

Artefakt

Mobile Computing
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MyCampus Mobile Application Requirements

Burak Iscier

burak.iscier@student.reutlingen-university.de

Felix Schoch

felix.schoch@student.reutlingen-university.de

Gustavo Sanchez Collado

gustavo.sanchez_collado@student.reutlingen-university.de

Hamza Bouzidi

hamza.bouzidi@student.reutlingen-university.de

Matthias Schüle

matthias_ulrich.schuelein@student.reutlingen-university.de

Mehmet Altuntas

mehmet.altuntas@student.reutlingen-university.de

Oliver Schneider

oliver_klaus.schneider@student.reutlingen-university.de

Betreuer: Prof. Natividad Martinez

Description

The mobile app MyCampus is an app that navigates you over the campus of reutlingen university. It provides you with not only detailed informations about buildings and offices and how to get there, but also gives you the opportunity to locate friends, colleagues and employees on the campus. It also shows you upcoming events and where to find a free parking spot.

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1 User stories

"As a student, I want to know where i can find a free parking slot because it can take a lot of time to find one."

Florian Keller, 21 , TEC student

"As a masters degree student, I often need to find my responsible professors, to be able to continue my work."

Mark Roller, 24 , ESB master student

"As a interested pupil, I want find to immediately every interesting lab, when I visit on student information day."

Tim Poltringer, 14 , school pupil

"As a first year student from Berlin, I want to know where and when events of the university take place to meet new people."

Hannah Wirth, 18 , TD student

2 Idea

MyCampus is a good simple to use App for students, employees, professors and guests on the campus. With the app you receive informations easy and fast. With just a few clicks you'll find everything about faculties, buildings, offices, labs, help points and special places on the campus.

MyCampus also allows you to send a request to people and receive their location on the campus. The tracking helps you to find friends and colleagues fast in urgent cases, just to hang out or grab a bite to eat. MyCampus also provide you with notification messages as soon as you drive into the parking spots to show you the best possible spot to find a free parking spot.

When you are new the app shows you upcoming events on the campus and as an employee, stupa or speaker of the student councils you can add events and show all users when and where they take place.

The main app is a map of the campus where you can navigate with your fingers and zoom into buildings to get a detailed map of the floors or informations about the things to find there. With the strong search function we also provide a way to find buildings, offices, labs or people fast. Just type in a few letters and first results show up, as soon as you've found what you searched for just click on it to receive informations or show it on the map.

In the menu you can set privacy and personal settings, in case you don't want to be trackable by certain groups or just not at all.

The app is fast and secure. It helps you exploring the campus in a new transparent and open way while respecting your privacy. It helps you to set up meetings fast and find free parking spots or your parked car in no time.

3 Comparable Applications

3.1 TU Dresden Campus Navigator

[TU Dresden Campus Navigator link to app](#)

- Plattform: IOs/Android
- Features:
 - Search
 - Buildinginformations
 - Roominformations
 - Roomschedules
 - Route calculation for Rooms
- Rating: 3.5 / 5.0
- Problems:
 - "Failure on Update" |
 - "Crashing" ||
 - "Maps not loading" |||
 - "Loading time" |||
 - "Tracking not working" |

3.2 University of Hamburg

[University of Hamburg link to app](#)

- Plattform: Webapp
- Features:
 - Dates
 - Campusnavigator
 - Institutes
 - News
 - Eating plans
 - Informations about the studium
 - Uni-Newsletter
- Rating: ∅
- Problems:
 - No reviews

3.3 MIT Mobile

[MIT Mobile App Link](#)

- Plattform: WebApp/IOs/Android
- Features:
 - News
 - Shuttle Tracking
 - Map
 - Events
 - People Directory
 - Libraries
 - Dining
 - Building Services
 - Emergency
 - Tours
 - Student support
- Rating: 4.0 / 5.0
- Problems:
 - "Loading time" |||
 - "Bugs" |||
 - "Crashing" |||||||||||
 - "Maps not loading" ||
 - "Tracking" |
 - "Compatibility" |

4 Priority Features

- Campus informations
 - Institutes
 - Buildings
 - Offices
 - Rooms
 - Help Desks
 - Student associations
 - Events
- Tracking
 - Buildings, Rooms, Offices
 - Professors, Employees, Students
 - Events
- Strong search
 - All items from the above
 - Incremental search
 - fast search
- Maps
 - Campus Overview
 - Buildings and floors
 - Fast loading maps
 - Zoomable maps
 - Zoom from Overview to Buildings
- Parking spots
 - Heatmap
 - Notification on entrance where to go
- Strong security
- Functionality before features
- Privacy Group Policies
- Encryption of all data

5 Project scope

Priority is a working and simple to use app that helps students on the reutlingen university campus. It's not our goal to create a feature heavy app, we serve consistency, stability and the best performance possible. The design is modern and the usability simple and fast.

After the login or if a valid session cookie exists a map of the campus is shown. The buildings are clickable a simple tap on the buildings shows information about the buildings. Special buildings are signed with an icon and colors (like the library). A double tap or a zoom in motion with the fingers on a building causes a crossfade animation. After the animation a buildings floor map is shown. Always the last opened floor will be shown first. In the buildings special rooms like offices, help desks, or rooms of student councils are colorized. Tapping on offices gives informations about the persons. You can tap on the person to receive further informations like email address or office phone.

Tracking has several privacy settings. You can dissable all tracking information, this means you're also not allowed to track other people. Tracking requests need to be confirmed by the tracked person. The person to be tracked gets a notification, if the tracking is granted, the exact position will be tracked and transitted. The person will be shown on the map.

The search is incremental this means after the first letter is typed, the first results are shown. Everything is accessible via the search function, even settings and menus.

6 Personas

6.1 Alf

Alf



“I want to know where my colleagues are to ask them questions quickly”

Alf is a professor at Reutlingen University, he teaches at the Engineering faculty. Besides his teaching in the field of mathematics he's also the head of the examination board. As a consequence he has many appointments with students and professors of the university. At the moment he settles his appointments in various ways, via phone, mail or private conversations.

Name: Alf
Gender: Male
Age: 63

Key characteristics

- Professor
- Head of examination board
- Would like to take less time investing in communication to settle appointments

Goals

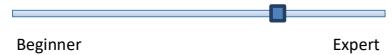
- Quickly finding people on the campus to clarify questions
- Making Appointments through one central application

User Case Scenario

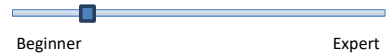
Alf has a meeting with a student in 30 minutes and needs information from one of his colleagues. He wants to know where he can find his colleague to avoid coming late to the meeting

Behaviors

Technical Skills



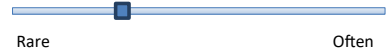
Social Media Skills



Interests in using mobile apps



Time spent on using mobile apps



Interests in technology



6.2 Hannah

Hannah



“I love to meet new people, but i am not that familiar with events of the university”

Hannah just started studying on the university of Reutlingen. She moved to the dorm next to the campus. Hannah likes to go to events and meet new friends. She would like to be able to have information about upcoming events on the campus or parties arranged by other students.

Name: Hannah
Gender: Female
Age: 18

Key characteristics

- Student
- Wants to find new friends
- Would like to go to faculty crossed events on the campus

Goals

- Get an overview on which events take place at the campus
- Information on upcoming partys for students

User Case Scenario

Hannah has a free weekend and and her roommates are out of town. She would like to know if there is a party or an event of the university or of other students where she can go to. She would also want to know what kind of events take place.

Behaviors

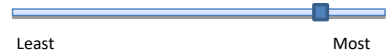
Technical Skills



Social Media Skills



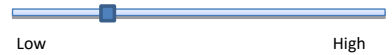
Interests in using mobile apps



Time spent on using mobile apps



Interests in technology



6.3 Florian

Florian



Name: Florian

Gender: Male

Age: 21

Key characteristics

- Student
- Likes to sleep in every morning
- Would like to take less time investing in searching a parking slot

Goals

- Remember the place where he parks his vehicle
- Wants to know where free parking slots are available

User Case Scenario

Florian arrives at the university parking lot at 9:30. He wants to know where he can park as fast as possible and as close to his lecture.

Behaviors

Technical Skills



Social Media Skills



Interests in using mobile apps



Time spent on using mobile apps



Interests in technology

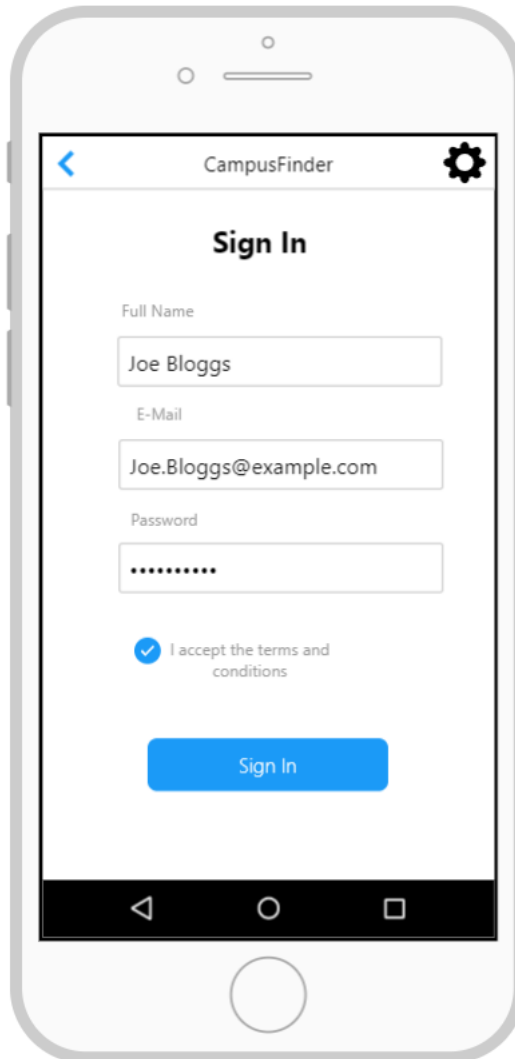


“I dont want to miss time on my lectures, but searching a parking slot always gets in the way“

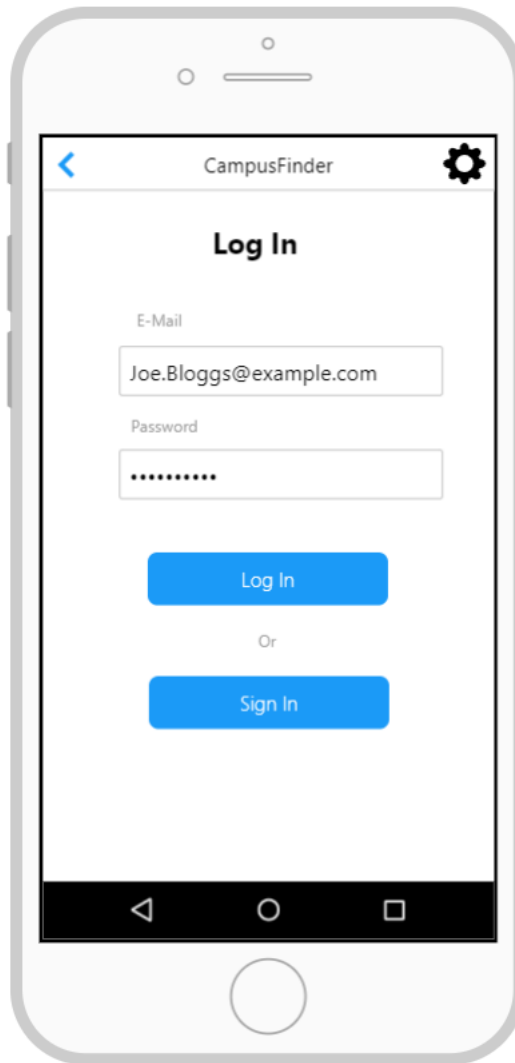
Florian is a student of Reutlingen University and is studying International Business Management. He lives in a neighboring village and arrives to the university by car. Florian uses every minute in the morning to stay in bed as long as possible. Florian would like to know where there is a free parking space in the parking lot of the university so that he wastes as little time as possible to find a parking space.

7 Mockups

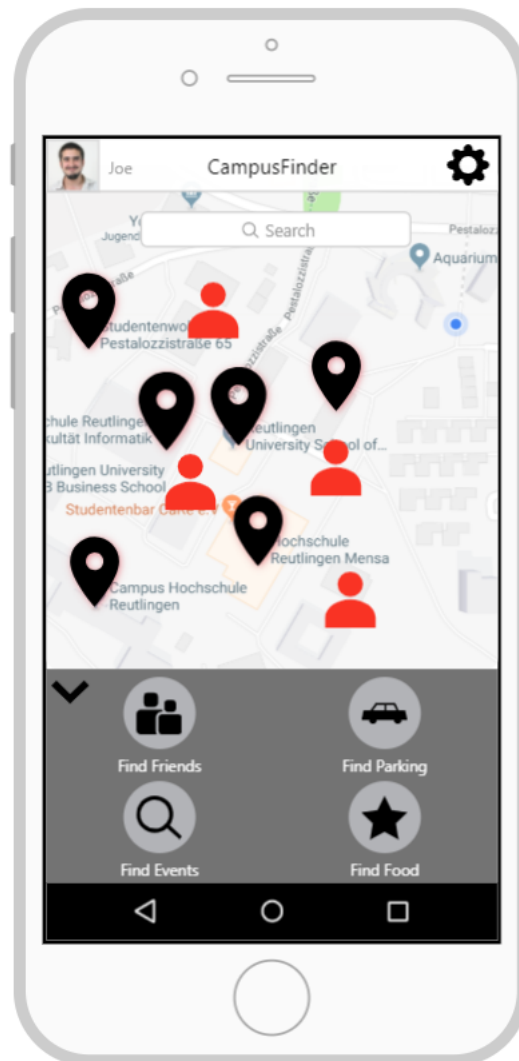
7.1 Signin



7.2 Login



7.3 Main Map



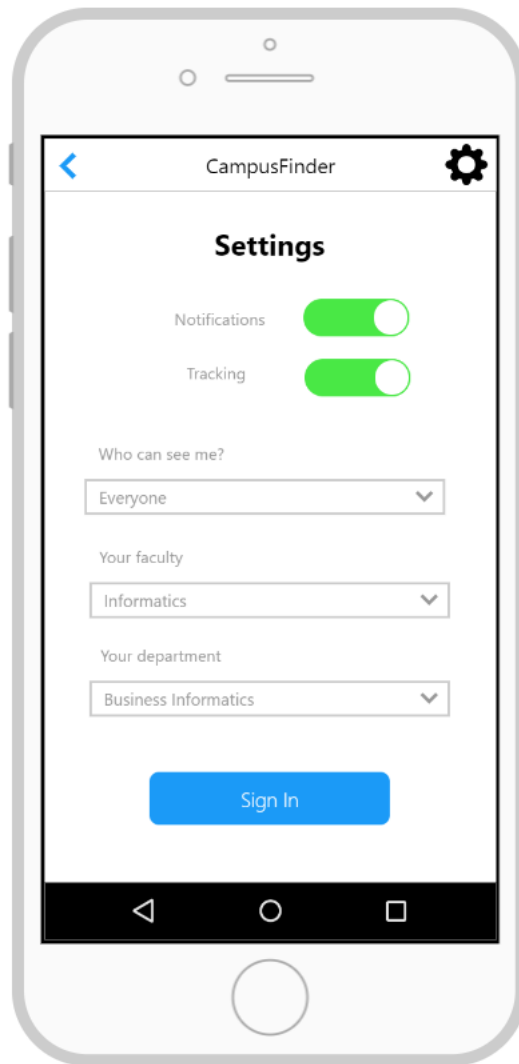
7.4 Buildings Map

7.5 Office Popup

7.6 Tracking Notification

7.7 Tracking Route

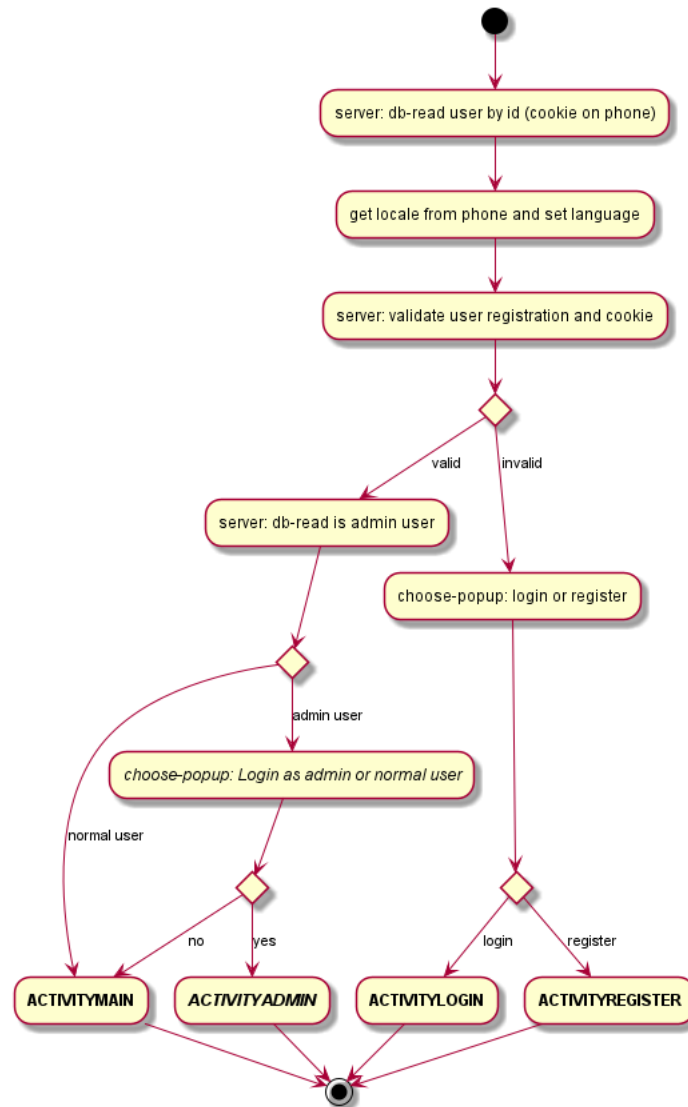
7.8 Settings



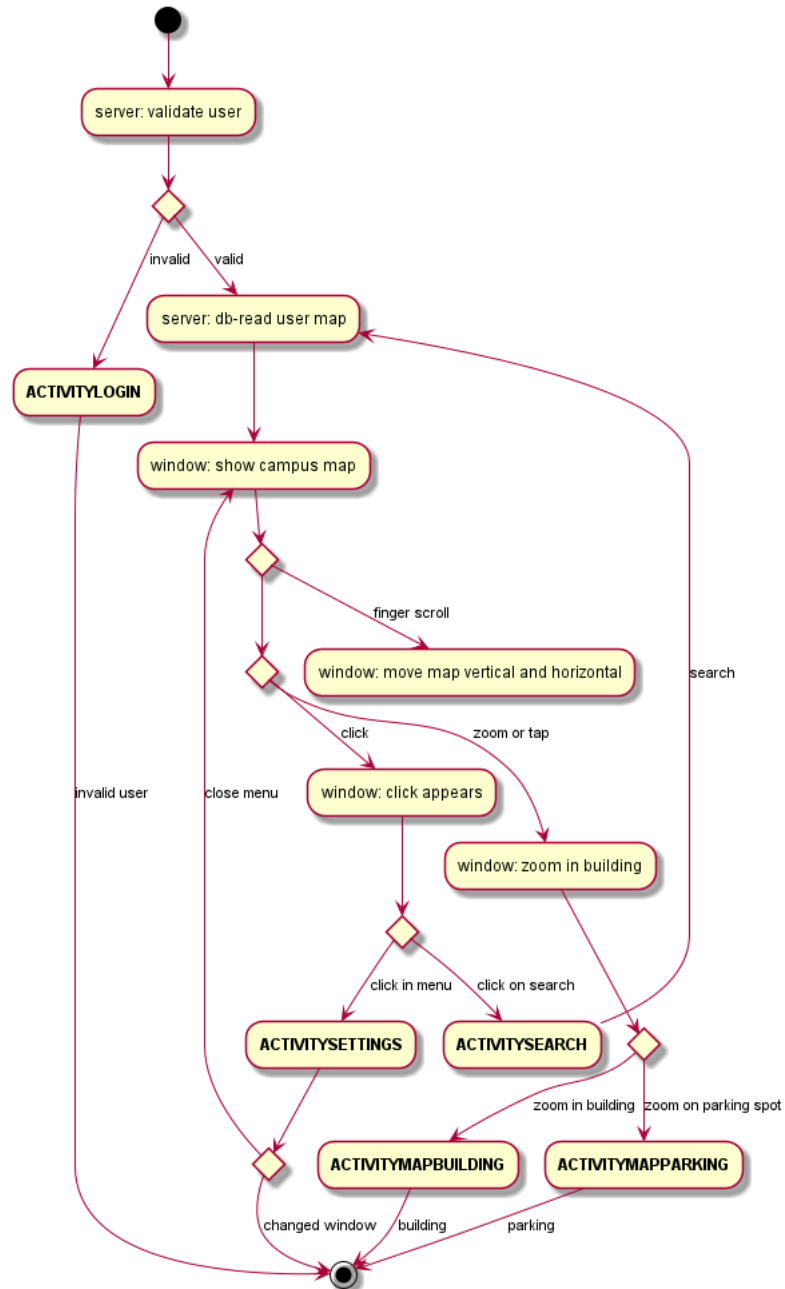
8 Technical specifications

8.1 Activity Diagrams

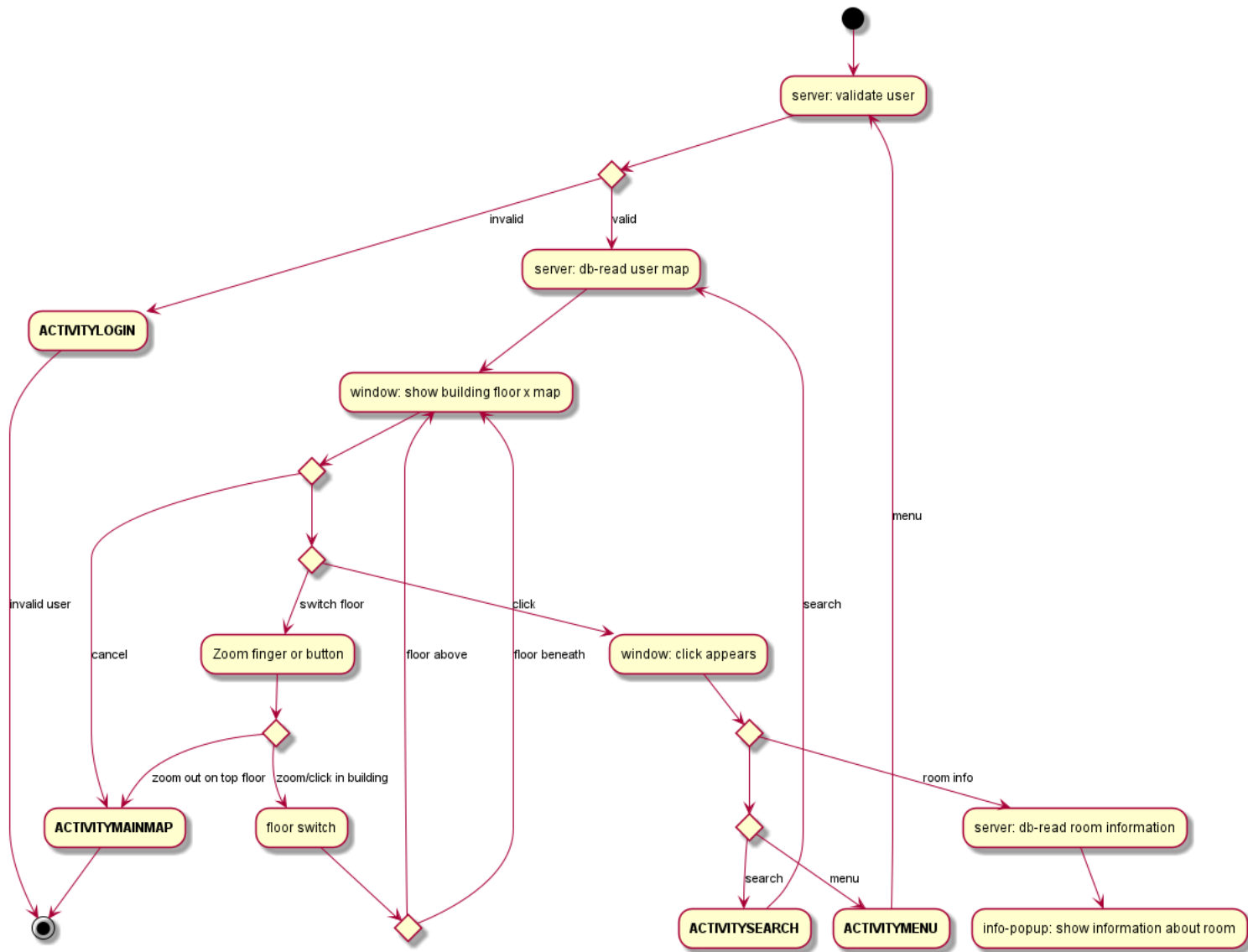
1 Startup



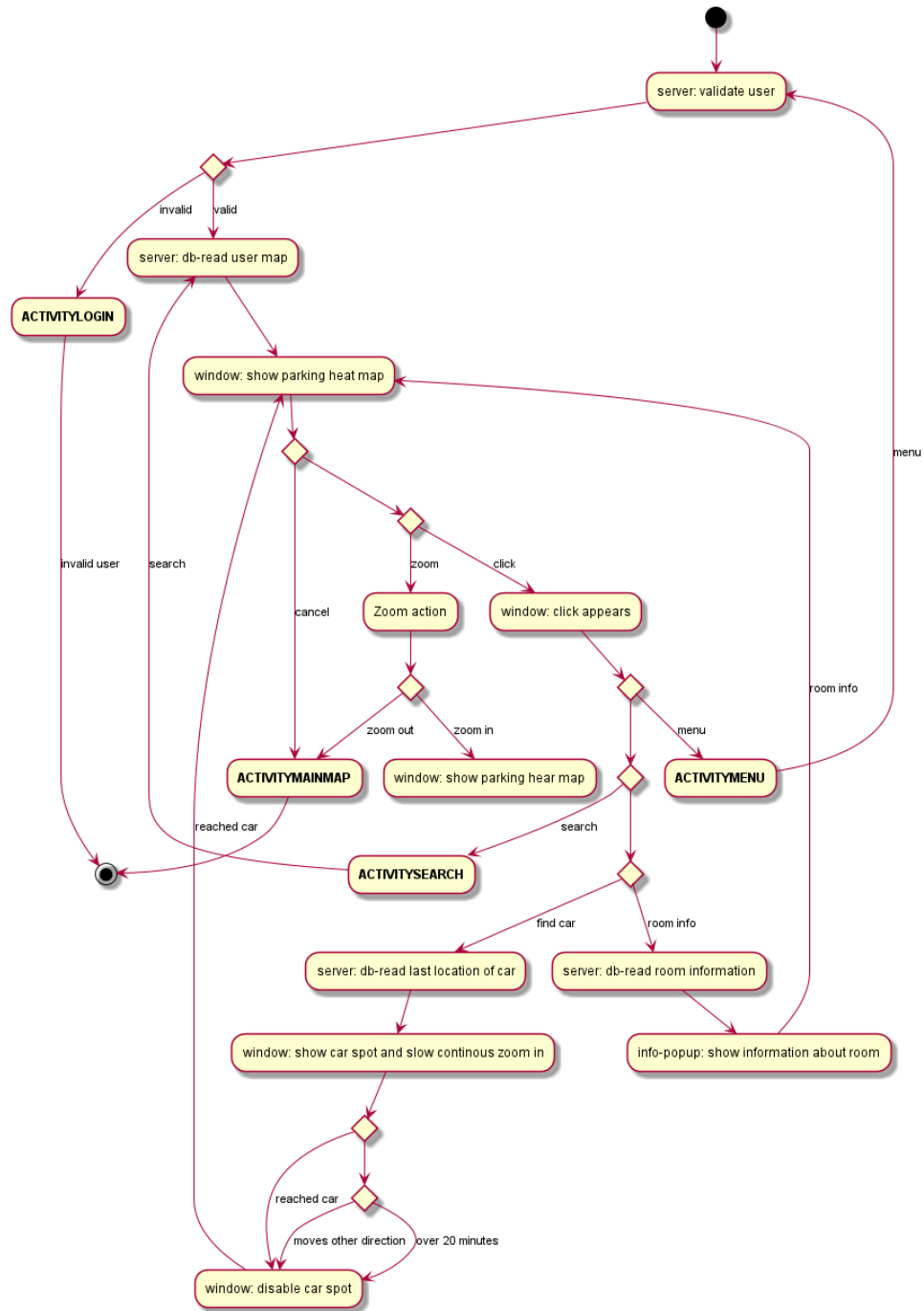
2 Main Map



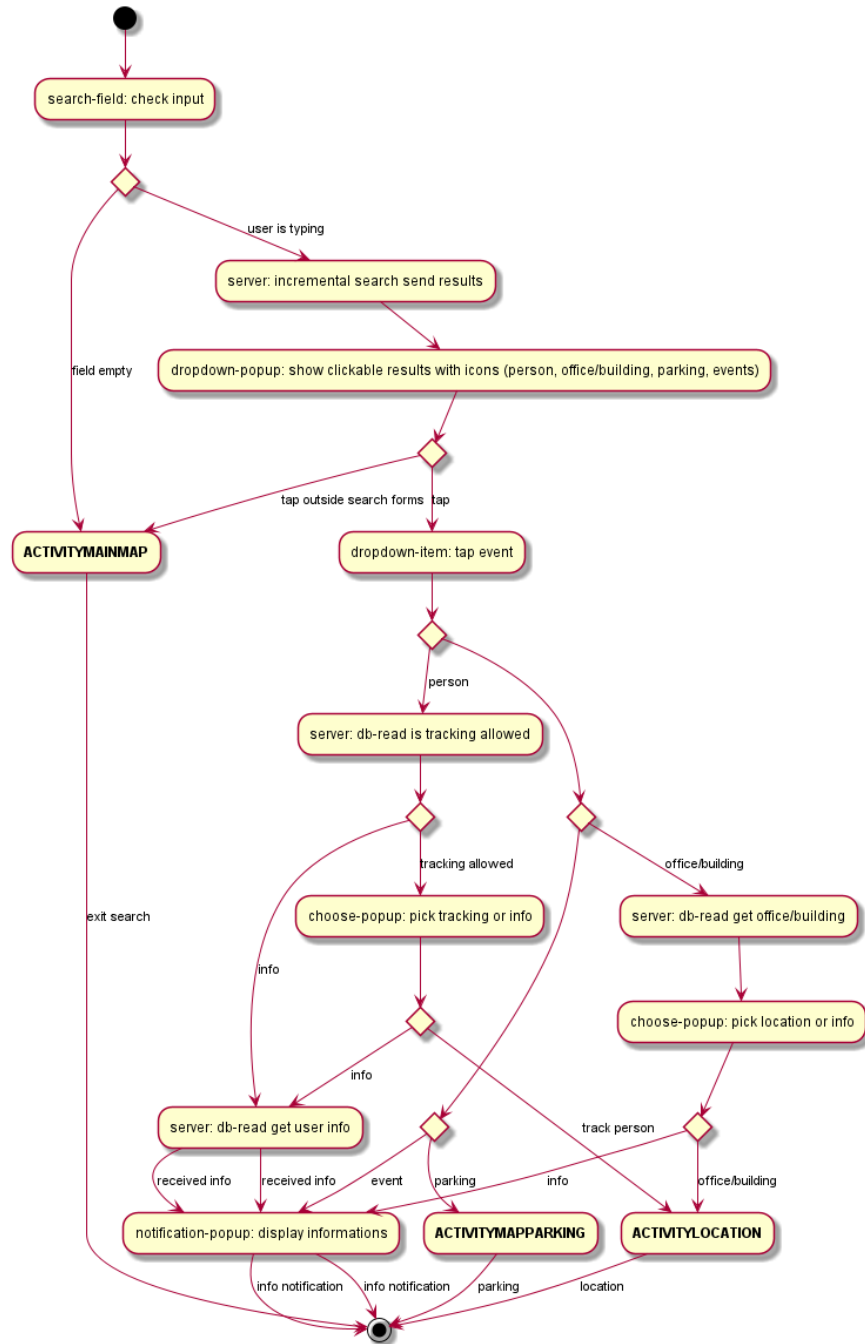
3 Buildings Map



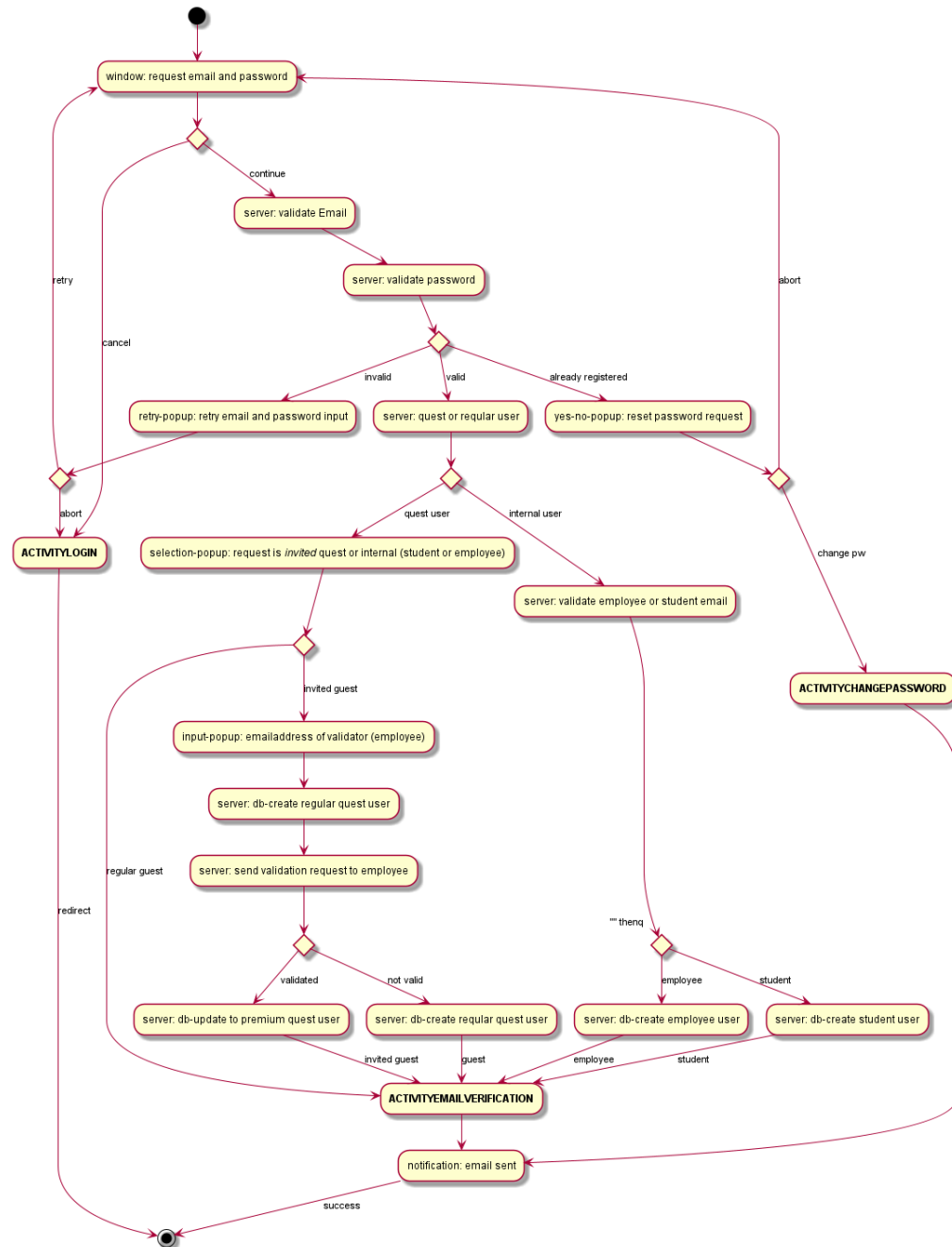
4 Parking



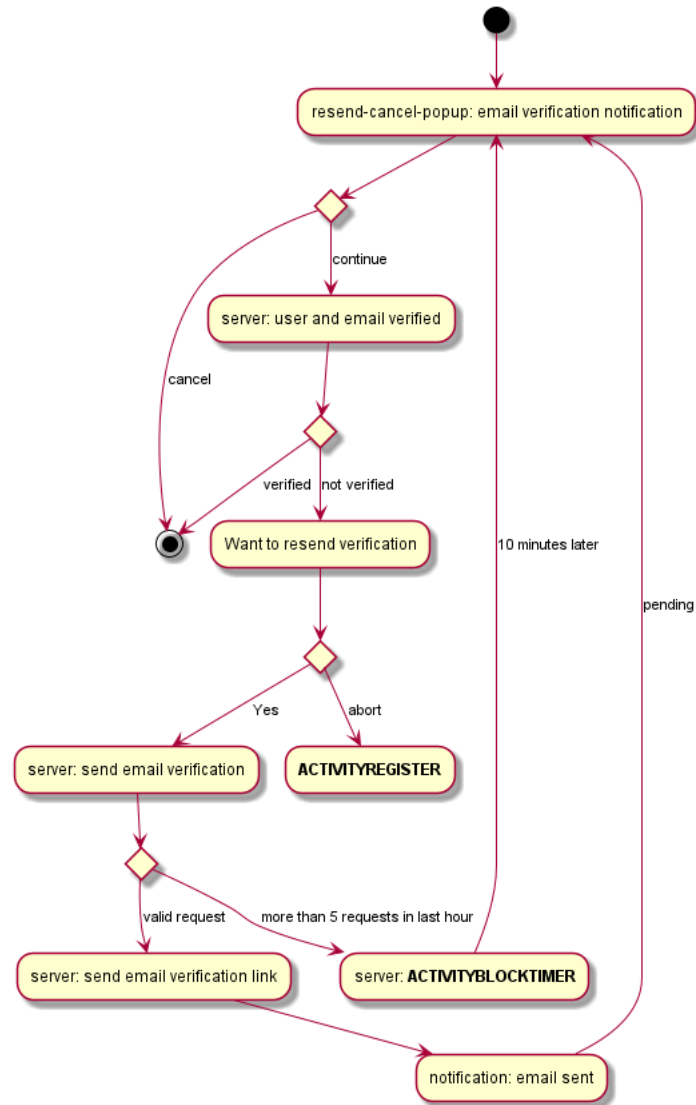
5 Search



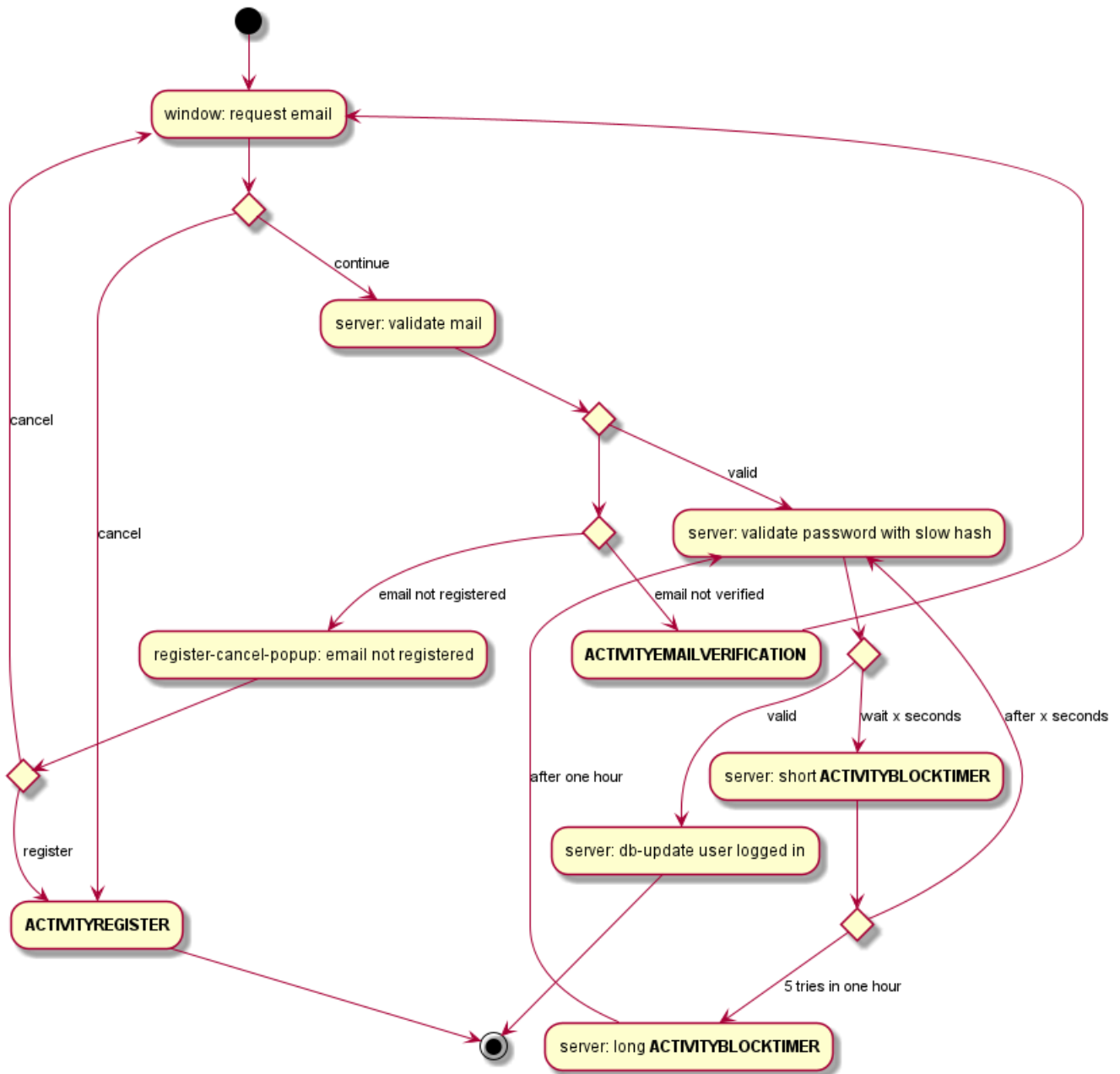
6 Register



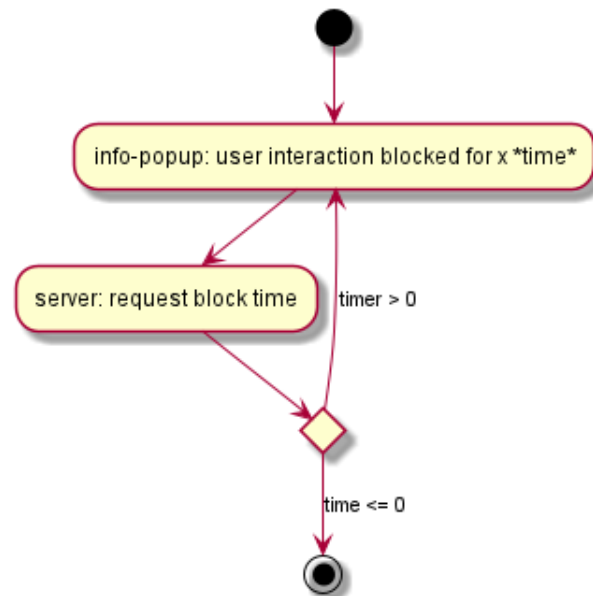
7 Email Verification



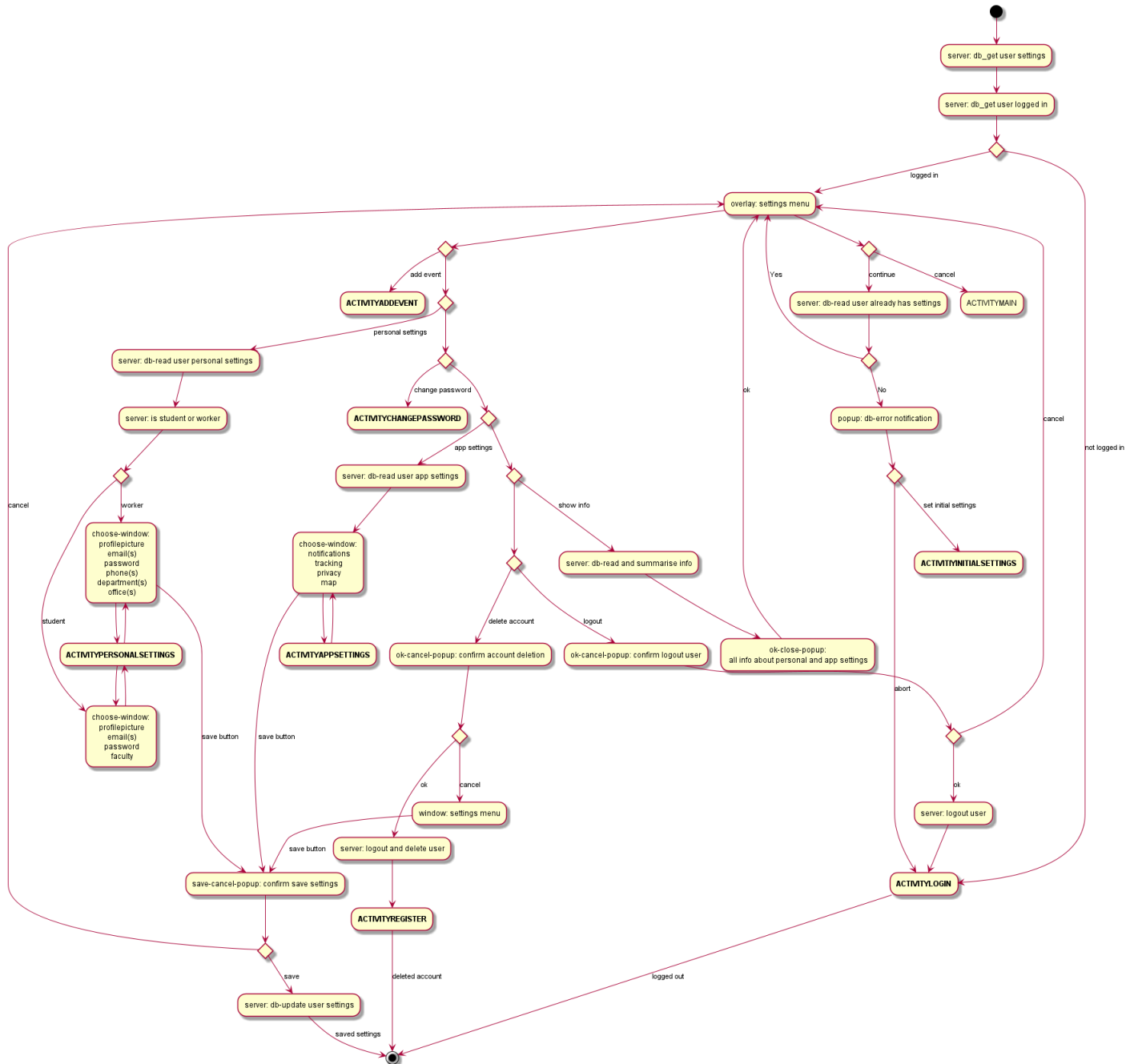
8 Login



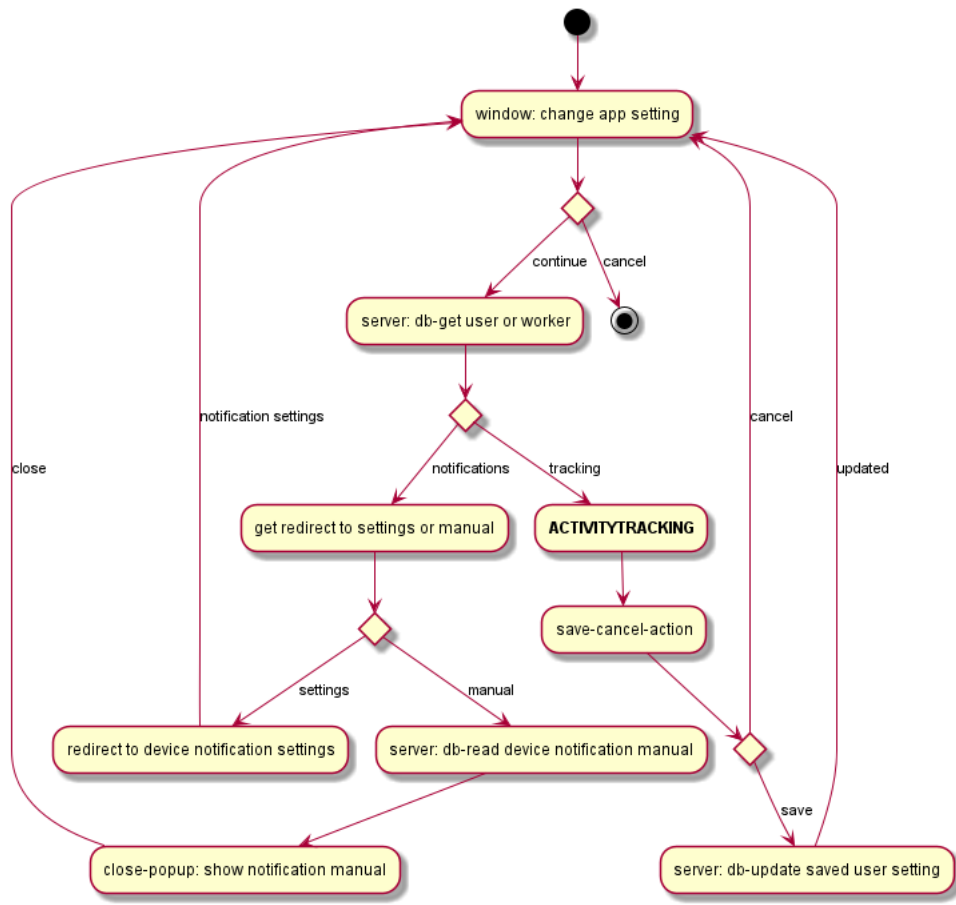
9 Blocktimer



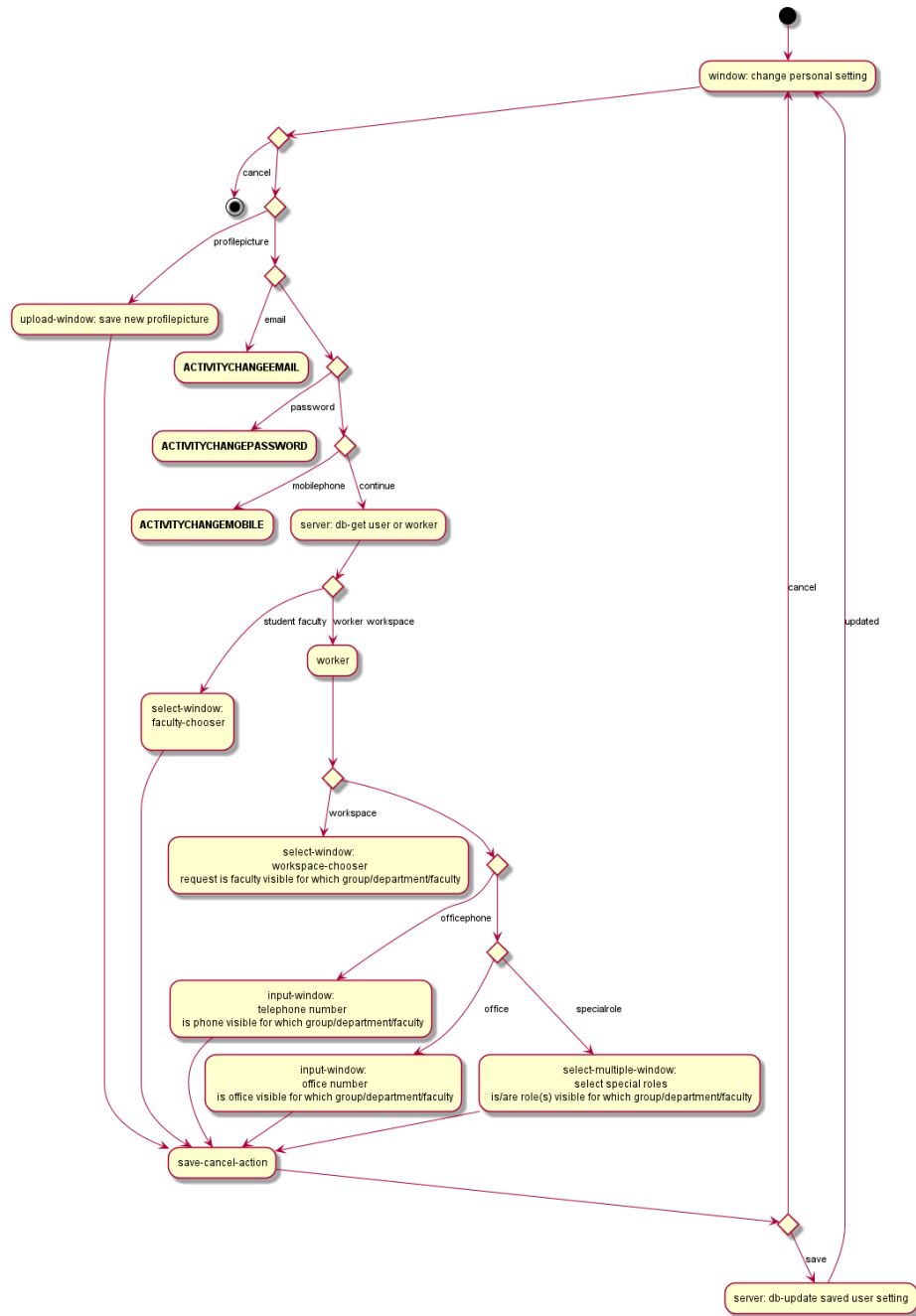
10 Main Settings



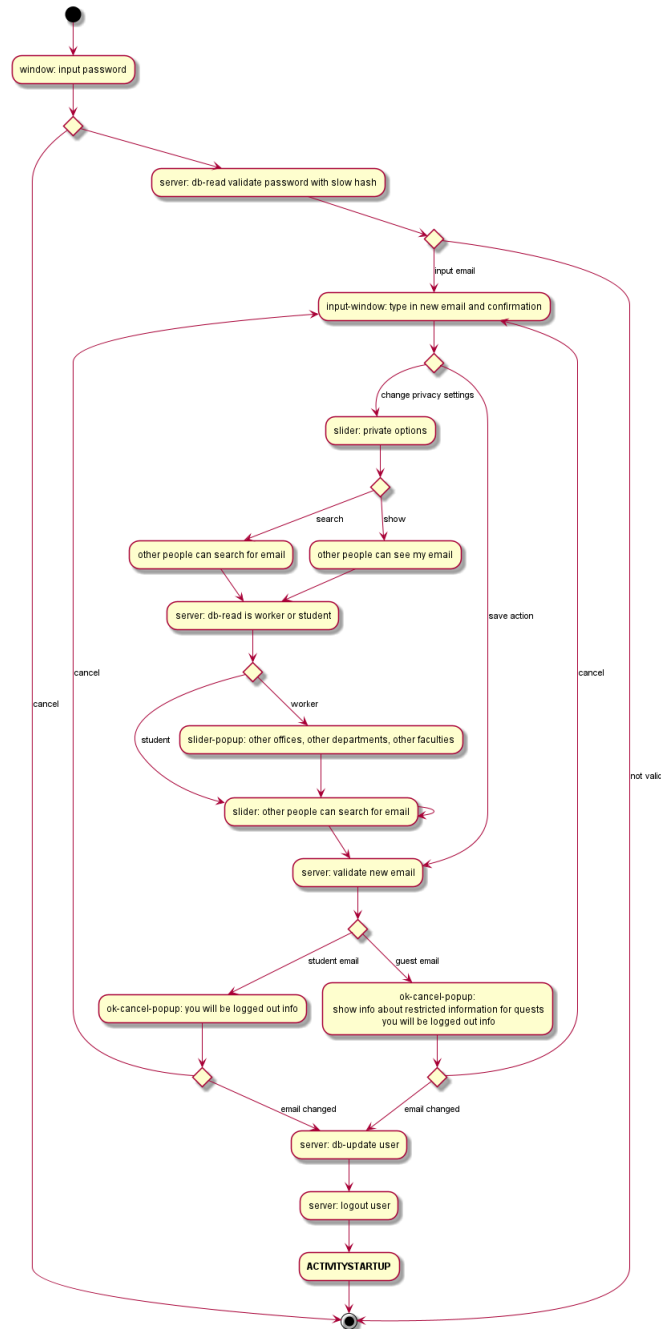
11 App Settings



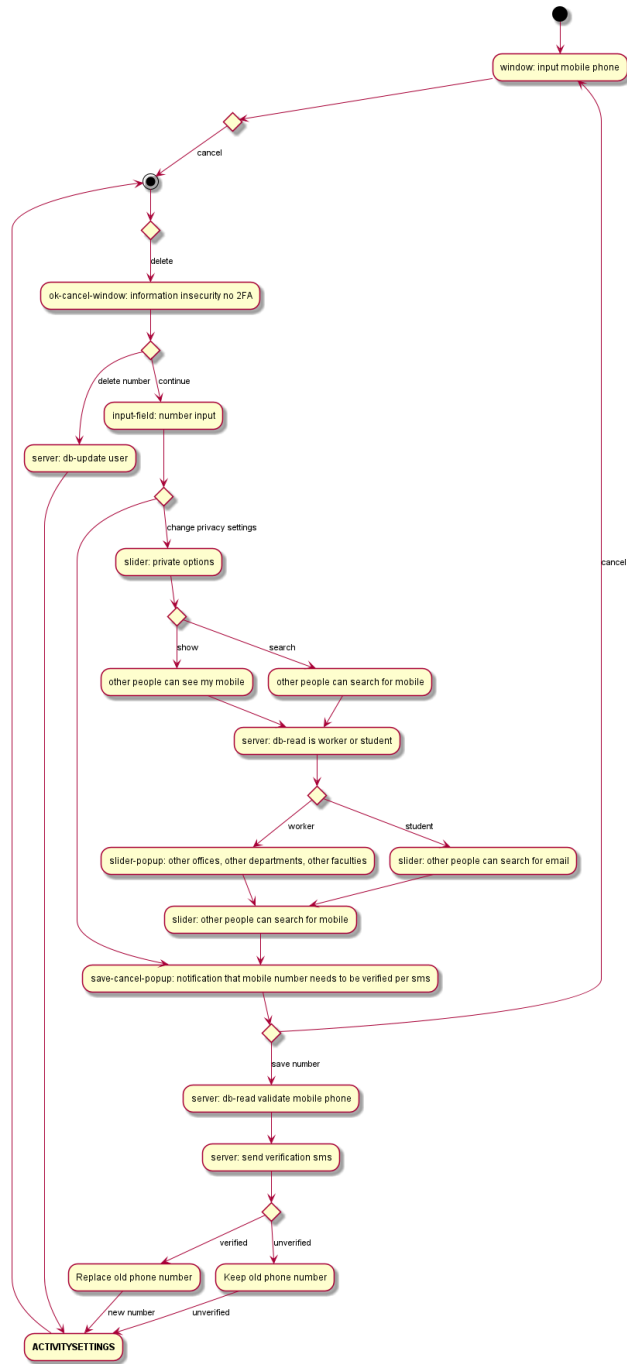
12 Personal Settings



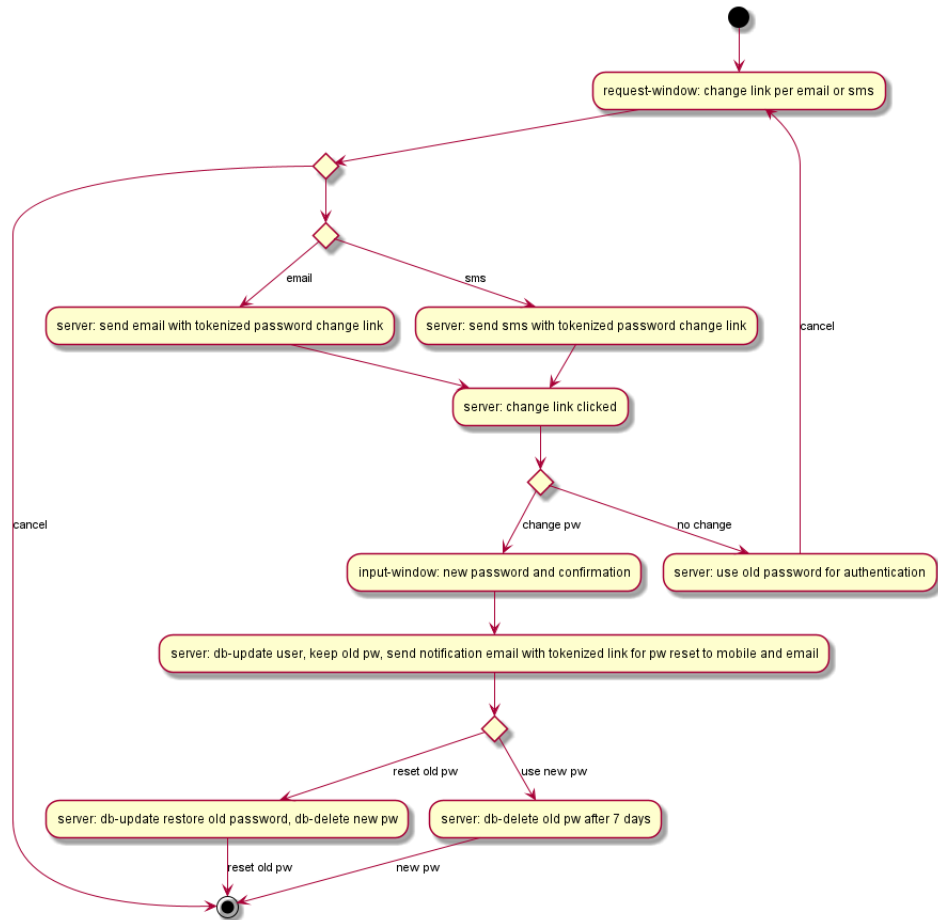
13 Change Email



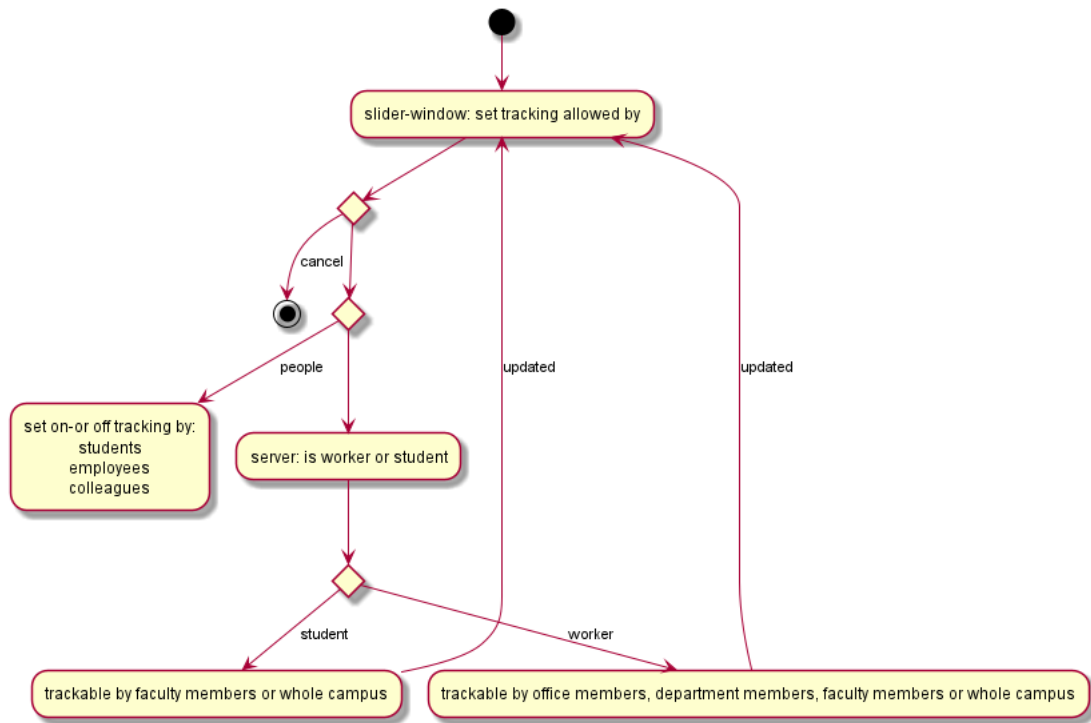
14 Change Mobile



15 Change Password



16 Change Tracking



8.2 Project Structure

Legend:

- Things we don't have to touch
- other stuff

Client: (React Native)

Reference on [Github](#).

- android (default for Deployment)
- ios (default for Deployment)
- index.ios.js (entry point IOs)
- index.android.js (entry point Android)
- app
 - components
 - * Button
 - Button.js
 - index.js (overwrite default react components)
 - styles.js
 - * GenericTextInput
 - GenericTextInput.js
 - index.js (overwrite default react components)
 - styles.js
 - * Loading (Generic loading overlay)
 - ...
 - * SearchInput (blend in dropdown on key stroke functionality)
 - * Menu (expand animations)
 - * Notification
 - * MapOverlay (All overlays for maps, example clickable info about special offices or something)
 - config
 - *
 - assets
 - * Mappictures
 - * Overlays

- * other pictures or icons
- * ...
- lib (Helpers for generic functionalities)
- features
 - * Login
 - * Register
 - * MainMap (Map loading, Menu and Search integration, plus functionalities like zooming and navigation)
 - * DetailMap (floor navigation or and MapOverlay composition)
 - * Settings
 - * Friends
- index.js

8.3 Libs

Client:

- [react-navigation](#)
- [react-native-elements](#)
-

Middleware:

- [Django Rest framework](#)

Server (Python):

-

9 Specifications

9.1 Functional Requirements

1 App Start

Requirement	App Start
Number	1
Description	Loading Maps and Pictures to the App cache. Searching for Updates. If a Cooke with a unique token exists, sends sends it to the server. Server validates the cookie. If a user is already logged in, he has to log out the other device. When no valid cookie is on the server he will be redirected to the login.
Failures	<ul style="list-style-type: none">• No cookie existent (2)• Cookie not valid or user already logged in(5)• Update required (7)
Success Criteria	The user cookie is valid (MainApp)
Level of Importance	5, basic requirement

2 User Registration

Requirement	User Registration
Number	2
Description	<p>The user sends the server his E-Mail address and password. The server verifies the E-Mail address by analyzing the domain. If the E-Mail address is not a university address a confirm Pop-up with the information that this only will be a guest account shows up. If he confirms it he will be registered as a guest user. With a valid university E-Mail address the server inspects the subdomains, if it begins with student. The user will be registered as a "Student User", otherwise he will be registered as an "Employee User".</p> <p>The client app first looks if the passwords are equal. If not a little warning icon is shown, that the passwords don't match. The password will be checked on the server. It has to be minimum of 8 characters long, containing upper and lowercase letters. It also has to contain a number and a special character (!#\$%&). The password has to a second field where the same password is put in.</p>
Failures	<ul style="list-style-type: none">• The two passwords doesn't match (2)• E-Mail adress is already registered (6)• Password is not safe enough (7)
Success Criteria	The user has entered an not registered E-Mail adress and a safe password (3)
Level of Importance	5, basic requirement

3 E-Mail Verification

Requirement	E-Mail Verification
Number	3
Description	The user sends the server a mail adress within the registration or in the settings under "Change E-Mail", the server sends a builds a unique Token and creates a Link with the token integrated within the GET-Request. As soon as the Link is called, the E-Mail is verified and the user can login
Failures	<ul style="list-style-type: none">• The user hasn't verified his E-mail yet and wants a new verification link (3)• The email is already registered (6)
Success Criteria	The user has verified his E-Mail adress (5)
Level of Importance	4

4 Logout User

Requirement	Logout from other device
Number	4
Description	User is valid and authenticated by E-Mail and password and is logged in. Then the server removes the cookie from the active cookie database.
Success Criteria	The user is logged out on all devices (5)
Level of importance	5, basic requirement

5 User Login

Requirement	User Login
Number	5
Description	The user needs a possibility to give the server his E-Mail and password. The server checks if the user exists by E-Mail in the database. If the user exists the password is compared with persistent Bcrypt-hashed-password from the databash with the Bcrypt-slow-hash-function. This happens on the server side. The more often a client with a tries to access the longer he has to wait until he can retry on wrong passwords.
Failures	<ul style="list-style-type: none">• The mail is not registered, the user needs to register (2)• The mail is registered, but not verified. The user needs to verify it via tokenized Email-Verfication Link(3)
Success Criteria	The user entered a correct E-Mail and a valid password and the server sends a valid cookie and data (MainApp)
Level of importance	5, basic requirement

6 Change Password

Requirement	Change Password
Number	6
Description	<p>The user wants to change his password. For this a password reset link with a tokenized link is send to his E-Mail adress or a link is send to his mobile phone via SMS. The link sends the user to a page, where he can type in the new password. It has to be at least 8 characters long contain lowercase and uppercase letters, as well at least one number and a special character (!#\$%&). The password is double checked with a confirmation field. The equality of password and confirmation field is verified on the client side. After a successful change the user cookie will be removed from the valid cookie database.</p>
Failures	<ul style="list-style-type: none">• Password and password confirmation don't match (6)
Success Criteria	The user has successfully changed his password (5)
Level of Importance	3

7 Notify User

Requirement	Notify User
Number	7
Description	The user gets notified about a certain circumstance. The notification can require an action, like "confirm"- "abort", "accept"- "decline", "ok"- "cancel" or just be a simple Open-OK-Close popup. It also can be a icon on a text field in case of a wrong input.
Success Criteria	The user confirms the notification ()
Level of Importance	3

8 Search

Requirement	Search
Number	8
Description	<p>The user can search for everything searchable (people, buildings, parking heatmap, mensa capacity, events by name or date and offices.</p> <p>The search is incremental. As soon as the user types in his first letter or number a Request is sent to the server. The server has cached representations of all searchable databases with the most searched items at the top.</p> <p>The server validates the user input, to prevent code injections and tries to find the first six most likely matching items and sends them back to the client. The client sees loads this clickable representations into a dropdown list right beneath the searchbar.</p>
Failures	<ul style="list-style-type: none">• Item not found ()
Success Criteria	The user finds and clicks the searched item ()
Level of Importance	4

9 Track Person

Requirement	Track Person
Number	9
Description	The user selects a user from the search dropdown list 8. The user name is send back to the server. The server sends a tracking request to the user to track. On the mobile phone of the user to track appears a "accept"-"decline" notification window.7 When the tracking is accepted the server receives the location and sends it to the user who requested the tracking. On the map of the user, who requested the tracking, the person appears as a small icon. The tracking request will be actualized every 5 seconds.
Failures	<ul style="list-style-type: none">• User declines tracking(7)• Tracking request circle breaks(7)• User to track is not logged in (7)
Success Criteria	User who requested tracking reaches tracked users location ()
Level of Importance	5

10 Retrieve Informations

Requirement	Retrieve Informations
Number	10
Description	When the user taps on a magnifier icon on a building or a item from the search list 8. The information about the item is send to the server. The server sorts out all informations that are allowed for the user and sends them back to the client. There it is showed in a popup window.
Failures	<ul style="list-style-type: none">• No informations received (7)
Success Criteria	Informations received and shown (7)
Level of Importance	2

11 Change Settings

Requirement	Change Settings
Number	11
Description	The user is able to change all settings over the settings menu.
Failures	• ()
Success Criteria	()
Level of Importance	2

12 Establish secure connection

Requirement	Establish secure connection
Number	12
Description	
Failures	• ()
Success Criteria	()
Level of Importance	2

13 Delete User

Requirement	Delete User
Number	13
Description	The client sends a confirmation request first 7 . If the user confirms the deletion, a request is send to the server. The server deletes all data saved with the user and removes the user cookie.
Failures	<ul style="list-style-type: none">• User is not deleted completely (7)
Success Criteria	User is deleted completely (2)
Level of Importance	4

14 Get all saved user data

Requirement	Get all saved user data
Number	14
Description	Client requests all saved data from the server. the server gets all saved data about the user from the database and sends it back to the user. Here it is represented in a information popup. This is a DSGVO requirement.
Failures	<ul style="list-style-type: none">• No data on the database (7)
Success Criteria	User receives all persistent informations about himself (7)
Level of Importance	3

9.2 User Requirements

Requirement	Show Map and Map Interactions
Number	1
Description	When the user is logged he needs to see a map in which he can move in every direction and zoom in and out
Success criteria	Map is shown on the screen and the user is able to navigate
Level of importance	5, basic requirement

Requirement	User Interface Map
Number	2
Description	The user must be able to either go to his settings or to the search while in the main window
Success criteria	The user can reach the search or settings window with one tap
Level of importance	5, basic requirement

Requirement	Search
Number	3
Description	The user can search for persons, offices, buildings, events and parking
Success criteria	The user gets results while typing, so the search is working incremental
Level of importance	4

Requirement	Parking Map
Number	4
Description	The user sees a heatmap of the approximately free parking spots on the university parking lot. It should also be possible to save the spot where the user has parked his car
Success criteria	The user sees a heatmap that is dynamicly calculated and is able to see the place where he parked his car
Level of importance	2

Requirement	Building Interaction
Number	5
Description	The user can interact with buildings by either tapping on them or zooming in. He then gets informations about the building and can look at floor plans to get further informations
Success criteria	The user gets a pop-up with informations, where he can choose further interactions like watching the floor plans.
Level of importance	4

Requirement	Floorplan Interaction
Number	6
Description	The floorplans have the same interactions as the main map, so it must be possible to move and to zoom in and out
Success criteria	The user can move in every direction and can zoom in and out.
Level of importance	4

Requirement	User Tracking
Number	7
Description	The user must be able to track persons and see them on the map. The other users must agree with the tracking in the form of a notification
Success criteria	The user can see where another person is located at the campus. The other person has to get a notification for it
Level of importance	3