Writing Use cases

Lecture 04

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More on Use cases!!!

Scenario

- A scenario is a specific sequence of actions and interactions between actors and the system under discussion;
  - it is also called a **use case instance.**
  - It is one particular story of using a system, or one path through the use case;

- successfully purchasing items with cash
- failing to purchase items because of a credit card transaction denial.

- Main Success scenario
  - aka Basic Flow, Typical course of events
- Extensions
  - aka Alternative flow, Alternative course of events

Black-box use cases

- Black-box use cases are use cases that do not describe the internal workings of the system, its components, or design.
  - System is described as having responsibilities.
  - *Focus is to specify what the system must do (the functional requirements) without deciding how it will do it (the design).*
- Example:
  - Good: The system records the sale.
  - **Bad: The system writes the sale to a database.**
  - Worse: The system generates a SQL INSERT statement for the sale

Formality Types

- Use cases are written in varying degrees of formality:
- High level (or Brief)
  - Concise one-paragraph usually of the main success scenario with limited headings
- Fully dressed (or Expanded)
  - All steps and variations are written in detail and there are multiple supporting sections etc.

High-level use case

- Example:

  Name: Process Sale

  Actor: Customer, Cashier

  Overview: A customer arrives at a checkout with items to purchase. The cashier uses the POS system to record each purchased item. The system presents a running total and line-item details. The cashier closes the sales and POS system present total amount payable. The customer enters his card information on POS System, which is validated and recorded. The system updates inventory. The cashier prints a receipt from the system hand sit over to customer who then leaves with the items.

- Headings in High Level Use Case (Brief)
  - Name, Actors, Purpose, Overview

Fully dressed uses case

- Fully dressed use cases show more detail and are structured.
  - They are useful in order to obtain a deep understanding of the goals, tasks, and requirements.
- Format of the Expanded (Fully Dressed) Use Case
  - Multiple headings
    - Name, Actors, Purpose, Overview, System Events and System Responses
  - **Usecases.org headings (single column format)**
  - **Two-column format/conversational style**

Process Sale

Use case UC1: Process Sale

Primary Actor: Cashier

Stakeholders and Interests:

-Cashier: Wants accurate and fast entry, no payment errors, …

-Salesperson: Wants sales commissions updated.

…

Preconditions: Cashier is identified and authenticated.

Success Guarantee (Postconditions):

-Sale is saved. Tax correctly calculated.

…

Main success scenario (or basic flow): [**see next slide**]

Extensions (or alternative flows): [**see next slide**]

Special requirements: Touch screen UI, …

Technology and Data Variations List:

-Identifier entered by bar code scanner,…

Open issues: What are the tax law variations? …

Main success scenario (or basic flow):

The Customer arrives at a POS checkout with items to purchase.

The Cashier records the identifier for each item. If there is more than one of the same item, the Cashier can enter the quantity as well.

The system determines the item price and adds the item information to the running sales transaction. The description and the price of the current item are presented.

On completion of item entry, the Cashier indicates to the POS system that item entry is complete.

The System calculates and presents the sale total.

The Cashier tells the customer the total.

The Customer gives a cash payment ("cash tendered") possibly greater than the sale total.

Extensions (or alternative flows):

If invalid identifier entered. Indicate error.

If customer didn't have enough cash, cancel sales transaction.

Writing use case!!!

Writing use cases

- Name use case with a verb
- Start first sentence with “<Actor> does <event>”
  - e.g Customer arrives with videos to rent.
- Capitalize “Actor” names.
  - Clerk enters…, System outputs
- Brief is good. No one like to read requirements.
- More verbose
    - The Clerk enters…
    - The System outputs…
  - Less
    - Clerk enters…
    - System outputs…

- Writing text styles
  - Essential
  - Real/Concrete

Essential Use Cases

- Use case text is relatively free of technology and implementation details.
  - Focus is on essential activities and motivations
- High level use cases are always essential in nature due to their briefness.

1. The customer identifies themselves
2. System presents options
3. and so on

Real Use Cases

- Describes the process in terms of its real current design, committed to specific I/O technology etc.

Actor Action	System Response
1. The Customer inserts their card	2. Prompts for PIN
3. Enters PIN on key pad	4. Display options menu.
…	……

Essential

Buy Items	
Actor Action	**System Response**
1. The Cashier records the identifier. If there is more than one of the same item, the Cashier can enter the quantity as well.	2. Determines the item price from each item and adds the item information to the running sales transaction.
3. and so on	4. and so on

Real

Buy Items	
Actor Action	**System Response**
1. For each item, the Cashier types in the Universal Product Code (UPC) in the UPC input field of Window1. They then press the "Enter Item" button with the mouse OR by pressing the <Enter> key	2. Displays the item price and adds the item information to the running sales transaction. The description and price of the current item are displayed in Textbox2 of Window1.
3. and so on	4. and so on

Examples

High-Level Use Cases

UC01: Use case:	**Buy Items**
Actor:	**Cashier**
Overview:	**A Customer arrives at a checkout with items to purchase. The Cashier records the purchase items and collects a payment. On completion, the Customer leaves with the items.**

UC02: Use case:	**Start Up**
Actor:	**Manager**
Overview:	**A Manager powers on a POST in order to prepare it for use by Cashiers. The Manager validates that the date and time are correct, after which the system is ready for Cashier use.**

Expanded Essential Use Cases

Two-column format (aka conversational style)

Use case:	**Buy Items**
Actor:	**Cashier**
Purpose:	**Capture a sale and its payment.**
Overview:	**A Customer arrives at a checkout with items to purchase. The Cashier records the purchase items and collects a payment. On completion, the Customer leaves with the items.**
Usecase Type:	**Primary and essential**
Cross References:	*** Functions: R1.1, R1.2, R1.3, R1.7** ***Use cases: Cashier must have completed the "Log_In" use case.**

Typical Course of Events

Actor Action	System Response
1. **The use case begins when Customer arrives at the POST checkout with items to purchase.**	
2. Cashier records each item. If there is more than one item, Cashier can enter the quantity as well.	3. Determines the item price and adds the item information to the running sales transaction. The description and price of the the current item are presented.
4. On completion of item entry, the Cashier indicates to the POST that item entry is complete.	5. Calculates and presents the sale total.
6. The Cashier tells the Customer the total.	
7. Customer chooses payment type: a. If cash payment, section: Pay by Cash b. If credit payment, section: Pay by Credit.	

Actor Action	System Response
	8. Logs the completed sale.
	9. Updates inventory levels.
	10. Generates a receipt.
11. Cashier gives the receipt to the Customer.	
12. Customer leaves with the items purchased.	

Alternative Courses

Line 2: Invalid item identifier entered. Indicate error.

Line 7: Customer could not pay. Cancel sale transaction.

Section: Pay by Cash

Typical Course of Events

Actor Action	System Response
1. The Customer gives a cash payment-the "cash tendered" - possibly greater then the sale total.	
2. The Cashier records the cash tendered.	3. Shows the balance due back to the Customer.
4. The Cashier deposits the cash received and extracts the balance owing.	
The Cashier gives the balance owing to the Customer.	

Alternative Courses

Line 1: Customer does not have sufficient cash. May cancel sale or initiate another payment method.

Line 4: Cash drawer does not contain sufficient cash. Cashier requests additional cash from supervisor or asks Customer for different payment amount or method.

Section: Pay by Credit

Actor Action	System Response
1. The Customer communicates their credit information for the credit payment.	2. Generates a credit payment Request and sends it to an external Credit Authorization service.
3. Credit Authorization Service authorizes the payment.	4. Receives a credit approval Reply from the Credit Authorization Service (CAS).
	5. POST (records) the credit payment and approval reply information to the Accounts Receivable system. (The CAS owes money to the Store, hence Acct/Recv must track it).
	6. Display authorization success message.

Alternative Courses

* Line 3: Credit request denied by Credit Authorization Service.
  Suggest different payment method.

Thank you!!!

- You must read Chapter 6,7 for concepts on Use-cases of *Applying UML Pattern and Design, Craig Larman, 2nd Edition*
- The sample use cases are provided for ready reference thus all students must read and keep a copy with them in hardcopy.