ID2207
Modern Methods in Software Engineering

Homework 2 - Group 19

September 2021
Royal Institute of Technology

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1. Glossary of the problem

General concepts of the problem used in the report	***Description***
Use case	Abstraction of a business process
Use case diagram	Diagram of use cases to characterize abstractions of different business processes within and/or outside the system, based on a flow of events.
Actor	Someone connected to one or more use cases who performs action within it, i.e. performs action within a certain business process. Abstraction of a role. E.g. HR manager.
Entry condition	Prerequisites for the use case. Mandatory for the use case to proceed.
Exit condition	What the use case provides, i.e. output of the use case. Could be the entry condition(s) of another use case.
Event flow	The flow of the use case described in detail, from start to end.
Quality condition	Quality of the use case to enhance its performance.
Validation	The process where the system confirms or neglects the user's credentials.
Authorization	The process where the system gives different permissions based on the user's role within the system.
Extend	Association between two or more use cases. Conditional associations, meaning that the base use case might be executed without the extended use case. Usually used for exceptions.
Include	Association between two or more use cases. Mandatory associations, meaning that the base use case and the included use cases are mandatorily executed in order to proceed with the event flow.
Scenario	Instance of a certain use case. A detailed description and event flow which describes realistics / possible events which might occur throughout the business process and

	hence the usage of the system. Also describes how different roles interact with the system.
Role	Instance of an actor, an actual person/user of the system. E.g. Joe.
Requirement	Functions of the system that it must have. Usually divided categorized to functional or non functional requirements. This paper mainly covers non functional requirements.
Non functional requirements	Constraints of the system which are distinct by the user and are not directly related with the functionality of the system. E.g. languages of the presented information by the system, or design of the GUI.
Roles used in the report	
Roles	● Mike, Administration Department Manager ● Simon, Senior HR manager ● Maria, HR assistant ● Janet, Senior Customer Service Officer ● Sarah, Sam, Judy, Carine, Customer Service ● David, Marketing Officer ● Emma, Marketing Assistant ● Alice, Financial Manager ● Fredrik, Sophia, Accountant ● Jack, Production Manager ● Tobias, Magdalena, Photographer ● Antony, Adam, Audrio Specialist ● Magy, Decorating Architect ● Angelina, Decorating Specialist ● Don, Tom, Decorating Assistant ● Julia, Raymond, Graphic Designer ● Christian, Nicolas, Network Engineer ● Michael, Robert, Technician ● Natalie, Service dpt. Manager ● Helen, Top Chef ● Diana, Chris, Daniel, Marilyn, Chef ● Kate, Senior Waitress ● Lauren, Johnny, Brad, Meryl, Waitress ● Charlie, VP ● Jennifer, Cameron, Secretary
Use cases used in the system and the report	***Description***

Use cases in the report	● **InitiateEventRequest** ○ Login ○ CreateEventRequest ○ SendEventRequest ○ SetStatus ○ ReviewApplication ○ CheckFeasibility ○ SendApprovedRequest ○ CalculateBudget ○ SendBudgetCalculations ● **CompleteEventRequest** ○ Login ○ ReviewApplication ○ CheckBudget ○ NotifyCustomerServiceDpt ○ CheckStatus ○ ArrangeMeeting ○ CheckMeetingTiming ○ SendMeetingAck. ○ Meeting ○ CreateEventSpecification ● **RequestAdditionalRecruitment** ○ CheckResourceAvailability ○ ShortageFound ○ InitiateResourceRequest ○ ShortageNotFound ○ ReviewApplication ○ LongTermRequest ○ OutSourceRequest ○ AdvertiseResourceRequest ○ ScheduleInterviews ○ InformManagers ● **InitiateSubTeamTasks** ○ FillClientNeedsForm ○ CreatSubTeamTasks ○ SendTaskToTeam ○ ReceiveTasks ○ CheckResources ○ SetApplicationStatus ○ PlanExecution ○ EditTask ● **AdditionalBudgetRequest(Extra)** ○ Login ○ ReceiveCommentsOnTask ○ EventActivitiesPlan ○ ReceiveBudget ○ SetApplicationStatus ○ ArrangeMeeting ○ ScheduleTime ○ NotifyCustomer ○ AttendMeeting ○ AgreementOnBudget ○ DiscussAdditionalBudget

Different concepts in the use cases / scenarios mentioned in the report	***Description***
Event request	The customer's event proposal containing information regarding their event.
From/application form	Element of the system in which the user fills in with required information/details.
Status	The current state of the event request. E.g. "under review", "approved".
Review	Go through information / requirements in detail, e.g. the event request or the budget.
Feasibility	Whether there are enough resources for the event request to be executed.
Available and displayed	Accessible by the actor and shown on the actor's GUI.
Notify/notification	An acknowledgement is sent by the system to a user of the system in order to create a clear communication flow. These are usually triggered when a certain use case is executed. Please note that some notifications are sent outside the system scope by the customer service to the customer due to customer care reasons.
Event specification	Document where the customer's event needs are specified, output of the meeting between employees and customer.
Additional recruitment	In case of shortage of staff / employees for a certain event. Then, a certain actor might request new hiring to fill the gap
Submit	Something is sent by the user by pressing a button (e.g. send/submit), usually a request / form / application form. Once the button is pressed, the system handles the dispatched form.
Subteam	Smaller team within a team.
Receive comments on task	Comments sent to the production manager from sub teams which contain requests for extra budget.
Get meeting minutes	Keeps track of the meeting in order for

	future report, this also includes different details about the meeting, namely agreement on budget and discussion of additional budget.
Advertise Resource Request	Announcement that further resources are needed for the event.

2. Identified Actors

Administration Department

- Administration Department Manager
- **HR**
    - Senior HR Manager
    - HR Assistant
- **Customer Service**
    - Senior Customer Service Officer
    - Customer Service Team (multiple)
- **Marketing**
    - Marketing Officer
    - Marketing Assistant

Financial Department

- Financial Manager
- Accountant (multiple)

Production Department

- Production Manager
- **Photography Team**
    - Photographer (multiple)
- **Audio Team**
    - Audio Specialist (multiple)
- **Graphic Designer Team**
    - Graphics Designer (multiple)
- **Decoration Team**
    - Decoration Architect
    - **Decoration Sub Team**
        - Decorating Specialist
        - Assistant (multiple)
- **IT Team**
    - Network Engineer (multiple)
    - Technician (multiple)

Services Department

- Services Department Manager
- **Food Team**
  - Top Chef
  - Chef (multiple)
- **Catering Team**
  - Senior Waitress
  - Waitress (multiple)

Top Management Department

- Vice President
- **Secretary Team**
  - Secretary (multiple)

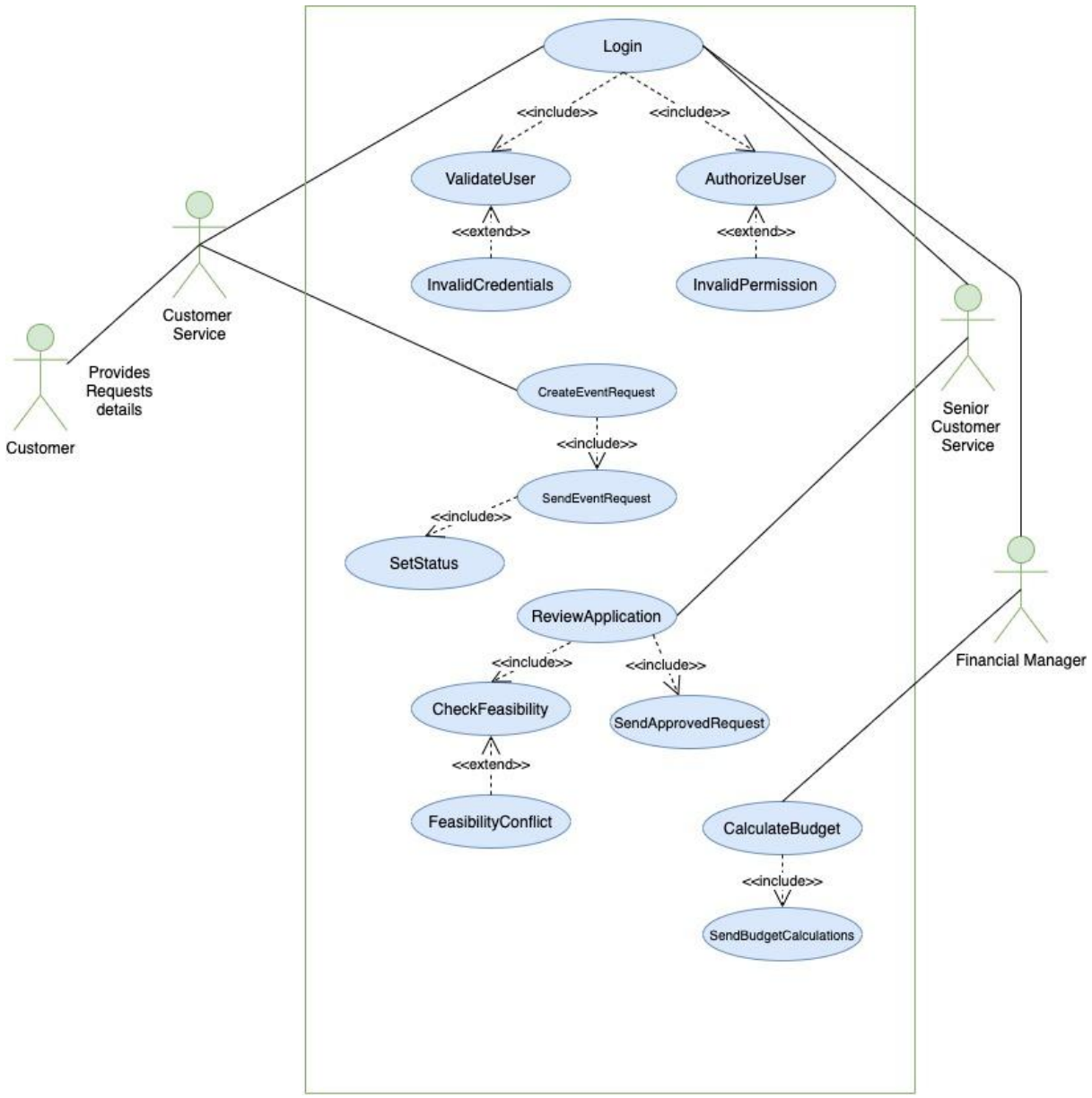
3. Use cases

Use case 1

Name: InitiateEventRequest
Participating actor(s): 1. Customer Service 2. Senior Customer Service 3. Financial Manager
Entry conditions: 1. Actors login to the system. 2. System validates the actor's credentials and authorization is executed. 3. The authorization follows: a. The customer service accesses the event request application form. b. The customer service (including senior customer service) accesses the filled application form. c. The financial manager accesses the data needed for budget calculation.
Exit conditions: 1. The event request is approved for further review or suspended for further negotiation with the client.
Quality conditions: 1. The system should be available. 2. The system should be easy to use. 3. The system should be functioning without unexpected interruptions. 4. The system should be easy to maintain. 5. The system should be secure.

Event Flow:

1. Customer provides event request details to customer service.
2. Customer service creates a new form.
3. The system displays the form.
4. The customer service fills the application form with necessary information about the event.
5. The customer service sends the form to senior customer service..
6. The request's status is set by the system to "under review".
7. The application is now available and displayed for the senior customer service.
8. The senior customer service reviews event requests.
9. The senior customer service approves or rejects the event request based on feasibility.
10. If rejected, the system displays the rejected application for the customer service who contacts the customer.
11. If approved, the application is sent and is now available and displayed for the financial manager.
12. The financial manager calculates the budget.
13. The financial manager sends his conclusions to the administration manager.



Use case 2

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Name: CompleteEventRequest

Participating actor(s):

1. Administration Manager
2. Senior Customer Manager
3. Customer
4. Financial Manager
5. Product Manager
6. Services department Manager

Entry conditions:

1. The event request is approved and set for completion.
2. Actors login to the system.
3. System validates the actor's credentials and authorization is executed.
4. The authorization follows:
    a. The administration manager accesses the event request application and the financial manager's calculations.

Exit conditions:

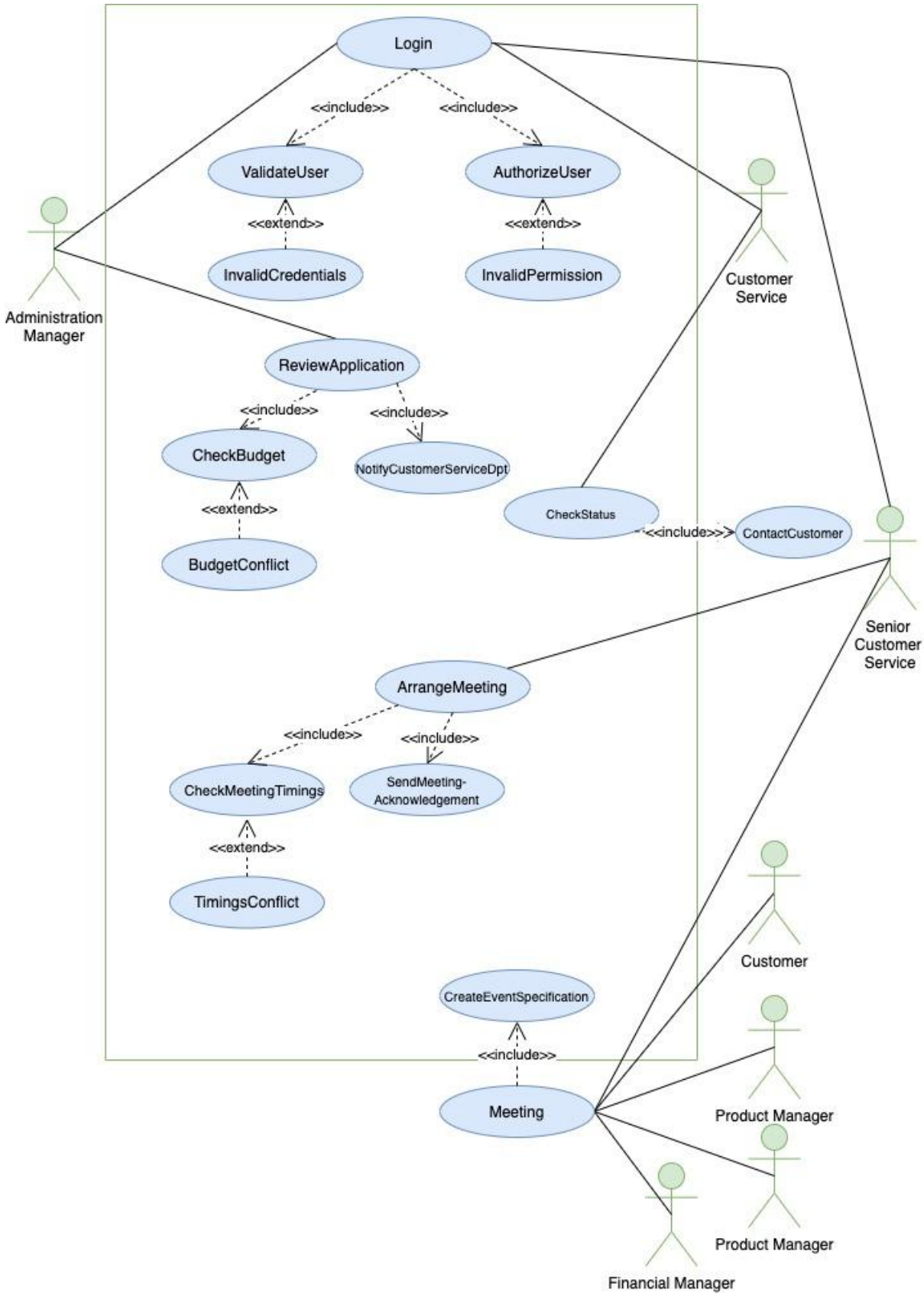
1. A specification of the customer's event.

Quality conditions:

1. The system should be available.
2. The system should be easy to use.
3. The system should be functioning without unexpected interruptions.
4. The system should be easy to maintain.
5. The system should be secure.

Event Flow:

1. The administration manager accesses the system.
2. The system displays the requested event application and the financial manager's budget calculation.
3. The administration manager reviews the application and the budget.
4. If rejected, the system notifies and displays the rejected application for the customer service who contacts the customer.
5. If approved, the system notifies and displays the approved application for the customer service who contacts the customer.
6. If approved, the system notifies the senior customer service.
7. The senior customer service is notified by the system about the approved application.
8. The senior customer service checks meeting timings for all participants.
9. The senior customer service arrange a meeting for the customer, financial manager, production manager, and services department manager.
10. The meeting participants are notified with a meeting confirmation.
11. The meeting is taking place.
12. An event specification is created.



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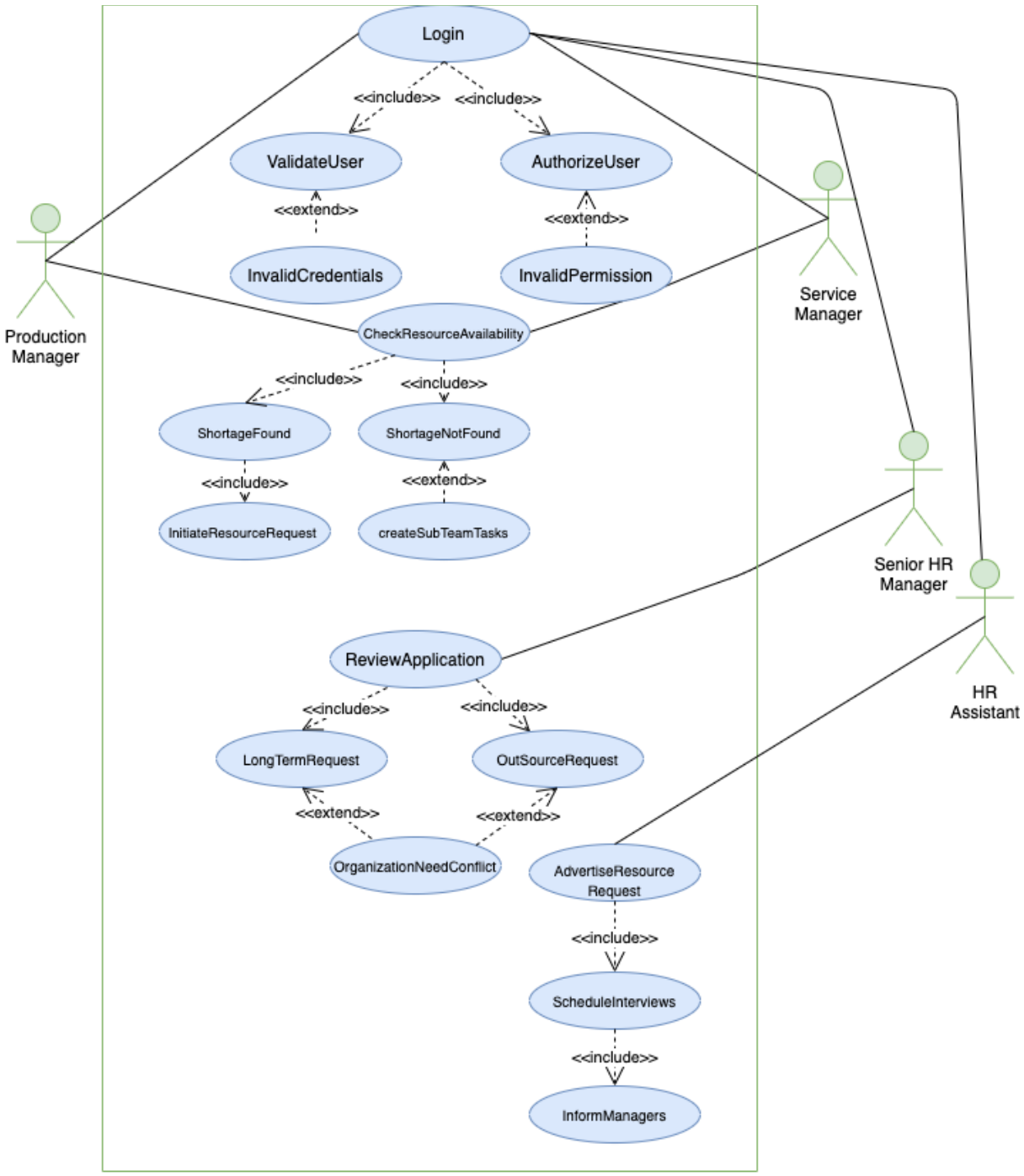
Use Case 3

Name: RequestAdditionalRecruitment
Participating actor(s): 1. Production Manager 2. Service Manager 3. HR Team
Entry conditions: 1. Client event specification document. 2. Actors login to the system. 3. System validates the actor's credentials and authorization is executed. 4. The authorization follows: a. The production manager and service manager have access to event specification documents and access to request resources form.
Exit conditions: 1. The request for recruitment if any is resolved by the HR Team.
Quality conditions: 1. The system should be available. 2. The system should be easy to use. 3. The system should be functioning without unexpected interruptions. 4. The system should be easy to maintain. 5. The system should be secure.
Event Flow: 1. Production and Service Manager checks availability of resources in respective departments. 2. In case of shortage both Managers initiate a request for additional recruitment of resources. 3. The system displays the request form 4. The managers fill the application with necessary information about the request. 5. The form is submitted. 6. The request application is now available and displayed for the HR Team. 7. The HR team reviews the request form. 8. On the basis of information provided, the HR team will prepare requests for either long term staff recruitment or out sourcing the specified request according to the availability of resources of the organization. 9. The HR team advertises for the required resource and after hiring will inform the respective managers about the resource resolvement.



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Use Case 4

Name: InitiateSubTeamTasks

Participating actor(s):

1. Production Manager
2. Production Team
    - Photography Team
    - Audio Team
    - Graphic Designer Team
    - Decoration Team
    - IT Team

Entry conditions:

1. Client event specification document.
2. Staff recruitment/resources resolved.
3. Actors login to the system.
4. System validates the actor's credentials and authorization is executed.
5. The authorization follows:
    a. The production manager logs in and has access to create and assign tasks to all sub teams in his/her department.
    b. The sub teams members log in and have access to see their tasks with assigned priority.
    c. The sub teams members have access to edit tasks about the expected plan and request for extra budget if required.
    d. The production manager has access to comments and requests edited by the sub teams members.

Exit conditions:

1. The edited tasks by sub team members with info about execution plan and extra resources if required is displayed to the production manager.

Quality conditions:

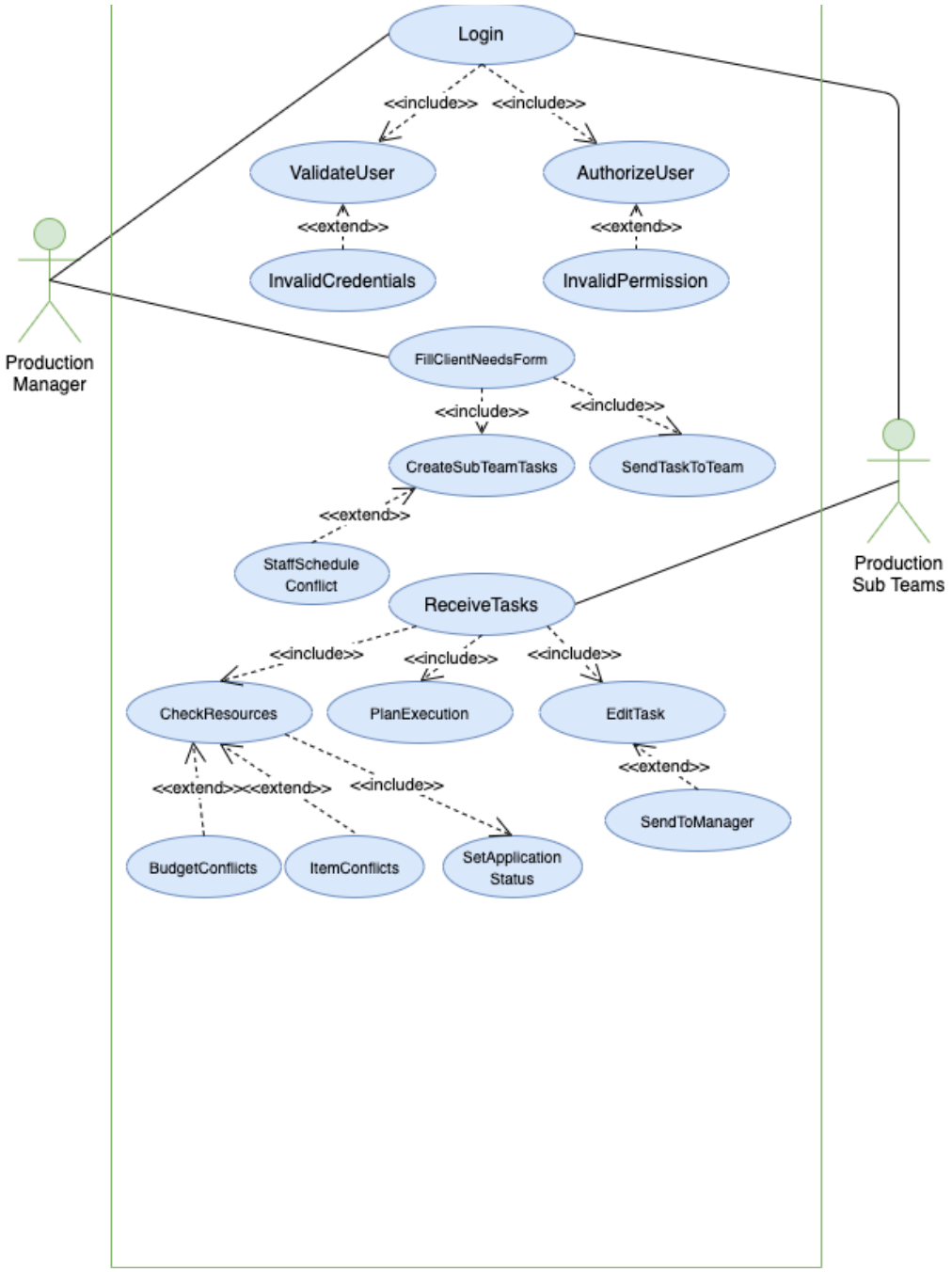
1. The system should be available.
2. The system should be easy to use.
3. The system should be functioning without unexpected interruptions.
4. The system should be easy to maintain.
5. The system should be secure.

Event Flow:

1. The Production Manager initiates a request for a form to fill the client needs from the production department.
2. The system displays the required form.
3. The production manager fills the application with client needs from the production department.
4. The production manager then creates tasks for each subteam and fills the required information like description, priority and to which member the task has to be assigned.
5. The production manager then sends the tasks to each subteam member.
6. The system displays each sub team member their tasks with assigned priority and details.
7. The sub team members plan on how to execute tasks for the event and edit the form with comments of their plan.
8. The sub team members request for extra budget or items according to the need

and the application status is set to open.

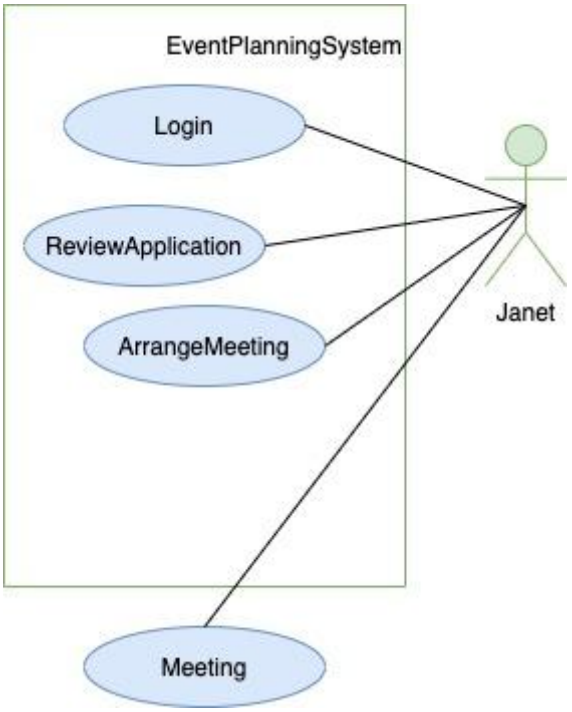
9. The application form is edited and is displayed by the system to the production manager.



4. Scenarios

Scenario 1

Janet is involved in four different key use cases of the system which can be seen below. In order to further understand the concrete functionality of the system, as well as Janet's participation in the system, we will create a set of scenarios of the use case "ReviewApplication". In the scenarios below, we will only consider one out of four customer service employee's, namely Sam. We also only consider one possible instance of the use case "ReviewApplication". The customer is not a role since he/she does not directly interact with the system.



Scenario name	initialConferenceRequestMeeting
Participating actor instances	Janet: Senior Customer Service Officer, Sam: Customer Service, Alice: Financial Manager
Flow of events	1. Sam is the initial contact with the customer, namely the large tech company "Boogle". 2. Boogle provides event request information to sam. 3. Sam, the customer service employee, must make sure that no important information is missing in the conference event request. 4. Afterwards, Sam creates and sends a form with the information about the conference event request to Janet. 5. Boogle receives a notification by Sam that their

	request is processed. 6. The system automatically sets the conference event request's status to "under review". 7. Janet receives notification by the system about the new request and the request is available and displayed by the system for her. 8. Janet reads about the Boogle's expectations and requirements, e.g. the budget amount is 100 000$, the number of participants are 1000 people and the customer asks for extremely luxurious food. 9. Janet knows that this is barely feasible for their mid-sized company but decides to proceed with the customer since she does not want to lose a big client. 10. As there are no other certain conflicts such as system error's (wrong data formats, empty fields etc.) or unclear requirements and expectations from Boogle, Janet may now consult Alice for further budgeting calculations. Otherwise, Sam is notified and contacts the Boogle again for clarification. 11. Boogle is notified by the progress by Sam and Alice is notified by the system about the new conference event. 12. The application is now available and displayed by the system for Alice. 13. Alice opens the request and starts to calculate the budget. It seems like the budget calculation suits Boogle's requirements and initial proposed budget. 14. Alice sends the application for further investigation and Boogle is notified by Sam about the progress..

Scenario 2

In this scenario, we consider the "ArrangeMeeting" use case, seen in the second use case diagram. The meeting is concerning a concert event request. The band manager James is not considered as a participating actor, since he does not directly interact with the system.

Scenario name	organizeConcertEventMeeting
Participating actor instances	Mike: Administration Department Manager, Janet: Senior Customer Service Officer, Alice: Financial Manager, James: , Fredrik: Accountant, Jack: Production Manager, Tom: Assistant, Natalie: Services Department Manager
Flow of events	1. The concert request has been approved by Mike and Janet is notified by the system. 2. Janet checks the schedule for business meeting time slots, which is displayed by the system.

	3. The customer, James, who is the band manager of a popular band called “Rock and Stroll”, is first contacted for the meeting timing. As James is not a busy man, he accepts the time offered by Janet. 4. Janet sends a request in the system to all to-be participating roles. The request is shown as “business meeting with James” in the schedule of all participants. 5. Unfortunately, Alice’s work load is greater than ever, so she rejects the time proposal which is shown by the system on her screen. Luckily, Fredrik will cover her absence. 6. Unfortunately, Jack is on vacation and can not participate. Therefore, the system shows the request on Tom’s screen instead, as he is covering for Jack. 7. In rare cases like this, the business meeting is held anyways as Janet has a great experience and may support Fredrik and Tom. 8. Natalie accepts the requested time slot, which is shown by the system on her screen. 9. As everyone has confirmed their presence in this meeting, the system sends a confirmation to each participant and the meeting is now shown in their schedule. 10. Janet is notified by the system about the successful arrangement and contacts James for confirmation.

Scenario 3

In this scenario, we consider the use case of “resolve/reviewExtraResourceApplication” submitted by the production manager for a project. When the production manager Jack submits the application for extra resources regarding the project, the application is displayed in the system. The Production Manager Jack, Senior HR Manager Simon, HR Assistant Maria, Financial Manager Alice, Administration Department Manager Mike and Graphic Designer Julia from the Graphic Designers Team within the Production Team are considered as participating instances of actors.

Scenario name	resolveExtraResourceApplication
Participating actor instances	Jack: Production Manager, Simon: Senior HR Manager, Mike: Administration Department Manager, Alice: Financial Manager. Maria: HR Assistant, Julia: Graphics Designer
Flow of events	1. Jack checks the project requirements and finds that there are some special skills required in filming of the event from a photographer. 2. Jack decides to fill a request for a photographer to

	cover the client's needs. 3. Jacks fills the request and submits it in the system. 4. The extra resource application is displayed in the system and is accessible to Simon. 5. Simon opens the application received from Jack. 6. Simon checks that Jack has requested for a new photographer with specific skills required for their current project with one of the clients. 7. Simon discusses the application with Mike to check whether they should hire a new long term resource for the current project or should outsource the project. 8. Mike arranges a meeting with Alice to discuss the extra resource arrangement in context of the financial situation of the organization. 9. Mike then arranges a final meeting with Alice and Simon to make a decision for the resource. 10. The decision is made by Mike after confirming the organization's resources and needs from Simon and Alice and they have decided that they can outsource the project task to a freelance photographer for this project as the skills required are related to this project only and also the budget allows to outsource this for now. 11. Now that the decision is made, Simon forwards the request to Maria. 12. Maria receives the details about outsourcing the task to a freelance photographer . 13. Maria coordinates with Julia to create a banner for advertising the task. 14. Julia develops and sends the banner to Maria. 15. Maria posts the task description along with a banner and advertises it on different platforms. 16. Maria notifies Jack about the advertisement of the task.

Scenario 4

In this scenario we consider the use case of “createSubTeamTask” by the service manager after the issues of any extra resources are solved. Services Department Manager Natalie, Top Chef Helen, one of her team members Diana, Senior Waitress Kate and two of her team members Lauren and Brad are considered as participating instances of actors.

Scenario name	createSubTeamTasks
Participating actor instances	Natalie: Services Department Manager, Helen: Top Chef, Kate: Senior Waitress. Diana: Chef, Lauren: Waitress, Brad: Waitress
Flow of events	1. Natalie has checked the resources required for the project and finds that two members from the chef

	team and three members from the waiters will cover the event and she doesn't need any extra resources for the project. 2. Now Natalie fills an application about the client needs regarding food, beverages and catering service for the event. 3. Natalie arranges a meeting with Helen to discuss the availability of her and one of her team members for the event day and checks for scheduling conflicts of her team members. 4. Natalie finds that there are no schedule conflicts for Chef Diana and Helen and they can cover the food and beverages for the event. 5. Natalie fills out the tasks of Top Chef Helen and Chef Diana after concerning the tasks and responsibility of Diana for the event from Helen and sends the tasks with priority mentioned. 6. In the same manner Natalie arranges a meeting with Kate to discuss the availability of her and two of her team members for event day catering services and checks scheduling conflicts of her team members. 7. Natalie finds that there are no schedule conflicts for Kate and her team members Lauren and Brad and they can cover the event catering services. 8. Natalie fills out the tasks of Kate, Lauren and Brad after concerning the tasks of Lauren and Brad from Kate and sends the tasks with priority mentioned. 9. Helen, Kate, Diana, Lauren and Brad receive their tasks with assigned priority values 10. All members edit the task to write about their activities they will perform on event day and also request for any resource if they need any. 11. Natalie reads the edited tasks from all team members and proceeds further with requests if any.

5. Non Functional Requirements

- The system should have helping guides in order to facilitate the usage for the employees.
- The errors and recoveries should be measured for future improvements.
- System errors such as network failures or missing input should be presented with an intuitive pop-up window for the user, which should inform the user how to solve the problem.
- The system should not contain any unnecessary delays,
- The Front end application must support all browsers (Chrome, Mozilla, Safari, Edge etc).
- The Front end application must be responsive (Mobile devices, Tablets, Laptops).
- The system's database must be backed up on a regular basis.
- The information presented in the interface should be in English.
- The system should have a consistent yet appealing design considering:
    a. Font,
    b. Font size,
    c. Colors,
    d. Structure of the visual elements (e.g. input fields, buttons, headings etc.).
- The system should be designed using WCAG 2.0 principles or similar.
- The system should store and process information in line with the GDPR.
- The system should not violate any inter-organizational policies nor governmental rules or law.
- As neither non functional requirements nor functional requirements are completely defined in the business use case, a development method which involves the system’s users should be used, namely an agile method.
- Cost and delivery is for future negotiation.

6. Extra

We considered the following use case diagram to cover the use case of handling the additional budget request from the production subteam.