

Use Case Analysis

Chapter 4

Key Ideas

- Use cases are a text-based method of describing and documenting complex processes
- Use cases add detail to the requirements outlined in the requirement definition
- Systems analysts work with users to develop use cases

Systems analysts develop process and data models later based on the use cases

Use Cases

Roles of Use Cases

- A *use case* is a set of activities that produce some output result
- Describes how the system reacts to an **event** that **triggers** the system
- Trigger -- event that causes the use case to be executed
- **Event-driven modeling** – everything in the system is a response to some triggering event
- All possible responses to the event are documented
- Use cases are helpful when the situation is complicated

Elements of a Use Case

- Basic information
 - Name, number and brief description
 - Trigger – event that causes the use case to being
 - External trigger – some from outside the system
 - Temporal triggers – time-based occurrences
 - Viewpoint of the use cases should be consistent
- Major inputs and outputs
 - Sources and destinations
 - Goal is to be all inclusive
- Details
 - Steps performed and the data inputs and outputs

Sample Use Case

Use case name: Patient makes, changes, or cancels appointment		ID: 2	Importance level: High
Primary actor: Patient			
Short description: This use case describes how we make a new appointment as well as change or cancel an existing appointment			
Trigger: Patient calls and asks for a new appointment or asks to change or cancel an existing appointment			
Type: External Temporal			
Major Inputs		Major Outputs	
Description	Source	Description	Destination
Patient name & address	Patient	Patient status	Receptionist
Patient information	Patient records	Canceled appointment	Appointment calendar
Unpaid patient bills	Patient records	Potential appointments	Patient
Appointment type	Patient	New appointment	Appointment calendar
Existing appointment	Patient	Appointment confirmation	Patient
Existing appointment	Appointment calendar		
Desired appointment	Patient		
Potential appointment	Appointment calendar		
Selected appointment	Patient		
Major Steps Performed:		Information for Steps	
Sample Use Case			
1. Patient contacts office regarding appointment			
2. Patient provides Receptionist with name & address		Patient name & address	
3. Receptionist validates that Patient exists in Patient Records If new patient, Receptionist performs New Patient use case		Patient record Patient status	
4. Receptionist checks for unpaid bills in Patient Records If unpaid bills, transfer call to Business Office		Unpaid patient bills	
5. Receptionist gets desired action from Patient—make new appointment, change or cancel existing appointment		Appointment type	
5.1. For appointment cancellations or changes, Receptionist gets date & time of existing appointment, finds appointment in appointment calendar.		Existing appointment date & time Canceled appointment	
5.2. For new appointment or appointment changes, Receptionist gets date & time of desired appointment and provides Patient with potential appointment dates & times until Patient tells Receptionist his/her appointment selection		Desired appointment Open appointments Potential appointments Selected appointment	
6. Receptionist creates new appointment and provides appointment confirmation to Patient		New appointment Appointment confirmation	

Building Use Cases

Process of Developing Use Cases

- Identify the major use cases
- Identify the major steps within each use case
- Identify elements within steps
- Confirm the use case
- Cycle through the above steps iteratively

Step 1:

Identify the major use cases

Activities	Typical Questions Asked
<p>Start a use case form for each use case</p> <p>If more than nine, group into packages</p>	<p>Ask who, what, and where about the tasks and their inputs and outputs:</p> <p>What are the major tasks performed?</p> <p>What triggers this task? What tells you to perform this task?</p> <p>What information/forms/reports do you need to perform this task?</p> <p>Who gives you these information/forms/reports?</p> <p>What information/forms/reports does this produce and where do they go?</p>

Sample List of Events-Actions Based on Requirements Definition

From Requirements Definition	Event	Action
2. Road De-icing		
2.1. System produces road de-icing schedule	Highway department requests road de-icing schedule	Road de-icing schedule is produced
2.2. System records all roads that have been treated	Truck drivers complete a road treatment and report completion status	Road treatment is recorded
2.3. System receives road condition information from road sensors	Road sensor transmits current road conditions	Sensors' current road conditions are recorded
2.4. System produces updated road de-icing schedule using road treatment and road sensor data	Need new road de-icing schedule based on current road conditions and road treatments	Updated road de-icing schedule is produced
etc.		

Step 2: Identify the major steps within each use case

Activities	Typical Questions Asked
For each use case, fill in the major steps needed to process the inputs and produce the outputs	Ask <i>how</i> about each use case: How do you produce this report? How do you change the information on the report? How do you process forms? What tools do you use to do this step (e.g., on paper, by email, by phone)?

Step 3: Identify elements within steps

Activities	Typical Questions Asked
For each step, identify its triggers and its inputs and outputs	Ask <i>how</i> about each step How does the person know when to perform this step? What forms/reports/data does this step produce? What forms/reports/data does this step need? What happens when this form/report/data is not available?

Step 4: Confirm the use case

Activities	Typical Questions Asked
•For each use case, validate that it is correct and complete	•Ask the user to execute the process using the written steps in the use case – that is, have the user role-play the use case

CD SELECTIONS

Use case name: <u>Take requests for CDs</u>		ID: <u>1</u>	Importance level: <u>High</u>
Primary actor: <u>Customer</u>			
Short description: <u>This use case describes how customers can search the Web site and place requests to hold CDs in stock or place special orders</u>			
Trigger: <u>Customer searches Web site for and finds CD(s) to place on hold or special order</u>			
Type: <u>External</u> Temporal			
Major Inputs:		Major Outputs:	
Description	Source	Description	Destination
<u>Search request</u>	<u>Customer</u>	<u>Special order</u>	<u>Special orders DB</u>
<u>CDs selected for request</u>	<u>Customer</u>	<u>Hold for in-stock CDs</u>	<u>In-store hold DB</u>
<u>Customer information</u>	<u>Customer</u>		
<u>Marketing materials</u>	<u>Marketing DB</u>		
Use case name: <u>Maintain marketing materials</u>		ID: <u>2</u>	Importance level: <u>High</u>
Primary actor: <u>Vendor</u>			
Short description: <u>This use case describes how we add, delete, and modify Web marketing materials based on reviews, music clips, received from vendors</u>			
Trigger: <u>Vendor, distributor, wholesaler, record company submits marketing materials</u>			
Type: <u>External</u> Temporal			
Major Inputs:		Major Outputs:	
Description	Source	Description	Destination
<u>Marketing materials</u>	<u>Vendor</u>	<u>Marketing materials</u>	<u>Marketing DB</u>
Use case name: <u>Process in-store holds</u>		ID: <u>3</u>	Importance level: <u>High</u>
Primary actor: <u>Customer</u>			
Short description: <u>This use case describes how stores handle in-store holds received from the take requests use case</u>			
Trigger: <u>Customer places in-store hold with take request use case</u>			
Type: <u>External</u> Temporal			
Major Inputs:		Major Outputs:	
Description	Source	Description	Destination
<u>Hold request</u>	<u>Take request use case</u>	<u>Hold label</u>	<u>Store staff</u>
Major Steps Performed		Information for Steps	

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Trigger: <u>Customer searches Web site for and finds CD(s) to place on hold or special order</u>			
Type: <u>External</u> Temporal			
Major Inputs		Major Outputs	
Description	Source	Description	Destination
<u>Search request</u>	<u>Customer</u>	<u>Special order</u>	<u>Special orders DB</u>
<u>CDs selected for request</u>	<u>Customer</u>	<u>Hold for in-stock CDs</u>	<u>In-store hold DB</u>
<u>Customer information</u>	<u>Customer</u>		
<u>Marketing materials</u>	<u>Marketing DB</u>		
Major Steps Performed		Information for Steps	
<ol style="list-style-type: none"> Customer enters search request and receives display of CDs matching customer's request, whether it is a search by artist, title, etc., a search by category (e.g., jazz, classical), or a request for "sale" items. Customer requests and receives more information about one CD. This starts with some basic information, but may also include extra marketing material such as review and music clips. Customer requests store location list and receives store list and availability of the CD in those stores' inventory. Customer selects the CD at a store to hold or special order. Customer "checks out" confirming the CDs the customer has selected, calculating the total amount, and accepting customer's name and contact information. Customer receives confirmation of hold(s) placed for CD(s) in stock. Customer receives confirmation of special order(s) placed for CD(s) not in stock. 			

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Trigger: <u>Customer searches Web site for and finds CD(s) to place on hold or special order</u>			
Type: <u>External</u> Temporal			
Major Inputs:		Major Outputs:	
Description	Source	Description	Destination
Search request	Customer	Special order	Special order system
CDs selected for request	Customer	Hold for in-stock CDs	In-store hold CD
Customer information	Customer	CDs matching search request	Customer
Marketing material	Marketing DB	CD(s) selected for request	Customer
CD information request	Customer	CD information	Customer
Zip code	Customer	Marketing material	Customer
CD inventory	Inventory DB	CD availability by store	Customer
		In-store hold confirmation	Customer
		Special order confirmation	Customer
Major Steps Performed		Information for Steps	
<ol style="list-style-type: none"> Customer enters search request and receives display of CDs matching customer's request, whether it is a search by artist, title, etc., a search by category (e.g., jazz, classical), or a request for "sale" items. Customer requests and receives more information about one CD. This starts with some basic information, but may also include extra marketing material such as review and music clips. Customer requests store location list and receives store list and availability of the CD in those stores' inventory. Customer selects the CD at a store to hold or special order. Customer "checks out" confirming the CDs the customer has selected, calculating the total amount, and accepting customer name and contact information. Customer receives confirmation of hold(s) placed for CD(s) in stock. Customer receives confirmation of special order(s) placed for CD(s) not in stock. 		<ul style="list-style-type: none"> Search request CDs matching search request CD information request CD information Marketing materials Zip code CD availability by store CD selected for request CD selected for request CD selected for request Customer information Hold for in-stock CD In-store hold confirmation Special order Special order confirmation 	

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Trigger: <u>Customer searches Web site for and finds CD(s) to place on hold or special order</u>			
Type: <u>External</u> Temporal			
Major Inputs:		Major Outputs:	
Description	Source	Description	Destination
Search request	Customer	Special order	Special order DB
CDs selected for request	Customer	Hold for in-stock CDs	In-store hold DB
Customer information	Customer	CDs matching search request	Customer
Marketing materials	Marketing DB	CD(s) selected for request	Customer
CD information request	Customer	CDs information	Customer
Zip code	Customer	Marketing materials	Customer
CD inventory	Inventory DB	CD availability by store	Customer
		In-store hold confirmation	Customer
		Special order confirmation	Customer
Major Steps:		Use case name: <u>Maintain marketing materials</u>	
Primary actor: <u>Vendor</u>		ID: <u>2</u>	
Short description: This use case describes how we add, delete, and modify Web marketing materials based on reviews, music clips, etc. received from vendors		Importance level: <u>High</u>	
Trigger: <u>Vendor, distributor, wholesaler, record company submits marketing materials</u>			
Type: <u>External</u> Temporal			
Major Inputs:		Major Outputs:	
Description	Source	Description	Destination
Marketing materials	Vendor	Marketing materials	Marketing DB
Marketing materials	Marketing manager	Marketing material report	Marketing manager
CD information	CD DB		
Vendor information	Vendor		
Use case name: <u>Process in-store holds</u>		ID: <u>3</u>	
Short description: This use case describes how stores handle in-store holds received from the take request use case		Importance level: <u>High</u>	
Trigger: <u>Customer places in-store hold with take request use case</u>			
Type: <u>External</u> Temporal			
Major Inputs:		Major Outputs:	
Description	Source	Description	Destination
Hold request	In-store hold DB	Hold Label	Store staff
Hold confirmation	Store staff	Hold request alert	Store staff
		Hold confirmation	In-store hold DB
		Inventory adjustment	Inventory DB

Summary

- Use cases contain all the information needed for process modeling, but are easier for users to comprehend
- Use cases are created in an iterative cycle of steps until they are considered accurate and complete