

CSE4006: Software Engineering

Lab 4: Software Requirements Specification and UML

Software Engineering Lab

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SRS

SRS ?

Software Requirements Specification

- description of a software system to be developed, laying out functional and non-functional requirements

IEEE Standard SRS Form

- Introduction
 - Purpose
 - Definitions
 - System overview
 - References
- Overall description
 - Product perspective
 - System Interfaces
 - User Interfaces
 - Hardware interfaces
 - Software interfaces
 - Communication Interfaces
 - Memory Constraints
 - Operations
 - Site Adaptation Requirements
 - Product functions
 - User characteristics
 - Constraints, assumptions and dependencies
- Specific requirements
 - External interface requirements
 - Functional requirements
 - Performance requirements
 - Design constraints
 - Standards Compliance
 - Logical database requirement
 - Software System attributes
 - Reliability
 - Availability
 - Security
 - Maintainability
 - Portability
- Other requirements

Link : <http://goo.gl/HgTF9L>

IEEE Standard SRS Form (cont.)

1. Introduction

- In Section 1.1 “Purpose”, describe the purpose of **this document**, not the purpose of the software being developed.
- In Section 1.2 “Scope”, describe the scope of **this document**, not the scope of the software being developed.
- In Section 1.5 “Overview”, provide an overview of **this document**, not the overview of the software being developed.
- In Section 1.4 “Definitions”, should be write using the following template: word_defined. <in lower case, ended with a dot “.”>
Followed by a definition.

IEEE Standard SRS Form (cont.)

2. Overall Description

- A Context Diagram is mandatory.
- Other important characteristics are: Product Perspective, product Functions, User Characteristics, Constraints, Assumptions and Dependencies

IEEE Standard SRS Form (cont.)

3. Specific requirements

- Never specify the Operating System or Language in the SRS, unless the customer demands doing so.
- Use Case Diagrams have to be included in most sections, specifically in the “Functional Requirements” section.

IEEE Standard SRS Form (cont.)

3. Specific requirements

- Specific Requirements Section should be split into:
 - “External Interfaces” derived from the Context Diagram
 - “Functional Requirements” that should be further split into “Input Requirements” (related to user inputs, commands, etc.), “Output Requirements” (mostly related to the GUI), “Input/Output Requirements” (if they cannot be separated), and “Processing Requirements”
 - “Non-Functional Requirements”, such as performance, reliability, safety, security, etc.
 - “Design Constraints”, normally related to software and hardware limitations (OS, platform, stand-alone or networked, network protocols, standards, etc.);
 - “Database Requirements” - can be combined with “Design Constraints”.

IEEE SRS Template and Example

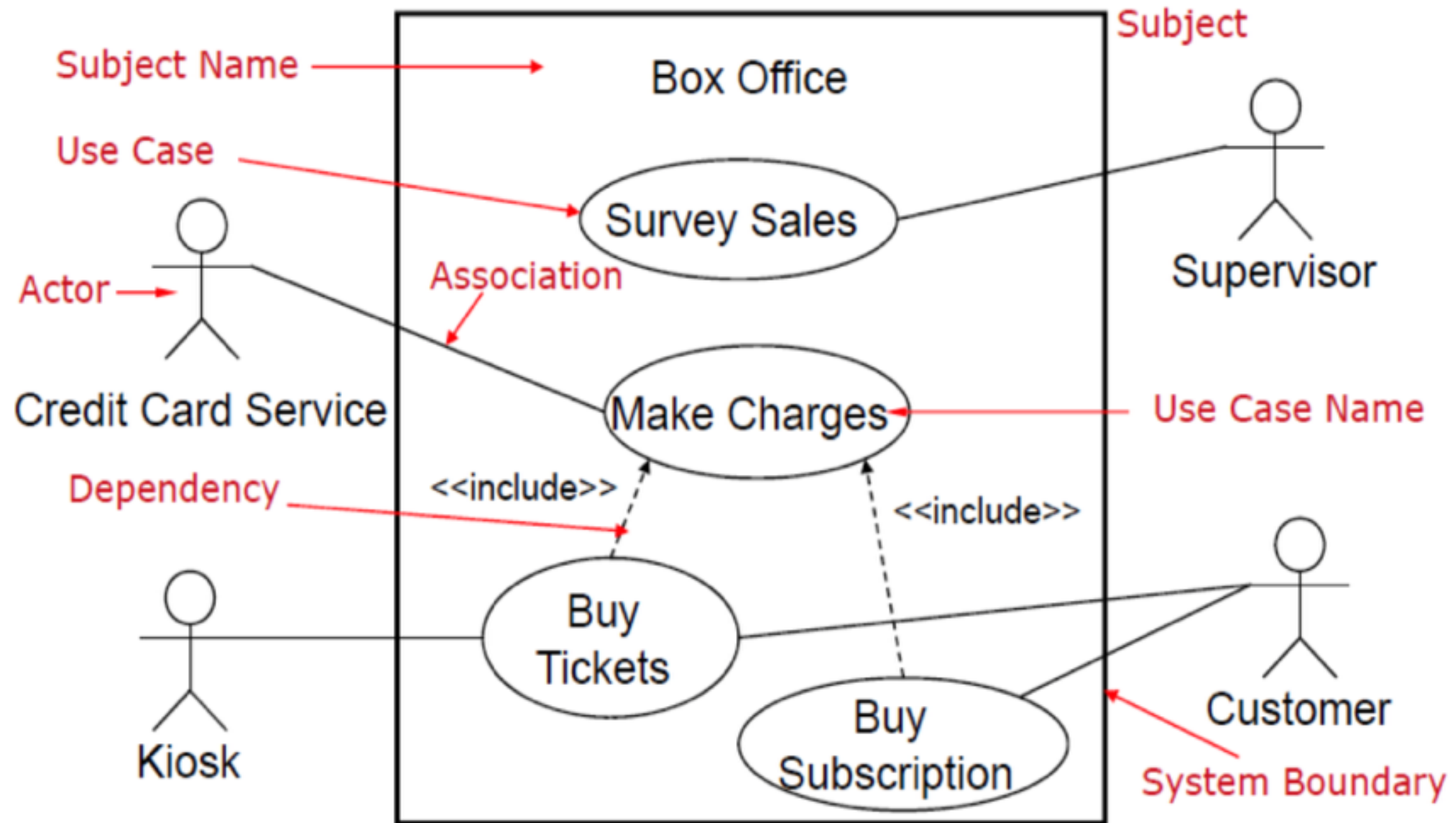
IEEE Software Requirements Specification Template

- <http://capstone.cs.ucsb.edu/cs189a/support/SRS-template.doc>
- http://www.csse.monash.edu.au/~sitar/CSE4002/Lectures/srs_template-1.doc

SRS Example

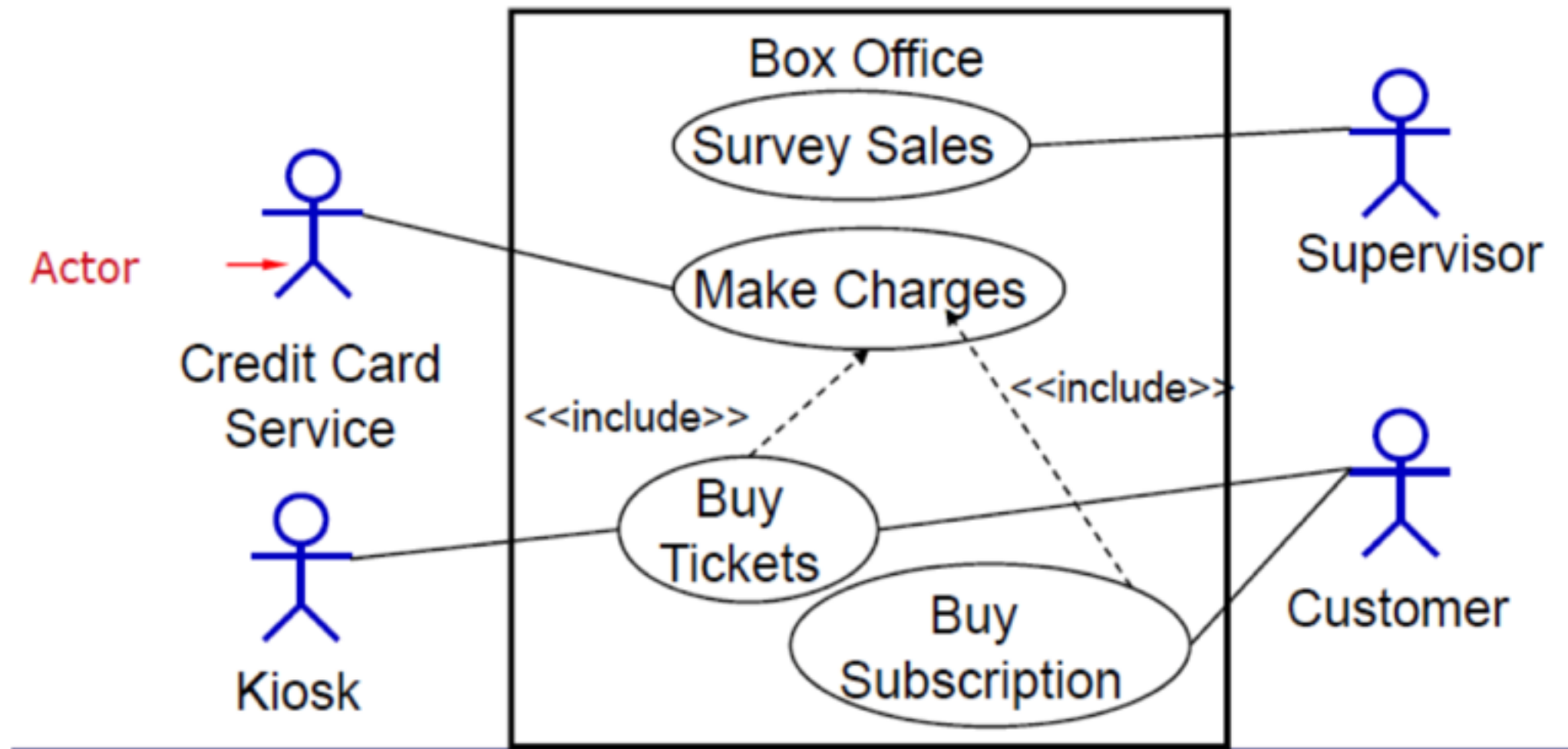
- http://regisindia.com/wp-content/uploads/2013/10/SRS-Development-of-Web-GIS-Tool_IEEE-SA-830-SRS-Format_Final_27082013.pdf

Use Case Diagrams



Actor

- Someone or some thing that must interact with the system under development
 - Users, external systems, devices



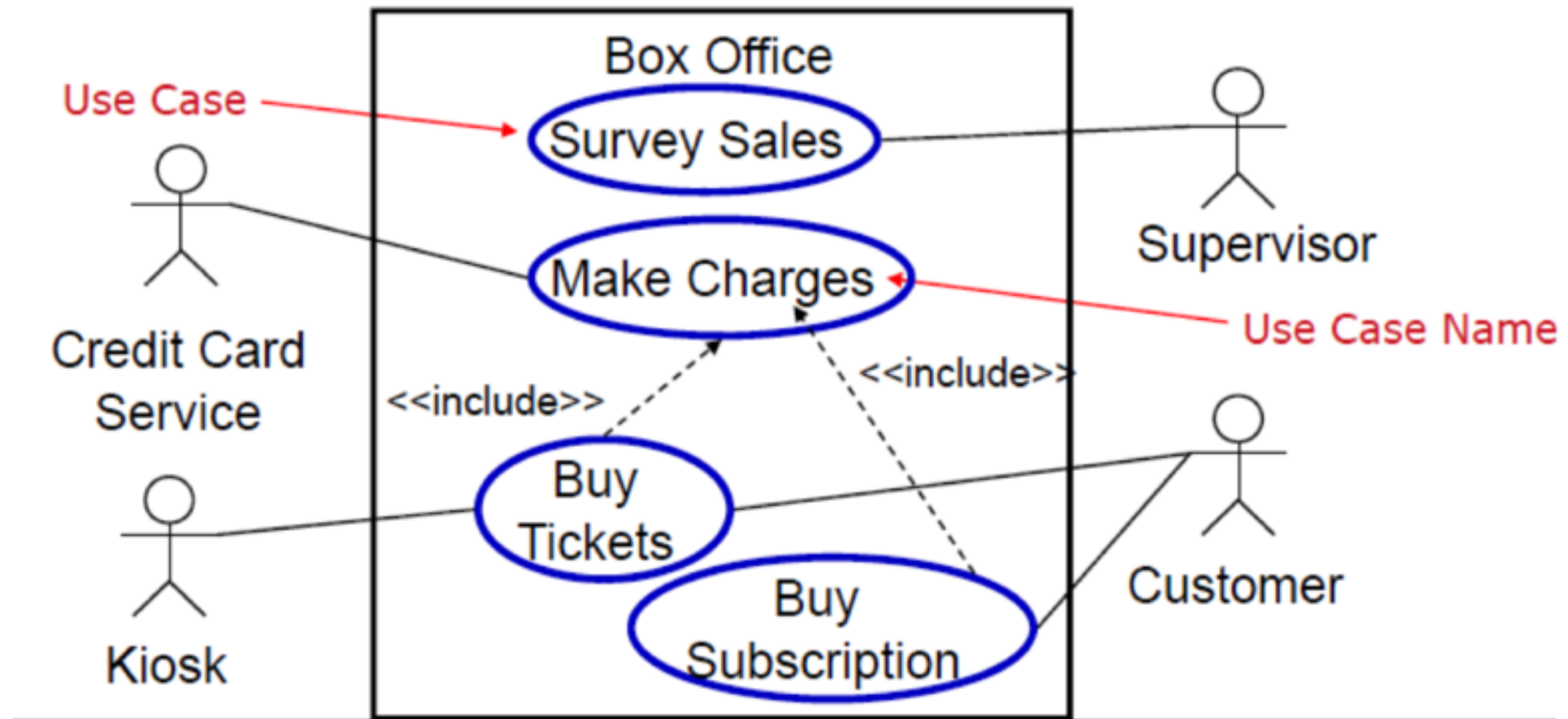
Identifying Actors

- **Primary Actor:** Who will use the main functionality of the system ?
- **Secondary Actor:** Who will need to maintain, administrate, and keep the system working?

Use Case – Diagram

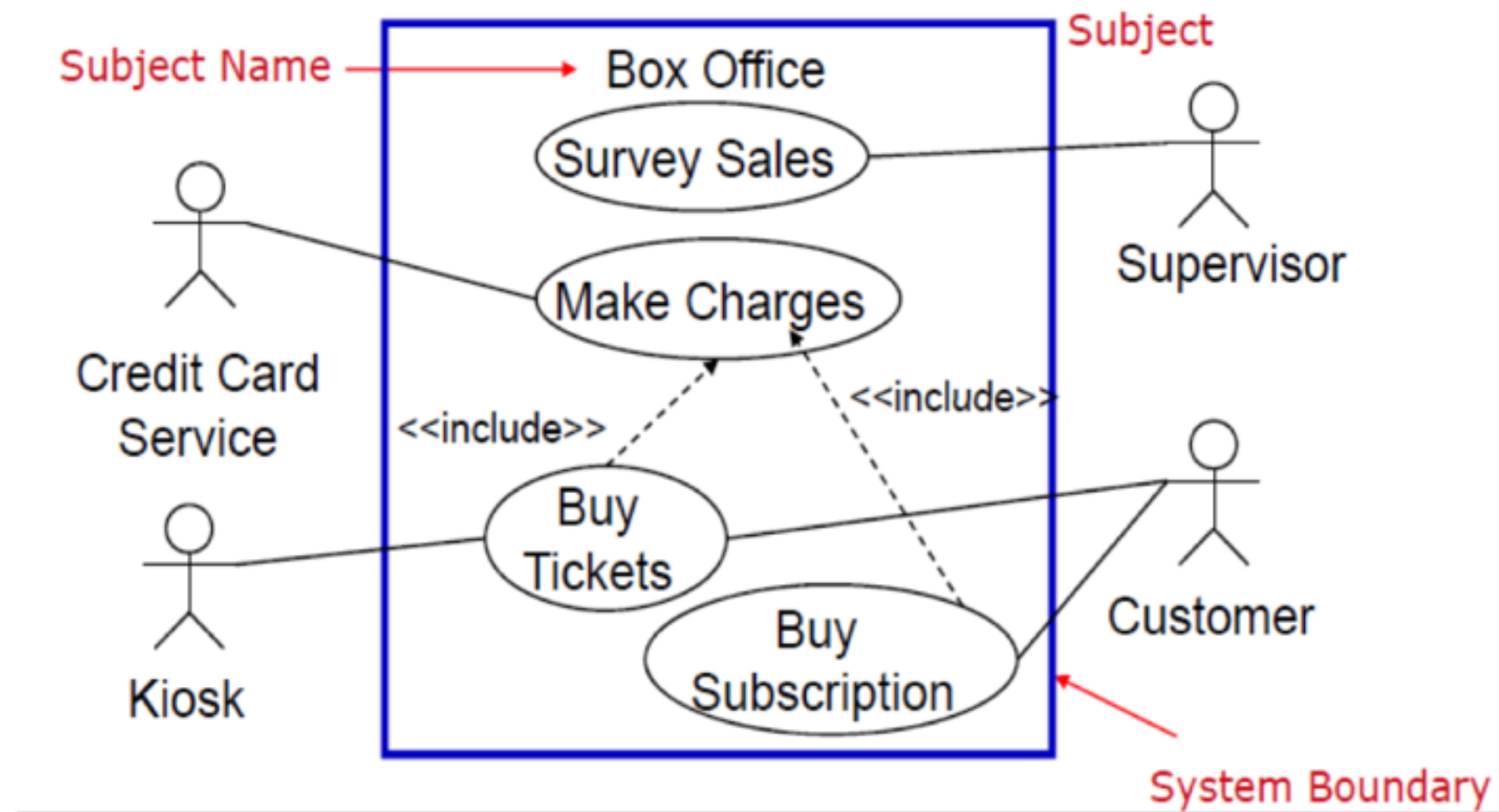
Use Case

- Functionality that the system shall offer to an actor
 - transaction among actors and the subject
 - interaction between one or more actors and the system



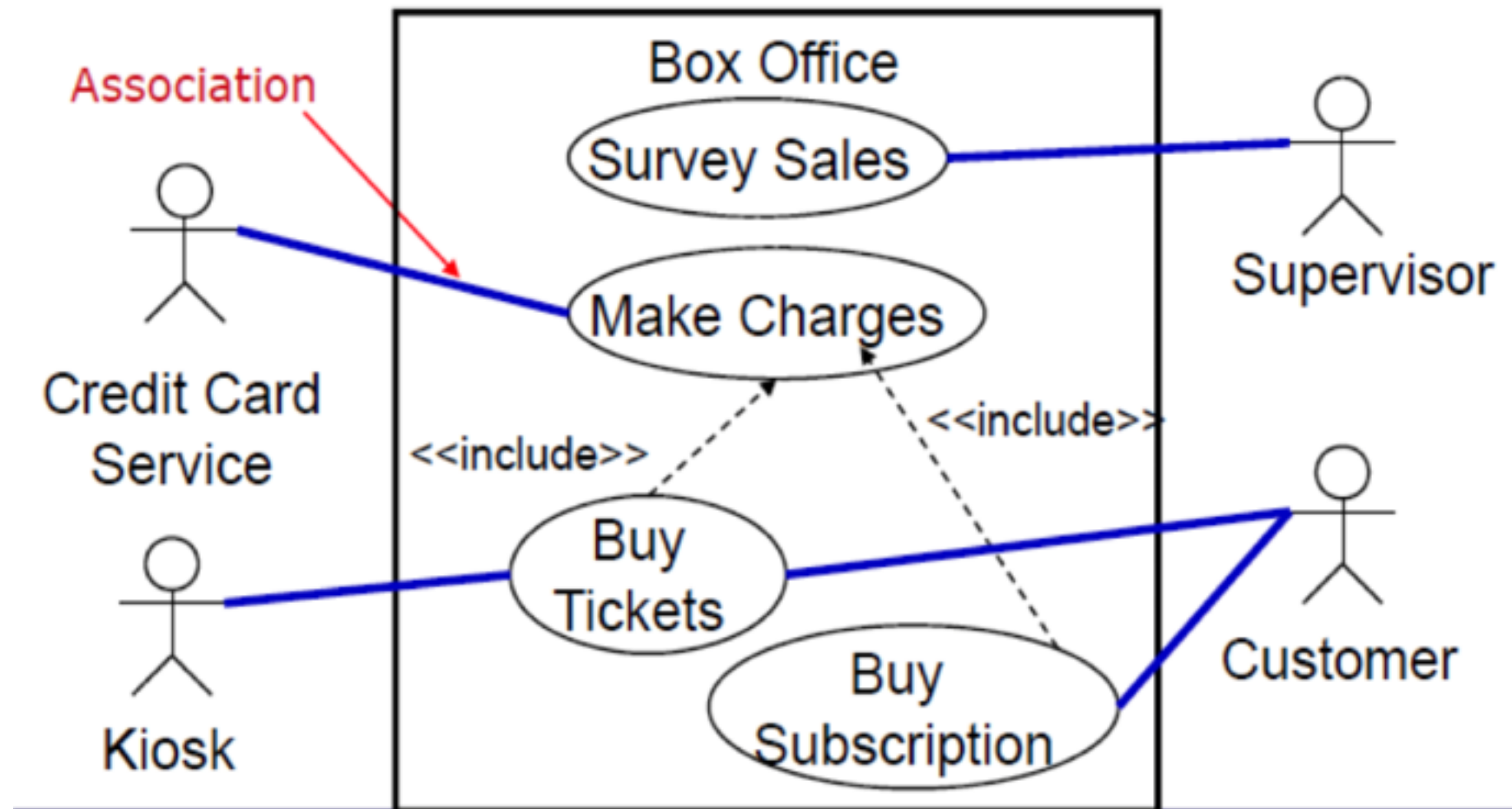
Subject Symbol

- Indicate system boundary
 - Represent the system begin developed
 - All actors who interact with the system are outside of it



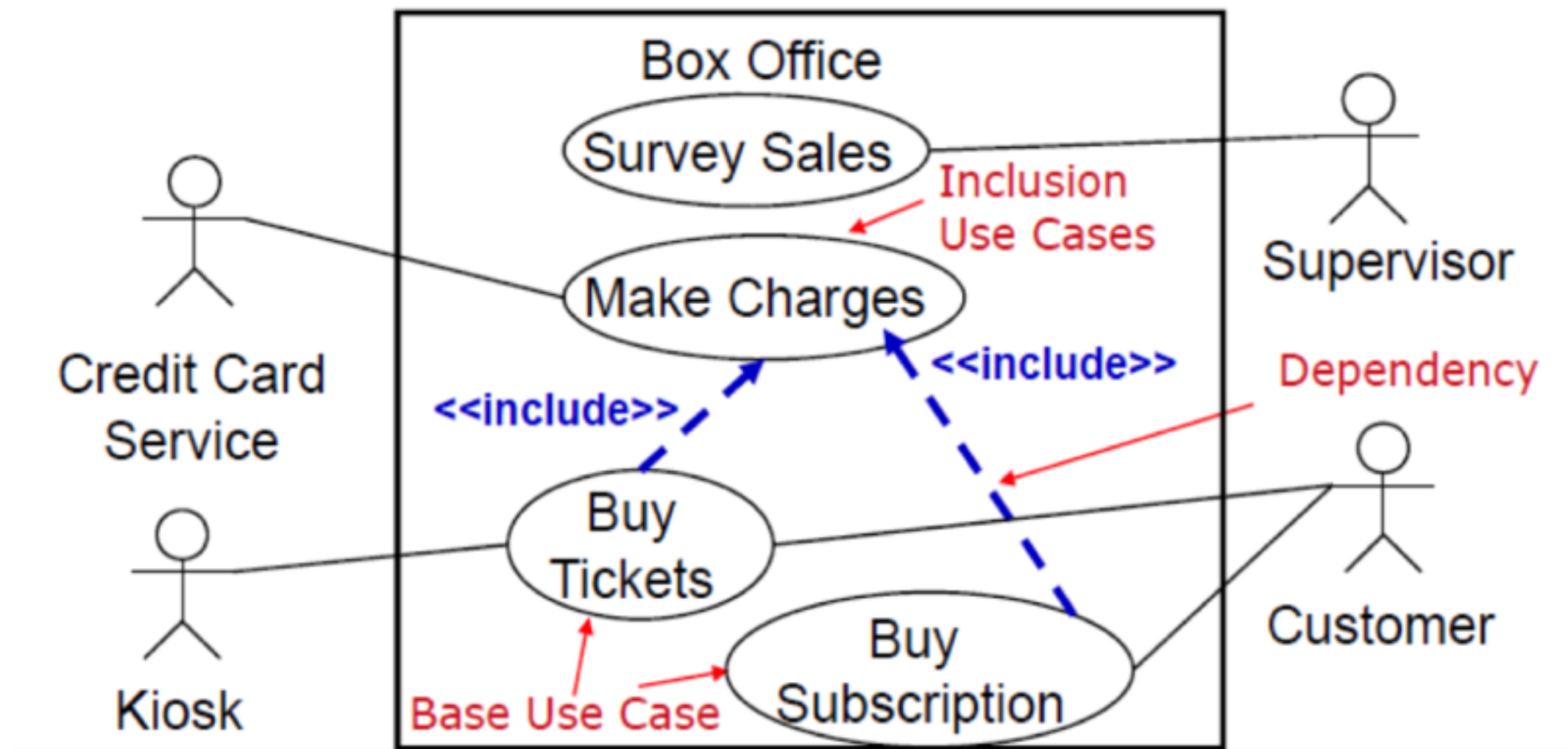
Association

- Drawn between an actor and a use case
- Represents bi-directional communication between the actor and the system



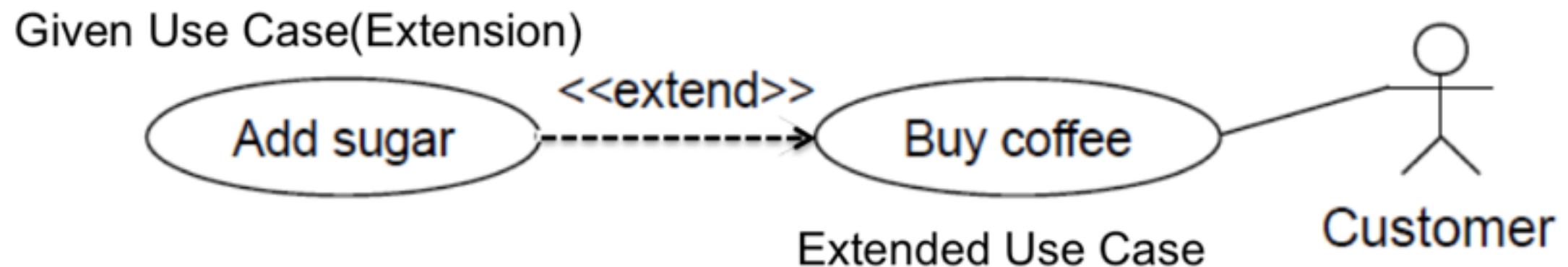
Dependency: Include

- Represent relationship from a base to an inclusion use case
 - imply a Use Case calling another Use Case
 - to reuse behavior common to several Use Cases

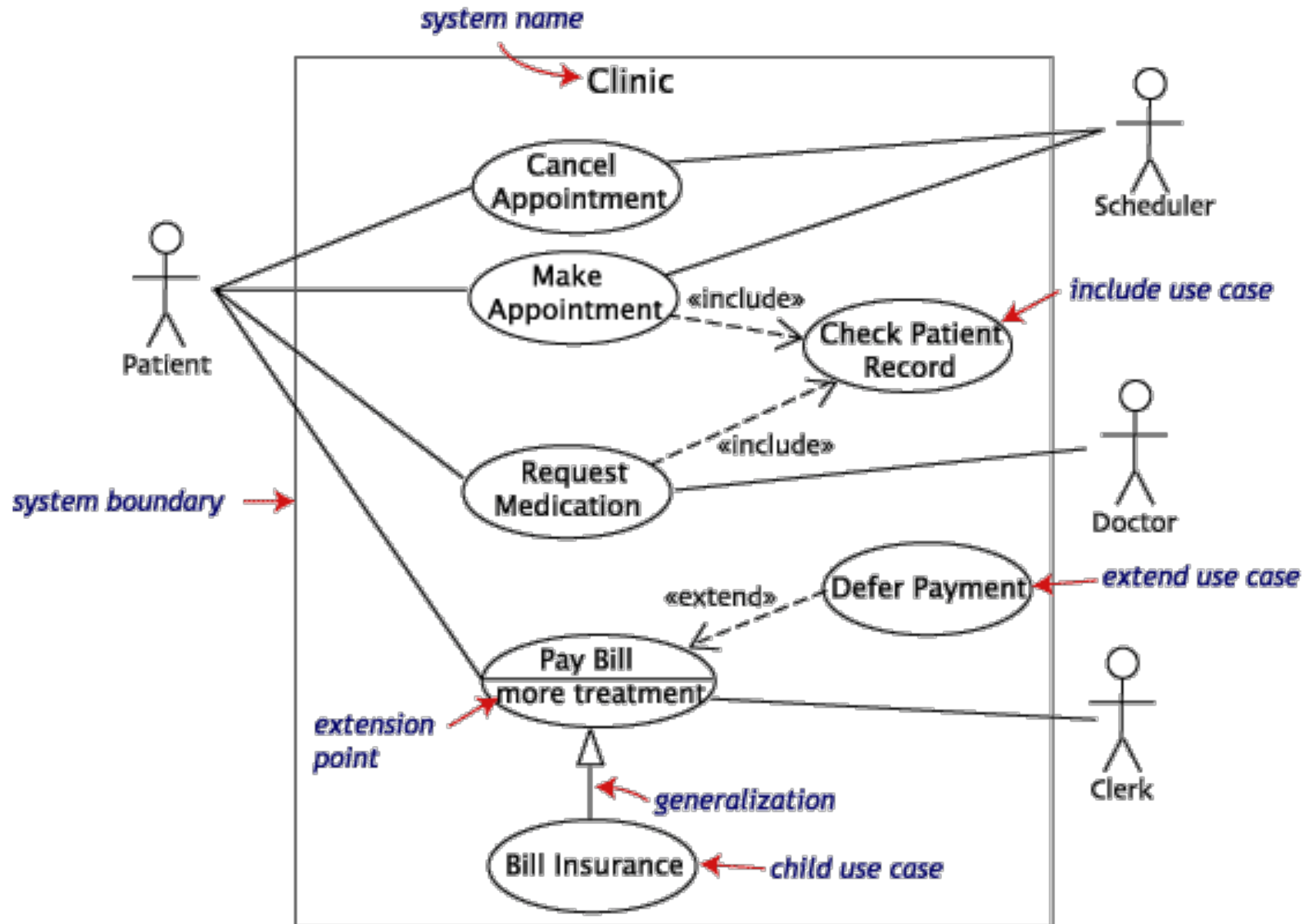


Dependency: Extend

- Used when additional behavior should be added
- models optional or conditional behavior
- show infrequent events



Use Case Diagram - Example



Use Case – Description

Use Case ID	UC-001
Use Case Name	Monitor Windows and Doors
Goal	To notify the monitoring personnel about a possible intrusion into the home.
Actor	Primary: Possible Intruder Secondary: Home Owner, Monitoring Personnel
Trigger	Home owner set monitoring service
Precondition	1. The monitor windows and doors options are not set.
Primary Scenario	<ol style="list-style-type: none"> 1. The home owner decides to take his entire family out for a considerable amount of time, so he or she closes all the windows and doors. 2. The home owner, outside with his family, enables the monitoring of windows and doors remotely using a remote control. 3. A door or window opens by a possible intruder as detected by the magnetic switch while the options are enabled, thus alerting SafeHome to send a notification to the monitoring personnel so that they can phone the police. An alarm bell goes off in the home, perhaps scaring the possible intruder. 4. The possible intruder runs away.
Exceptions	<ol style="list-style-type: none"> 1a. Or the family goes to bed for the night, expecting no visitors. 2a. The home owner enables the monitoring of windows and doors using the control panel inside the house then goes to bed. 2b. The monitoring option for windows or doors fails to enable because a window or door is not shut, so the home owner checks and shuts the appropriate opening(s) and is finally able to enable the monitoring options. 4a. The possible intruder is not an intruder, so he/ she disables the alarm by typing the correct pin and cancels the notification already made to monitoring personnel
Postcondition	1. Personnel are alerted of intrusion (and informed it was a false alarm if the correct pin is entered to disable the alarm, otherwise, the police are phoned).
Priority	High

Ex1 : Pizza deliver SRS

Write a SRS document for Pizza deliver

- Using IEEE template
- Just write functional requirements.

Ex2 : Pizza deliver Use Case

- Draw Use Case diagram

Each diagram should have at least 2 Dependency, 3 Use cases and 2 Actors.

- Write Use Case Discription

- At least 2 Use Cases.