IMSE - WS 2018

Milestone 1: Specification of IS

Oliver Schweiger, 01220194

1.1 Conceptual Modeling:

Textual Description of IS:

The information system will be designed for the collection and storage of information concerning a local cinema business.

The following components were selected as entities: Ticket, screening, hall, seat, employees as well as film and customer.

The ticket is always assigned to a fixed screening and each ticket has its own number as a key attribute. A screening always shows exactly one film and has a unique ID. A film also has a clear ID. A screening always takes place in exactly one hall, of course any number of screenings can take place in one hall. A hall consists of several seats. Both the seat and the hall have an ID number for clear identification. An employee can supervise those halls; several supervisors per room are also possible. In addition, one of the employees is defined as the manager of all the others. The employee is clearly identified by his personnel number. Finally, there's a customer, defined by a customer ID, who can buy tickets for screenings.

Further attributes of the individual entities are listed and described below for a better overview:

- Ticket: has a base price and a possible discount in addition to the ticket number.

- Screening: has a precisely defined start time and a duration.

- Film: title, country of production, director, language and age rating are noted.

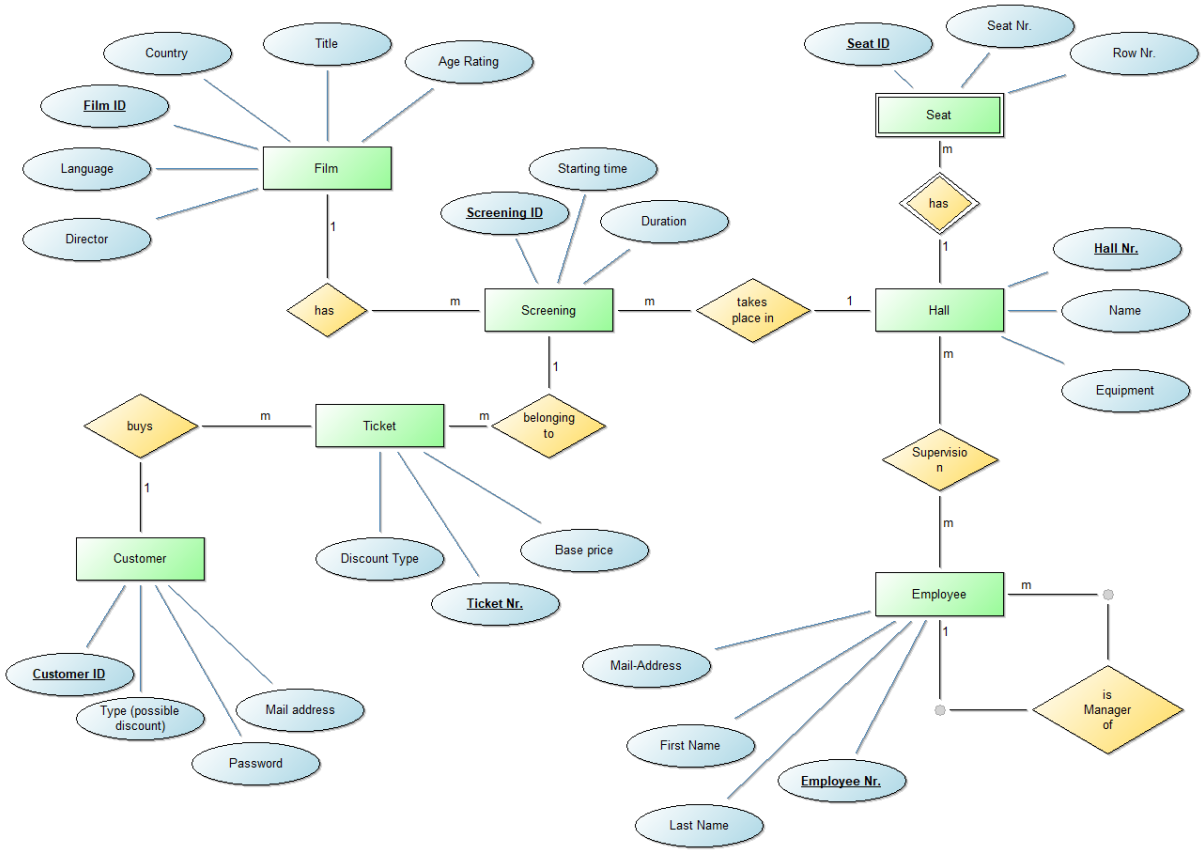
- Hall: has a name and specific equipment (3D etc.).

- Seat: has a unique seat ID and a row and seat number.

- Employee: has first and last name, a mail address.

- Customer: has a customer ID, a type (student, pensioner etc. – important for ticket prices), a mail address and a password.

UML/ER Diagram:



Relational Model:

PK… Primary key

FK… Foreign key

Film (Film ID, Language, Director, Country, Title, Age rating)

PK: Film ID

Screening (Screening ID, *Film ID*, *Hall ID*, Starting time, Duration)

PK: Screening ID

FK: Screening.Film ID ◊ Film.Film ID

FK: Screening.Hall ID ◊ Hall.Haal ID

Hall (Hall ID, Name, Equipment)

PK: Hall ID

Seat (Seat ID, *Hall ID*, Seat Nr., Row Nr.)

PK: Seat ID, Hall ID

FK: Seat.Hall ID ◊ Hall.Hall ID

Employee (Employee Nr., *Manager ID*, First Name, Last Name, Mail-Address)

PK: Employee Nr.

FK: Employee.Manager ID ◊ Employee. Employee Nr

Ticket (Ticket Nr., *Screening ID*, *Customer ID*, Base Price, Discount Type)

PK: Ticket-ID

FK: Ticket.Screening ID ◊ Screening.Screening ID

FK: Ticket.Customer ID ◊ Customer.Customer ID

Supervision (Hall ID, Supervisor ID)

PK: Hall ID, Supervisor ID

FK: Supervision.Hall ID ◊ Hall.Hall ID

FK: Supervision.Supervisor ID ◊ Employee.Employee Nr.

Customer (Customer ID, Type, Mail address, Password)

PK: Customer ID

1.2 Use-Case Design:

8 Use Cases combine basic functionality:

I. Sign Up

II. Login

III. Look at and search for films/screenings

IV. Buy ticket

V. Look at and cancel bought tickets

VI. Manage films

VII. Manage screening

VIII. Employee administration

Note that some of these use cases combine more than one action into one, because they fit logically together or are extensions of a very basic Use Case (like "Look at table XY"). This was done to clear up the Use Case overview. For example: Use Case III are two different tasks, since Film and Screening are separate tables, but I combined them into one since the way they work is nearly identical and offer the same functions to the user. The use case, activity and sequence diagrams below should clear things up further.

1.2.1 Use-Case descriptions:

USE CASE I: Sign Up

Goal: Sign up as a new customer for the Cinema IS

Description: If you want to use the IS as a customer to buy tickets, you need to be registered. Employees do not sign up, as they are registered automatically by the admin.

Prerequisite: User not yet signed up in the system (Mail not yet registered)

Actors: Customer

Trigger: User wants to create account for the cinema IS

Workflow:

1. Customer fills in the required data (Mail, password)
2. Data is transferred.
3. If mail not yet used, the system registers the customer as a new user and saves the data

USE CASE II: Login

Goal: Login into the Cinema IS

Description: To actively use the features of the IS, you need to be logged in. This goes for admins, employees and admins.

Prerequisite: User needs to be signed up for the cinema IS

Actors: Admin, Employee, Customer

Trigger: User wants to create login into the cinema IS

Workflow:

1. User fills in the required data (Mail, password) and hits the “Log in” button
2. Data is transferred.
3. If the given data matches the user entry in the Database, the user is logged in.

USE CASE III: See and search for films/screenings

Goal: Customer searches for films and when there are screenings for it. See current screenings (“What films are shown tomorrow?”)

Description: The user is presented a list of screenings that are happening in the near future. By clicking a link, the user can also see all the film information related to a specific screening. By using a search field, the user is also able to search for specific screening and films.

Prerequisite: User needs to be logged in

Actors: Customer

Trigger: Customer wants to have a look at available screenings and films

Workflow:

1. User selects “Screenings” or “Films”
2. As list is loaded from the database and presented to the user

Optional: Searching

3. By typing a query into the search form, the user can look for a specific title.

Optional, when in “Screenings”: Buy ticket

3. *See Use Case IV*

USE CASE IV: Buy ticket

Goal: Customer buys ticket for a certain screening

Description: When looking at the different screenings, the user can buy a ticket for one or more of them. Depending on the type of customer (Student, Pensioner etc.) a simulated money transaction happens, and the ticket is added to the database. Note: tickets only specify the hall and not the seat.

Prerequisite: User needs to be logged in

Actors: Customer

Trigger: Customer wants to buy a ticket for a screening

Workflow:

1. Customer looks at screenings, selects “Buy ticket” for one of them
2. The price (calculated according to the customer type) is calculated and the systems asks for confirmation.
3. A simulated money transaction happens.
4. Sold ticket is added to the database.

USE CASE V: See tickets / Cancel ticket order

Goal: The customer looks at all his acquired tickets. Can also cancel his ticket order for a certain screening

Description: Option to have all tickets presented to customer. Option: Cancel a ticket order, revert the simulated money transaction and delete the ticket from the database.

Prerequisite: User needs to be logged in as a customer and has ordered a ticket before

Actors: Customer

Trigger: Customer wants to have a look at the ticket he has bought / wants to cancel a specific ticket

Workflow:

1. Customer selects “My tickets”

Optional: Cancel ticket order

2. Navigate to ticket
3. Click “Cancel order”. Transaction is reverted
4. After reverting the trans

USE CASE VI: Manage films

Goal: CRUD (create, read, update, delete) functionality for all films in the database.

Description: The functionality to add new films, delete and update existing films.

Prerequisite: User needs to be logged in as an employee

Actors: Employee

Trigger: User wants to make changes to the film database

Workflow:

1. User selects “Manage Films”

Add film:

2. User navigates to “Add” form
3. Enters information about film to be added

4. Clicks “Add”. New film is stored in database

Update film:

2. User navigates to film that needs to be updated
3. Clicks on “Update”
4. Enters new film information via form
5. Clicks “Apply”. Updated information is stored in database

Delete film:

2. User navigates to film that needs to be deleted
3. Clicks on “Delete”. Film is deleted from database

USE CASE VII: Manage screenings

Goal: CRUD (create, read, update, delete) functionality for all screenings in the database.

Description: The functionality to add new screenings, delete and update existing screenings.

Prerequisite: User needs to be logged in as an employee

Actors: Employee

Trigger: User wants to make changes to the screening database

Workflow:

1. User selects “Manage Screenings”

Add screening:

2. User navigates to “Add” form
3. Enters information about screening to be added
4. Clicks “Add”. New screening is stored in database

Update screening:

2. User navigates to screening that needs to be updated
3. Clicks on “Update”
4. Enters new screening information via form
5. Clicks “Apply”. Updated information is stored in database

Delete screening:

2. User navigates to screening that needs to be deleted
3. Clicks on “Delete”. Screening is deleted from database

USE CASE VIII: Employee administration

Goal: CRUD (create, read, update, delete) functionality for all employees in the database. Change/set manager relationship between employees.

Description: Admin can set management relationships in the employee database. He can also add new employees, delete and update existing employees.

Prerequisite: User needs to be logged in as an admin

Actors: Admin

Trigger: Admin wants to make changes to the employee database

Workflow:

1. Admin selects “Employee administration”

Add employee:

2. Admin navigates to “Add” form
3. Enters information about employee to be added
4. Clicks “Add”. New employee is stored in database

Update employee information:

2. Admin navigates to employee that needs to be updated
3. Clicks on “Update”
4. Enters new employee information via form
5. Clicks “Apply”. Updated information is stored in database

Delete employee:

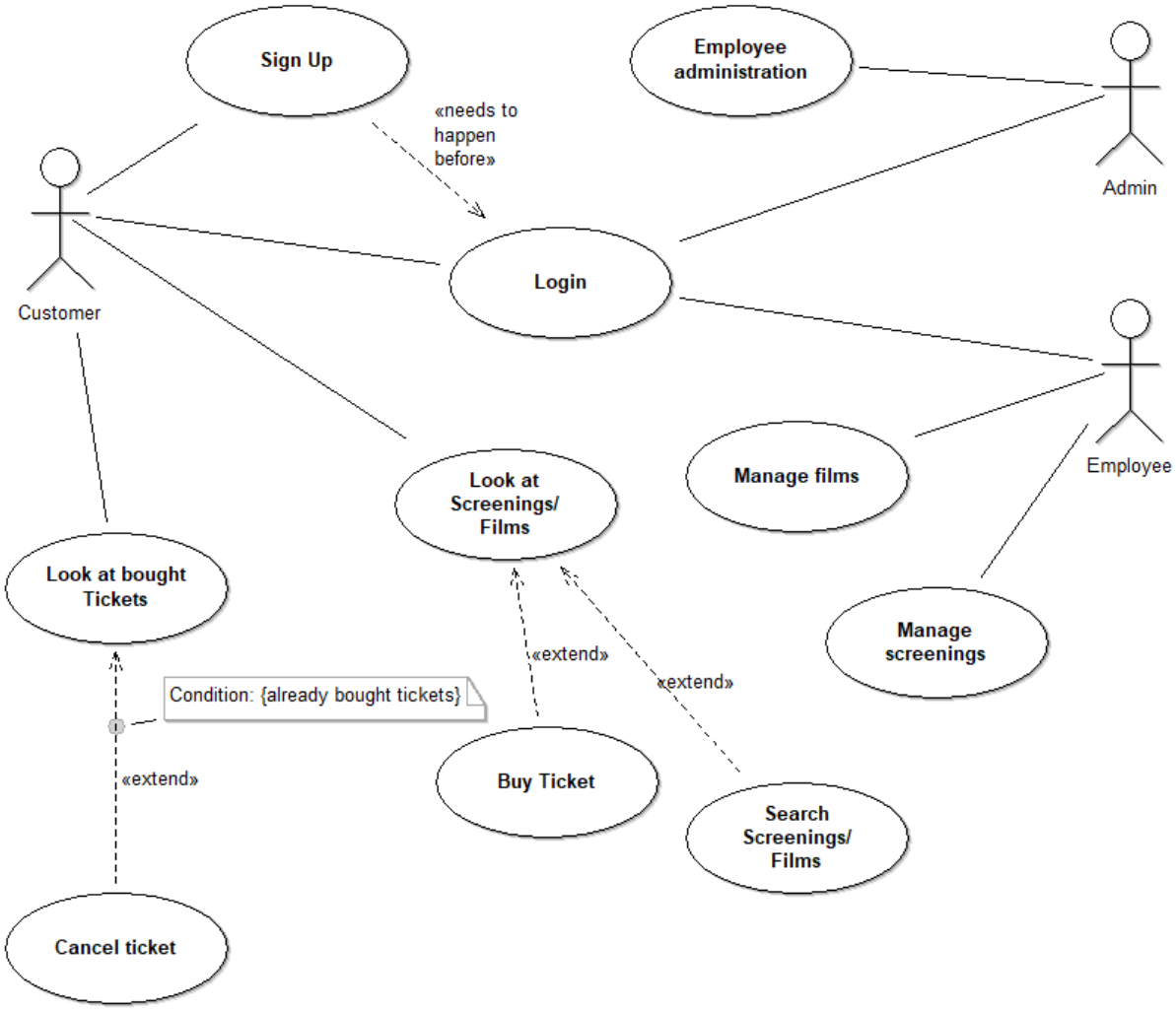
2. Admin navigates to employee that needs to be deleted
3. Clicks on “Delete”. Employee is deleted from database

1.2.2 Graphical representation of dynamics:

This section contains:

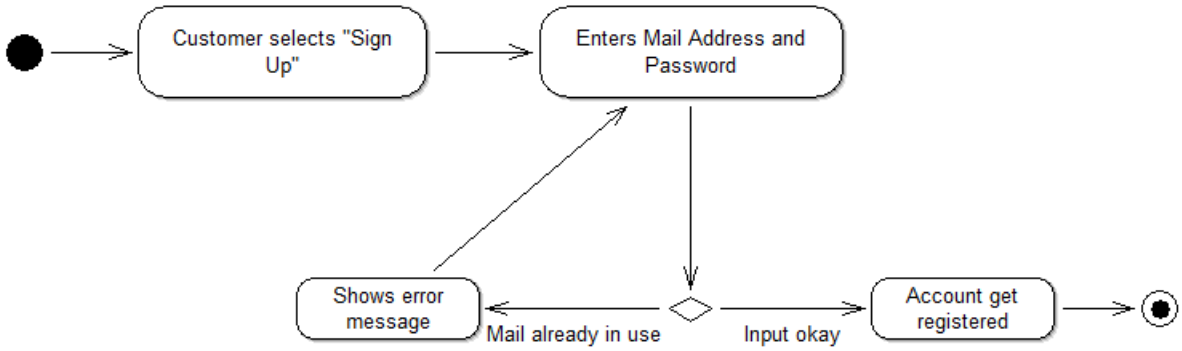
1. Use case diagram
2. Activity diagrams for all use cases
3. Class diagram
4. Sequence diagram for the more complex use cases

Use Case diagram:

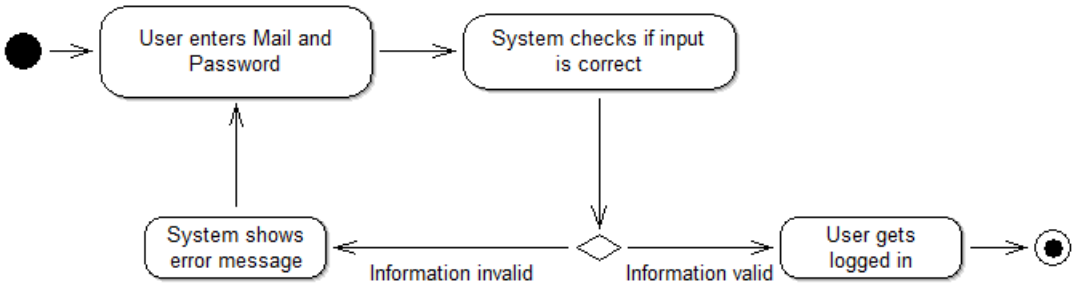


Activity diagrams of the Use Cases:

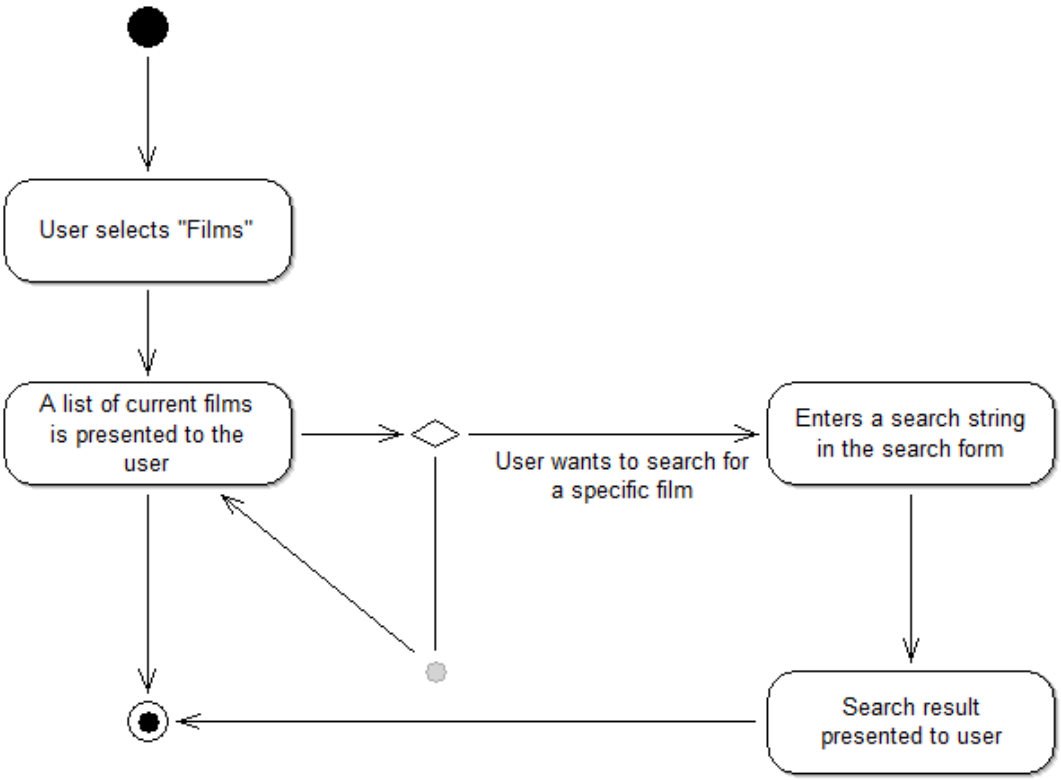
I. Sign Up



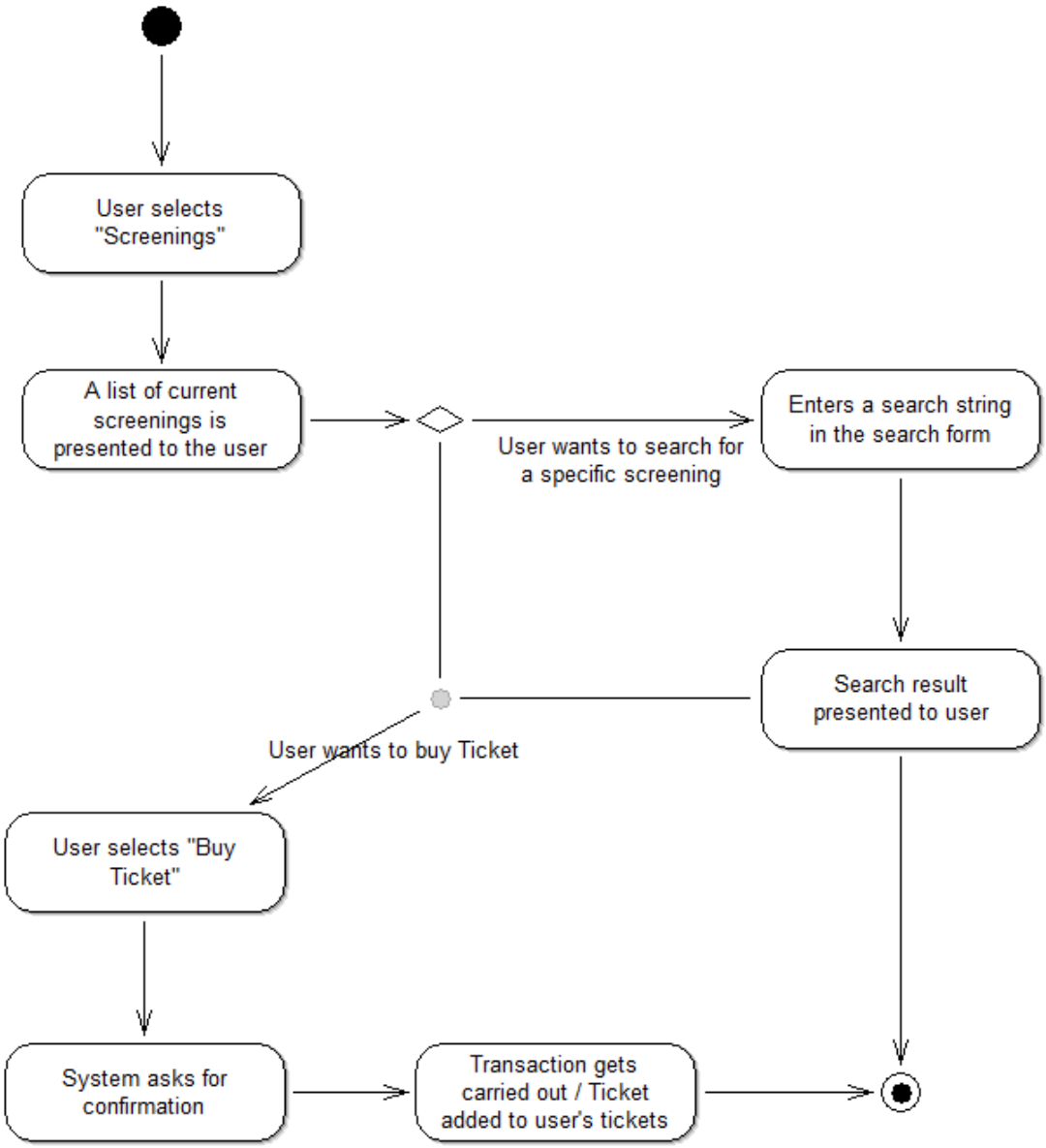
II. Login



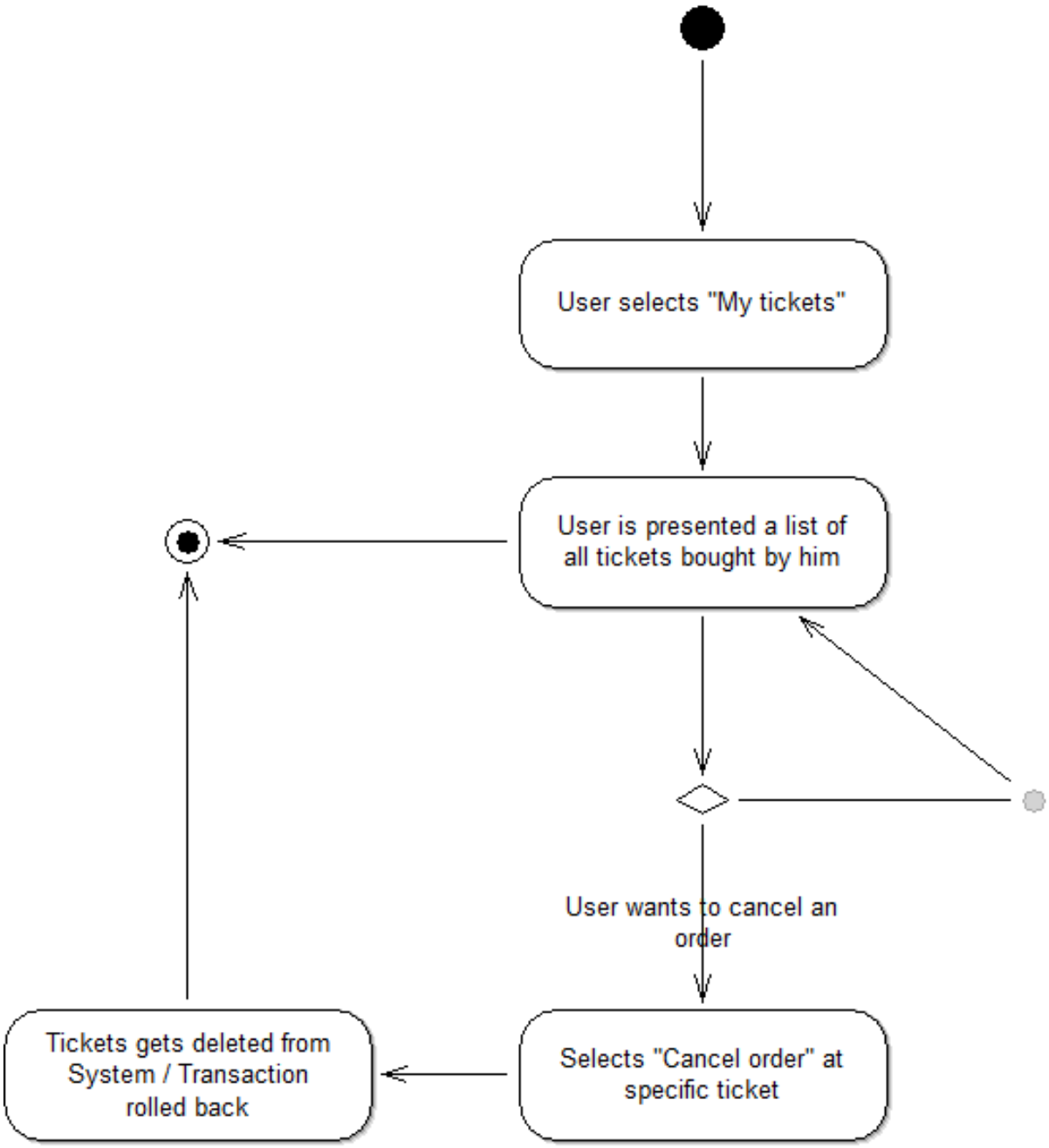
III. Look at and search for films



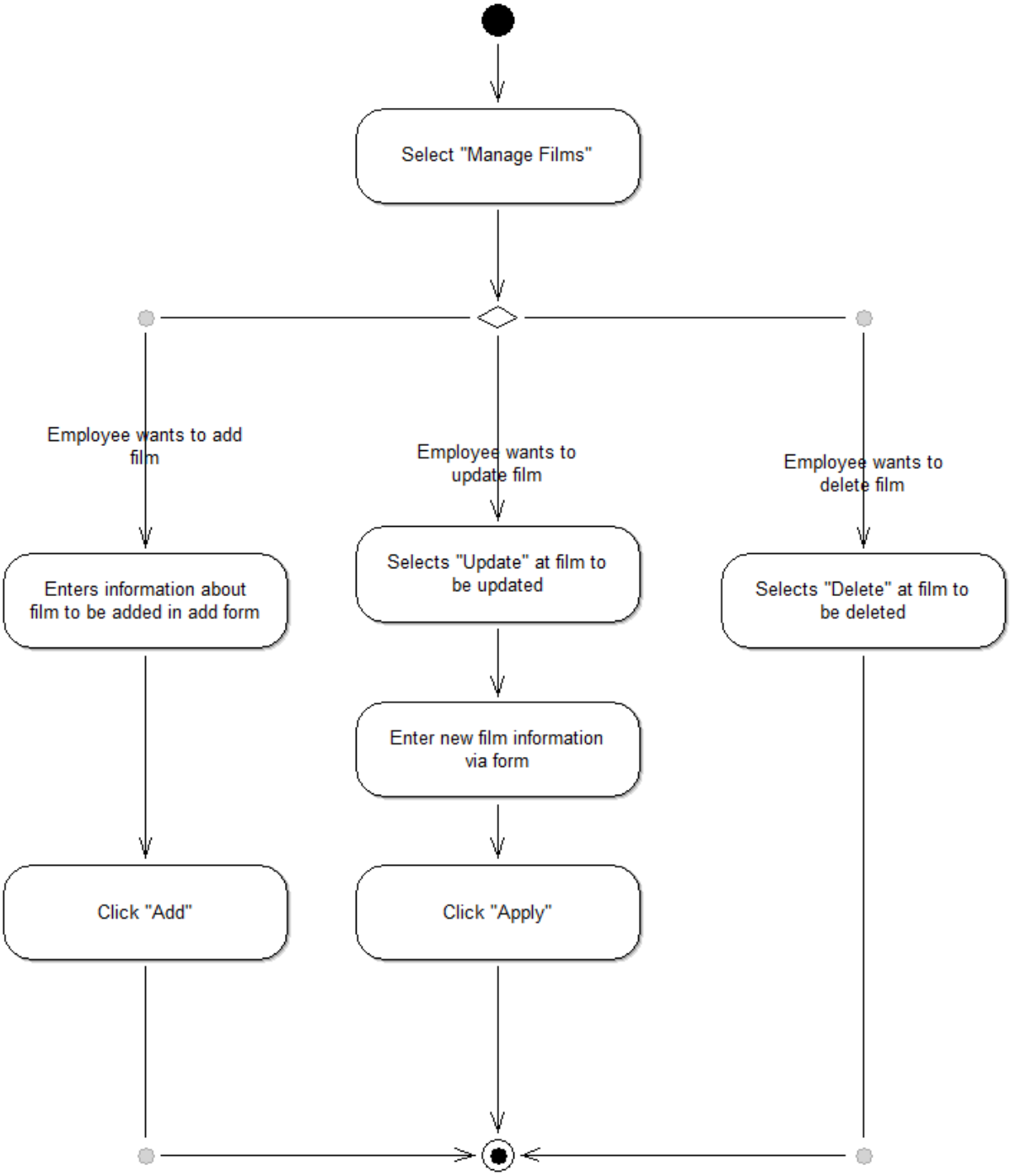
III. Look at and search for screenings + IV. Buy Ticket



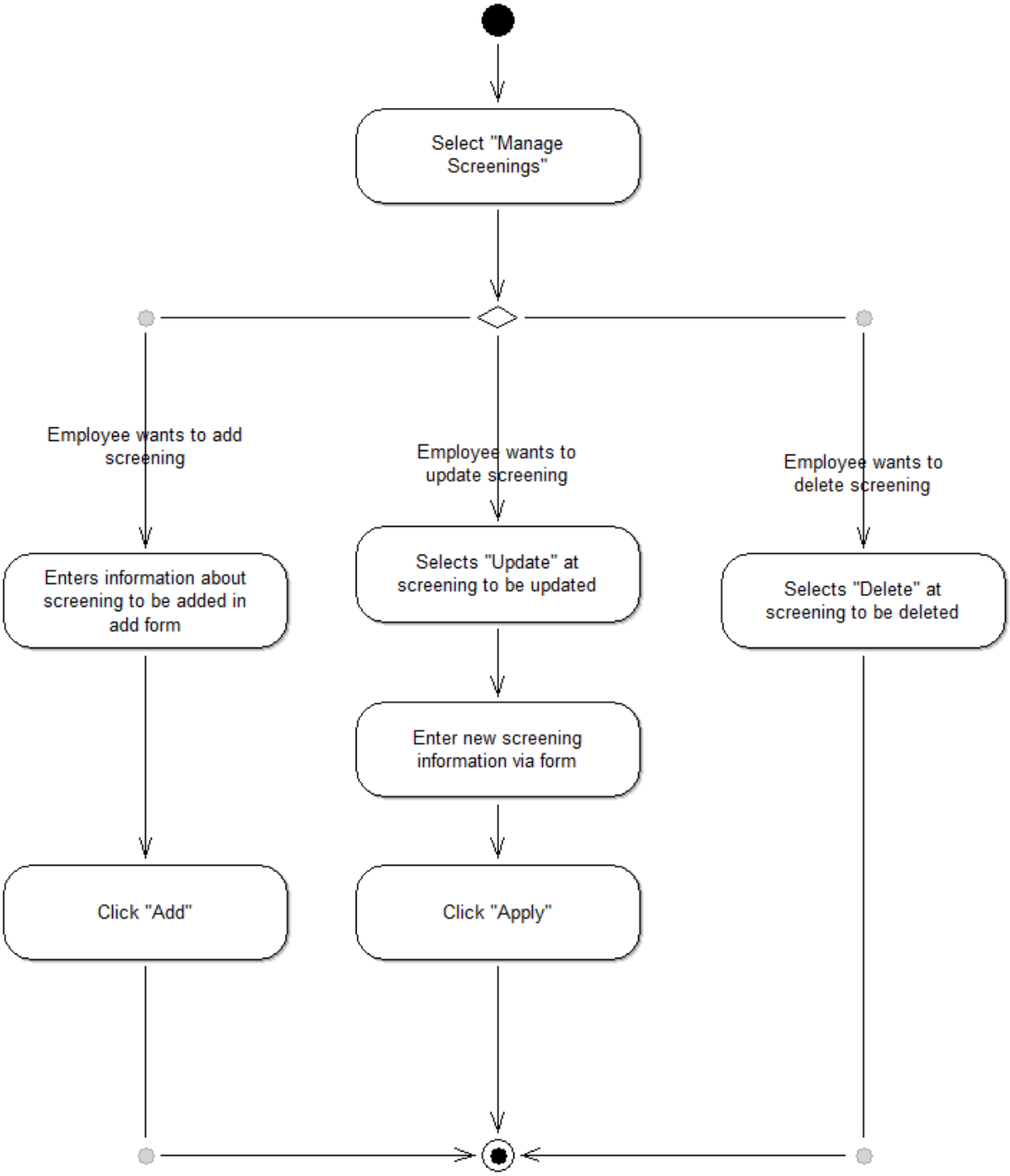
V. Look at and cancel bought tickets



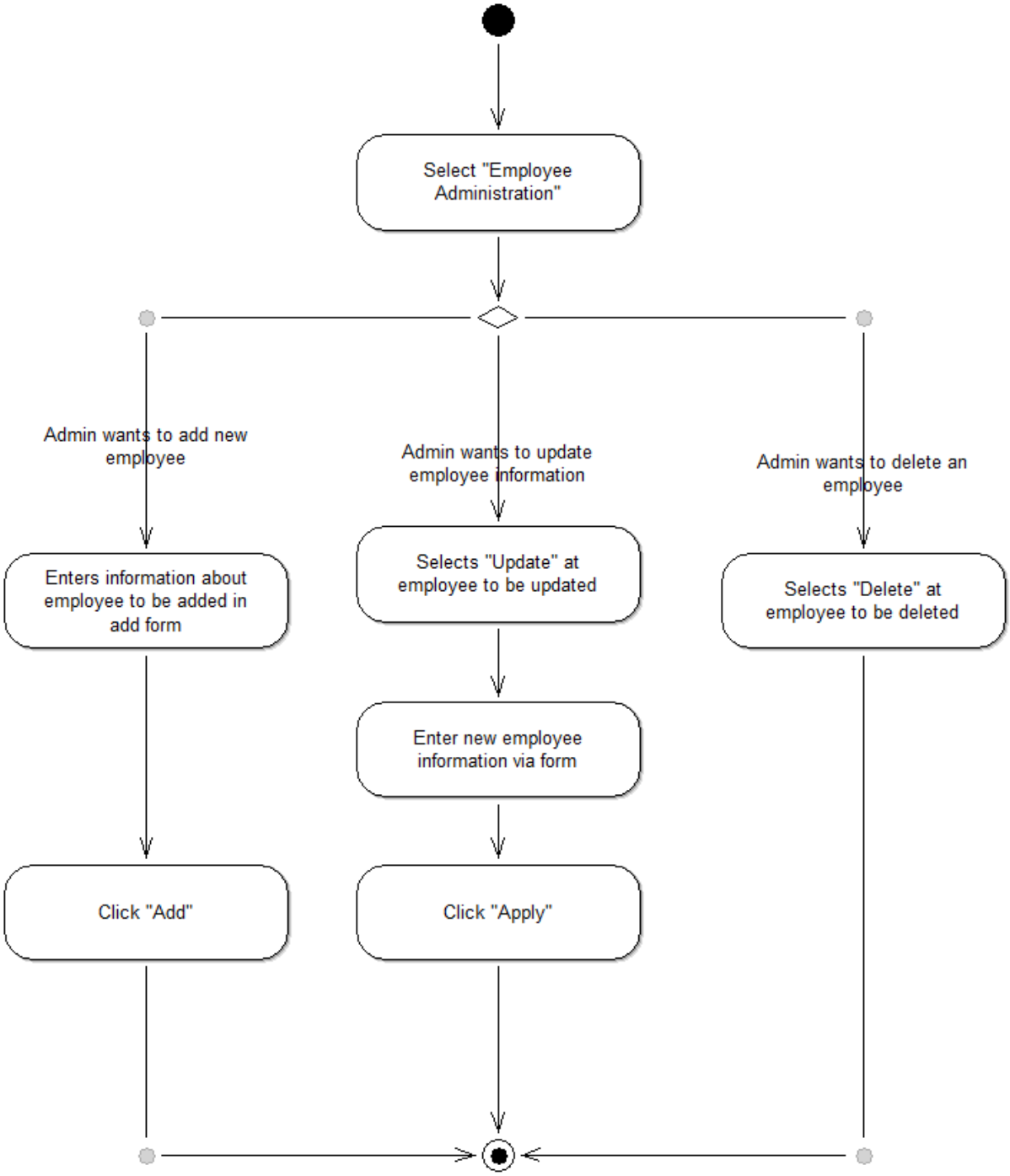
VI. Manage films



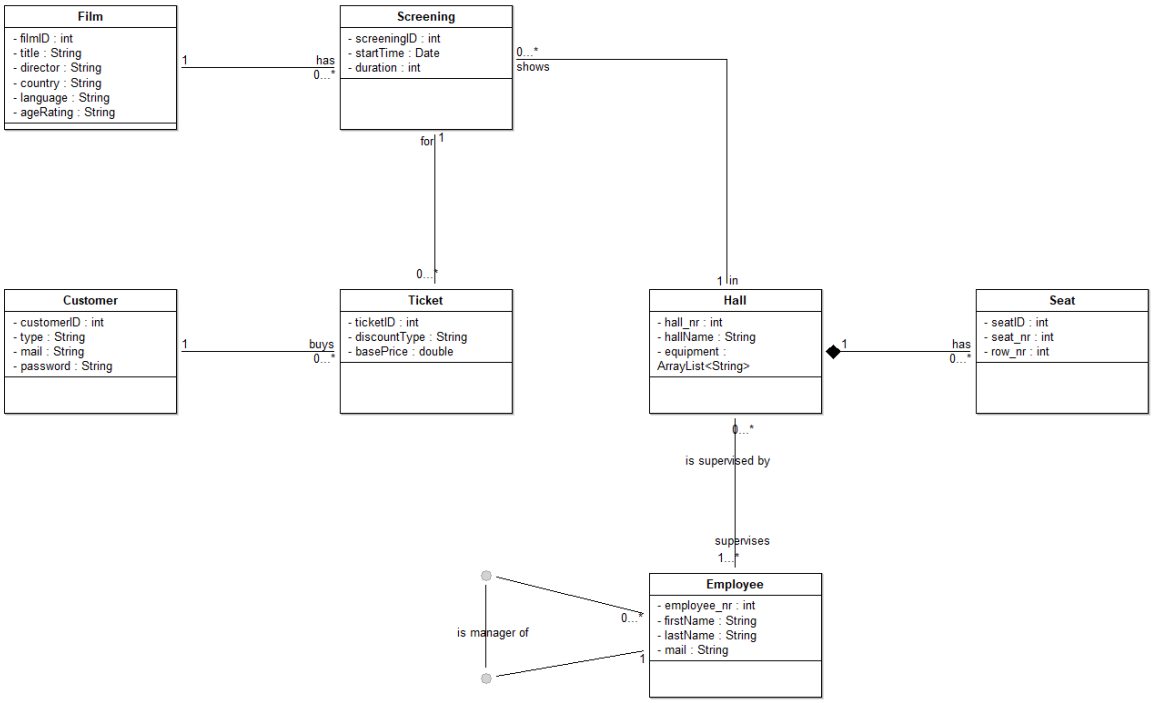
VII. Manage screening



VIII. Employee administration

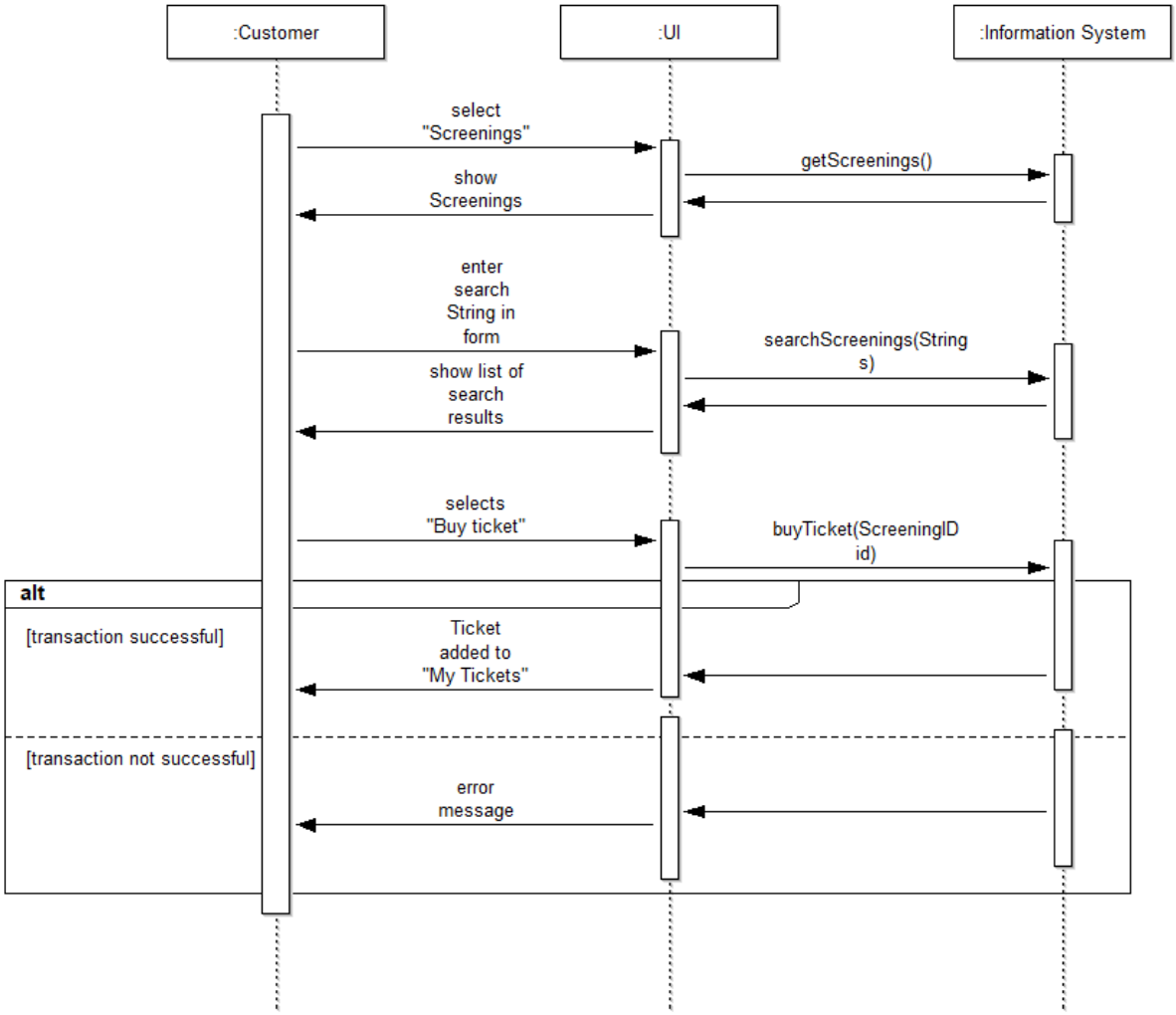


Class diagram:

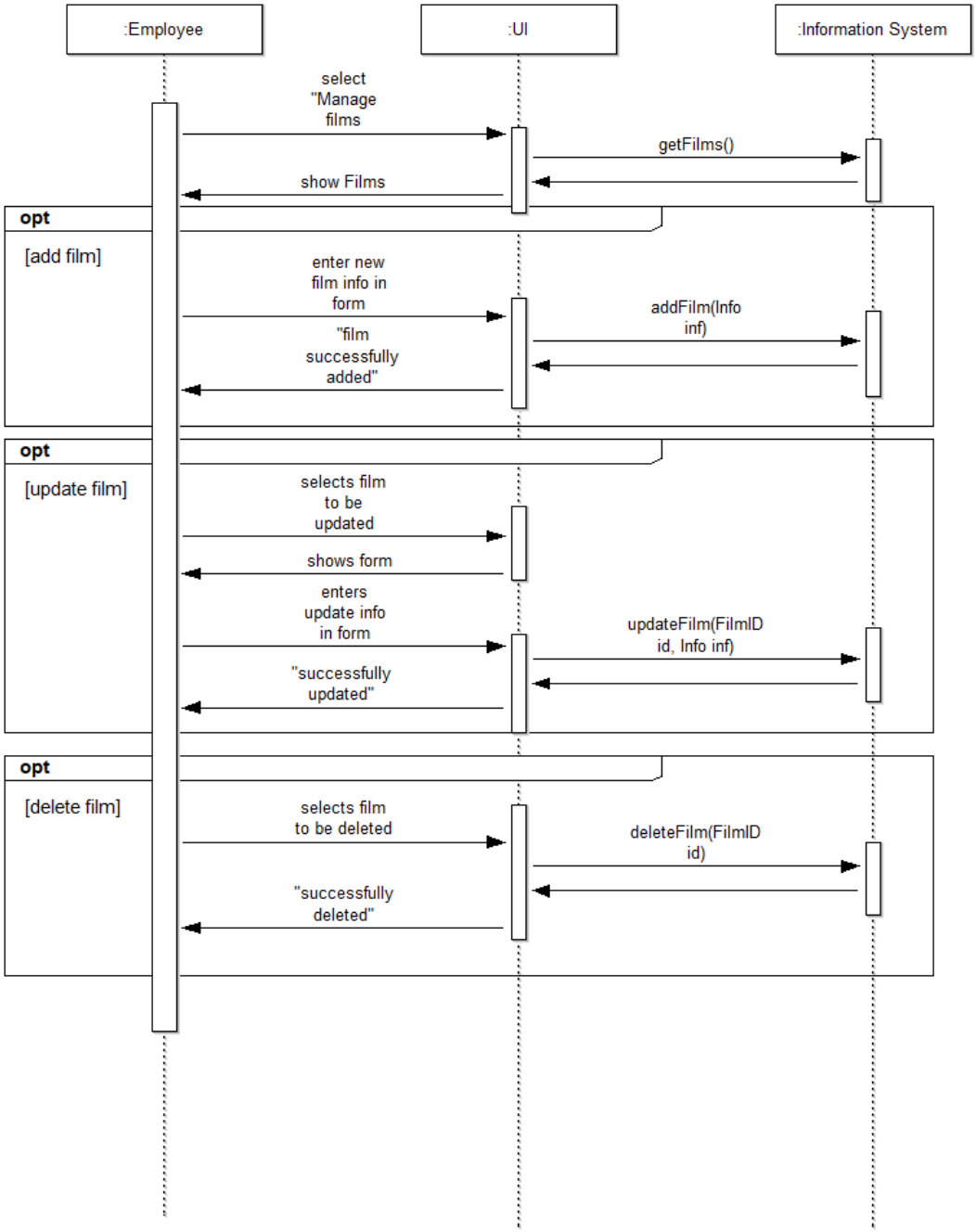


Sequence diagrams:

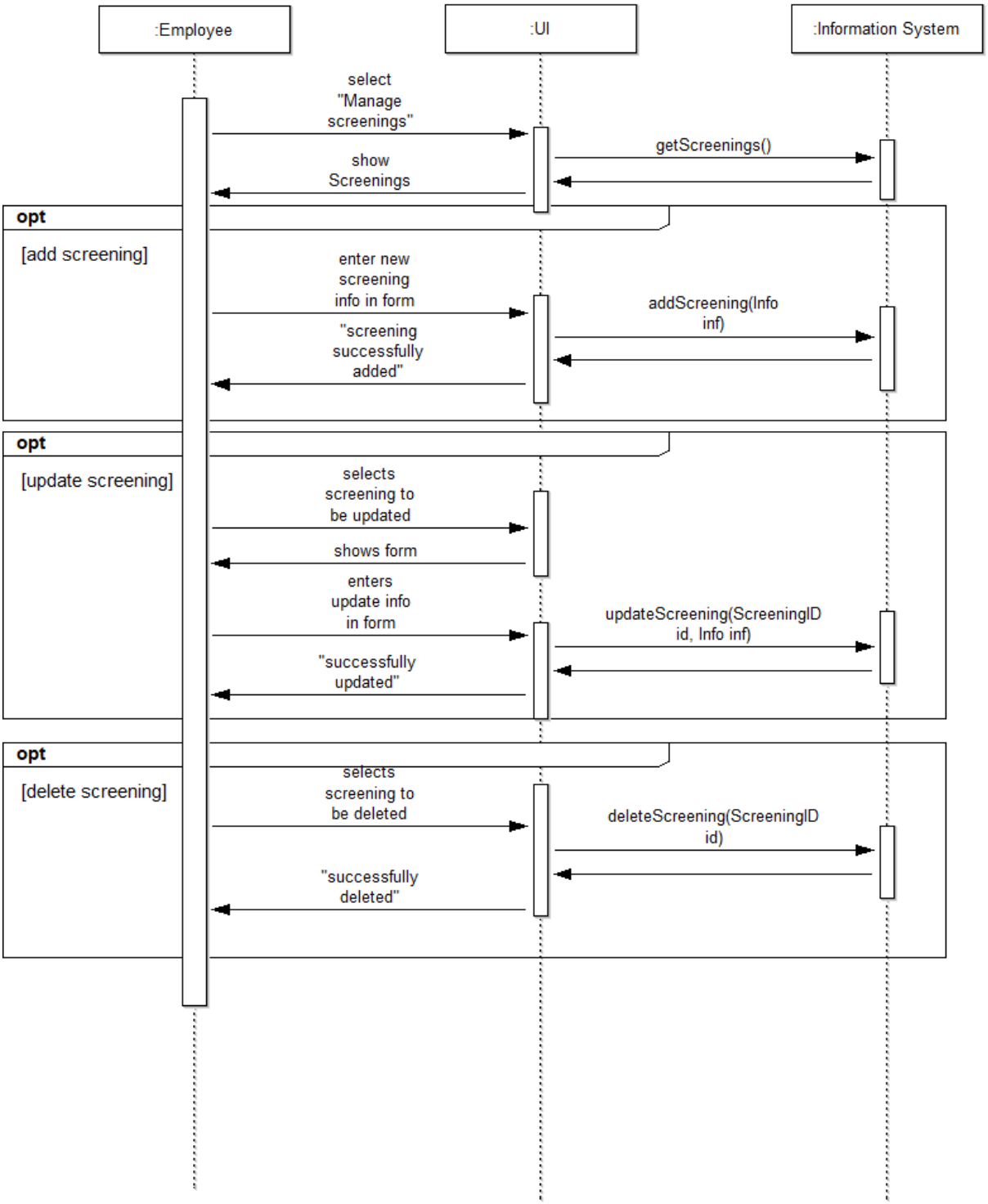
III. Look at and search for screenings + IV. Buy Ticket



VI. Manage films



VII. Manage screenings



VIII. Employee administration