SE202 Introduction to Software Engineering

Lecture 4-2
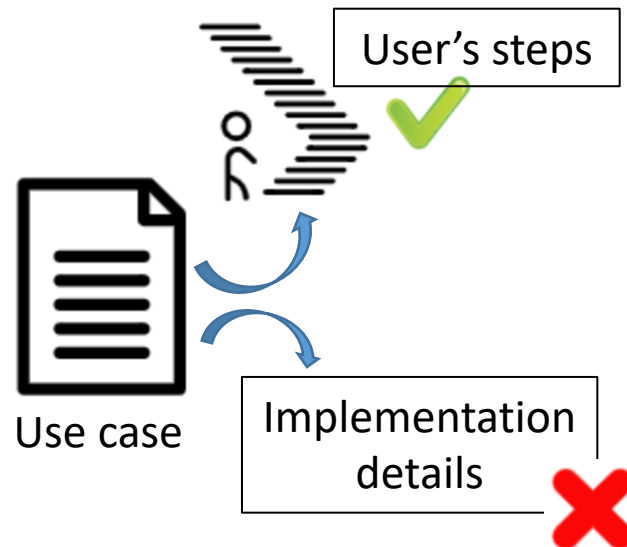**Use case**

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Last class

- Requirement engineering process
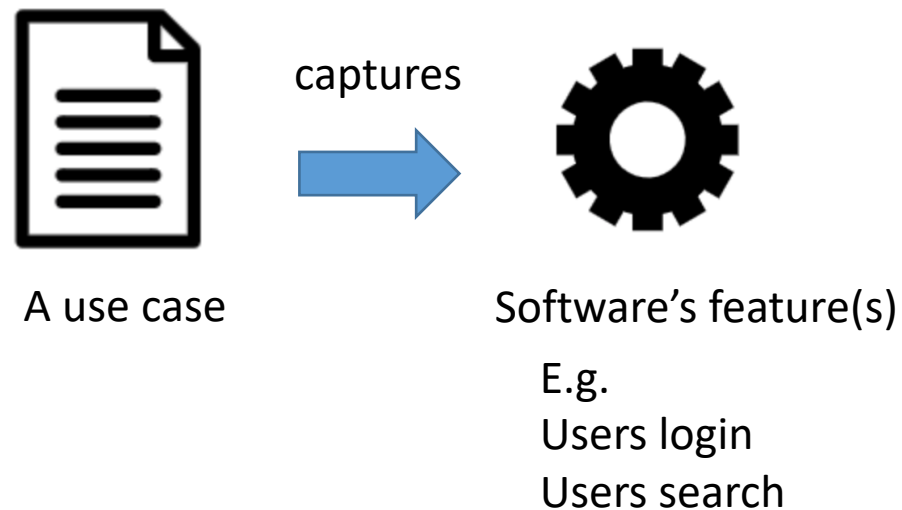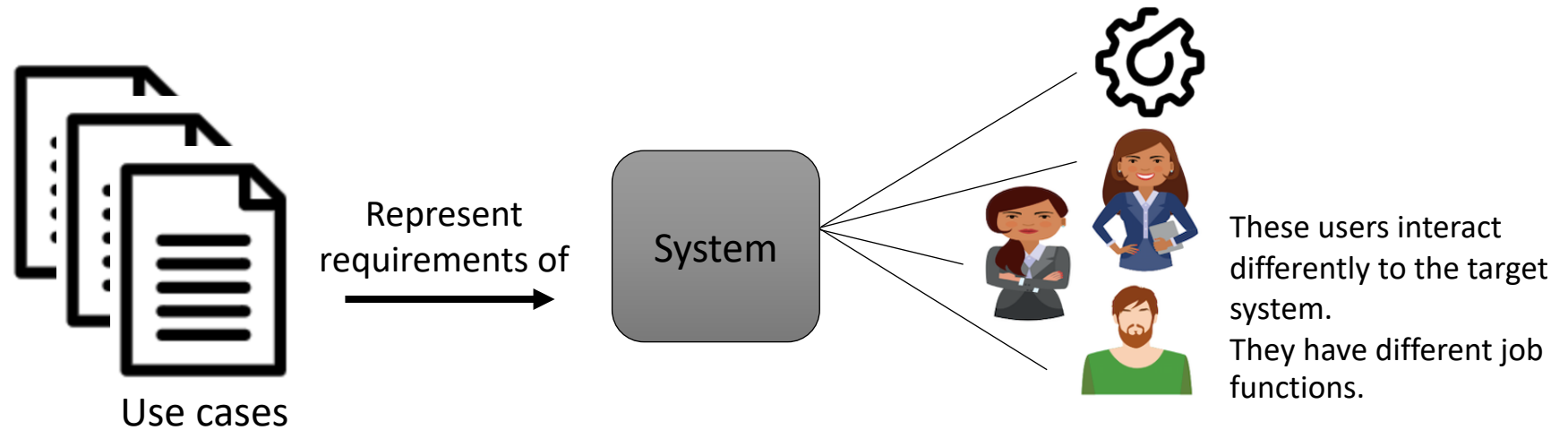- Requirement elicitation
- Discussion summary

Today

- Use case

Use Case

- Requirement tool for describing the behavior of the software

- Use case is a textual description explaining the way (steps) the users interact with the software.

Use Cases

Use cases → Represent requirements of → System

These users interact differently to the target system.
They have different job functions.

Use cases

A use case → captures → Software's feature(s)

E.g.
Users login
Users search

Develop Use Cases Iteratively

- Developing use cases
    - Identifying the basic features that will be developed from the vision and scope document.
    - This will probably not be the final set of use cases
- As the use cases are developed, additional information about how the software should behave will become clear.

Analysis of Library management system

- Background

- Users

- Features/functionalities

Example of library management system use cases

- Borrower:
  - Login
  - Search for items by title.
    - by author.
    - by subject.
  - Place a book on hold if it is on loan to somebody else.
  - Check the borrower's personal information and list of books currently borrowed.

- Checkout Clerk:
  - All the Borrower use cases, plus
  - Check out an item for a borrower.
  - Check in an item that has been returned.
  - Renew an item.
  - Record that a fine has been paid.
  - Add a new borrower.
  - Update a borrower's personal information (address, telephone number etc.).

- Librarian:
  - All of the Borrower and Checkout Clerk use cases, plus
  - Add a new item to the collection.
  - Delete an item from the collection.
  - Change the information the system has recorded about an item.

- Accounting System (acting autonomously):
  - Obtain the amount of overdue fines paid by borrowers.

Use case template

Name	Use case number and name
Description	Brief description of the use case and the reason that the use case is needed
User	A list of all of the categories of users that interact with this use case
Precondition	The state of the software before the use case begins
Normal flows	A numbered list of interactions between the users and software
Alternative flows	Conditions under which the basic course of events could change
Postcondition	The state of the software after the basic course of events is complete

Use case for a simple login feature

Name	UC-1: Login
Description	This use case describes how a user logs into the library management system.
User	Borrower, Checkout Clerk, Librarian
Precondition	None
Normal flows	The use case begins when the actor types his/her name and password on the login form. 1. The system validates the actor's password and logs him/her into the system. 2. The system displays the Main Form and the use case ends.
Alternative flows	1. Invalid Name / Password If the system cannot find the name or the password is invalid, an error message is displayed. The actor can type in a new name or password or choose to cancel the operation, at which point the use case ends.
Postcondition	If the use case was successful, the actor is now logged into the system. If not, the system state is unchanged.

Use case for Check out

Name	UC-5: Check out
Description	This use case helps the borrower to borrow the items if they are allowed, and ensures a proper record is entered of the loan.
User	Checkout clerk
Precondition	The borrower must have a valid card and not owe any fines.
Normal flows	The use case begins when the user scans item's barcode and barcode of the borrower's card. 1. The system validates the barcodes and displays confirmation that the loan is allowed. 2. The user stamps item with the due date. 3. The user confirms that the loan is to be initiated. 4. The system display confirmation that the loan has been recorded.
Alternative flows	1. Invalid barcodes If the borrower does not have a valid card and owe any fines, an error message is displayed. The use case ends.
Postcondition	The system has a record of the fact that the item is borrowed, and the date it is due.

Quiz: Use cases of a camping reservation system

A camping reservation system for multiple campgrounds. Campground managers register many details of their site in the system, including maps of camping locations and services available. Campers use the system to select and reserve a camping location.

Use cases of time attendant system

- Background
- Users
- Features

Use case

| Name	
Description	
User	
Precondition	
Normal flows	
Alternative flows	
Postcondition	

Use case diagram

- To illustrate an overall scope of the system, presenting user's goals (use case).

- Actor specifies a role played by a user or any other system that interacts with the system

- A use case describes a scenario of how user(s) interacts with the system.
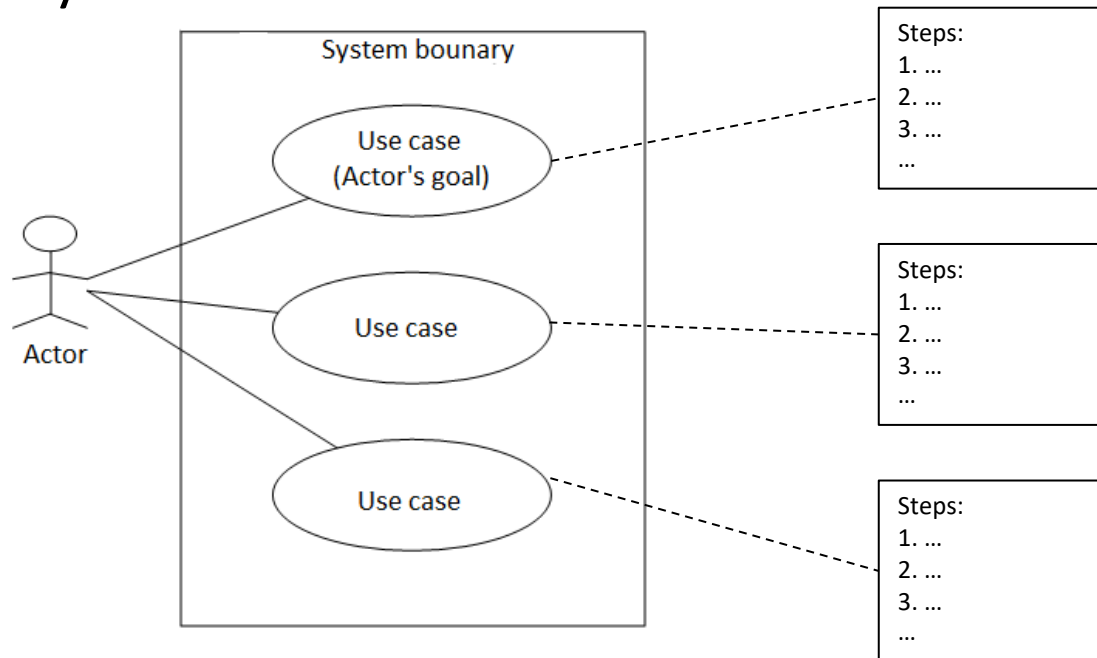
Example: Room reservation system

- Teacher uses the system to view room available, request for booking.

- Student uses the system to only view room available.

- IT staff uses the system to view room available, manage booking, approve booking and manage room.

Room reservation system use case diagram
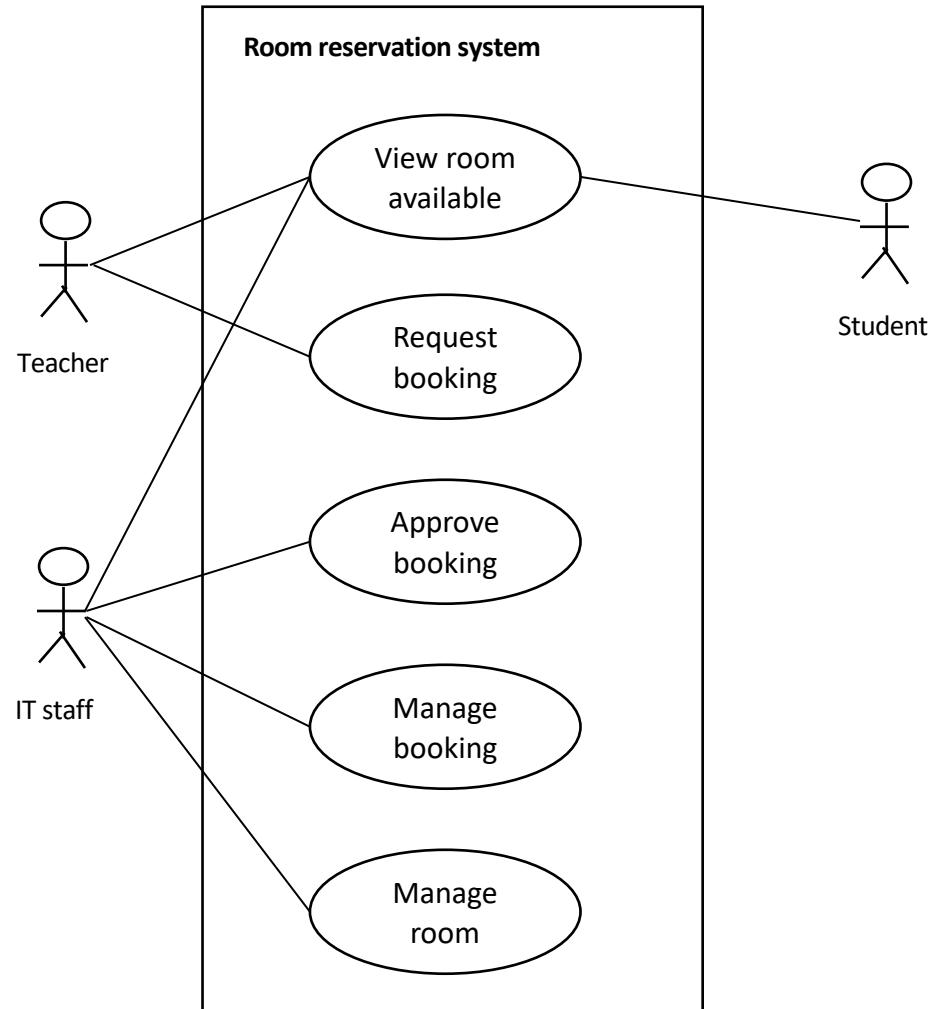
Draw use case diagram of the CMU Time attendance system

The benefits of basing software development on use cases

- They can
  - Help to define the *scope* of the system

  - Be used to *plan* the development process

  - Be used to both develop and validate the requirements

  - Form the basis for the definition of test cases

  - Be used to structure user manuals