Chapter 4

Use Case Analysis

SYSTEMS ANALYSIS AND DESIGN

SEVENTH EDITION

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Learning Objectives

- Explain the purpose of use cases in the analysis phase of the SDLC.
- Describe the various parts of a use case and the purpose of each part.
- Describe how use cases contribute to the functional requirements.
- Describe how use cases inform the development of test plans.
- Explain the process used to create a use case.

What is a Use Case?

UNDERSTANDING THE PURPOSE OF THIS TOOL

Role of Use Cases

- Use cases express and clarify user requirements.
- Purpose - define the expected interaction between user and system.
- Use that interaction to more fully describe functional requirements
- Used extensively in the analysis phase. Often a part of user interviews or JAD sessions.
- Text-based use cases are easy for the users to understand.
- Flow easily into the creation of process models and the data model.

Use Cases

- Represents how a system interacts with its environment
- Illustrates the activities that are performed by the users and the system's responses.
- Activities produce some output result.
- Each use case describes how an external user triggers an event to which the system must respond.
- In event-driven modeling, everything in the system can be thought of as a response to some triggering event.

Use Case Styles

ELEMENTS AND FORMATS

Elements of a Use Case

- Each use case has a *name* and *number*, and brief *description*.
- The *priority* may be assigned to indicate the relative significance.
- The *actor* refers to a person, another system, or a hardware device that interacts with the system to achieve a useful goal.
- The *trigger* for the use case – the event that causes the use case to begin.
- Events triggers can be *external* or *temporal*

Use Case Basic Information

From Figure 4-1

Casual Format Use Case

Use Case Name: Create preliminary custom drone order	**ID:** UC-6	**Priority:** High
Actor: Customer		
Description: The customer selects and customizes a commercial drone to purchase		
Trigger: Customer wants to purchase a commercial drone		
Type: ☑ External ☐ Temporal		

Normal Course

- The major steps that are performed to execute the response to the event

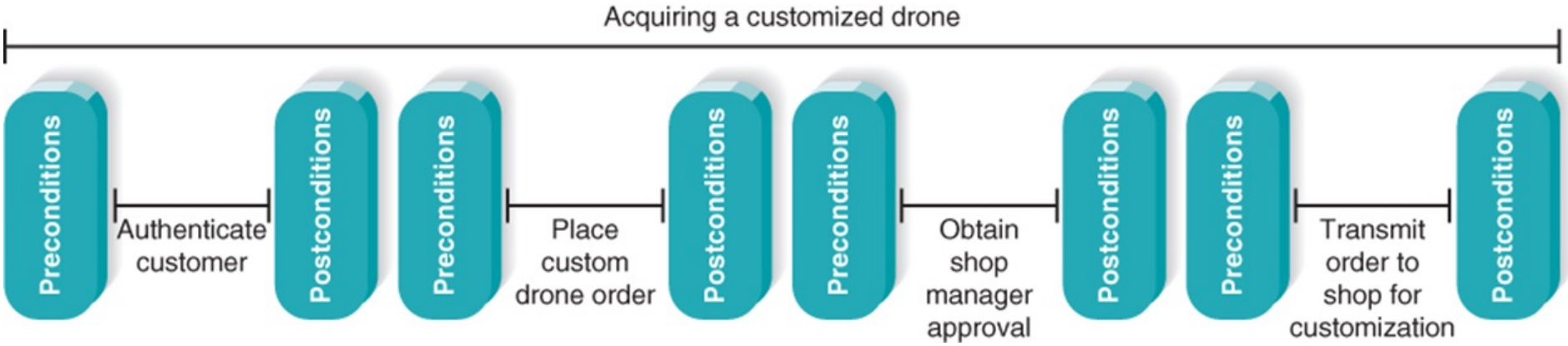
Normal Course:

1.0 Order a customized drone

1. The customer selects a base model drone from a list of models
2. The system provides availability status for that model (in stock, out of stock)
3. For out of stock status, system displays expected date available
    a. Customer accepts future availability date; proceed to step 4
    b. Customer rejects future availability date; return to step 1
4. The system displays a list of options and upgrades for the selected model
5. The customer selects desired model options and upgrades
6. Preliminary order with cost estimate is created and displayed
7. Customer may return to step 4, confirm order, save for future consideration, or exit without saving
8. Unconfirmed orders are stored in Unconfirmed Custom Order datastore
9. Confirmed orders are saved in Confirmed Custom Order datastore
10. Shop manager is notified of Confirmed Order requiring approval

Use Cases in Sequence

- Uses cases often performed in sequence.
- No single use case should be too large.
- Important to define initial and ending states.



Preconditions and Postconditions

- Preconditions define what must be complete before beginning this use case.
- Postconditions define what is complete when this use case ends.

Preconditions:

1. The customer is authenticated by logging in to his account
2. The Sales System Order Processing application is online

Postconditions:

1. Unconfirmed order is stored in Unconfirmed Custom Order datastore
2. Confirmed order is stored in Confirmed Custom Order datastore
3. Shop manager sent notice of Confirmed Order requiring approval

Fully-Dressed Use Case Format (1 of 2)

- Very thorough, detailed, and highly structured.
- Adds new sections, including,
  - Alternative courses
  - Inputs and outputs for steps
  - Summary inputs and outputs.
- See Figure 4-3 for example

Fully-Dressed Use Case Format (2 of 2)

- Use this format when:
  - Users are not closely engaged with development team
  - Project has high complexity and high risk
  - Test cases need to be fully described
  - Remote collaborating teams need detailed, shared understanding of user needs.

Use Case Practical Tips

- Use gradual refinement.
- Concentrate on describing the user's objectives with the system completely and accurately.
- Keep both audiences in mind – users and developers.
- Create use cases only when needed to clarify what the system must do from the user's perspective. Not needed for simple events.

Use Cases and the Functional Requirements

- Use cases are useful tools to clarify user requirements.
- Use cases convey only the user's point of view.
- Transforming the user's view into the developer's view through functional requirements is one of the system analyst's key contributions.
- The derived functional requirements tell the developers more about what the system must do.

Detailed Functional Requirements

Use case content used to create more complete and descriptive functional requirements

- The system displays a list of base drone models
- The system accepts customer selection of base drone model
- The system displays in stock/out of stock status for selected drone model
- For an out of stock model,
  - The system displays the expected date of availability
  - The system asks customer to accept future date available and continue or to select a different drone model
- The system displays optional features for the selected drone model (batteries, motors, cameras, sensors, etc.)
- The system accepts user choices of options
- The system displays summary and price of selected drone configuration
- The system allows user to continue modifying the drone configuration, save the order for later, confirm the order, or exit without saving.
- For orders saved without confirming, the system stores the order in the Unconfirmed Custom Order datastore
- For confirmed orders,
  - The system displays a completed order summary for the customer
  - The system stores the order in the Confirmed Custom order
  - The system sends a notice of new Confirmed Custom order to the Shop Manager for approval

Creating Use Cases

- Identify events the system must respond to – develop Event-Response List
- Create use case form for the complex events
- For each use case:
  - Identify the major steps
  - Identify elements with each major step (inputs and outputs)
  - Confirm use case with users through role-playing
- Revise functional requirements as needed

After reading and studying this chapter, you should be able to:

- Explain the purpose of a use case in the analysis phase of the SDLC.
- Explain why use cases are commonly used in the analysis phase.
- Discuss the various sections found in a use case form and the purpose and content of each section.
- Explain how use cases help the systems analyst create a more in-depth understanding of the system's functional requirements.
- Describe how use cases can contribute to the development of test plans for the new system.
- Discuss the four steps of the process used to create use cases.