



Master project HS Fulda Fall2016

Milestone 2

Group #1

17.11.16

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1. Use Cases V2

Register

Sheldon is an exchange student from the USA. He is studying at University Fulda for only one Semester. He is looking for furnished rooms for short-term. He chooses our website www.fuldaflats.de for his request. To search for or ask after this special kind of room, he must be a registered user. On our website he found a button „Sign Up“. A click on that button opens a pop-up window containing a form which asks him some personal information. These information contain „First name“, „Last name“, „Email Address“, „Password“ twice, „Gender“ and „Birthday“. He also must agree to the terms of service from Fuldaflats. To complete the registration he clicks on „Sign Up“. After registration is completed, Sheldon is redirected to his personal user page. Now he can go further to look for his request.

Login

Penny is a master student at University Fulda. She is interested in moving to a new apartment because she doesn't want to live in a shared flat anymore. Because she already found her location (the shared flat) on www.fuldaflats.de, she is already a registered user. For the search after a single apartment she navigates to [www.fuldaflats](http://www.fuldaflats.de) again. On the website she found the button „Sign In“. A click on that button pops up the sign-in form. She fills in her email and password. Optionally she can hook to remember her sign-up data. A click on the „Sign in“ button will load her user account for her current page.

Search (Unregistered User)

Howard is a Student who wants to study at Hochschule Fulda. For this reason, he seeks a small apartment in or near Fulda. He heard from the website www.fuldaflats.de, which is an online portal for students who search apartments. He decided to go on the website to look for possible apartments himself. On the main website, he found a search function which gave him the opportunity to select some pre-defined options for his search. These options contain „Type“, „Max. Distance“, „Max-Price“, „Min. Area Size“ and „Tags“. Because he is not a registered user at this moment, the button for the „Extended Search“ is disabled. He choose the best accordance and forwarded it via the „Search“ button. The offer search result page opens and show him all found results, ordered by success. A click on any offer will forward Howard to the detail page from the selected offer.

Post Apartment

Mrs. Wollowitz is a nice old lady. She wants so rent her guestroom for students in Fulda. She has pictures and detailed information about the guestroom. From her daughter, she gets the tip to go on www.fuldaflats.de to post her offer. She followed the tip and navigates to www.fuldaflats.de. On the Website she found a button named „Sign Up“. A click on that button opens a pop-up window containing a form which asks her some personal information. After her registration as user she has to become a landlord. For this step she clicks on the button „Become Landlord“ on her personal profile page. The become landlord process asks her a few additional information. The process ends with a

redirect to her personal page again. Now that she is a landlord, she looks for a possibility to post her offer. On her personal page she found a button „New Offer“ in the top bar. A click on this button navigates her to a new page which shows her a „New Offer - Wizard“. The wizard asks her for detailed information about her offering. She filled out all fields. The „Next“ button navigates her to the next step of the wizard. This process is repeated until the last step, „Add Picture Or Video“. A button „Add“ gives her the opportunity to upload the pictures she has made. When all information are filled in and the pictures are uploaded, the form is completed with a click on „Finish“. After the click on „Finish“ she is redirected to the detail page of her new offer, which is also in the offer list on her personal page now.

Browse Recent Offers (Unregistered User)

Leonard is a student at Hochschule Fulda. He currently lives with his parents but wants to move into a shared flat at the beginning of the new semester. A post at the university indicates the link www.fuldaflats.de. He followed the link which navigates him to the website of Fuldaflats. On the website he found a section called „Recent Offers“. Recent offers have the highest chance to be still available for rent. A slider indicates, that there are more recent offers to browse. When Leonard found a preferred offer, he clicks on it. A new page opens to show him the primary information about that offer. Because he is not a registered user at this moment, he gets a message, that he cannot see the secondary details until he has signed up.

2. Data Definitions V2

This section does describe terms, which will be used in the further development process of project *fuldaflats.de*. These terms will be extended with more implementation details as the development goes on. Furthermore, the structure of the database with its tables is described in this section and a high-level UML diagram of the database is shown.

Data Glossary

Name: **User**

Meaning: A user is a human, which interacts with this application.

Usage: The user will be used with many other terms. Like the apartment, the user can be the new owner or the seller of it.

Name: **User Details**

Meaning: This term is needed to describe a user.

Usage: This term describes properties of a user. A property is e.g. the name or the E-Mail address of the user.

Name: **MediaObjects**

Meaning: A user should be able to make a better idea of the apartment.

Usage: A MediaObject is attached to the offer and can be an image of the apartment or a building plan.

Name: Review

Meaning: To ease a user's decision, there should be a reviewing process.

Usage: Every user can rate the owner of the apartment with up to 5 stars. A user can also leave a comment about the rating. Reviews are accumulated to form an overall user rating.

Name: Offer

Meaning: The main object of this application (the apartment), attachments, comments, rating and the owner should be grouped into one object.

Usage: An offer gets one page, which will be used to display the above-mentioned objects.

Name: Tag

Meaning: Offers can be categorized using predefined tags.

Usage: Tags indicate interests, nationalities, spoken languages, faculties and more of flat shares and neighborhoods.

Name: Favorite

Meaning: List of a user's favorite offers.

Usage: Authenticated users can mark offers as favorite, which will add them to a list that users can view in their user profiles.

Name: Session

Meaning: A browser session, used to track authentication.

Usage: Browser sessions are used to track authentication and authorization; they are implemented by utilizing browser cookies.

Name: Statistics

Meaning: Tracking of offer views, comments and more.

Usage: Some data (e.g. number of views of an offer) is collected to give landlords some statistical information about their offers.

Name: Landlord

Meaning: describes the user which owns an apartment and offers it

Usage: A trade will be made between a landlord and a prospective customer.

Name: Account

Meaning: The application needs an authorization process verify the users

Usage: A user creates an account with his E-Mail Address and a password. The user should verify himself with the password as he wants to login into his account.

Table Definitions

Table 1: User

Column name	Description
User ID	Unique identifier of the user
Email-Address	User signs in with the E-Mail Address
Type	Whether the user is a normal or landlord user
Password	The hash of the password, which the user signs in with
First Name	First name of the user
Last Name	Last name of the user
Birthday	Date of the user's birthday
Upgrade Date	Date of the upgrade to a landlord user
Creation Date	Date of user creation
Phone Number	A phone number which can be used to contact the user
ZIP Code	The ZIP code of the current user address
City	The city name of the current user address
Street	The street name of the current user address
House number	The house number of the current user address
Gender	The gender of the user
Office address	Current office address of the landlord
Average rating	The average rating of the review ratings
Offers	List of offer-IDs, which the user created
Profile Picture	MediaObject-ID of the user's profile picture
Favorites	List of the offer-IDs, which the user favorites
Sessions	List of the session-IDs, which the user is associated with

Table 2: Offer

Column name	Description
Offer ID	Unique identifier of the offer
Title	Title of the offer
Offer type	Whether the offer is about an apartment, sublet, intermediate-rent, couch surfing or party-sleepover
Description	Contains a description of the offer
Rent	The price in euros to rent the offer
Rent type	Whether the rent includes warm water/heating
Rooms	Amount of available rooms.
Side costs	Costs which have to be paid additional to the rent
Price type	Whether the payment is monthly, daily or per semester
Street	The street name of the apartments address
ZIP code	The ZIP code of the apartments address
House number	The house number of the apartments address
City	The City in which the offer is located
Floor	The floor number of the apartments address
Size	The size of the apartment in quadrat meters
Furnished	Whether the apartment has already furniture ready to use
Pets	Whether pets are allowed in the apartment
Bathroom Number	Number of bathrooms in the apartment
Bathroom Description	Description of the bathrooms in the apartment
Kitchen Description	Description of the kitchen in the apartment

Cellar	Whether the offer includes access to a cellar
Parking	Whether the offer includes access to one or more parking slots
Elevator	Whether the building of the apartment has an elevator
Accessibility	Whether the apartment is disability-friendly
WLAN	Whether the offer includes access to the internet via WLAN/Wi-Fi
LAN	Whether the offer includes access to the internet via a wire
Internet speed	The possible maximum internet bandwidth that the offer includes
Heating Description	Description of the heating system of the apartment
Television	Whether the offer includes access to cable TV
Dryer	Whether the offer includes one or more dryer
Washing machine	Whether the offer includes access to one or more washing machines
Telephone	Whether the offer includes access to a telephone line
Status	Whether the offer is hidden, public or closed
Creation Date	Date when the offer was created
Last Modified	Date when of the last time the offer was changed
Longitude	Longitude value to geolocate the apartment
Latitude	Latitude value to geolocate the apartment
Landlord	User-ID of the user, which created this offer
Reviews	List of reviews-IDs, which were created for this offer
Tags	List of tags, which are landlord set for this offer
Media	List of MediaObject-IDs, which the landlord attached to this offer
Statistics	List of Statistic-IDs, which are associated with this offer

Table 3: Review

Colum name	Description
Review ID	Unique identifier of the review
Title	Title of the review
Rating	Value which represents the rating of an offer
Comment	Text which is a comment about an offer
Creator	Unique identifier of a user, which created this rating
Offer	Unique identifier of the offer, which this rating belongs to.
Creation date	Date, when this review was created
Media	List of MediaObject IDs, which are attached to this rating.

Table 4: Tag

Colum name	Description
Tag ID	Unique identifier of the tag
Title	Name of the tag
Category	Category to which the tag belongs
Offers	List of offer IDs, which are associated with this tag

Table 5: Favorite

Colum name	Description
Favorite ID	Unique identifier of this favorite
User	Unique identifier of a user, who favorited an offer
Offer	Unique identifier of an offer, which was favorited

Table 6: MediaObject

Column name	Description
MediaObject ID	Unique identifier of an media object
Type	Whether the media is an image or video
Creation Date	Date when the entry was created
Main URL	URL that locates the main media file
Thumbnail URL	URL that locates the smaller thumbnail media file

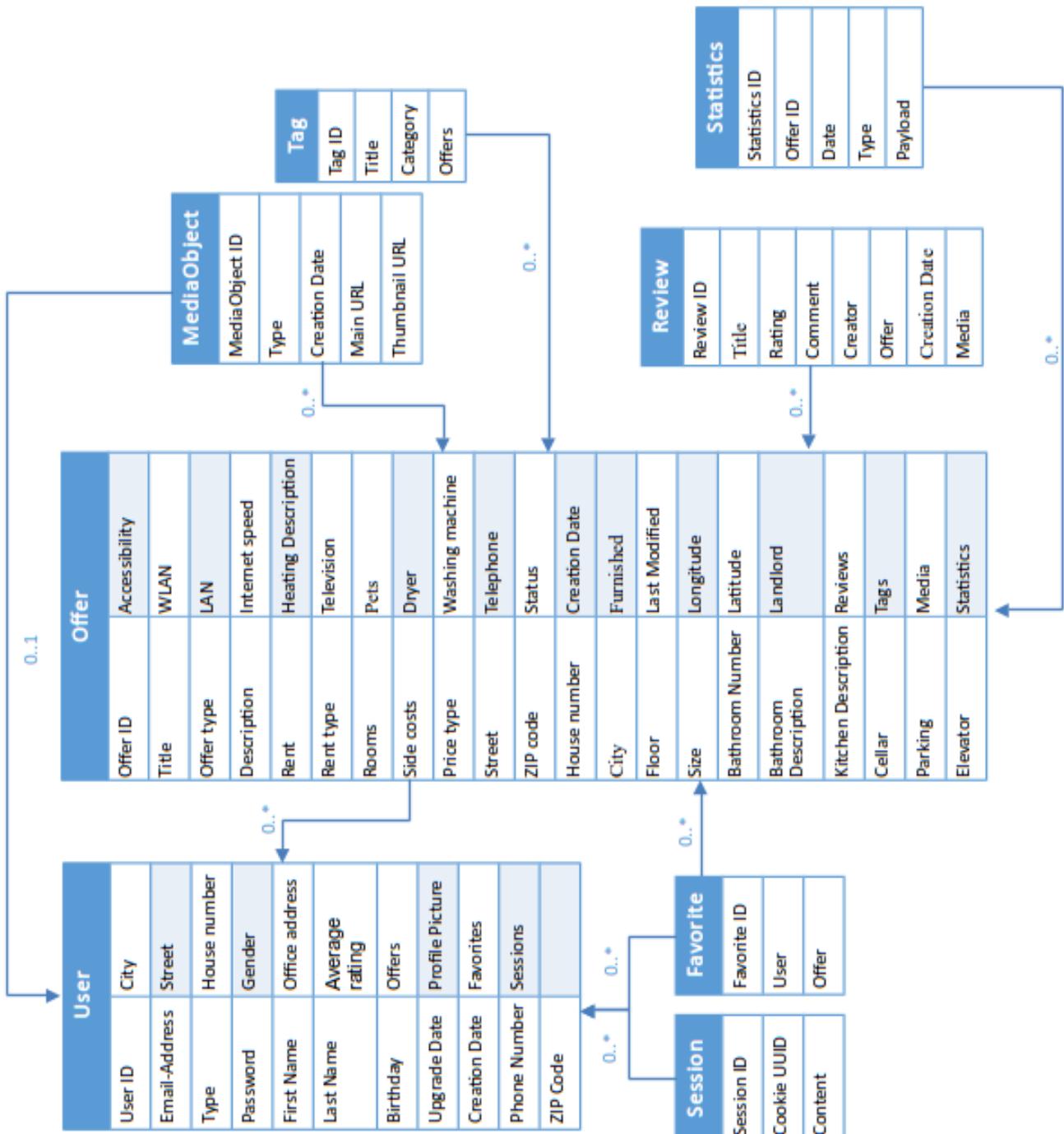
Table 7: Session

Colum name	Description
Session ID	Unique identifier for the session
Cookie ID	ID of the cookie for this session
Content	Contains all session relevant data

Table 8: Statistics

Colum name	Description
Statistics ID	Unique identifier for the statistic
Offer ID	Unique identifier for the offer, which is associated with this statistic
Date	Date, when this statistic was created
Type	What the statistic is about
Payload	Payload of the http(s) packet

Database UML Diagram



3. Functional Requirements V2

1. Sign up (Priority 1)

A user should be able to sign up.

1. The sign-up process should collect some basic information about the user, like his first name, last name, gender, email address and birthday.
2. Additionally, should be set the user account password in the sign-up process.
3. After a user signed up, he should be get an account on fuldaflats.de.
4. The “sign up” functionality should be available in the top bar on every page when the user is not signed in.

2. Sign in (Priority 1)

A user should be able to sign in into his account.

1. The “sign in” functionality should be available in the top bar on every page when the user is not signed in.
2. After a user signed in, he should be get more permissions which are described in the non-functional specs under the permission concept.
3. The default sign in should be able with the account related email address and password.

3. New offer (Priority 1)

Only a sign in user with a landlord account should be able to create an offer.

1. An offer creation should be done with a wizard, which show a small form on each step.
2. After an offer creation, the landlord get displayed the offer details page.
3. The “new offer” functionality should be available when the user is sign in with a landlord account.
4. The “new offer” functionality should be available on every page in the top bar and on the offer management page.
5. A special detail for an offer should be a tag able attribute. Available tags for this attribute should be provided from fuldaflats.de. The user should not be able to create his own tags.

4. Landlord contact information (Priority 1)

A user should be able to get the contact information from a landlord.

1. The contact information from a landlord should be displayed on the offer details page.
2. A required contact information is an email address or a telephone number.
3. An additional contact information is an office address.

5. Offer attachments (Priority 2)

A landlord should be able to add up to seven images and one video to an offer.

1. Added images and an added video should be displayed in a slider on the offer details page.
2. The first added image or the first frame from the added video should be displayed in the brief description from an offer.

6. Offer review (Priority 1)

A user should be able to create a review to an offer.

1. A review consists a title, a star rating, a comment and optional an image.
2. The “review creation” functionality should be available on the offer details page.

3. All review ratings which are related to a landlord over an offer, should be aggregated to a landlord rating. A landlord rating should be displayed on the landlord profile page, on the offer details page and on the brief description from an offer.

7. Browse offers (Priority 1)

A user should be able to browse a filtered subset from offers.

1. This functionality should be available on the offer search result page and on the start page, where default filtered offers are displayed.

8. Offer details page (Priority 1)

A user should be able to see all details from an offer on one page.

1. This page should contain all attachments, all primary details and all other secondary details.
2. Additionally, should this page contain the landlord contact information and all reviews.
3. This page should be open when a user click on the title in the brief description from on offer.

9. Manage offers (Priority 1)

A landlord should be able to manage his offers. This contains the ability to change offer details, change the offer status and to delete an offer.

1. This functionality should be available over the landlord profile page in der offer overview page.

10. Sign out (Priority 1)

A sign in user should be able to sign out.

1. The “sign out” functionality should be available in the top bar on every page.
2. After a user used the sign out functionality, he should be redirected to the start page.

11. Offers overview map (Priority 2)

A user should be able to see the location from an offer on a map.

1. One big map should be displayed on the offers search result page.
2. Another map should be displayed in the offer details page.

12. Search offers (Priority 1)

A user should be able to filter all available offers.

1. A search panel should be available on the start page, which contains the important primary attributes from an offer as a search criteria.
2. Additionally, should the signed in user be able to expand the default search panel. The expanded search panel should display all important secondary attributes from an offer as a search criteria.
3. The search functionality should be triggered though a button in the search panel and should be forwarding the user to the offer search result page.
4. The search result page should contain a search panel too.

13. Manage user profile (Priority 2)

A user should be able to manage his account and his profile.

1. This contains the ability to update his profile details, to change his password, to change his profile image and to manage his favorite offers.
2. The user profile should be available over the top bar on every page.

15. Add and manage favorite offers (Priority 2)

A user should be able to add an offer as a favorite offer and manage his favorite offers.

1. The “manage” functionality contains the ability to delete a favorite and to contact the landlord to the favorite.
2. The “add an offer as favorite” functionality should be available on the offer details page.
3. Favorite offers should be available over the user profile page.

16. Upgrade to a landlord account (Priority 1)

A user should be able to upgrade his account to a landlord account.

1. This functionality should be available in the bar on every page.
2. The upgrade process should collect more information about the user, like phone number, zip code, city, street and house number.
3. By using this functionality, the user should be get more permissions which are described in the non-functional specs under permission concept.

4. Non-Functional Requirements V2

General

1. Application shall be served from the team's account.
2. Pay functionality (how to pay for goods and services) shall be simulated with proper UI, no backend.

User Interface

3. Application shall be very easy to use and intuitive. No prior training shall be required to use the website.
4. Application shall be optimized for standard desktop/laptop browser, and shall render correctly on the two latest versions of all major browsers: Mozilla, Safari, Chrome. It shall degrade nicely for different sized windows using class approved programming technology and frameworks so it can be adequately rendered on mobile devices.
5. The language used shall be English.

Infrastructure

6. Data shall be stored in the MySQL database on the class server in the team's account.
7. The web service application shall be run in a node.js web server like express.
8. Based on the service side application (RESTful service) shall it be possible to build other clients like an android app or a universal windows app.

Deployment and Upgrade

9. An application deployment or an application upgrade shall not take longer than two hours.
10. An application deployment and an application upgrade shall be easy as possible for the administrator. For error-prone or time-consuming configurations shall be provided a configuration script and guidance.

Performance

11. No more than 50 concurrent users shall be accessing the application at any time.

Development Tooling

12. Application shall be developed using class provided LAM stack.

13. Application shall be developed using pre-approved set of SW development and collaborative tools provided in the class. Any other tools or frameworks shall be explicitly approved by Prof. Todtenhöfer on a case by case basis.
14. Modern SE processes and practices shall be used as specified in the class, including collaborative and continuous SW development, and only the tools and practices approved by instructors.

File Upload

15. To prevent the server from a user's spam, an image size limit of 5MB per file and a video size limit of 30MB.
16. A single offer is only allowed to contain up to 7 images and 1 videos.
17. A review for an offer shall contain only a single image.

Security

18. Privacy of users shall be protected and all privacy policies will be appropriately communicated to the users.
19. User account passwords shall be saved in the database as hash values.
20. Messaging between users shall be done only by class approved methods to avoid issues of security with e-mail services.
21. Site security: basic best practices shall be applied (as covered in the class).
22. The communication between the client application (browser) and the server application shall be run over HTTPS.
23. A user account shall be blocked after ten following failed sign in tries.

Permission Concept

24. An unregistered user shall be having the permission to ...
 - a. sing up
 - b. search based on base search criterias and browse for offers
 - c. see primary details to an offer
25. A registered and signed in user has the same permission as an unregistered user. Additional to this permission he shall be having the permission to ...
 - d. sign in
 - e. search based on expanded search criterias
 - f. see the secondary details to an offer
 - g. create a review to an offer
 - h. retrieve the contact information from landlord to an offer
 - i. create and manage his favorite offers
 - j. manage his profile and account
 - k. upgrade his account to a landlord account
26. A signed in landlord has the same permission as a registered and signed in user. Additional to this permission he shall be having the permission to ...
 - l. create an offer
 - m. manage his offers

5. UI Mockups and Storyboards (high level only)

Start page (Not signed in)

The image shows a high-level wireframe of a web application interface. At the top, there's a header bar with the URL <https://www.fuldaflats.de>, the Fuldaflats logo, a yellow sticky note labeled "Top Bar", and two buttons: "Sign Up" and "Sign In". Below the header is a large search panel containing dropdown menus for "Apartment Type", "Max. Distance", "Max. Price", "Min. Area Size", "Tags", and a "Search" button, along with a "Extend Search" link. A yellow sticky note labeled "Search Panel" is placed over the search controls. To the right of the search panel is another yellow sticky note stating "Disabled For Not Signed In User". The main content area is divided into sections: "Recent Offers" and "Living International", each displaying three placeholder apartment listings with "X" marks over them. Each listing includes fields for "Apartment Type", distance from HS ("xxx km tu HS"), and price ("\$\$\$"). Below these sections is a "Couchsurfing" section featuring a grid of tags: "International", "flatshares", "1-Room-Flat", "Cheap", "<5km to HS", "Gamer flatshares", and a yellow sticky note labeled "Default Searchable Tags". At the bottom, there's a footer with links for "Impressum", "Contact", and "Terms Of Use", and a yellow sticky note stating "Contact opens user's email".

Start page (Standard user)

The wireframe depicts the layout of the Fuldaflats.de website for standard users. At the top, there's a header bar with the URL <https://www.fuldaflats.de>. Below the header is a red banner stating "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The main content area includes a logo placeholder, navigation links for "My Profile", "Become Landlord", and "Sign Out", and a search bar with dropdowns for "Apartment Type", "Max. Distance", "Max. Price", "Min. Area Size", "Tags", a "Search" button, and an "Extend Search" link. Below the search bar is a section titled "Recent Offers" containing three placeholder apartment cards, each with "Apartment Type", distance, and price information. A horizontal scrollbar is shown below these cards. The next section, "Living International", also contains three similar placeholder apartment cards. At the bottom, there are several category buttons: "flatshares", "International", "Cheap", "1-Room-Flat", "<5km to HS", "Couchsurfing", and a large button for "Gamer flatshares". The footer contains links for "Impressum", "Contact", and "Terms Of Use".

Fuldaflats Logo

My Profile

Become Landlord

Sign Out

Apartment Type Max. Distance Max. Price Min. Area Size Tags Search

Extend Search

Recent Offers

Apartment Type
xxx km tu HS \$\$\$

Apartment Type
xxx km tu HS \$\$\$

Apartment Type
xxx km tu HS \$\$\$

Living International

Apartment Type
xxx km tu HS \$\$\$

Apartment Type
xxx km tu HS \$\$\$

Apartment Type
xxx km tu HS \$\$\$

flatshares

International

Cheap

1-Room-Flat

<5km to HS

Couchsurfing

Gamer flatshares

Impressum | Contact | Terms Of Use

Start page (Landlord)

The wireframe shows the layout of the Fuldaflats.de website for landlords. At the top, there is a header bar with the URL <https://www.fuldaflats.de>. Below the header is a red banner with the text "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The main content area includes a logo placeholder, user navigation links for "My Profile", "New Offer", and "Sign Out", and a search bar with dropdown menus for "Apartment Type", "Max. Distance", "Max. Price", "Min. Area Size", "Tags", a "Search" button, and an "Extend Search" link. Below the search bar is a section titled "Recent Offers" containing three placeholder apartment cards, each with a title "Apartment Type", distance "xxx km tu HS", price "\$\$\$", and a large X mark. A horizontal scrollbar is present below this section. The next section is titled "Living International" and also contains three placeholder apartment cards with similar details. At the bottom of the page are several category buttons: "flatshares", "International", "Couchsurfing", "1-Room-Flat", "Cheap", "<5km to HS", and "Gamer flatshares". The footer contains links for "Impressum", "Contact", and "Terms of use".

Fuldaflats Logo

My Profile
New Offer
Sign Out

Apartment Type Max. Distance Max. Price Min. Area Size Tags Search
Extend Search

Recent Offers

Apartment Type
xxx km tu HS \$\$\$

Apartment Type
xxx km tu HS \$\$\$

Apartment Type
xxx km tu HS \$\$\$

Living International

Apartment Type
xxx km tu HS \$\$\$

Apartment Type
xxx km tu HS \$\$\$

Apartment Type
xxx km tu HS \$\$\$

flatshares International Couchsurfing
1-Room-Flat Cheap <5km to HS Gamer flatshares

Impressum | Contact | Terms of use

Sign Up

https://www.fuldaflats.de

SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only

Fuldaflats Logo

Sign Up Sign In

Apartment Type Max

First name
Last name
Email address
Password
Confirm Password
Gender: Gender
Birthday
Day Month Year
 I agree to Fuldaflats Terms of Service..
Sign Up
Already have an Fuldaflats account? Sign In

Search Extend Search

Recent Offers

Apartment Type xxx km tu HS \$\$\$

Apartment Type xxx km tu HS \$\$\$

Apartment Type xxx km tu HS \$\$\$

Living International

Apartment Type xxx km tu HS \$\$\$

Apartment Type xxx km tu HS \$\$\$

Apartment Type xxx km tu HS \$\$\$

flatshares International Cheap <5km to HS 1-Room-Flat Couchsurfing Gamer flatshares

Impressum | Contact | Terms Of Use

Sign In

The wireframe depicts a web browser window for the URL <https://www.fuldaflats.de>. The title bar reads "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The main content area features a "Fuldaflats Logo" placeholder and two buttons: "Sign Up" and "Sign In". A central modal dialog box contains fields for "Email" and "Password", a "Remember me" checkbox, and a "Sign in" button. Below the dialog are links for "Need account?" and "Sign Up". To the right of the dialog are search filters for "Category", "Tags", and a "Search" button, along with an "Extend Search" link. The page displays three sections: "Recent Offers" with three placeholder apartment cards, "Living International" with three placeholder apartment cards, and a bottom section with various search filters and a "Gamer flatshares" box.

Fuldaflats Logo

Sign Up

Sign In

Email

Password

Remember me

Sign in

Need account? Sign Up

Recent Offers

Apartment Type

xxx km tu HS \$\$\$

Apartment Type

xxx km tu HS \$\$\$

Apartment Type

xxx km tu HS \$\$\$

Living International

Apartment Type

xxx km tu HS \$\$\$

Apartment Type

xxx km tu HS \$\$\$

Apartment Type

xxx km tu HS \$\$\$

flatshares

International

Couchsurfing

1-Room-Flat

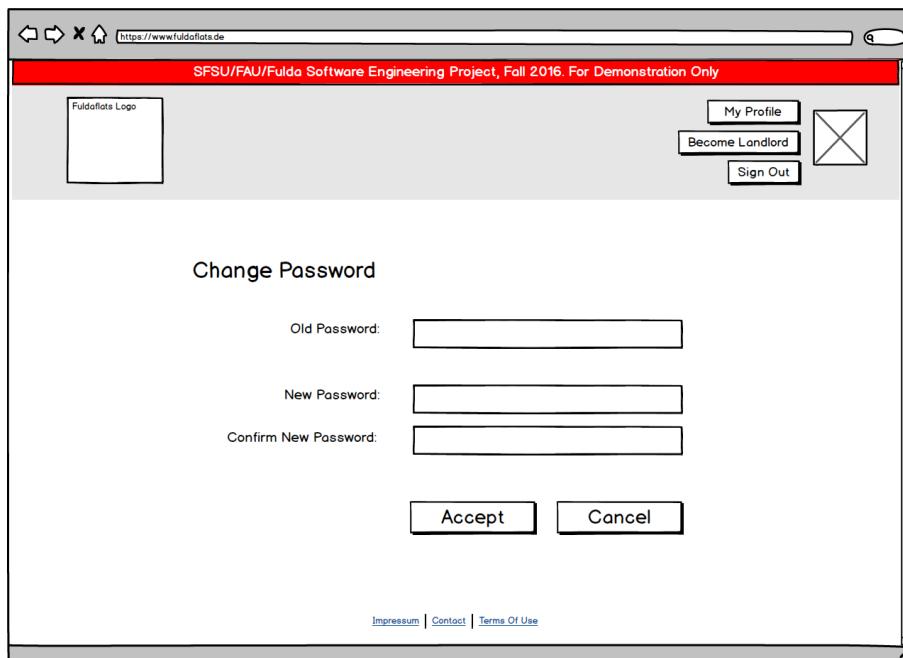
Cheap

<5km to HS

Gamer flatshares

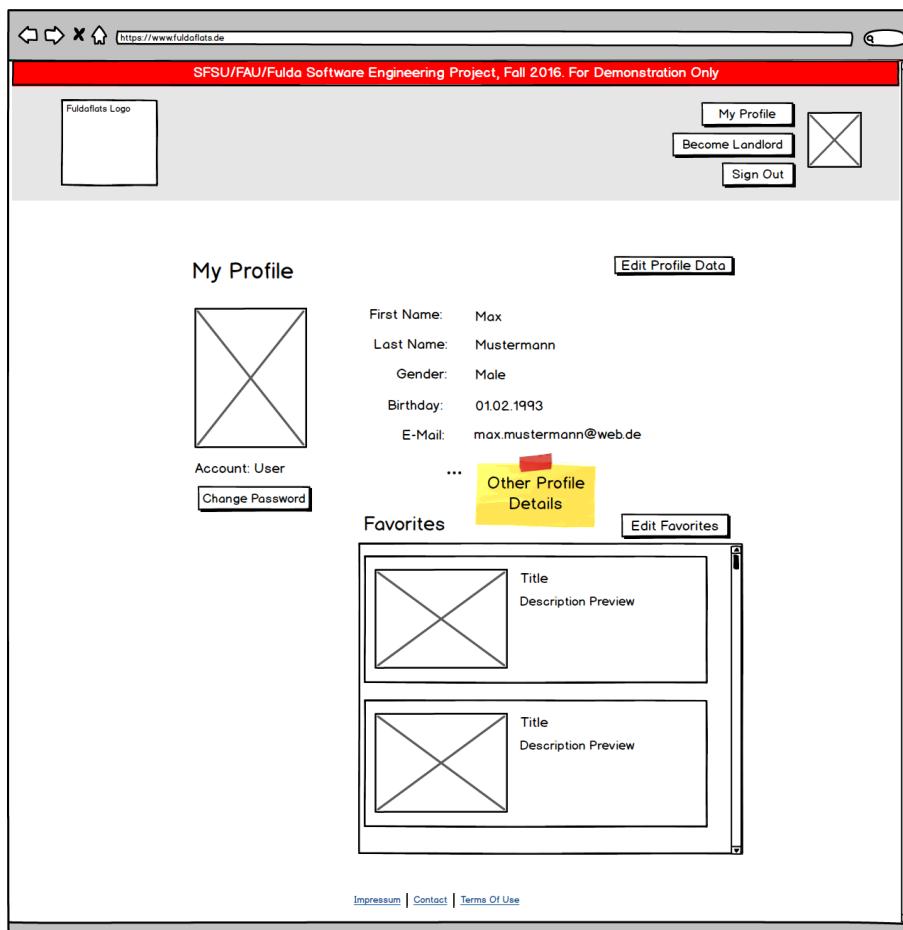
Impressum | Contact | Terms Of Use

Change Password



The screenshot shows a web browser window with the URL <https://wwwfuldaflats.de>. The title bar reads "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The page content is titled "Change Password". It contains three input fields: "Old Password", "New Password", and "Confirm New Password". Below these fields are two buttons: "Accept" and "Cancel". At the bottom of the page, there are links for "Impressum", "Contact", and "Terms Of Use".

Profile (Standard user)



The screenshot shows a web browser window with the URL <https://wwwfuldaflats.de>. The title bar reads "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The page content is titled "My Profile". It displays a user's profile information: First Name: Max, Last Name: Mustermann, Gender: Male, Birthday: 01.02.1993, and E-Mail: max.mustermann@web.de. There is also a placeholder for "Account: User" and a "Change Password" button. A yellow callout box labeled "Other Profile Details" points to the "Edit Profile Data" button. Below this, there is a section titled "Favorites" with two preview cards, each showing a placeholder image and the text "Title Description Preview". At the bottom of the page, there are links for "Impressum", "Contact", and "Terms Of Use".

Profile (Landlord)

https://wwwfuldaflats.de

SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only

Fuldaflats Logo

My Profile

New Offer

Sign Out

My Profile

Edit Profile Data

First Name: Max
Last Name: Mustermann
Gender: Male
Birthday: 01.02.1993
E-Mail: max.mustermann@web.de
Phone Number: 0123456789
ZIP Code: 12345
City: Musterstadt
Street: Musterstraße
Housenumber: 123

Account: Landlord
Rating 4,7 ★
Change Password

... Other Profile Details

Offers

Edit Offers

Title
Description Preview

Title
Description Preview

Favorites

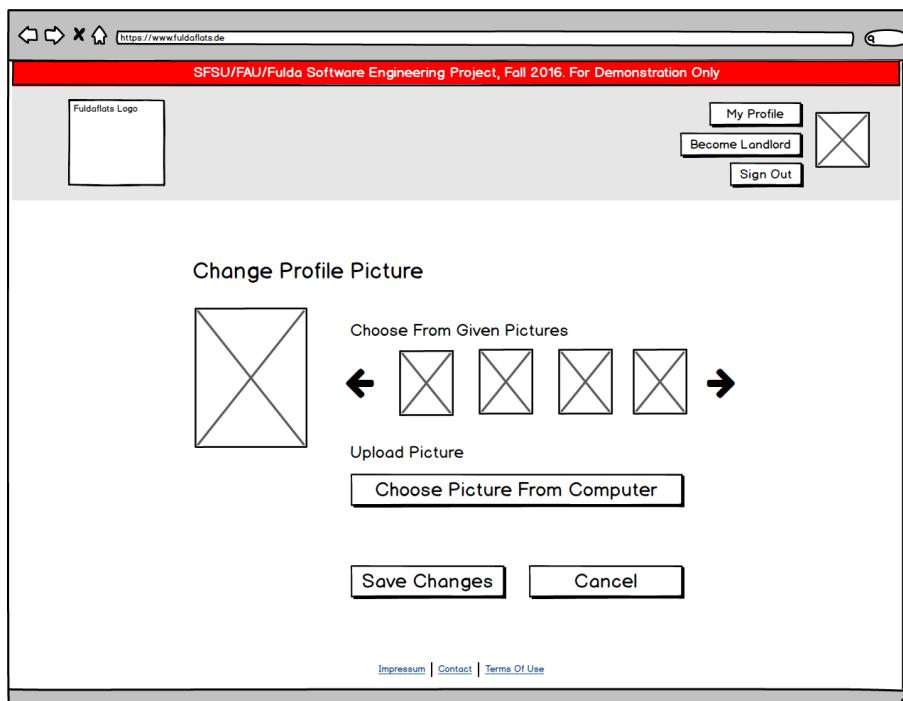
Edit Favorites

Title
Description Preview

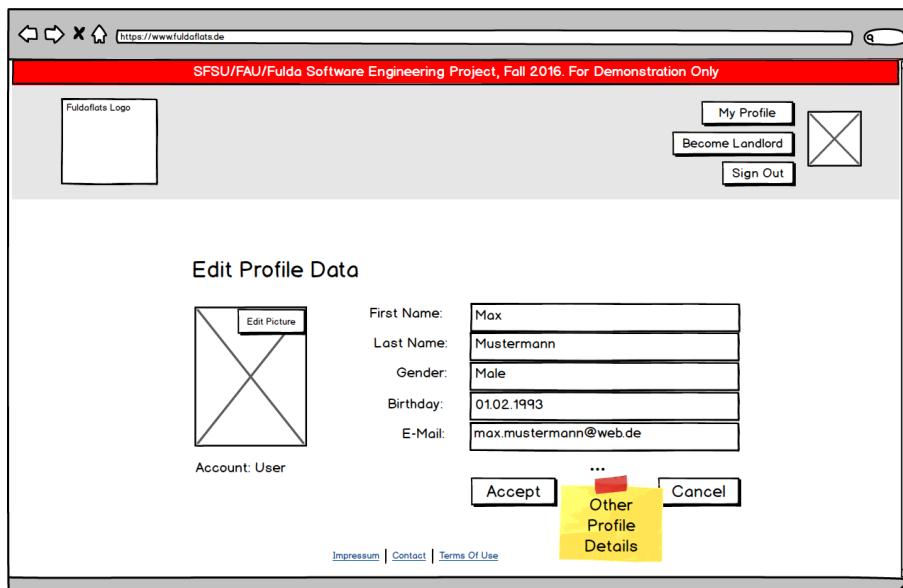
Title
Description Preview

Impressum | Contact | Terms of use

Change Profile Picture



Edit Profile Data (Standard user)



Edit Profile Data (Landlord)

The screenshot shows a web browser window with the URL <https://wwwfuldaflats.de>. The title bar reads "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The page header includes a "Fuldaflats Logo" placeholder, a search bar, and navigation links for "My Profile", "New Offer", and "Sign Out".

The main content area is titled "Edit Profile Data". It features a placeholder image for a profile picture with an "Edit Picture" button. Below it, the account type is listed as "Account: Landlord".

A form contains the following data:

First Name:	Max
Last Name:	Mustermann
Gender:	Male
Birthday:	01.02.1993
E-Mail:	max.mustermann@web.de
Phone Number:	0123456789
ZIP Code:	12345
City:	Musterstadt
Street:	Musterstraße
Housenumber:	123

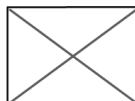
At the bottom are buttons for "Accept", "Cancel", and a yellow-highlighted "Other Profile Details" link.

At the very bottom of the page are links for "Impressum", "Contact", and "Terms Of Use".

Favorites Overview

The screenshot shows a web browser window with the URL <https://wwwfuldaflats.de>. The title bar reads "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The page header includes a "Fuldaflats Logo" placeholder, a search bar, and navigation links for "My Profile", "Become Landlord", and "Sign Out".

The main content area is titled "Favorites Overview". It displays two items in a list:

-  **Title**: Description Preview [Remove](#) [Contact Landlord](#)
-  **Title**: Description Preview [Remove](#) [Contact Landlord](#)

At the bottom of the page are links for "Impressum", "Contact", and "Terms Of Use".

Become Landlord (Standard user)

The screenshot shows a web browser window with the URL <https://wwwfuldaflats.de>. The title bar reads "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The page header includes a "Fuldaflats Logo" placeholder, "My Profile", "Become Landlord" (which is highlighted in red), "Sign Out", and a mail icon. The main content area is titled "Become Landlord". It features a placeholder image for a profile picture with an "Edit Picture" link. Below it is a form with the following fields:

First Name:	Max
Last Name:	Mustermann
Gender:	Male
Birthday:	01.02.1993
E-Mail:	max.mustermann@web.de
Phone Number:	0123456789
ZIP Code:	12345
City:	Musterstadt
Street:	Musterstraße
Housenumber:	123

Below the form are three buttons: "Upgrade" (disabled), "Other profile information" (highlighted in yellow), and "Cancel". At the bottom of the page are links to "Impressum", "Contact", and "Terms Of Use".

Offer Overview (Landlord)

The screenshot shows a web browser window with the URL <https://wwwfuldaflats.de>. The title bar reads "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The page header includes a "Fuldaflats Logo" placeholder, "My Profile", "New Offer" (highlighted in red), "Sign Out", and a mail icon. The main content area is titled "Offers Overview" and contains a "New Offer" button. Below it is a table showing three offer entries:

Significant Offer Title	Rental: (EUR) Size: (qm) Rooms:	Active: <input type="checkbox"/>	
Address-Line		<input type="button" value="Edit Offer"/>	<input type="button" value="Delete Offer"/>
Significant Offer Title	Rental: (EUR) Size: (qm) Rooms:	<input checked="" type="checkbox"/>	<input type="button" value="Edit Offer"/>
Address-Line		<input type="button" value="Delete Offer"/>	
Significant Offer Title	Rental: (EUR) Size: (qm) Rooms:	<input checked="" type="checkbox"/>	<input type="button" value="Edit Offer"/>
Address-Line		<input type="button" value="Delete Offer"/>	

At the bottom of the page are links to "Impressum", "Contact", and "Terms of use".

Search Results (Not signed in)

The screenshot shows a web browser window for the URL <https://www.fuldaflats.de>. The title bar reads "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The page header includes the Fuldaflats logo, "Sign Up", and "Sign In" buttons. The search bar contains fields for "Type: Couch", "Max. Distance: 5 km", "Max. Price: 500 €", "Min. Area Size: 40 m²", and "Tags: -". A "Search" button and an "Extend Search" link are also present. A yellow callout box with a red arrow points to the "Extend Search" link, stating "Disabled For Not Signed In User". Below the search bar, the heading "Search Results:" is displayed. Three search results are shown as cards, each featuring a placeholder image (a large 'X'), four "Tag" buttons, a "Title" field, and a "Description Preview" section. The second result's "Description Preview" field contains the text "Brief Description From On Offer". To the right of the search results is a large placeholder image for a map, with the word "MAP" in the center. At the bottom of the page are links for "Impressum", "Contact", and "Terms Of Use".

Search Results (Standard user)

The wireframe depicts a web browser window with the following layout:

- Header:** A red bar at the top contains the text "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only".
- Left Sidebar:** A placeholder box labeled "Fuldaflats Logo".
- User Navigation:** Buttons for "My Profile", "Become Landlord", and "Sign Out", along with a large "X" icon.
- Search Bar:** A grey search panel containing dropdown menus for "Type: Couch", "Max. Distance: 5 km", "Max. Price: 500 €", "Min. Area Size: 40 m²", a "Tags" dropdown, a "Search" button, and an "Extend Search" link.
- Search Results:** A section titled "Search Results:" featuring three items. Each item has a placeholder image, four "Tag" buttons, a "Title" field, and a "Description Preview" field. The second item's preview is highlighted with a yellow background and the text "Brief Description From On Offer".
- Map:** A large rectangular area with a large "X" drawn through it, labeled "MAP" in the center.
- Footer:** Links for "Impressum", "Contact", and "Terms Of Use".

Extended Search (Standard user)

The screenshot shows the Fuldaflats Extended Search interface for standard users. At the top, there's a header bar with the URL <https://www.fuldaflats.de>, followed by a red banner stating "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The main search area contains various filters:

- Types:** Apartment, Couch
WG
- Distance range from:** 0 km to: 10 km
- Price range from:** 100 EUR to: 200 EUR
- Area size from:** 30 m² to: 60 m²
- Rooms count from:** 2 to: 4
- Tags:** Apartment, Couch
WG
- Rentable from:** 01.10.2016 to: 01.01.2017

On the right side of the search area, there are several toggle switches and a "Search" button:

- Near HS Fulda:
- Furnished:
- Pets allowed:
- Parking spot:
- Elevator:
- LAN:
- WLAN:
- Television:

A yellow sticky note labeled "Other Searchable Details" is pinned to the right of the search filters.

Below the search area, there are two sections of "Recent Offers":

- Recent Offers**: Three placeholder boxes for apartment listings, each with a large X over it and the text "Apartment Type", "xxx km tu HS", and "\$\$\$".
- Living International**: Three placeholder boxes for international apartment listings, each with a large X over it and the text "Apartment Type", "xxx km tu HS", and "\$\$\$".

At the bottom, there are several category labels in boxes:

- flatshares
- International
- Couchsurfing
- 1-Room-Flat
- Cheap
- <5km to HS
- Gamer flatshares

At the very bottom, there are links for [Impressum](#), [Contact](#), and [Terms Of Use](#).

Extended Search Results (Standard user)

The screenshot shows a web browser window for the Fuldaflats website. The URL is https://www.fuldaflats.de. The title bar says "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only".

The interface includes:

- Fuldaflats Logo** in the top left.
- User Navigation** in the top right: "My Profile", "Become Landlord", "Sign Out", and a sign-out icon.
- Search Filters** in the center-left:
 - Types:** Apartment, Couch, WG
 - Distance range from:** 0 km to: 10 km
 - Price range from:** 100 EUR to: 200 EUR
 - Area size from:** 30 m² to: 60 m²
 - Rooms count from:** 2 to: 4
 - Tags:** Apartment, Couch, WG
 - Rentable from:** 01.10.2016 to: 01.01.2017
- Search Options** in the center-right:
 - Near HS Fulda:
 - Furnished:
 - Pets allowed:
 - Parking spot:
 - Elevator:
 - LAN:
 - WLAN:
 - Television:
- Search Button**: A large "Search" button.
- Search Results**: A section titled "Search Results:" containing three placeholder cards. Each card has a large "X" over it and includes:
 - Title**
 - Description Preview**
 - Tags**: Tag, Tag, Tag, TagA yellow sticky note on the second card says "Brief Description From On Offer".
- Map Placeholder**: A large rectangular area with a large "X" over it labeled "MAP".
- Page Footer**: Impressum | Contact | Terms Of Use

Offer Details (Not signed in)

Offer Details (Not signed in)

Fuldaflats Logo

Sign Up

Sign In

A very nice apartment in the heart of the city.

Big Main Image

« »

Kitchen

Bathroom

Main Room

Cellar

Offer Type: Apartment

Size: 25 qm

Rooms: 3

Rental(w): 270 EUR

Addition: 50 EUR

Rental: 320 EUR

Primary Offer Details

Secondary Offer Details

To See All Details ...

Sign Up

Sign In

Impressum | Contact | Terms of use

Offer Details (Standard user)

https://www.fuldaflats.de

SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only

Fuldaflats Logo

My Profile

Become Landlord

Sign Out

A very nice apartment in the heart of the city.

Big Main Image

Add as Favorite Offer

« »

Kitchen

Bathroom

Main Room

Cellar

Offer Type: Apartment

Size: 25 qm

Rooms: 3

Rental(w): 270 EUR

Primary Offer Details

Addition: 50 EUR

Rental: 320 EUR

Landlord:

Name: Max Mustermann

Phone Number: 0123456789

E-Mail: max.mustermann@web.de

Office: 

★★★★★ Secondary Offer Details

Street: Musterstraße

Nr.: 12

Floor: 3

Post Code: 12345

City: Musterstadt

MAP

Description:

Bathroom: Shower and WC

Kitchen: Fridge and Oven

Cellar: Yes

Parking: Yes

Elevator: No

Heating: With gas

Washer: Yes, in the Cellar, free to use

Dryer: Yes, in the Cellar, free to use

TV: Yes, over Cable

Phone: No, but possible to get

Internet: Yes, over DSL 100 Mbit/s

Customer Reviews

★★★★★ Very nice apartment

By Paul on February 3, 2014

Write A Customer Review

Impressum | Contact | Terms of use

New Offer Wizard 1 (Landlord)

The screenshot shows the first step of the 'New Offer - Wizard'. The form is titled 'New Offer - Wizard' and contains fields for 'Offer Title' (Title), 'Offer Type' (Apartment), and 'Address' (Street: Musterstraße, Nr: 12, Floor: 3, Post Code: 12345, City: Musterstadt). Navigation buttons 'Cancel' and 'Next' are at the bottom.

Offer Title:

Offer Type:

Address

Street:

Nr:

Floor:

Post Code:

City:

[Cancel](#) [Next](#)

[Impressum](#) | [Contact](#) | [Terms of use](#)

New Offer Wizard 2 (Landlord)

The screenshot shows the second step of the 'New Offer - Wizard'. It displays two columns of details: 'Size: 25 qm', 'Rooms: 3', 'Rental(w): 270 EUR', 'Addition: 50 EUR', 'Rental: 320 EUR' in the left column, and 'Both: Shower/WC', 'Kitchen: Fridge/Oven', 'Cellar: ', 'Parking: ', 'Elevator: ' in the right column. Navigation buttons 'Prev' and 'Next' are at the bottom.

Details

Size: qm

Rooms:

Rental(w): EUR

Addition: EUR

Rental: EUR

Details

Both:

Kitchen:

Cellar:

Parking:

Elevator:

[Prev](#) [Next](#)

[Impressum](#) | [Contact](#) | [Terms of use](#)

New Offer Wizard 3 (Landlord)

The screenshot shows the third step of the New Offer Wizard for landlords. The page title is "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The main content area is titled "New Offer - Wizzard". It contains two sections: "Details" and "Optional description ...". The "Details" section includes dropdown menus for "Heating" (Gas), "TV" (Cable), and "Phone" (Cable), and toggle switches for "Washer", "Dryer", and "Internet". Below these are three empty text input fields for an optional description. At the bottom are "Prev" and "Next" navigation buttons.

New Offer Wizard 4 (Landlord)

The screenshot shows the fourth step of the New Offer Wizard for landlords. The page title is "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The main content area is titled "New Offer - Wizzard". It has a section titled "Add Picture Or Video" with three placeholder boxes labeled "Kitchen", "Bathroom", and "Room", each containing a large "X". Below these is a button with a plus sign and the word "Add". At the bottom are "Prev" and "Finish" navigation buttons.

Change offer details (Landlord)

https://wwwfuldaflats.de

SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only

Fuldaflats Logo

My Profile
New Offer
Sign Out

A very nice apartment in the heart of the city.

Add Picture Or Video

Kitchen Bathroom Room

+ Add

Active:

Offer Type: Apartment

Size: 25 qm

Rooms: 3

Rental(w): 270 EUR
Addition: 50 EUR
Rental: 320 EUR

All Offer Details

Street: Musterstraße
Nr.: 12
Floor: 3
Post Code: 12345
City: Musterstadt

MAP

Optional Description ...

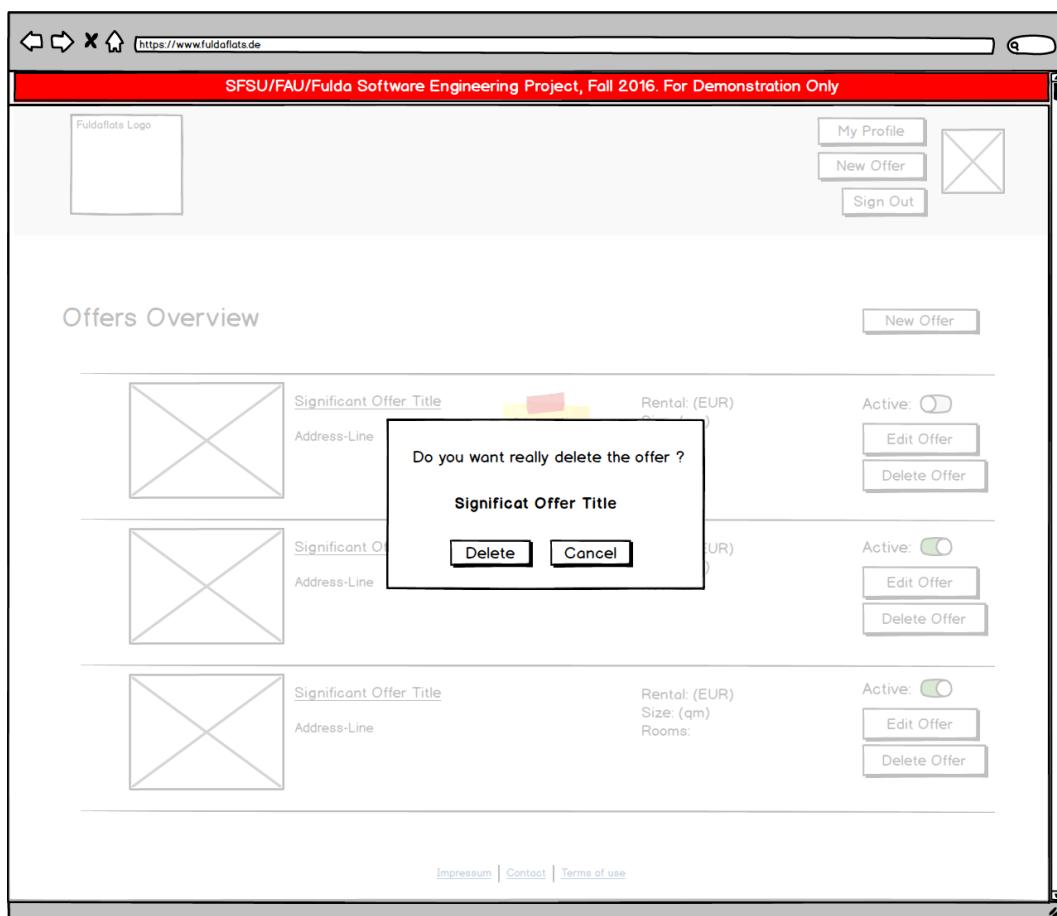
Bathroom: Shower/WC
Kitchen: Fridge/Oven
Cellar:
Parking:
Elevator:

Heating: Gas
Washer:
Dryer:
TV: Cable
Phone:
Internet:

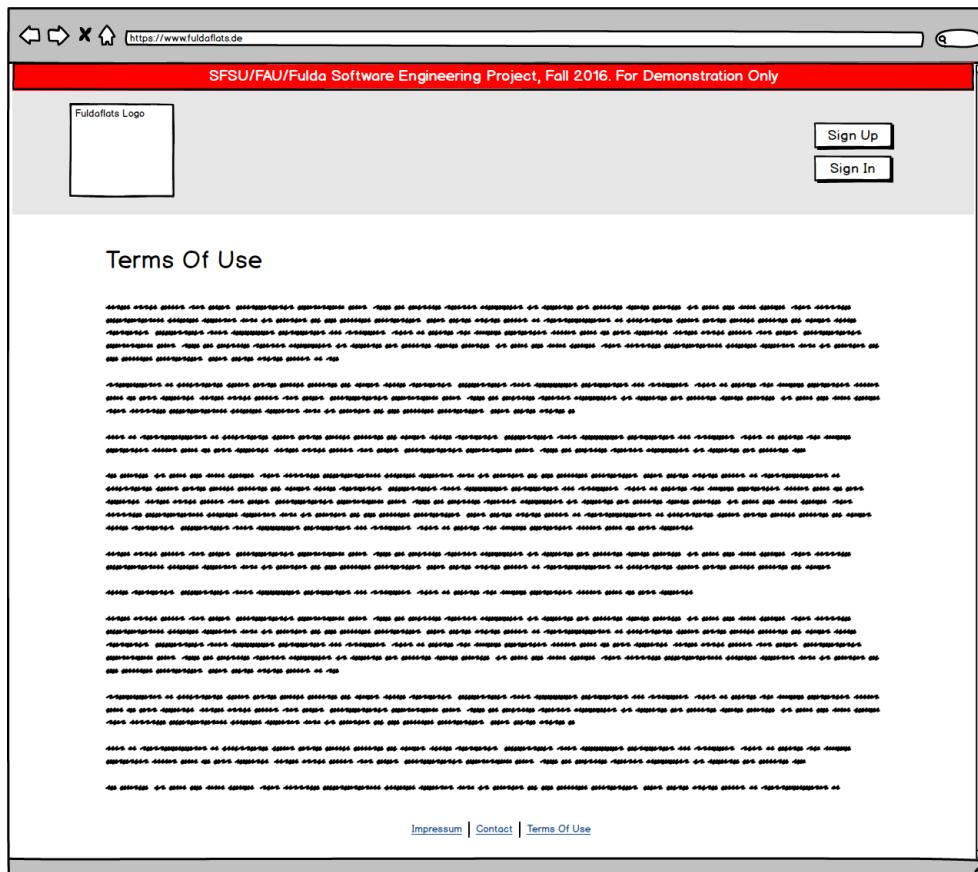
Accept Cancel

Impressum | Contact | Terms of use

Delete offer (Landlord)

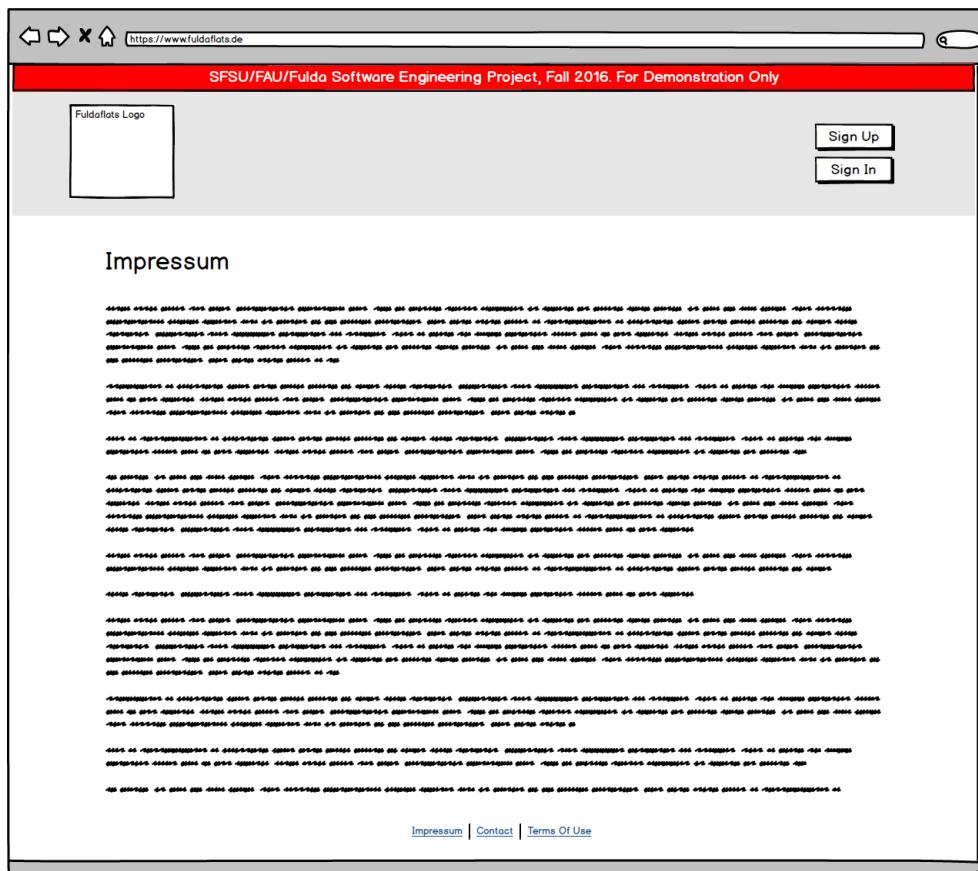


Terms of Service



The screenshot shows a web browser window with the URL <https://www.fuldaflats.de> in the address bar. The title bar reads "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The page content area is titled "Terms Of Use" and contains a large amount of illegible placeholder text. At the top right, there are "Sign Up" and "Sign In" buttons. At the bottom left, there is a placeholder for the Fuldaflats logo. At the bottom right, there are links for "Impressum", "Contact", and "Terms Of Use".

Impressum



The screenshot shows a web browser window with the URL <https://www.fuldaflats.de> in the address bar. The title bar reads "SFSU/FAU/Fulda Software Engineering Project, Fall 2016. For Demonstration Only". The page content area is titled "Impressum" and contains a large amount of illegible placeholder text. At the top right, there are "Sign Up" and "Sign In" buttons. At the bottom left, there is a placeholder for the Fuldaflats logo. At the bottom right, there are links for "Impressum", "Contact", and "Terms Of Use".

6. High Level Architecture, Database Organization

This section describes the system architecture and technology stack of fuldaflats.de. It contains the most important software components, frameworks, libraries and development tools that are used in the development process.

General Architecture Purpose

The general purpose for our system architecture is to create a loose coupling between the web client in a user's browser and our server sided program code. We aim to achieve this by using a RESTful web service architectural style. Our server sided code focuses purely on business logic, authentication, authorization and database connectivity. It does not process any kind of HTML templates. Our whole HTML, CSS and JavaScript code will be delivered as static files to the client. Interactivity is created by using client sided JavaScript code.

Client sided JavaScript is used to manipulate the user interface, react to user input and to load data from the server asynchronously using AJAX and JSON technology. Thus, we aim to create a 3-Tier architecture with a database, a thin server layer and a more powerful client.

Through this we get the advantage that we can easily split our team in frontend and backend developers that interfere less with each other's work and connect to each other via a predefined, standardized HTTP interface. This also makes it very easy to provide test data in JSON format and makes the application more stable and user friendly against server errors (HTTP 500), since this makes it more unlikely that a user sees them.

Server Foundation Software

The overall architecture goal for fuldaflats.de is to create a multi-tier web application that uses a REST-Webservice and AJAX technology as main data exchange interfaces. We use a **Linux/Debian** virtual machine that is hosted on the **Microsoft Azure Cloud** as a server for our project.

The data-tier of the application is handled by a **MySQL Database** which can be administrated by the phpMyAdmin user interface.

Server Sided Programming

The application / logic tier uses **Node.js 7.0¹** as technology platform to enable **server-sided JavaScript** coding. Node.js itself is quite a bare software platform, but it can be extended through the package-manager **npm²**. Node.js modules that are mandatory for the fuldaflats.de project are **CaminteJS³** as an ORM library for database access and **Express⁴** to create RESTful web service endpoints and start a web server within node.js (Those two are comparable to JPA and JAX-RS in Java EE).

¹ <https://nodejs.org>

² <https://www.npmjs.com>

³ <http://www.camintejs.com>

⁴ <http://expressjs.com>

File Upload

Uploaded image files will be stored in the .png image format directly on the server's file system (contrary to storing them as BLOBS in the database), because that makes it much easier to backup text-based data in the database and to provide demo data. When providing demo images, they do not need to be stored in the database first to be used. To store the images on the file system, the Express module **multer** will be used, which is capable of handling *multipart/form-data* HTTP requests that contain uploaded images. To prevent the server from a user's spam, an image size limit of 5MB per file will be programmed. Furthermore, a single flat offer is only allowed to contain up to 7 images.

There are also plans to allow users to upload one video file per flat offer which interested users can then stream from the server. However, we classified this feature as prio2 and it would eventually be developed as a separate web service function.

Search Algorithm

The search functionality is one of the key features of fuldaflats.de. It is very prominent on the home page of the application and is refined in the result overview. Since our application only focusses on the area around Fulda, a full-text search of different search criteria is not that necessary (for example to enter a city to search in). Instead, we have a wide variety of predefined search criteria for the user to choose. This includes the apartment type, the distance from the Hochschule Fulda, the price, the size of the apartment and many more (see story boards for more details). While the search function on the home page only lists the most important criteria, a detailed search mask is also available on the results page.

On the backend, this search uses query functions that are included in CaminteJS. The algorithm will first search for the criteria that are chosen by the user and will put the results into a list. This list is then ordered by the creation date of the offer, but the user can also choose another sort criteria in the detailed search mask.

Client Sided Programming

For the web client, we use **jQuery**⁵ as a standard library to enhance browser APIs, as well as some small JavaScript libraries for handling user input and server connectivity (for example **KnockoutJS**⁶ for lightweight DOM-Databinding). We also use **Twitter Bootstrap**⁷ as a presentation framework (mainly for its CSS) for responsive web design.

Map Data

For showing Map data to the users, we want to use the library **Leaflet.js** which enables interactive maps from different map providers in the browser. We will use **Open Street Map (OSM)** as a free, open source map provider. Geolocation data is stored as float-valued latitude and longitude coordinates. To get the coordinates for a given street name and house number, we want to use the **Open Street Map** lookup service **Nominatim**. We will query Nominatim server sided upon the creation of a flat offer.

⁵ <https://jquery.com>

⁶ <http://knockoutjs.com>

⁷ <http://getbootstrap.com>

Development Tools

The fuldaflats.de project uses **git**⁸ as a source code management system, the code is hosted as a **private repository on GitHub**⁹. GitHub issues and milestones are also used for project management and team communication. We use **Visual Studio Code**¹⁰ as development environment for web applications and node.js (which is not Visual Studio 2015, but rather just a free, enhanced text editor tool from Microsoft).

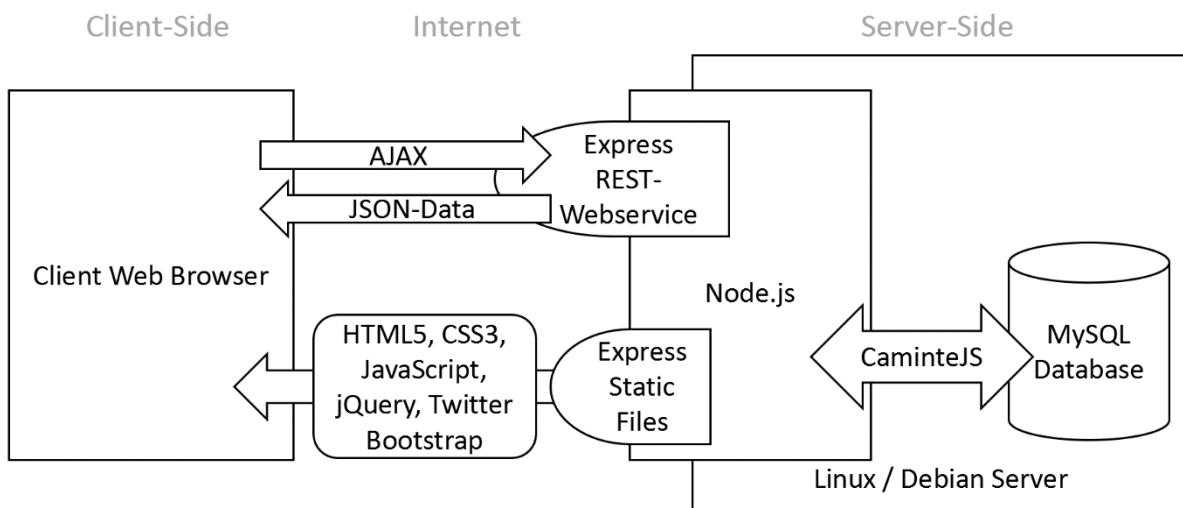
Compatibility

The final product will support and be tested on the following Browsers:

- **Google Chrome (Version 54.0)**
- **Mozilla Firefox (Version 42.0)**
- **Apple Safari (Version 10.12)**

7. High Level UML Diagrams

System Overview Graphic



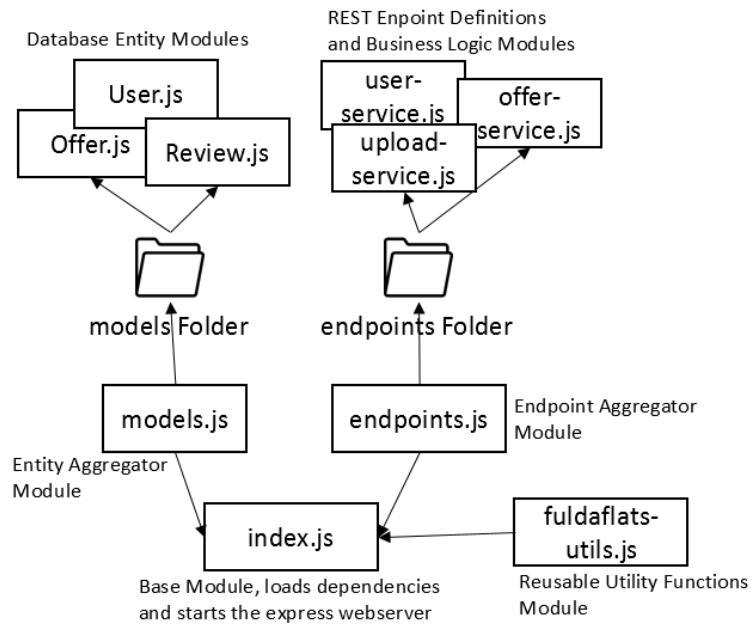
Node.js Module Overview

Instead of classes in conventional object oriented programming, Node.js mainly uses modules to divide program code into self-contained parts. The following diagram gives an overview of how the codebase of our server side will be organized.

⁸ <https://git-scm.com>

⁹ <https://github.com>

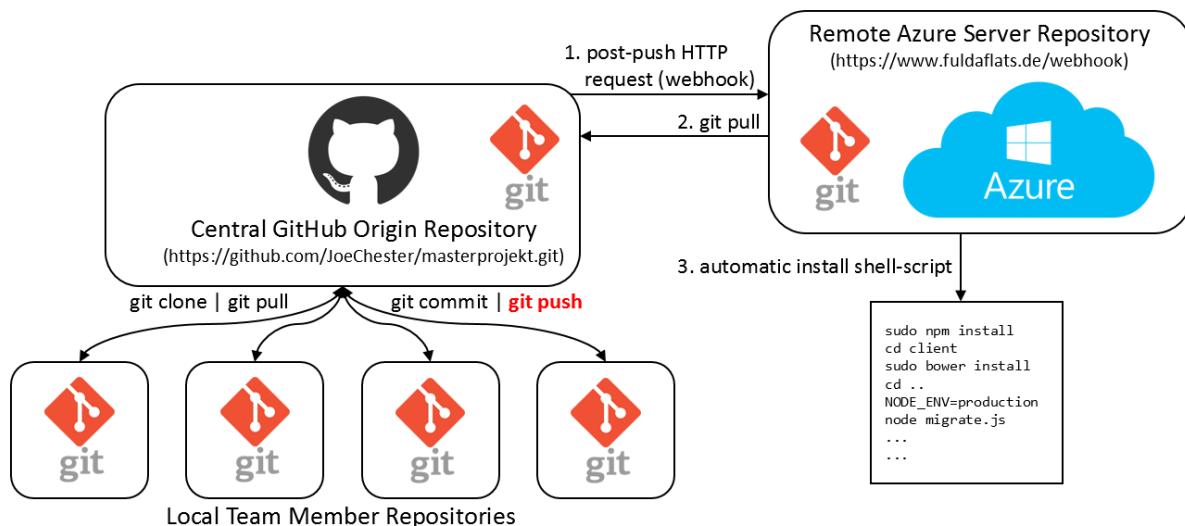
¹⁰ <https://code.visualstudio.com>



Deployment

The deployment process to get our application running on the Azure cloud server is fully automated by incorporating GitHub's webhook feature. We configured our GitHub repository in that way that every time a developer pushes something into the GitHub origin repository, GitHub automatically sends a specific POST http request to our server that runs on Microsoft Azure. This POST request is handled by a little node.js script that checks the content of the request for a secret passphrase that we configured on GitHub and runs a shell installation script afterwards if the passphrase is correct.

This shell script pulls the latest commits from the GitHub, installs all dependencies that are configured in npm, migrates the database, inserts demo data into the database and restarts the server application.



8. High Level APIs

This subsection describes the various REST API Endpoints of the Fuldaflats.de server code. The client accesses these endpoints by sending asynchronous HTTP Requests (AJAX) and retrieves JSON formatted data back. Colons are used to mark path parameters like `:id`.

API Methods that are marked blue in these tables require a logged in user to work, otherwise they will just return a **403 Forbidden** status code.

User related endpoints

Method	Path	Description
POST	/api/users/auth	Authenticate current Session with login data
POST	/api/users	Create a new User (Registration functionality) with given JSON data in the body
GET	/api/users/me	Retrieve own user data (when logged in)
PUT	/api/users/me	Manipulate own user data (when logged in) with given JSON data in the body
GET	/api/users/:id	Get user data of user with <code>:id</code> (PRIO 2, for future use)
DELETE	/api/users/auth	Logout (delete authentication in current session)

Offer related endpoints

Method	Path	Description
POST	/api/offers/search	Most important API function of the application. Search for a list of offers based on search criteria that is sent in the body in JSON format.
GET	/api/offers/recent	Get list of recent offers
GET	/api/offers/:id	Get detailed information on the offer with given <code>:id</code> . (More information when session is authenticated)
POST	/api/offers	Create a new offer with given JSON data in the body. Requires the account to be upgraded to landlord.
PUT	/api/offers/:id	Manipulate the data of the offer with given <code>:id</code> with given JSON data in the body under the prerequisite that the offer is owned by the currently logged in user

DELETE	/api/offers/:id	Delete the offer with given :id und the prerequisite that the offer is owned by the currently logged in user
POST	/api/offers/:id/review	Post a review for the offer with the given :id when a user is logged in
DELETE	/api/offers/:id/review	Delete a posted review for offer with given :id with the prerequisite that the review was created by the currently logged in user
PUT	/api/offers/:id/favorite	Mark the offer with given :id as favorite for the currently logged in user
DELETE	/api/offers/:id/favorite	Unmark the offer with given :id as favorite for the currently logged in user
GET	/api/tags	Get a list of all available tags for filtering

File upload related endpoints

Method	Path	Description
POST	/api/files	Upload a file as multipart/form-data onto the file server system. Retrieve the MediaObject link when the upload is completed
GET	/uploads/:filename	Get the uploaded file with given :filename (this is the link that is stated in the MediaObject responses)
DELETE	/uploads/:filename	Delete file resource with given :filename from the server, given it was uploaded by the currently logged in user

9. Key Risks

Skills risks

Our group consists of two people with significant experience in web development, three people with network/server management experience, one in project management, one in testing and we are all strongly motivated to learn web technologies. Each one of us has the basis to appropriate the new web technologies we need for our project.

However, the project team needs time to acquire new skills for the project. There is a risk that productivity will be low. The quality training for certain skills can be difficult to secure because of the short period available to learn them.

Schedule risks

Working in a group of 8 makes the scheduling very complex and difficult. We use GitHub for tasks and project management. It offers all of the distributed version control and source code management (SCM) functionality of GIT as well as adding its own features. So far it work well, thanks to our expert in project management.

Some risks like prioritized non-essential changes, continually schedule extending, dependencies impact from each project, fair tasks sharing must be well managed.

Technical risks

The tools which we are using are well documented and tested. We have them already installed and tested on each team member's personal computer. The technical leader ensures that all details are well documented.

Technical problems with the project management tools, development tools compatibility, platforms tools or technology components maintaining difficulties, integration with legacy components that are no longer in support, components that are difficult to extend with new capabilities, may complicate the realization of the project.

Teamwork risks

Our team is doing a very good job of management, installation, testing and communications. Everyone has accomplished his/her tasks within the time deadlines. The use of instant messaging has enabled us to create an interesting sharing dynamics.

It should however be noted that misinterpretation by the project team, low team motivation, unfavorable communication may cause the project to fail. Team leaders must be patient because, they may need to communicate the same idea many times in different ways before people remember it.

Legal and content risks

The decision, to focus on open source technologies, tools and free contents, distant all legal and copyright risks in connection with the completion of this project.

Media / Videos related to this project are exclusively free license and special material produced are only for the project.

10. Team Organization

Name	Initial Role
Michelle Rothenbücher	Team Lead / Frontend
Jonas Kleinkauf	Technical Lead / Backend Lead
Patrick Hasenauer	Frontend Lead
Martin Herbener	Server Admin / Frontend
Franz Weidmann	Backend / (Frontend)
Steffen Scholl	Frontend / (Backend)
Plisam Ekpai-Laodema	Backend / (Frontend)

