

*Lab for Software Engineering*

# Cinema Management Application

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# 1 Analysis

## 1.1 A1

### 1.1.1 Requirements & Domain-Knowledge

#### Requirements

- R1 Customers can create an account by providing an e-mail address and a password.
- R2 If an e-mail address which is already associated with an account is provided during registration, account creation fails.
- R3 Customers can log in by providing their e-mail address and their password.
- R4 A logged in customer can log out.
- R5 A customer can browse available showings, ascendingly sorted by date.
- R6 A logged in customer can book tickets by selecting the showing from the browsing list and selecting the desired seats.
- R7 A showing can only be booked up to 15 minutes before it starts.
- R8 Staff can add new showings to the database by providing the required data.
- R9 Once a showing starts it is marked as "archived".
- R10 Archived showings are visible to staff, but not to customers.
- R11 Staff can cancel showings.
- R12 When a showing is cancelled it is deleted.
- R13 When a showing is cancelled the customers who booked tickets for it are notified via e-mail.
- R14 Showings which took place a year ago or longer are automatically removed from the database.
- R15 When a showing is deleted its associated bookings are also deleted

#### Facts

- F1 A showing consists of the title of the movie, its duration, the date date, the hall number and unique ID.
- F2 A hall consists of a number of rows, a number of seats per row and a unique hall number.
- F3 Only one person at a time can sit in a seat.

## Assumptions

- A1 A web application is a good choice for implementing the desired functionality and all customers are able to use it.
- A2 Customers only provide e-mail addresses they can access.
- A3 Customers will stay up to date with the list of available showings.
- A4 The cinema operator has provided a predefined list of cinema halls.
- A5 Every booking is paid via an external service.
- A6 Staff will only add showings which take place in the future.

### 1.1.2 Contextdiagram

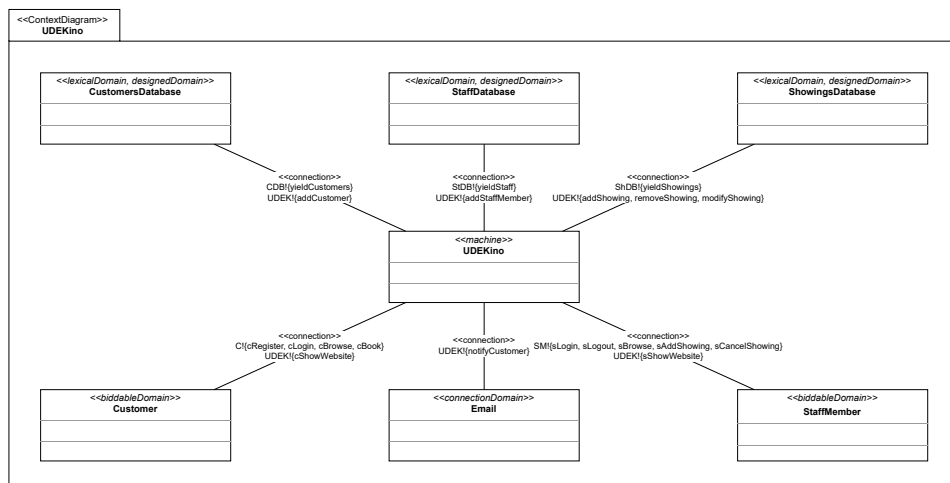


Figure 1.1: Contextdiagram

## 1.2 A2

We can derive the following problem diagrams

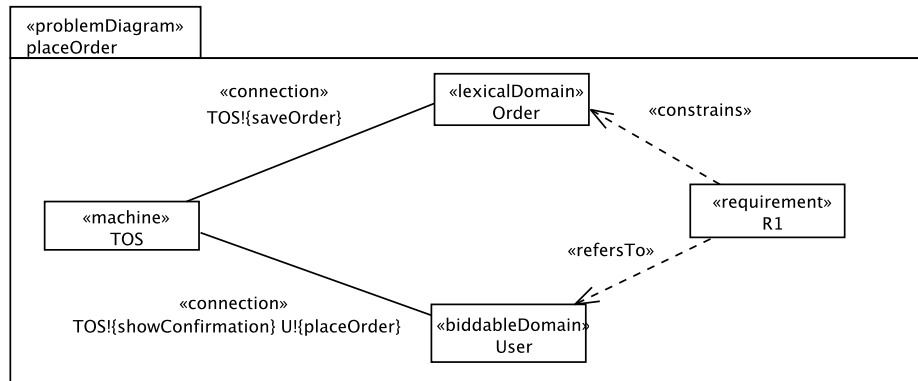


Figure 1.2: Problemdigram for R1

## 1.3 A3

## 1.4 A4



## 1.5 A5

A short OCL example:

```
1 context Person inv: self.alter >=0
2
3 pre alter >30
4 post alter=alter@pre+1
```

## 1.6 A6

Examples of a life-cycle using the math-environment:

$$LC_{guest} = (Browse^+; [Book])^*$$

## 2 Design

### 2.1 D1

### 2.2 D2

### 2.3 D3

### 2.4 D4

State diagrams with tikZ:

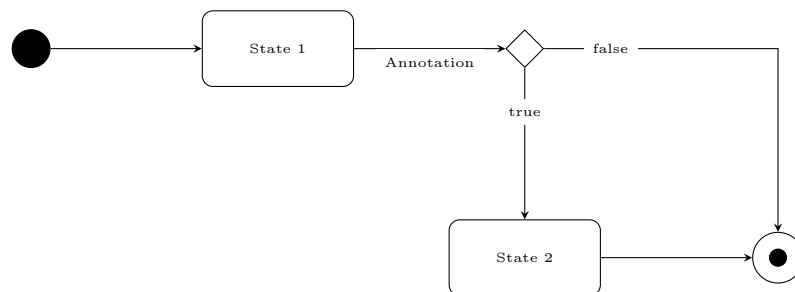


Figure 2.1: Zustandsdiagramm Person 1

## **3 Implementation & Testing**

**3.1 I**

**3.2 T1**

**3.3 T2**

**3.4 T3**

## 4 Glossary

Table 4.1: Glossary

Name	Type	Description	Source
<b>A</b>			
addCustomer	phenomenon	the machine adds a customer to the CustomersDatabase	CD
addShowings	phenomenon	the machine adds a showing to the ShowingsDatabase	CD
addStaffMember	phenomenon	the machine adds a staff account to the StaffDatabase	CD
<b>B</b>			
<b>C</b>			
Customer	biddable domain	a customer of UDEKino	CD
CustomersDatabase	lexical domain	the database of Customer accounts	CD
cBook	phenomenon	a customer books tickets for a showing	CD
cBrowse	phenomenon	a customer browses available showings	CD
cLogin	phenomenon	a customer attempts to log in	CD
cLogout	phenomenon	a customer attempts to log out	CD
cRegister	phenomenon	a customer attempts to register create an account on UDEKino	CD
cShowWebsite	phenomenon	the machine shows a website to the Customer	CD
<b>D</b>			
<b>E</b>			
Email	causal domain, connection domain	an e-mail service offering to deliver e-mails	CD
<b>F</b>			
<b>G</b>			
<b>H</b>			
<b>I</b>			
<b>J</b>			
<b>K</b>			
<b>L</b>			

Table 4.1: Glossar

Name	Type	Description	Source
<b>M</b>			
modifyShowing	phenomenon	the machine modifies a showing in the database	CD
<b>N</b>			
notifyCustomer	phenomenon	the machine notifies the customer via e-mail	CD
<b>O</b>			
<b>P</b>			
<b>Q</b>			
<b>R</b>			
<b>S</b>			
sAddShowing	phenomenon	a staff member submits a new showing to the machine for entry into the database	CD
sBrowse	phenomenon	a staff member browses available showings	CD
sCancelShowing	phenomenon	a staff member attempts to cancel a showing	CD
ShowingsDatabase	lexical domain	the database of Showings	CD
sShowWebsite	phenomenon	the machine shows a website to the StaffMember	CD
StaffDatabase	lexical domain	the database of Staff accounts	CD
StaffMember	biddable domain	a member of UDEKino staff	CD
<b>T</b>			
<b>U</b>			
<b>V</b>			
<b>W</b>			
<b>X</b>			
<b>Y</b>			
yieldCustomers	phenomenon	the CustomersDatabase yields its stored Customer accounts	CD
yieldShowings	phenomenon	the ShowingsDatabase yields its stored Showings	CD
yieldStaff	phenomenon	the StaffDatabase yields its stored Staff accounts	CD
<b>Z</b>			