



UNIFIED MODELING LANGUAGE (UML)

### 3-1. USE CASE DIAGRAM

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## Content

⇒ 1. Requirement modeling with use-case


2. Actors
3. Use cases
4. Use case diagrams



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## Purpose of Requirement


- Establish and maintain agreement with the customers and other stakeholders on what the software should do.
- Give software developers a better understanding of the requirements of the software.
- Delimit the software.
- Provide a basis for planning the technical contents of the iterations.
- Provide a basis for estimating cost and time to develop the software.
- Define a user interface of the software.

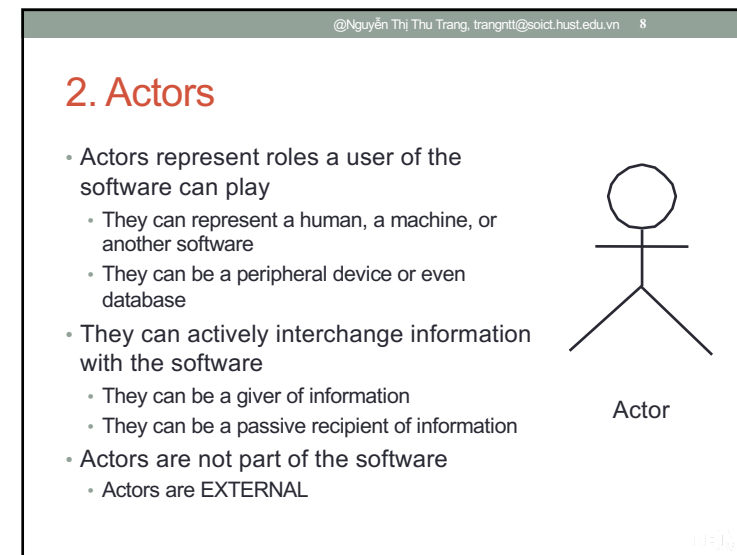
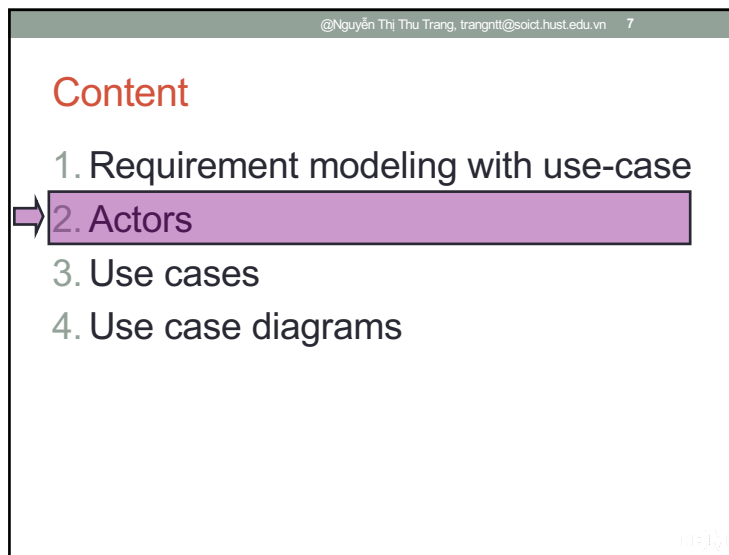
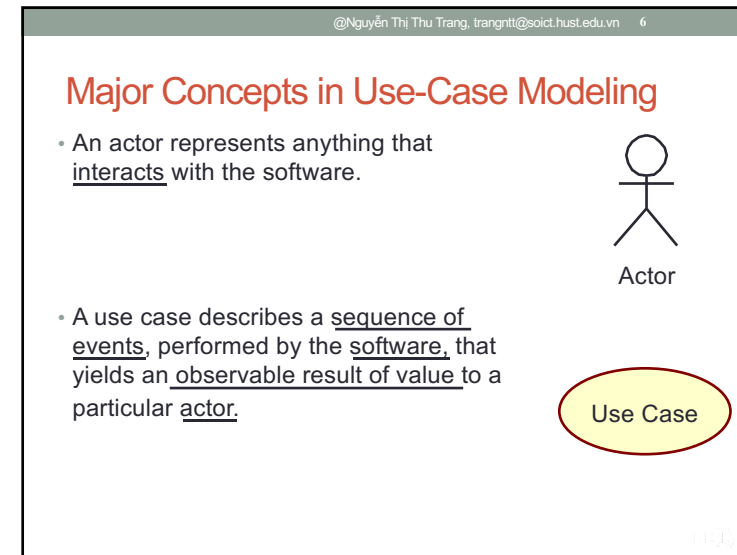
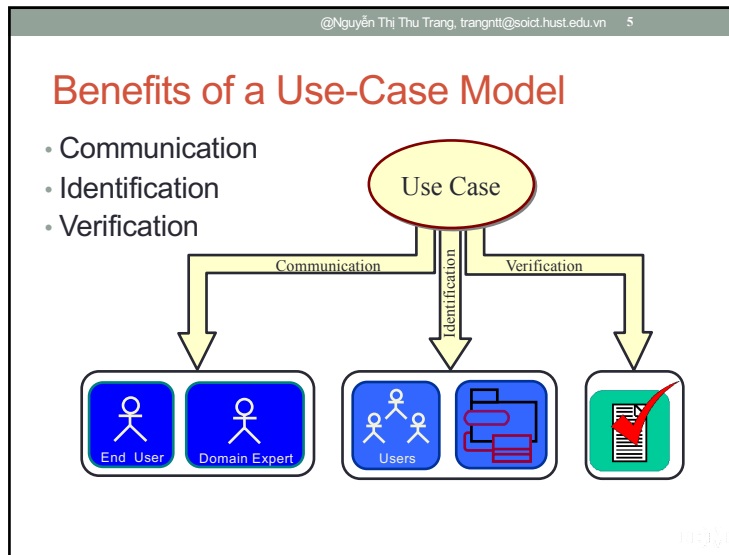


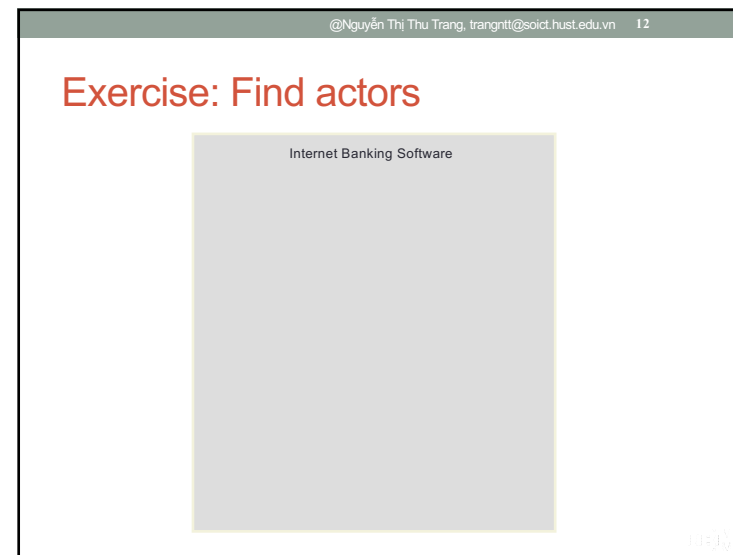
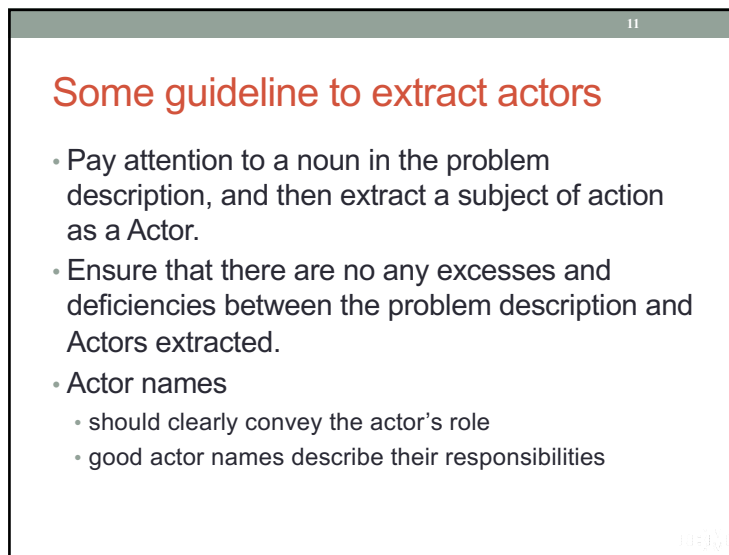
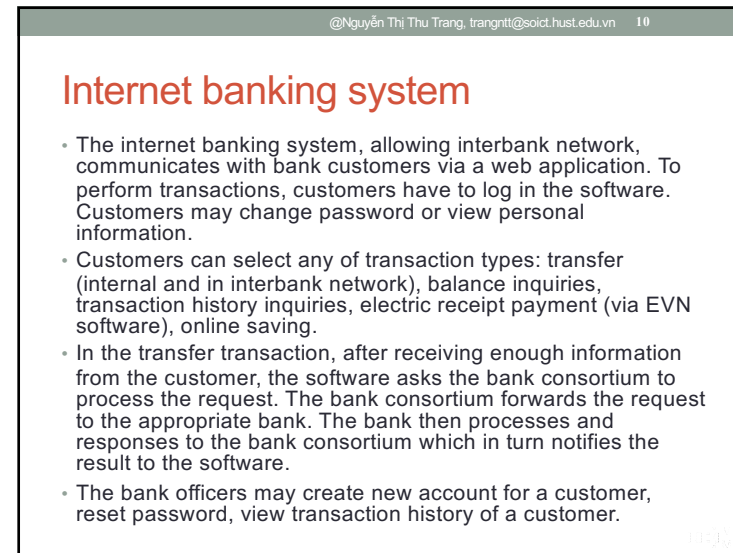
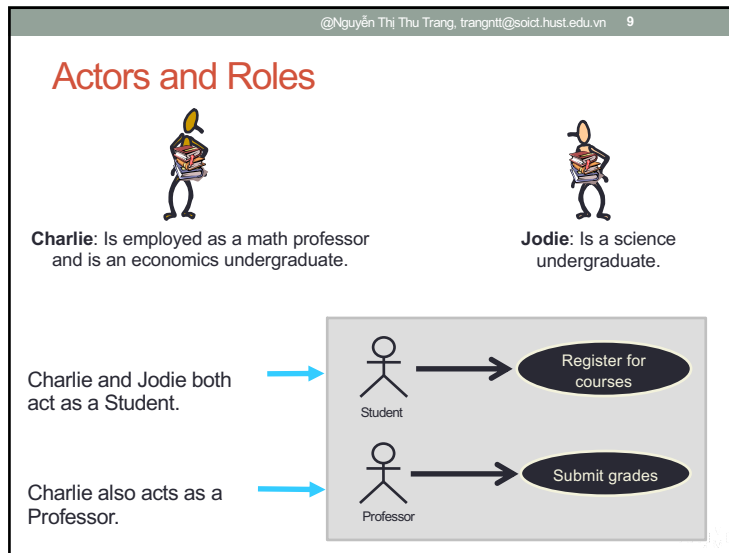
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## What Is Software Behavior?

- Software behavior is how a software acts and reacts.
  - It comprises the actions and activities of a software.
- Software behavior is captured in use cases.
  - Use cases describe the interactions between the software and (parts of) its environment.







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## 3. Use Cases

- Define a set of use-case instances, where each instance is a sequence of actions a software performs that yields an observable result of value to a particular actor.
  - A use case models a **dialogue** between one or more actors and the software
  - A use case describes the **actions the software takes** to deliver something of value to the actor



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## Some guidelines to extract use cases

- Pay attention to a verb in the problem description, and then extract a series of Actions as a UC.
- Ensure that there are no any excesses and deficiencies between the problem description and Use cases extracted.
- Check the consistency between Use Cases and related Actors.
- Conduct a survey to learn whether customers, business representatives, analysts, and developers all understand the names and descriptions of the use cases

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## Exercise: Find use cases

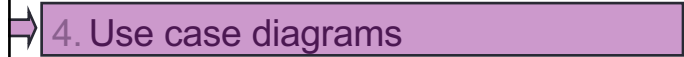


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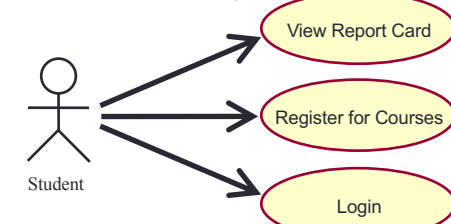
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## Overview of Use-Case Diagram

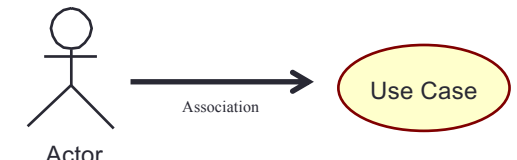
- A diagram modeling the dynamic aspects of softwares that describes a software's functional requirements in terms of use cases.
- A model of the software's intended functions (use cases) and its environment (actors).



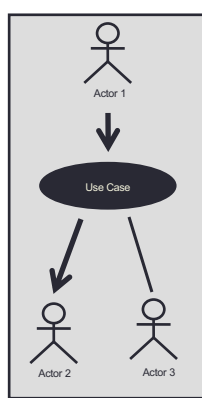
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## Association between actor and use case

- Establish the actors that interact with related use cases
  - Associations clarify the **communication** between the actor and use case.
  - Association indicate that the actor and the use case instance of the software communicate with one another, each one able to **send and receive messages**.
- The arrow head is optional but it's commonly used to denote the initiator.



Communicates-Association



- A channel of communication between an actor and a use case.
- A line is used to represent a communicates-association.
  - An arrowhead indicates who initiates each interaction.
  - No arrowhead indicates either end **can** initiate each interaction.

