Princess Noura University
Department of Computer Science

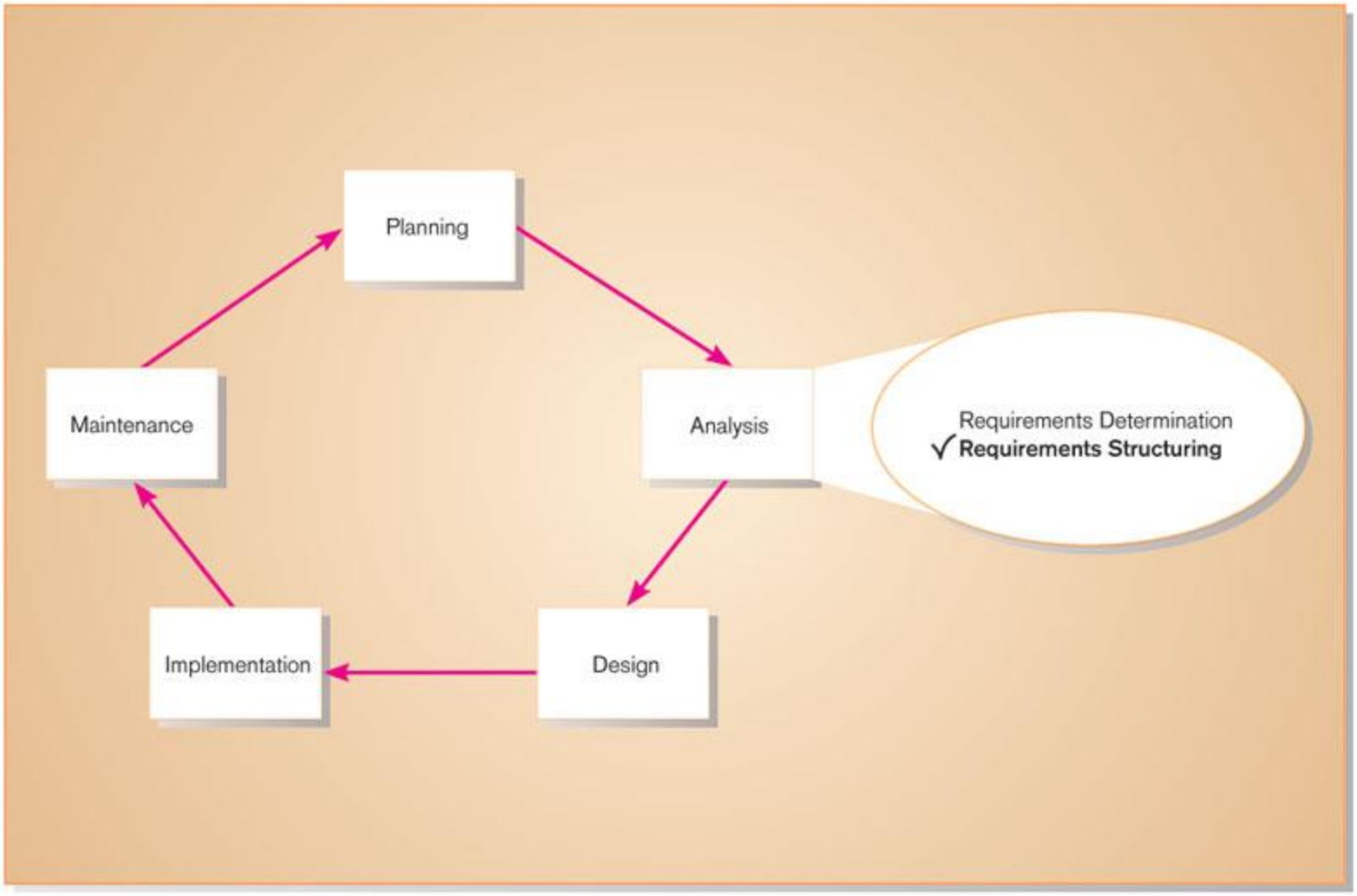
Chapter 7 part B

Analyzing System Process Requirements

Learning Objectives

- ✓ Use decision tables to represent logical choice in conditional

Figure 8-1 Systems development life cycle with the analysis phase highlighted



Logic Modeling with Decision Tables

- A matrix representation of the logic of a decision
- Specifies the possible conditions and the resulting actions

3 Parts of a Decision Table

1. Condition stubs
   - Lists condition relevant to decision
2. Action stubs
   - Actions that result from a given set of conditions
3. Rules
   - Specify which actions are to be followed for a given set of conditions

- Indifferent Condition
  - Condition whose value does not affect which action is taken for two or more rules

Procedure for Creating Decision Tables

1. Name the condition and values each condition can assume
2. Name all possible actions that can occur
3. List all possible rules:
   - # of rules = # of values of condition 1 * # of values of condition 2 * ……* # of values of condition n
4. Define the actions for each rule
5. Simplify the decision table

Decision Table

Figure 8-4 Complete decision table for payroll system example

	Conditions/ Courses of Action	Rules					
		1	2	3	4	5	6
Condition Stubs	Employee type	S	H	S	H	S	H
	Hours worked	<40	<40	40	40	>40	>40
Action Stubs	Pay base salary	X		X		X	
	Calculate hourly wage		X		X		X
	Calculate overtime						X
	Produce Absence Report		X				

Note: for salaried employees the action stub chosen will always be the same…therefore hours worked is an *indifferent condition*

Reduced Decision Table

Figure 8-5 Reduced decision table for payroll system example

Conditions/ Courses of Action	Rules			
	1	2	3	4
Employee type	S	H	H	H
Hours worked	–	<40	40	>40
Pay base salary	X			
Calculate hourly wage		X	X	X
Calculate overtime				X
Produce Absence Report		X		

Because of indifferent condition, the complete decision table can be reduced to one with fewer rules

Example1

Conditions	Printer does not print	Y	Y	Y	Y	N	N	N	N
	A red light is flashing	Y	Y	N	N	Y	Y	N	N
	Printer is unrecognized	Y	N	Y	N	Y	N	Y	N
Actions	Check the power cable			X					
	Check the printer-computer cable	X		X					
	Ensure printer software is installed	X		X		X		X	
	Check/replace ink	X	X			X	X		
	Check for paper jam		X		X				

Example 2

- Company X sells furniture to wholesale and retail outlets. Wholesale customers receive a two percent discount on all orders. The company also encourages both wholesale and retail customers to pay cash on delivery by offering a two percent discount for this method of payment. Another two percent discount is given on orders of 50 or more units. Each column represents a certain type of order.

Example 2

DECISION TABLE SAMPLE

Conditions	Less than 50 Units Ordered	Y	Y	Y	Y	N	N	N	N
	Cash on Delivery	Y	Y	N	N	Y	Y	N	N
	Wholesale Outlet	Y	N	Y	N	Y	N	Y	N
Actions	Discount Rate 0%				X				
	2%		X	X					X
	4%	X					X	X	
	6%					X			

Example 3

- A bank uses the following rules to classify new accounts. If depositor's age is 21 or above and if the deposit is 100 SR or more, classify the account type as A. If the depositor is under 21 and the deposit is 100 SR or more, classify it as type B. If the depositor is 21 or over and the deposit is below 100 SR classify it as type C. If the depositor is under 21 and the deposit is below 100 SR do not open account. Use a decision table that shows all rules to represent this logic.

Conditions / Courses of Actions	Rules			
	1	2	3	4
Age >= 21	Y	Y	N	N
Deposit >= 100	Y	N	Y	N
Class A	X			
Class B			X	
Class C		X		
Do not open account				X