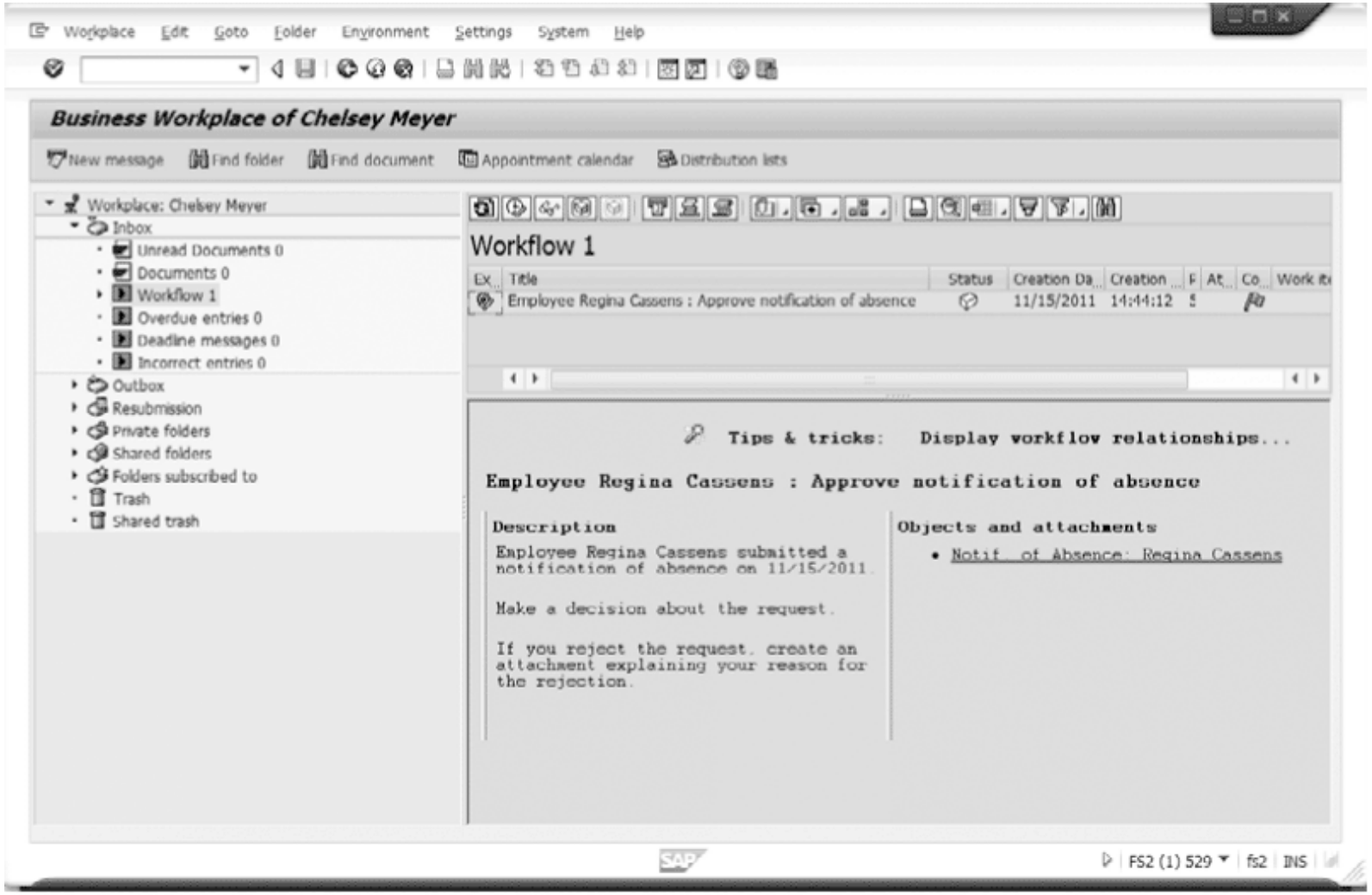
- Eg: **SAP Business Workflow**
- Links employees to the business transactions that need to be performed
- Employees can track and monitor progress of workflow tasks and take action if tasks seem to be falling behind schedule
- Proactively connects employees with business transactions using SAP's internal email system and workflow tasks
- Workflow system can automatically take various actions like:
  - Changing the workflow task priority
  - Sending email reminders to the employees responsible for the work
- For sporadic processes, workflow tools are a powerful way to improve process efficiency and effectiveness



SAP ERP Workflow Builder screen

Create notification of absence screen





Manager's Business Workplace with workflow task

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

ERP System Costs and Benefits

ERP implementation is expensive

- Usually ranging between $10 million and $500 million, depending on company size

Costs of ERP implementation

- Software licensing fees
- Consulting fees
- Project team member time
- Employee training
- Productivity losses

ERP System Costs and Benefits

To justify the cost:

- Companies must identify a significant financial benefit that will be generated by ERP system
- Only way companies can save money with ERP systems is by using them to support more efficient and effective business processes

Additional implementation issues

- Companies must manage transfer of data from old computer systems to new ERP system
- Change management

We will explore Change Management and other ERP implementation issues in greater detail in subsequent lectures.

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

Staff involvement

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

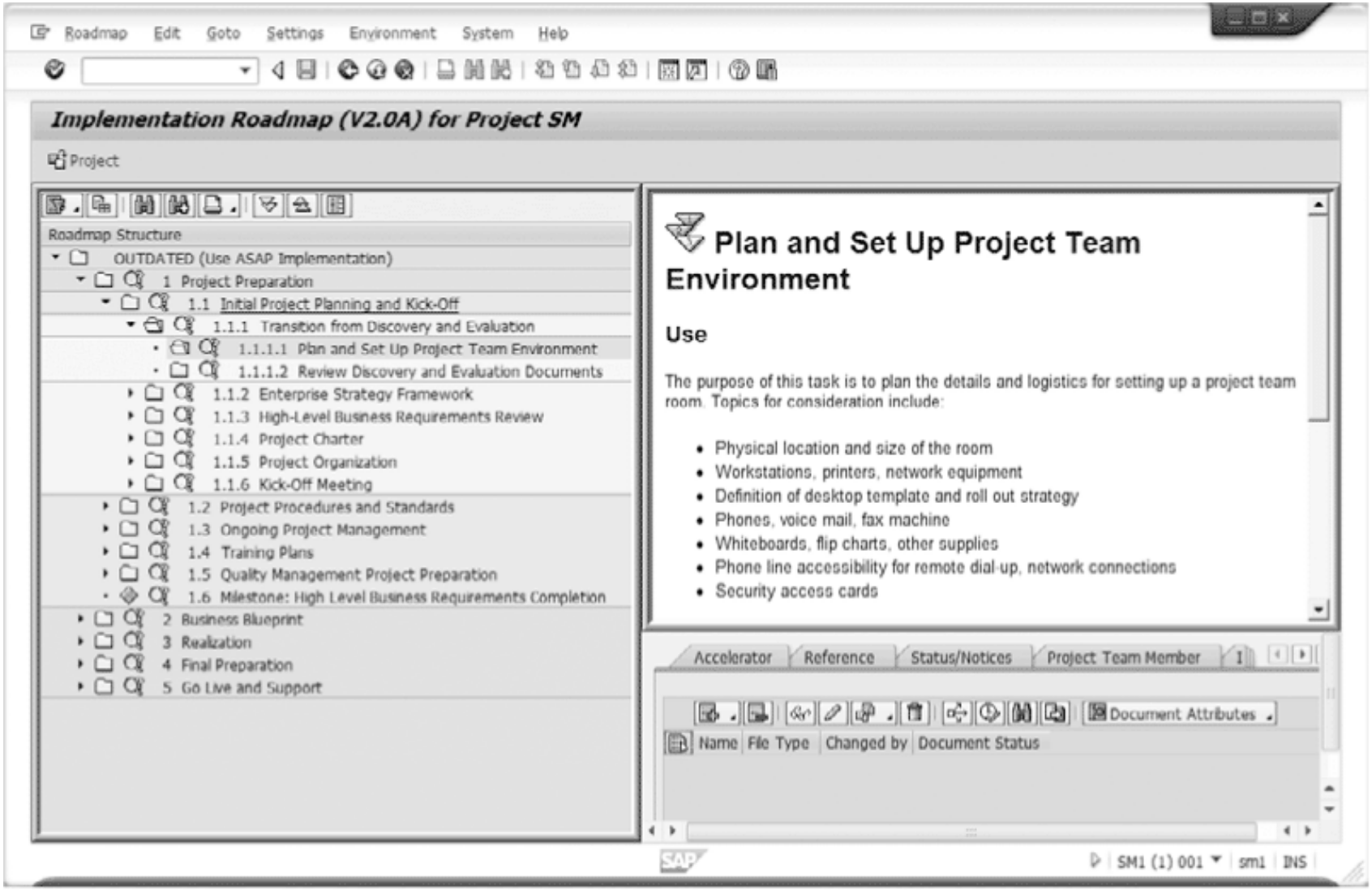
Implementation Tools

Implementation Tools

- Many tools are available to help manage implementation projects
- Example: process mapping

SAP Solution Manager tool

- Helps companies manage implementation of SAP ERP
- 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 Roadmap

Project Preparation

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

Business Blueprint

- Produces detailed documentation of business process requirements of the company

Realization

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

Implementation Roadmap (cont'd.)

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

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

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

Summary (cont'd.)

- Process mapping: process-modeling tool that uses graphical symbols to document business processes
  - Other methodologies: hierarchical modeling, deployment flowcharting, event process chain diagramming, value analysis, and business process improvement
  - 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

Summary (cont'd.)

- SAP's system landscape was introduced to show how changes to ERP system during implementation (and beyond) are managed
- Most challenges to ERP implementation involve managing personnel and their reactions to the change, rather than managing technical issues

End of Lecture 7

References:

- Davenport, T. H. (1993). Process Innovation: Reengineering Work Through Information Technology. Boston, MA:Harvard Business School Press.
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- Hammer, M. and Champy, J. Reengineering the Corporation, Harper Business, 1993 (H&C)
- Gartner Research. (July 27, 2010). Hype Cycle for Business Process Management, 2010.
- Motiwalla & Thompson. (2012). Enterprise Systems for Management, 2/e. Pearson Education, Inc. Chapter 9

Assignment 2 - **Business Case for an ERP implementation**

Assignment Aim and Objectives:

- To develop skills in producing a succinct and convincing business case;
- To develop skills in researching various ERP software vendors and to provide a recommendation;
- To develop skills in performing a cost-benefit analysis as well as critically assessing the potential risks involved and other implementation issues; and
- To explore the current trend in cloud computing and in-memory computing in real-time enterprise systems

Assignment 2 - **Business Case for an ERP implementation**

The Case:

Top Gear Bikes (TGB) is a company who manufactures and distributes racing bikes. They plan to implement an enterprise system for the first time.
TGB Board of Directors are doing everything they can to ensure that their ERP project is a success.

As part of this initiative, they have requested a Business Case to justify and recommend a solution to their situation.

Assignment 2 - Business Case for an ERP implementation

A Business Case, which should include the following:

1.0 Introduction/ Background

2.0 Business Objective.

3.0 Current Situation and Problem/Opportunity Statement

4.0 Critical Assumptions and Constraints

5.0 Analysis of Options and Recommendation
- Including a weighted scoring model

		Requirement score				
Criteria	**Weight**	**A**	**B**	**C**	**D**	**E**
Value	20%	80	45	40	15	35
Risk	20%	60	85	30	20	75
Difficulty	15%	55	80	50	15	25
Success	10%	30	60	55	65	30
Compliance	5%	35	50	60	50	50
Relationships	5%	80	70	50	85	80
Stakeholder	15%	25	50	45	60	60
Urgency	10%	60	25	40	65	80
Weighted Scores	100%	54.8	60.0	43.3	38.0	52.3

Assignment 2 - Business Case for an ERP implementation

6.0 Preliminary Project Requirements

7.0 Budget Estimate and Financial Analysis
- Including NPV and ROI

8.0 Schedule Estimate

9.0 Potential Risks
- Including a detailed risk analysis

10.0 Exhibits

Discount rate	8%				
Assume the project is done in about 6 months		Year			
	0	1	2	3	Total
Costs	140,000	40,000	40,000	40,000	
Discount factor	1	0.93	0.86	0.79	
Discounted costs	140,000	37,037	34,294	31,753	243,084
Benefits	0	200,000	200,000	200,000	
Discount factor	1	0.93	0.86	0.79	
Discounted benefits	0	186,185	171,468	158,766	515,419
Discounted benefits - costs	(140,000)	148,148	137,174	127,013	
Cumulative benefits - costs	(140,000)	8,148	145,322	272,336	← NPV
	Payback in Year 1				
Discounted life cycle ROI---------->	112%				

Assignment 2 - **Business Case for an ERP implementation**

Due Date: Monday 17th October 2022 11:55 pm

Value: 20% of final Assessment

Mode of submission: **Online** on Moodle

Type of Assignment: Group Assignment
Students are required to work in groups of 2.