

Black-Box Use Cases

- Do **NOT** describe the internal workings of the system
 - Only system responsibilities
 - Focus on “what” the system should do
 - Good: “The system records the sale”
 - Bad:
 - “The system writes the sale to a database”
 - “The system generates SQL INSERT statement for the sale”

Levels of Formality

- Brief: one-paragraph, for the main success scenario
 - Process Sale example is brief
- Casual: multiple paragraphs that cover several scenarios
 - Handle Return example is casual
- Fully dressed: all steps and variations
 - Developed iteratively during elaboration; the **product** of requirement analysis

Fully Dressed Use Case - Outline

Use Case UC1: Process Sale

Primary Actor: Cashier

Stakeholders and interests:

E.g., Cashier: want accurate and fast payment

Preconditions

Success guarantee

Main success scenario

Extensions

Special requirements

Technology and data variation list

Frequency of Occurrence

Preconditions

- State what **must always** be true before a scenario begins in the use case
 - Often the postconditions of another use case
 - Don't bother with it unless you are stating something noteworthy
 - "The system has power" -not interesting

Preconditions: Cashier is identified and authenticated

Success Guarantees (Postconditions)

- State what **must** be true on successful completion of the use case—either the success scenario or alternative ones

Success guarantee: Sale is saved. Tax is correctly calculated. Accounting and Inventory are updated. Commissions recorded. Receipt is generated.

Main success scenario (Basic Flow)

- Defer all conditional and branching statements to the Extension section
- Records three kinds of steps:
 - An interaction between actors
 - A validation (usually by the system)
 - A state change by the system

Main Success Scenario:

1. Customer arrives at a POS checkout with items to purchase
2. Cashier starts a new sale
3. Cashier enters item identifier
4. System records the item, presents description and price.
Price and total are calculated based on a set of rules.

Main Success Scenario: (cont'd)

Repeat 3-4 until cashier indicates done.

5. System presents total with tax calculated by an external Tax Calculator system.
6. Cashier asks Customer for payment.
7. Cashier enters cash amount tendered, System handles payment.
8. System logs completed sale and sends sale and payment information to the external Accounting system and external Inventory system.
9. System presents receipt.

Extensions (or Alternative Flows)

- Often comprise the majority of text
- Indicate all the other scenarios or branches, both success and failure
- Notated with respect to its corresponding steps 1..N in the main success scenario.

Main Success Scenario:

... ..

3. Cashier enters item identifier

... ..

Extensions:

3a. Invalid identifier

1. System signals errors and rejects entry.

2. Cashier responds to the error:

2a. There is a human-readable item ID(e.g., a numeric UPC)

1. Cashier manually enters the item ID.

2. System displays description and price.

2a. Invalid item ID: System signals error. Cashier tries alternative methods.

2b. There is no item ID, but there is a price on the tag:

1. Cashier asks Manager to perform an override operation.

2. Manager performs override.

3. Cashier manually enters the price

Special Requirements

- If a non-functional requirement relates specially to a user case, record it with the use case

Special Requirements:

- Credit authorization responds within 30 seconds 90% of the time.
- Robustly recover the system when access to remote Inventory service fails

Technology and Data Variations List

- Technical variations in “how” something must be done
 - Early design decisions or constraints
 - Technical constraint imposed by stakeholders about input/output technologies.
 - Try to avoid premature design decisions unless they are obvious or unavoidable
- Data scheme variations necessary to understand

Technology and Data Variations List:

- 3a. Item identifier is entered by laser scanner or keyboard.
- 3b. Item identifier may be any UPC, EAN, JAN, or SKU coding scheme.
- 7a. Credit account information is entered by card reader or keyboard.
- 7b. Credit payment signature is captured on paper receipt. But within two years, we predict many customers will want digital signature capture.

Homework: Withdraw Money from ATM

Customer inserts a card to ATM. The ATM prompts to enter password. Customer enters a password. ATM validates the customer and presents options "check balance", "withdraw", and "transfer". Customer indicates withdraw and enters the amount to withdraw. ATM validates the amount, debits the account, and charges process fee if necessary. ATM delivers money and receipt. Customer indicates log off. ATM pops up the card for customer to take away.

Questions to Answer

- Who are the actors?
- What is the casual use case description?
(one success scenario + at least three alternative scenarios)
- What are some non-functional requirements? (at least two)

Who are the actors ?

- Customer
- Card issuer bank
 - May charge foreign fee/transaction fee
 - Overdraft fee
- ATM owner bank
 - May charge surcharge fee
 - Electronic Funds Transfer, ACH (Automated Clearing House) the funds later

Policy

- You are allowed to discuss about the problem and solution at high level
- Don't plagiarize other people's work
- Deadline: 02/21/22