

Lab for Software Engineering

Cinema Management Application

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Contents

1	Analysis	iv
1.1	A1	iv
1.1.1	Requirements & Domain-Knowledge	iv
1.1.2	Contextdiagram	v
1.2	A2	vi
1.3	A3	vii
1.4	A4	viii
1.5	A5	ix
1.6	A6	x
2	Design	xi
2.1	D1	xi
2.2	D2	xi
2.3	D3	xi
2.4	D4	xi
3	Implementation & Testing	xii
3.1	I	xii
3.2	T1	xii
3.3	T2	xii
3.4	T3	xii
4	Glossary	xiii

List of Figures

1.1	Contextdiagram	v
1.2	Problemdiagram for R1	vi
2.1	Zustandsdiagramm Person 1	xi

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

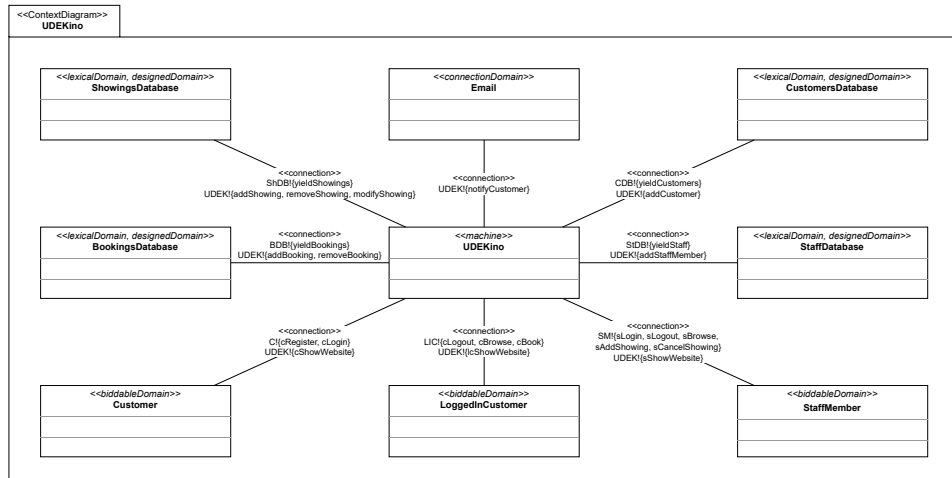


Figure 1.1: Contextdiagram

1.2 A2

We can derive the following problem diagrams

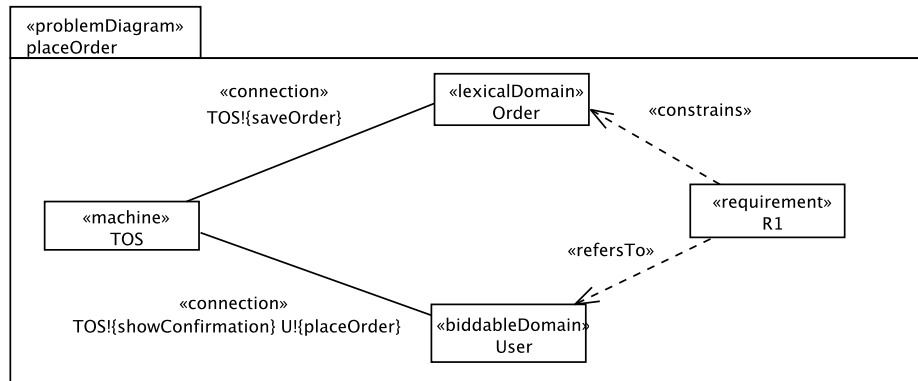


Figure 1.2: Problemdigram for R1

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:

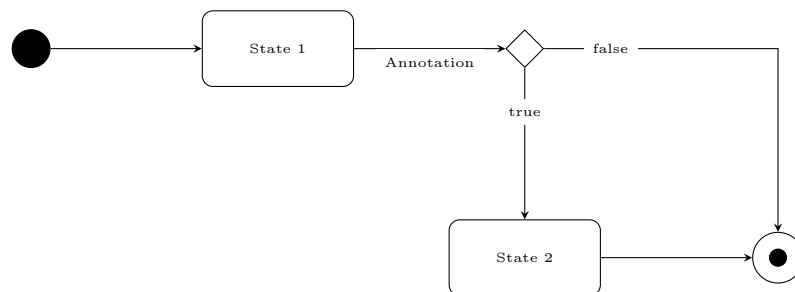


Figure 2.1: Zustandsdiagramm Person 1

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
A			
addBooking	phenomenon	the machine adds a booking to the BookingsDatabase	CD
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			
BookingsDatabase	lexical domain, designed domain	the database of bookings made by customers	CD
C			
Customer	biddable domain	a customer of UDEKino	CD
CustomersDatabase	lexical domain, designed 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
D			
E			
Email	causal domain, connection domain	an e-mail service offering to deliver e-mails	CD
F			
G			
H			
I			
J			
K			

Table 4.1: Glossar

Name	Type	Description	Source
L			
LoggedInCustomer	biddable domain	a customer who has logged into their account	CD
lcShowWebsite	phenomenon	the machine shows a website to the LoggedInCustomer	CD
M			
modifyShowing	phenomenon	the machine modifies a showing in the database	CD
N			
notifyCustomer	phenomenon	the machine notifies the customer via e-mail	CD
O			
P			
Q			
R			
S			
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, designed domain	the database of Showings	CD
sShowWebsite	phenomenon	the machine shows a website to the StaffMember	CD
StaffDatabase	lexical domain, designed domain	the database of Staff accounts	CD
StaffMember	biddable domain	a member of UDEKino staff	CD
T			
U			
V			
W			
X			
Y			
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
Z			

Table 4.1: Glossar

Name	Type	Description	Source