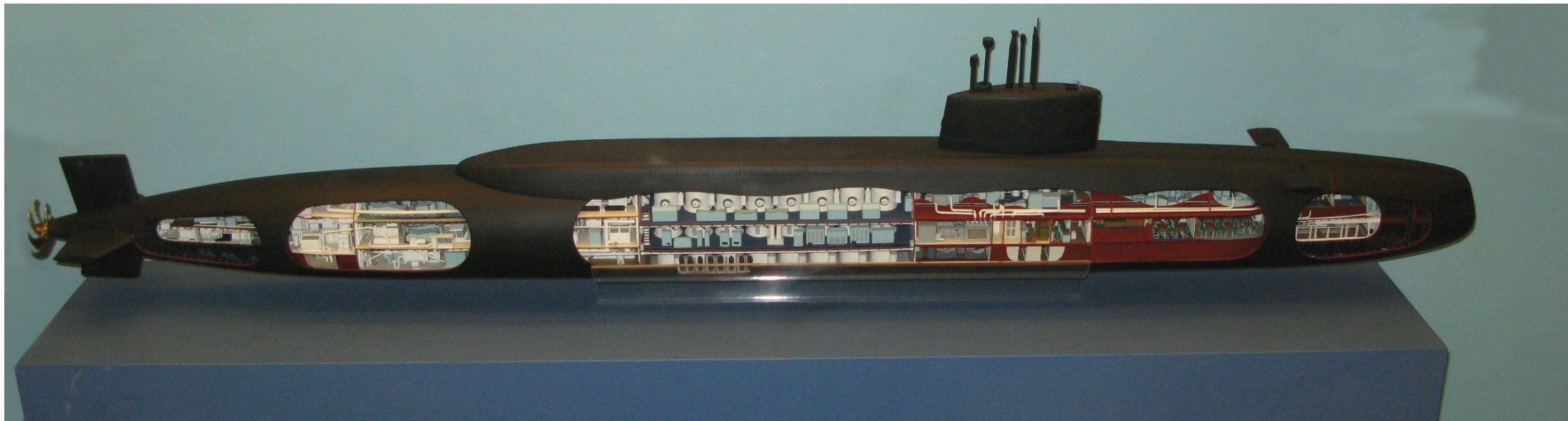# Requirements Modelling with Use Cases

Why Model Requirements?

- **See requirements in context**
- **Multiple views**
  - high-level
  - detail
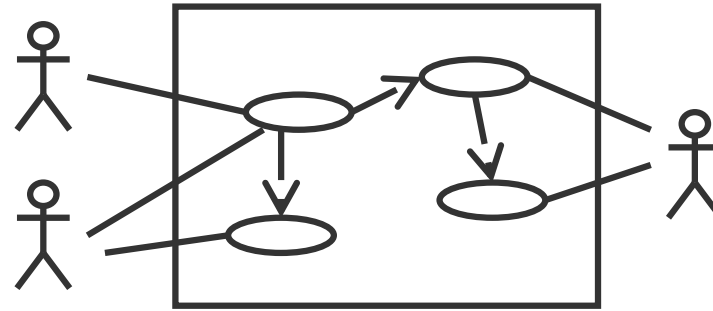- **See what's missing**

Product vs User Centred

- **Product-Centred**
  - Focus on features to be delivered
    - » expect users will use features to complete tasks

- **User-Centred**
  - Focus on anticipated usage
    - » what do users need to accomplish
  - Reveal necessary functionality
  - Assists with prioritisation

Use Case Modelling

Use Case Modelling

- **Models and documents functional requirements of a problem domain**
  - **user centred**
  - **role based**
  - **detailed**

Background

- **Use cases first described by Ivar Jacobson**
  - *Object-Oriented Software Engineering: A Use Case-Driven Approach.* Addison Wesley, 1992.

- **Incorporated into numerous other methods**
  - e.g. RUP, OPEN, Process MeNtOR, RWSP, RDD, ...

- **Basic technique for capturing user requirements**

Why Use Cases?

- **Formalises users' expectations of what the system is to do and how the system is to be used**

- **Easy technique to understand**
  - **documents actual paths through the system**

- **User-driven process**
  - **encourages user involvement**

- **Basis for scoping and prioritising development work**

- **Basis for acceptance testing**

- **Well aligned with Business Process Modelling**

Actors, Use Cases & Association

- *Actors* – things outside of the system that interact with the system
  - users, other systems, ...
- *Use Cases* – features of the system that an actor uses
- *Associations* – indicates a relationship between an actor and a use case

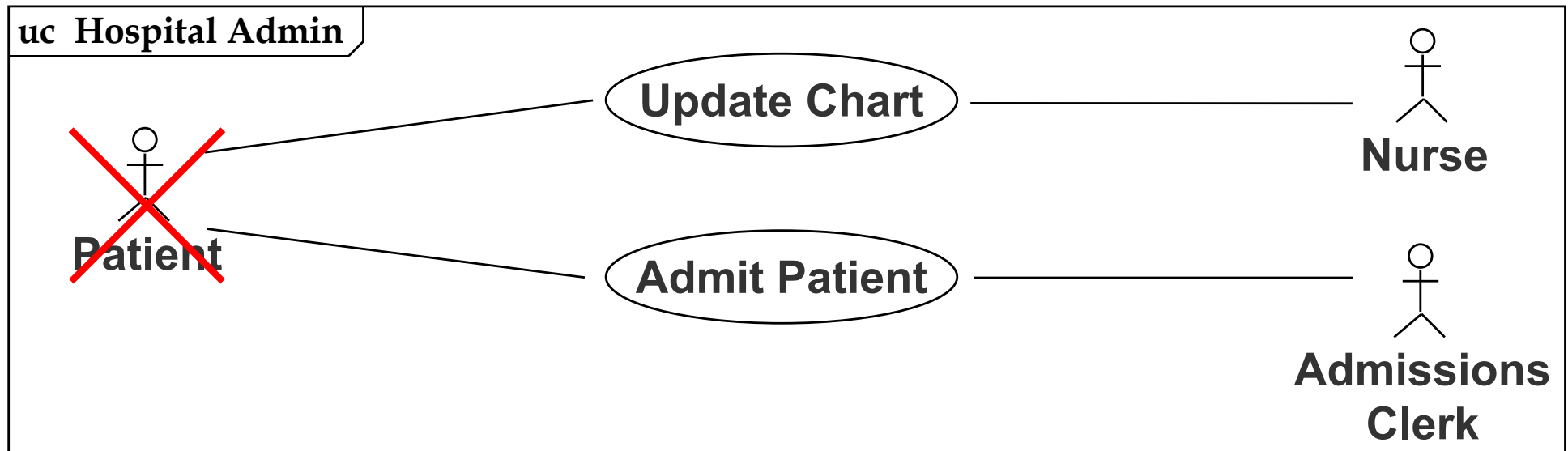Actor   Association   Use Case

Actors

- *Everything* that interacts with the system
  - people as well as other systems
  - important in defining the boundary of the system

- Not described in detail (they're outside of system)
  - though their interface is usually defined

- Normally act in several use cases

- Represents a *role* that a user can play
  - many users are represented by a single actor
  - one user can be different actors at different times
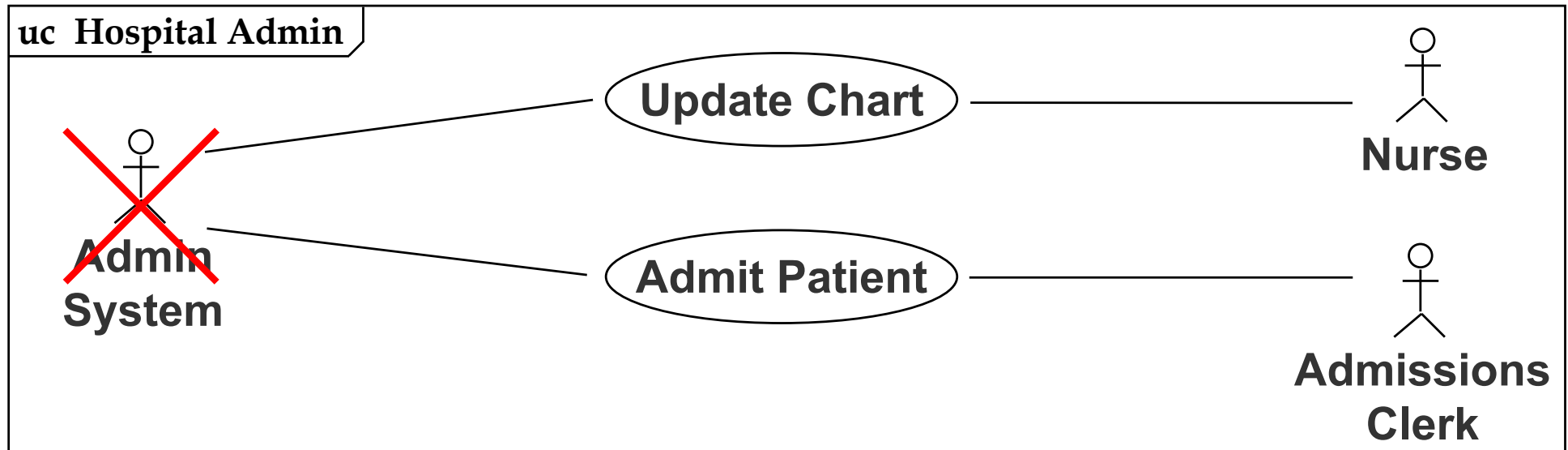   - » performs different use cases depending on role

Actors and Users

- **Distinguish between actors and users**
- **A user plays the role of an actor**
  - **e.g. actor is a "clerk"**
  - **e.g. user is "John Smith" – an actual clerk**
- **A user may play the roles of many different actors**
  - **e.g. "Sarah Jones" who sometimes plays the role of a "developer" and at other times the role of "system administrator"**
    - » **"Developer" and "System Administrator" are actors**

Actors are External to System
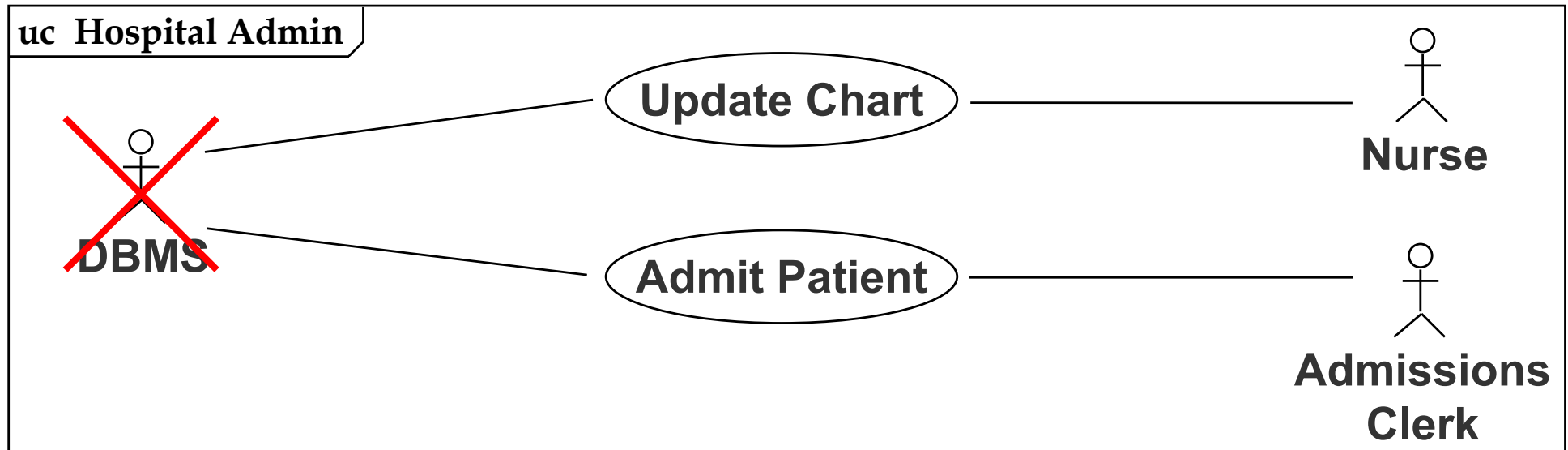

uc Hospital Admin

- **Make sure that actors are people or other systems that would actually *use* the system**
  - not things that would be modelled *within* the system
    - » hospital administration system
      - patients would be modelled *within* the system
      - but are unlikely to *use* the system themselves

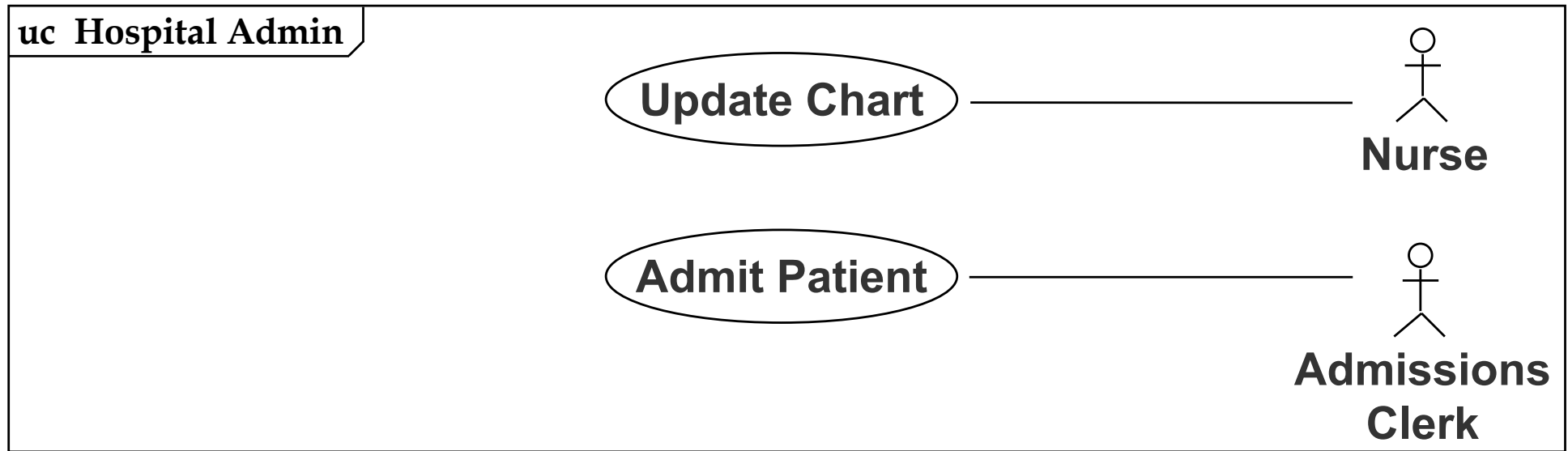# *Actors are __External__ to the System*

uc Hospital Admin

Admin System

Update Chart — Nurse

Admit Patient — Admissions Clerk

- **The system does not use itself**
- **Use cases describe what the system does**

Actors are Not Technical Choices

uc Hospital Admin

~~DBMS~~

Update Chart — Nurse

Admit Patient — Admissions Clerk

- **DBMS is a particular storage strategy**
  - design decision
  - should not appear in the requirements

Actors Interact with the System

uc Hospital Admin

(Update Chart) ——————— Nurse

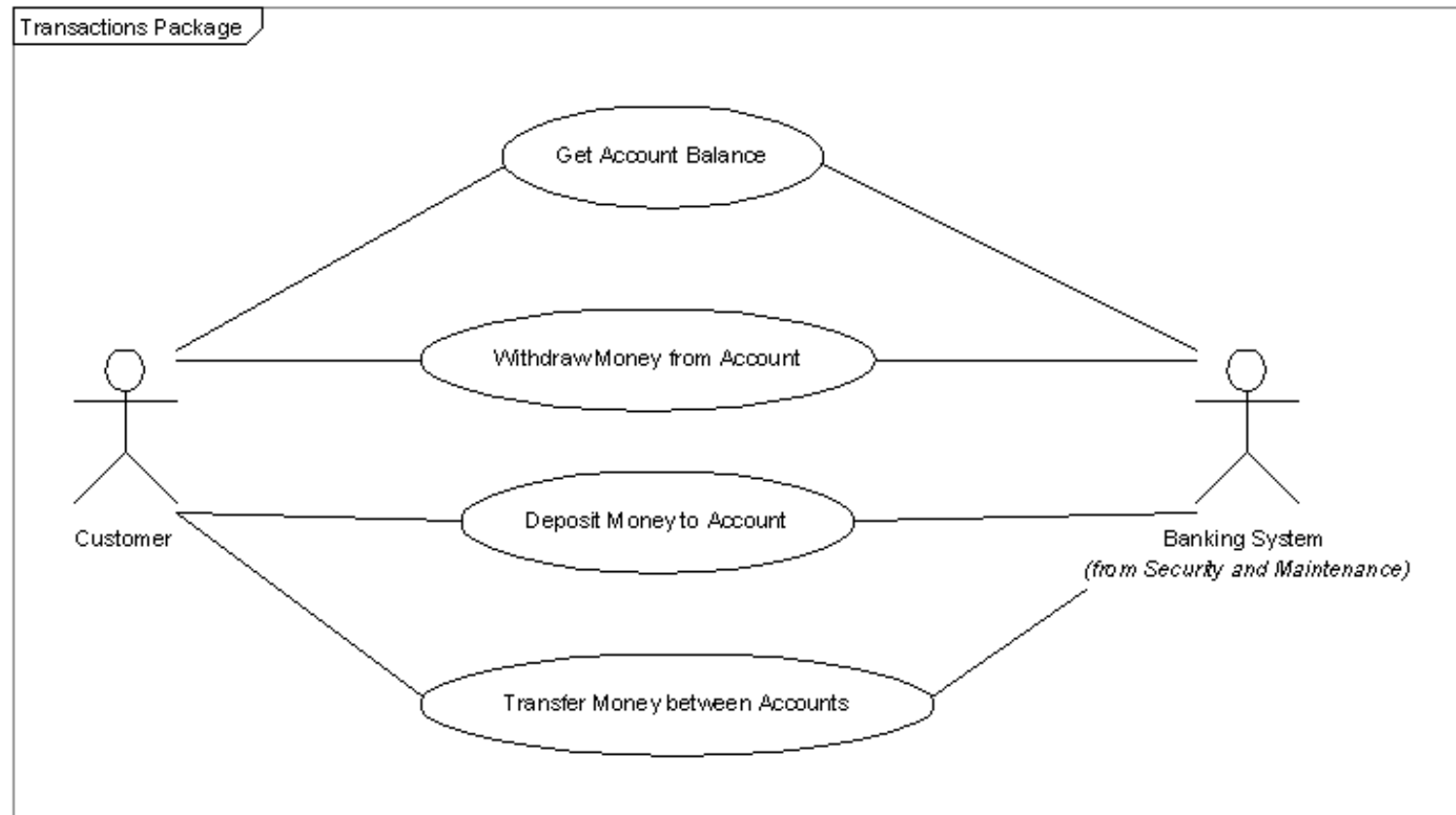(Admit Patient) ——————— Admissions Clerk

- **Actors interact with the system**
  - use it to perform a task
  - provide a service used by the system
    - » secondary actors

Primary and Secondary Actors

- **Primary actors are those actors that the system is designed to serve**
  - main users of the system

  - represent the users for whom the system is designed

  - focus for modelling the system

- **Secondary actors are support roles**
  - secondary actors only exist so that primary actors can use the system
    - » **administration**
    - » **services**

ATM: Primary & Secondary Actors

Actors – Naming Guidelines

- **Use a noun for an actor name**

- **Begin each word in the name with a capital letter**

What is a Use Case?

- **A way to use the system**
  - *"A sequence of transactions offered by the system that yield a useful result for an actor." [Jacobson et al, 1992]*

- **Externally required functionality**

- **What a system does**
  - **not how it does it**

- **Specify behaviour of a use case as a flow of events**
  - **textually**
  - **graphically**

Use Cases – Naming Guidelines

- **Use a verb phrase. Not a noun phrase.**
  - **use cases describe an *activity***

- **Name from the primary actor's perspective**

Reading

- **Wiegers**
  - Chapter 8

- **Larman**
  - Chapters 6 & 7

- **Sommerville**
  - Sections 5.1 & 5.2