

Chapter 4

■ Understanding Requirements

Requirements Engineering-I

- **Inception**—ask a set of questions that establish ...
 - basic understanding of the problem
 - the people who want a solution
 - the nature of the solution that is desired, and
 - the effectiveness of preliminary communication and collaboration between the customer and the developer
- **Elicitation**—elicit requirements from all stakeholders
- **Elaboration**—create an analysis model that identifies data, function and behavioral requirements
- **Negotiation**—agree on a deliverable system that is realistic for developers and customers

Requirements Engineering-II

- **Specification**—can be any one (or more) of the following
 - A written document
 - A set of models
 - A formal mathematical
 - A collection of user scenarios (use-cases)
 - A prototype
- **Validation**—a review mechanism that looks for
 - errors in content or interpretation
 - areas where clarification may be required
 - missing information
 - inconsistencies (a major problem when large products or systems are engineered)
 - conflicting or unrealistic (unachievable) requirements.
- **Requirements management**

Quality Function Deployment

- **Function deployment** determines the “value” (as perceived by the customer) of each function required of the system
- **Information deployment** identifies data objects and events
- **Task deployment** examines the behavior of the system
- **Value analysis** determines the relative priority of requirements

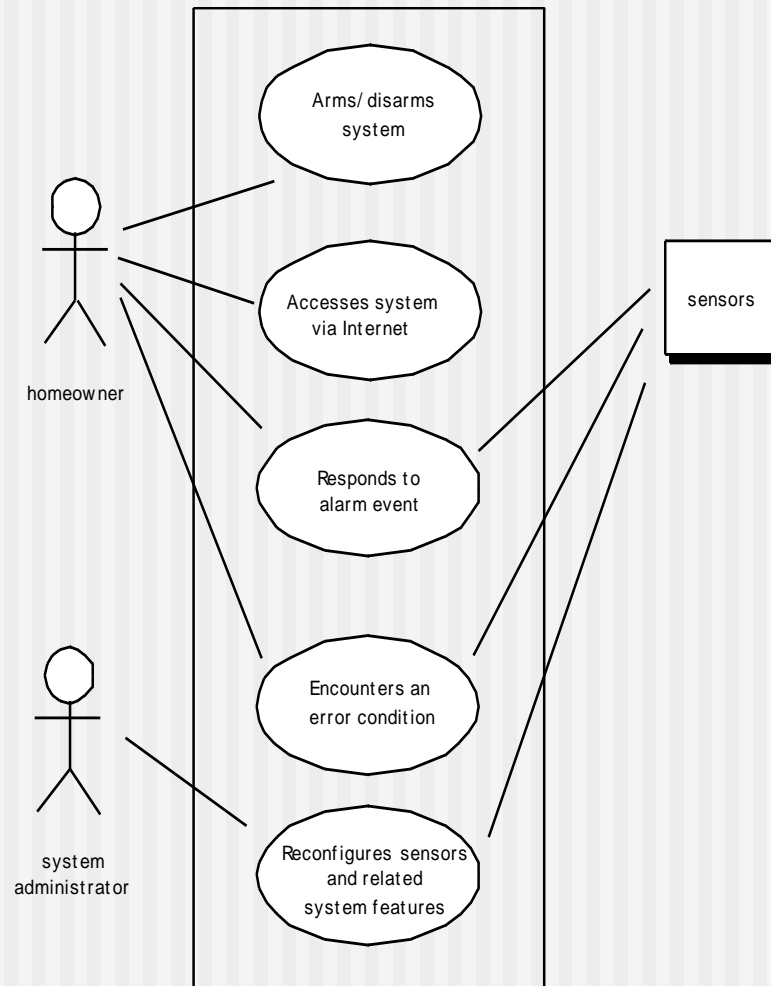
Building the Analysis Model

- Elements of the analysis model
 - Scenario-based elements
 - Functional—processing narratives for software functions
 - Use-case—descriptions of the interaction between an “actor” and the system
 - Class-based elements
 - Implied by scenarios
 - Behavioral elements
 - State diagram
 - Flow-oriented elements
 - Data flow diagram

Use-Cases

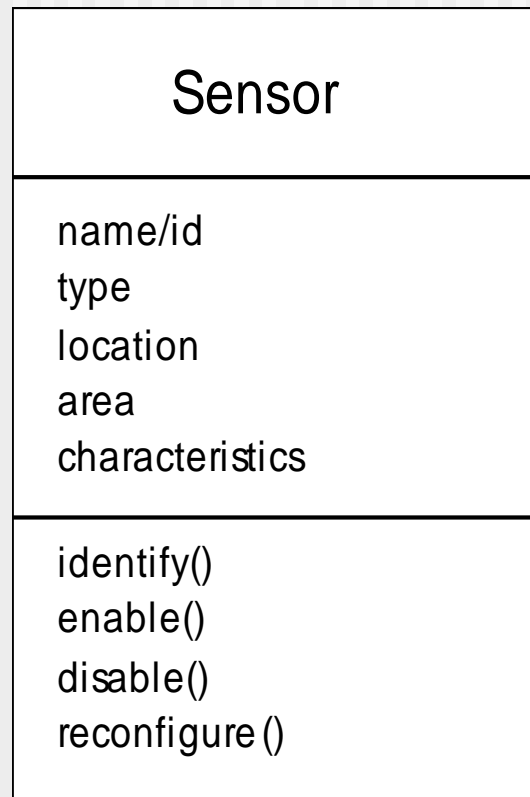
- A collection of user scenarios that describe the thread of usage of a system
- Each scenario is described from the point-of-view of an “actor”—a person or device that interacts with the software in some way
- Each scenario answers the following questions:
 - Who is the primary actor, the secondary actor (s)?
 - What are the actor’s goals?
 - What preconditions should exist before the story begins?
 - What main tasks or functions are performed by the actor?
 - What extensions might be considered as the story is described?
 - What variations in the actor’s interaction are possible?
 - What system information will the actor acquire, produce, or change?
 - Will the actor have to inform the system about changes in the external environment?
 - What information does the actor desire from the system?
 - Does the actor wish to be informed about unexpected changes?

Use-Case Diagram

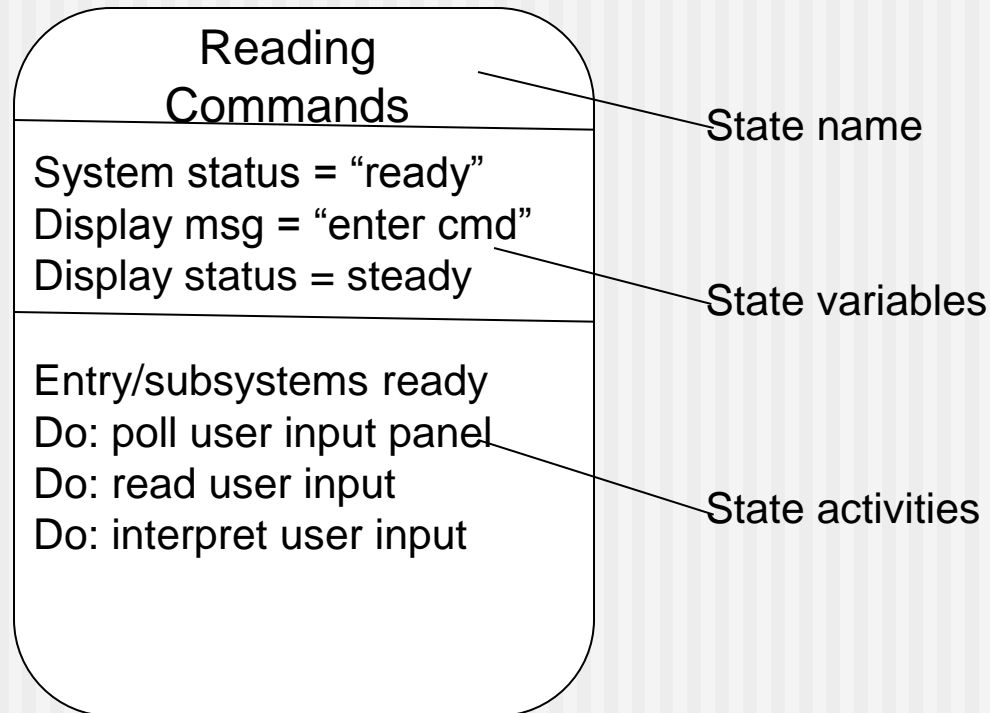


Class Diagram

From the *SafeHome* system ...



State Diagram



Questions

- 1、 What is the tasks of Requirements Engineering?
- 2、 What are the three types of requirements for quality function deployment?
- 3、 What are the elements of the analysis model?