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. If an e-mail address which is already associated with an account is provided, account creation fails.

R2 Customers can log in by providing their e-mail address and their password.

R3 A logged in customer can log out.

R4 A customer can browse available showings, ascendingly sorted by date.

R5 A logged in customer can book tickets by selecting the showing from the browsing list and selecting the desired seats. A showing can only be booked up to 15 minutes before it starts.

R6 Staff can add new showings to the database by providing the required data.

R7 Once a showing starts it is marked as "archived".

R8 Archived showings are visible to staff, but not to customers.

R9 Staff can cancel showings. When a show is cancelled all customers who booked tickets for it are notified via e-mail and the showing is then deleted.

R10 Showings which took place a year ago or longer are automatically removed from the database.

R11 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 Every booking is paid via an external service.

A5 Staff will only add showings which take place in the future.

1.1.2 Contextdiagram

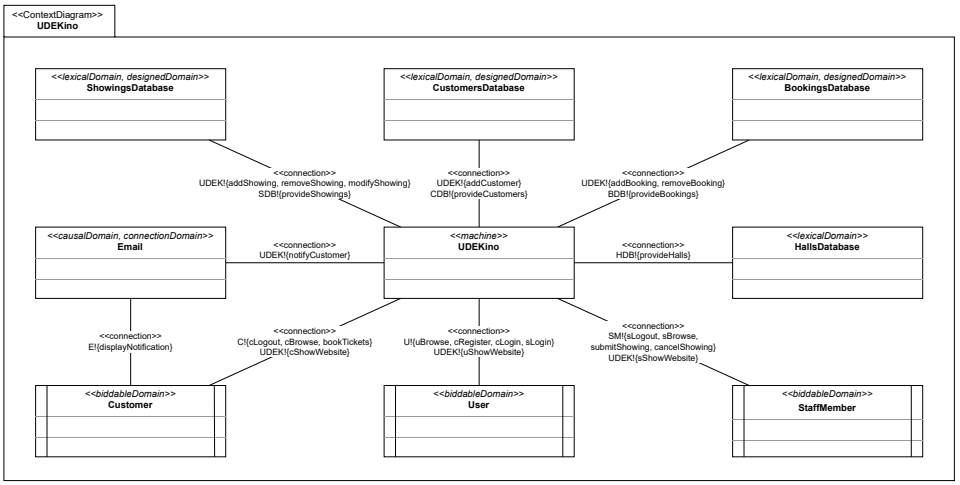

Figure 1.1: Contextdiagram

1.2 A2

We can derive the following problem diagrams

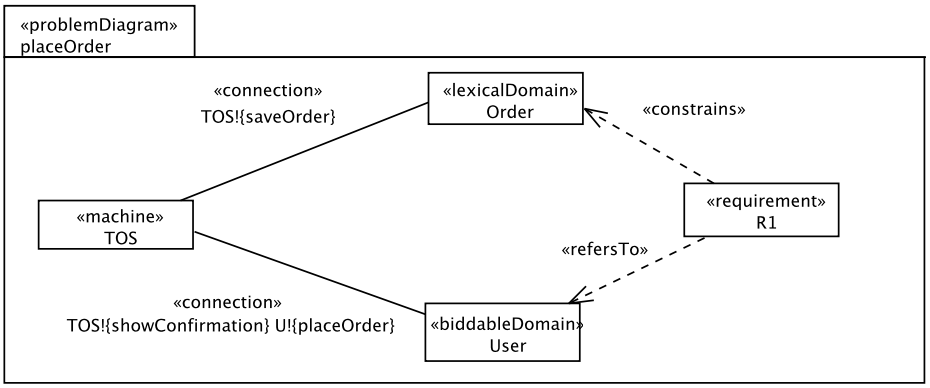

Figure 1.2: Problemdiagram for R1

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:

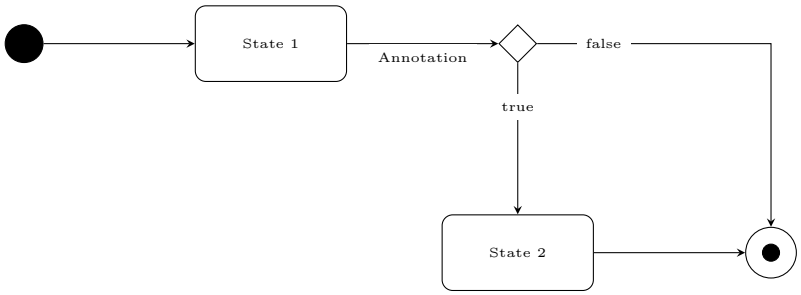

Figure 2.1: Zustandsdiagramm Person 1

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
A			
addBooking	phenomenon	the machine adds a new booking to the bookings database	CD
addCustomer	phenomenon	the machine adds a new customer to the customers database	CD
addShowing	phenomenon	the machine adds a new showing to the customers database	CD
B			
BookingsDatabase	lexical domain, designed domain	a database containing the bookings made by customers	CD
bookTickets	phenomenon	a customer books tickets for a showing	CD
C			
Customer	biddable domain	a customer of UDEKino; a user who has logged into a customer account	CD
CustomersDatabase	lexical domain, designed domain	a database containing customer data	CD
cBrowse	phenomenon	a customer browses available showings	CD
cLogin	phenomenon	a user attempts to log into a customer account	CD
cLogout	phenomenon	a customer attempts to log out	CD
cRegister	phenomenon	a user attempts to create customer account on UDEKino	CD
cShowWebsite	phenomenon	the machine shows a website to the customer	CD
D			
displayNotification	phenomenon	the customer's e-mail client displays a notification e-mail to the customer	CD
E			
Email	causal domain, connection domain	an e-mail service offering to deliver e-mails	CD
F			
G			
H			
HallsDatabase	lexical domain	a database containing the cinema halls, provided by the cinema operator	CD

Table 4.1: Glossary

Name	Type	Description	Source
I			
J			
K			
L			
M			
modifyShowing	phenomenon	the machine modifies a showing in the showings database	CD
N			
notifyCustomer	phenomenon	the machine notifies the customer via e-mail	CD
O			
P			
provideBookings	phenomenon	the bookings database provides the bookings data to the machine	CD
provideCustomers	phenomenon	the customers database provides the customers data to the machine	CD
provideHalls	phenomenon	the halls database provides the halls data to the machine	CD
provideShowings	phenomenon	the showings database provides the showings data to the machine	CD
Q			
R			
removeBooking	phenomenon	the machine removes a booking from the bookings database	CD
removeCustomer	phenomenon	the machine removes a customer from the customers database	CD
removeShowing	phenomenon	the machine removes a showing from the showings database	CD
S			
sBrowse	phenomenon	a staff member browses available showings	CD
sCancelShowing	phenomenon	a staff member attempts to cancel a showing	CD
ShowingsDatabase	lexical domain, designed domain	a database containing the cinema showings	CD
sLogin	phenomenon	a user attempts to log in as a staff member	CD
sLogout	phenomenon	a staff member attempts to log out	CD
sShowWebsite	phenomenon	the machine shows a website to the staff member	CD
StaffMember	biddable domain	a member of cinema staff; a user who has logged in as staff	CD

Table 4.1: Glossary

Name	Type	Description	Source
submitShowing	phenomenon	a staff member submits a new showing to the machine for entry into the database	CD
T			
U			
uBrowse	phenomenon	a user browses available showings	CD
UDEKino	machine	the machine to be developed	CD
User	biddable domain	a user of the application who is not logged in	CD
uShowWebsite	phenomenon	the machine shows a website to the user	CD
V			
W			
X			
Y			
Z			