软件工程

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Unified Process

➤ **Unified Process ---- a good OO paradigm**

➤ **Analysis workflow ---- to understand requirements deeper, to make it easier to design and implement the target system**

➤ **Unified process covers 3 kinds of classes:**

▶ **Entity class**

▶ **Boundary class**

▶ **Control class**

5. Object-Oriented Analysis

Three Steps of OOA

1. Use-case modeling

- ◆ **Determine how the various results are computed by the product (without regarding to sequencing)**
- ◆ **Use case diagram**

2. Class modeling

- ◆ **Determine the classes and their attributes**
- ◆ **Class diagram**

3. Dynamic modeling

- ◆ **Determine the actions performed by or to each class**
- ◆ **State diagram**

5.1 Use Case Modeling

Use-Case Modeling

- **What is a Use-Case Model?**

  - ◆ **A model that describes a system's functional requirements in terms of use cases.**

  - ◆ **System's environment ----** *actors*

  - ◆ **System's intended functions ----** *use cases*

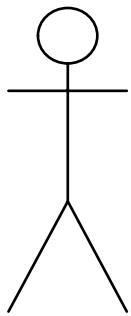 - ◆ *Relationship* **between actors and use cases**

What is an Actor?

An **actor** represents a coherent set of roles that one plays when interacting with these use cases.
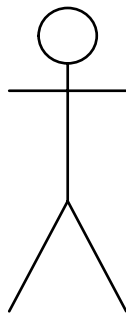
➢ **Actors are not part of the system ---- *EXTERNAL***

➢ **Actors can represent a human, a machine, or another system that plays with the system.**

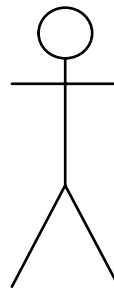➢ **They can be a giver of information, or a passive recipient of information.**

Actor Symbol

➢ **Actor is represented as stickman named by singular domain-related noun, which can reflect the role that one plays or adopts in the model precisely.**
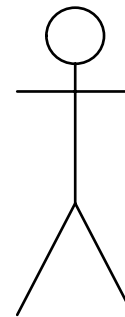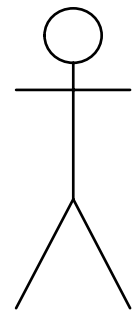
Customer   **Student**   **<<System>> Payment Processor**   **Timer**   **Sensor**

What is Actor for?

◆ **Actors help delimit the system and give a clearer picture of what it is supposed to do.**

◆ **Use cases are developed on the basis of the actor's needs, ensuring that the system turns out to be what the users expected.**

What is a Use Case?

◆ **A use case describes a sequence of actions a system performs, that yields an observable result of value to a particular actor.**

◆ **A use case describes what a system does, but it does not specify how it does it.**

Examples of Use Case

- **Take course**

- **Take exam**

- **Deposit funds**

- **Place order**

- **Book ticket**

- **Borrow book**

- **……**

Use Case Symbol

➢ **A use case is represented as ellipse, with case name inside, which is domain-related and starts with strong verb.**

Login

Deposit Funds

Place Order

Take Course

Relationship between Actors and Use Cases

➢ **A use case is initiated by an actor to invoke a certain functionality in the system.**

➢ **A use case models a dialogue between one or more actors and the system.**

Relationship Symbol

➢ **An actor is connected to one or more use cases, by an association, which is represented as a line between the actor and the use cases.**

➢ **An association between an actor and a use case indicates that the actor and the use case communicate with one another, each one able to send and receive messages.**

Relationship Symbol

Customer

Place Order