***CSE\_347 (Use case)***

**What is Use Case**

• A formal way of representing how a business system interacts with its environment

• Illustrates the activities that are performed by the users of the system

• A scenario-based technique in the UML

• A sequence of actions a system performs that yields a valuable result for a particular actor.

**Use Case**

• Use case diagrams describe what a system does from the standpoint of an external observer. The emphasis is on what a system does rather than how.

• Use case diagrams are closely connected to scenarios. A scenario is an example of what happens when someone interacts with the system.

**Use Case Analysis**

• Actor:

A user or outside system that interacts with the system being designed in order to obtain some value from that interaction

• Use Cases describe scenarios that describe the interaction between users of the system (the actor) and the system itself.

**Use Cases for a medical clinic**

• A patient calls the clinic to make an appointment for a yearly checkup. The receptionist finds the nearest empty time slot in the appointment book and schedules the appointment for that time slot.

• We want to write a use case for this scenario.

• Remember: A use case is a summary of scenarios for a single task or goal.

**Use Cases for a medical clinic**

• As we read the scenario, define those people or systems that are going to interact with the scenario.

• A patient calls the clinic to make an appointment for a yearly checkup. The receptionist finds the nearest empty time slot in the appointment book and schedules the appointment for that time slot.

**Questions for Identifying People Actors**

• Who is interested in the scenario/system?

• Where in the organization is the scenario/system be used?

• Who will benefit from the use of the scenario/system?

• Who will supply the scenario/system with this information, use this

information, and remove this information?

• Does one person play several different roles?

• Do several people play the same role?

• Does one person play several different roles?

• Do several people play the same role?

**Actors**

• An Actor is outside or external the system. It can be a:

Diagram

Description automatically generated• Human

• Peripheral device (hardware)

• External system or subsystem

• Time or time-based event

• Database etc.

• Whether human or not, represented by stick figure with the name of the actor

• Actors are NOT a part of the system (external to the system)

• A single actor may represent multiple physical users

**Identifying Actors**

• A use case is a summary of scenarios for a single task or goal.

Diagram

Description automatically generated• An actor is who or what initiates the events involved in the task of the use case. Actors are simply roles that people, or objects play.

• So, from the previous scenario, what or who is the actor????

• The actor is a Patient.

**Use Case Component**

• The use case has three components.

• The use case task referred to as the use case that represents a feature needed in a software system.

• The actor(s) who trigger the use case to activate.

• The communication line to show how the actors communicate with the use case.

**Use Case and Function**

• Each use case in a use case diagram describes one and only one function in which users interact with the system

• May contain several “paths” that a user can take while interacting with the system

• Each path is referred to as a scenario

• Use Case Labelled using a descriptive verb-noun phrase represented by an oval

A picture containing icon

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**Use case: Relationship**

• Relationship represent communication between actor and use case

• Depicted by line or double-headed arrow line

• Boundary

**#** A boundary rectangle is placed around the perimeter of the system to show

how the actors communicate with the system.

Icon

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Text

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**Use Case Diagram Relationship**

Diagram

Description automatically generated• Include Relationship

• Represents the inclusion of the functionality of one use case within another

• Arrow is drawn from the base use case to the used use case

• Write << include >> above arrowhead line

Diagram

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**Use Case Relationships**

**• Pros:**

• Reduces redundancy in use cases

• Reduces complexity within a use case

**• Cons:**

• May introduce complexity to use case diagram

• Mainly talking about extend, include, and generalization relationships.

• 95% of relationships on a use case diagram is association

**Benefits of Use Case**

• Relatively easy to write and easy to read

• Comprehensible by users

• Engage the users in the requirements process

• Force developers to think through the design of a system from a user viewpoint

• Identify a context for the requirements of the system

• Critical tool in the design, implementation, analysis and testing process

• Rapid change allows exploratory approach

• Serve as inputs to the user documentation

**Difficulties with Use Cases**

• As functional decompositions, it is often difficult to make the transition from functional description to object description to class design

• Reuse at the class level can be hindered by each developer “taking a Use Case and running with it”. Since UCs do not talk about classes, developers often wind up in a vacuum during object analysis, and can often wind-up doing things their own way, making reuse difficult

• Use Cases make stating non-functional requirements difficult

• Testing functionality is straightforward, but unit testing the particular implementations and non-functional requirements is not obvious

**Use Case Model Survey**

• The Use Case Model Survey is to illustrate, in graphical form, the universe of Use Cases that the system is contracted to deliver.

• Each Use Case in the system appears in the Survey with a short description of its main function. Participants:

• Domain Expert

• Architect

• Analyst/Designer (Use Case author)

• Testing Engineer