UNIVERSITÄT DUISBURG ESSEN

Open-Minded

Lab for Software Engineering
Winter term 2022/2023

Lab for Software Engineering

Cinema Management Application

Ifrat Jahan (3098878)
Jenniffer Maxisch (3106694)
Georgios Adamos (3093306)
Thomas Klimek (3067855)
Melvin van der Linde (3106762)

October 24, 2022

University of Duisburg-Essen · Faculty of Engineering Working group Software Engineering – Prof. Dr. M. Heisel
Date: Do. 12-14- Supervisor: Marcel Schweikert

Contents

List of Figures

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 provied a predifned 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

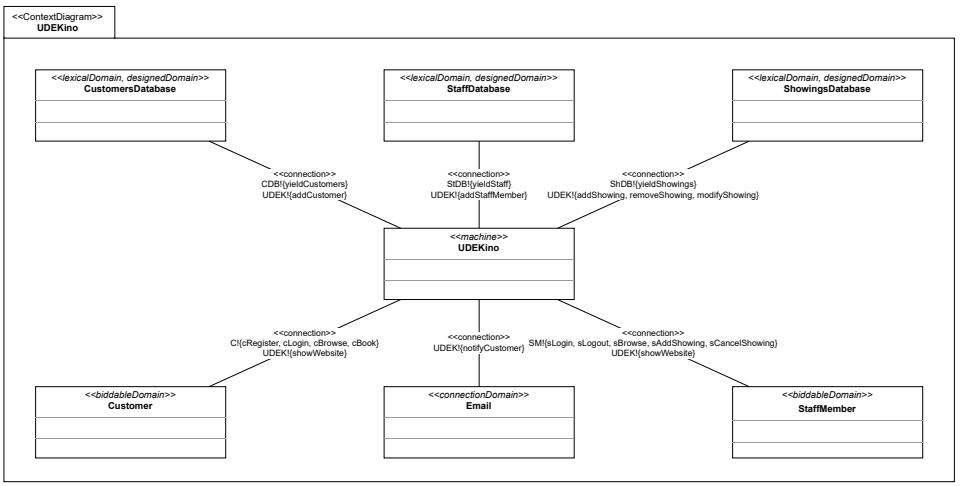

Figure 1.1: Contextdiagram

1.2 A2

We can derive the following problem diagrams

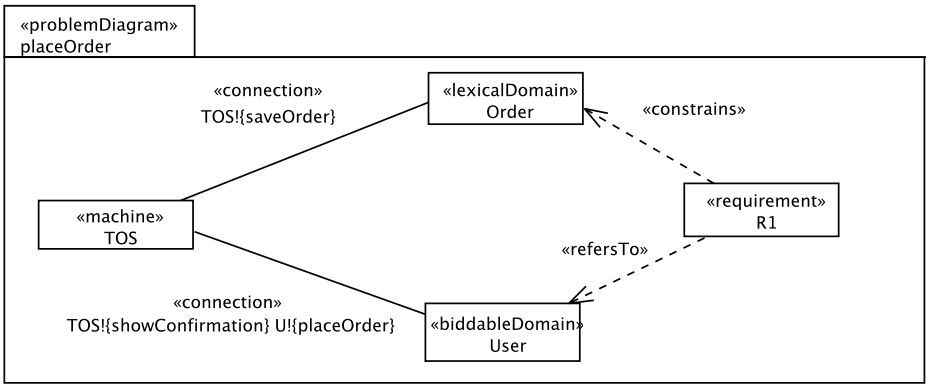

Figure 1.2: Problemdiagram for R1

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:

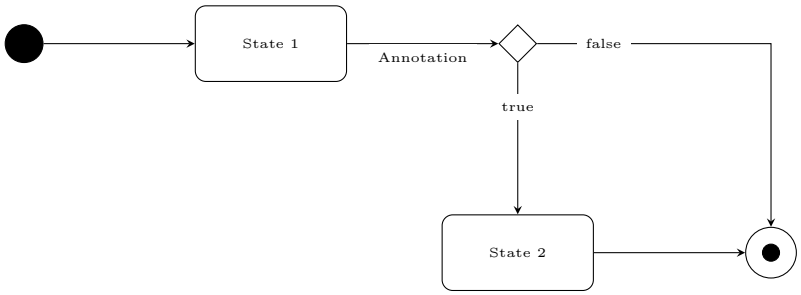

Figure 2.1: Zustandsdiagramm Person 1

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			
addCustomer	phenomenon	the machinea 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			
C			
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
D			
E			
Email	causal domain, connection domain	an e-mail service offering to deliver e-mails	CD
F			
G			
H			
I			
J			
K			
L			

Table 4.1: Glossar

Name	Type	Description	Source
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	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
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			