



one stop destination for your property search

Web Development Project on our Real Estate Website

MILESTONE #1 DOCUMENT

(Use cases, High Level Requirements and Architecture)

Local Group #22

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Version Control

Number	Version Number	Revision Date	Revision Description
1	Milestone1, Version 1.0	26-10-2017	Added Milestone1 document sections.
2	Milestone1, Version 1.1	30-10-2017	Added initial ideas.
3	Milestone1, Version 1.2	01-11-2017	Edited Data Definitions, Use Cases, Functional Requirements.
4	Milestone1, Version 1.3	04-11-2017	Edited Use Cases, Data Definitions.
5	Milestone1, Version 1.4	05-11-2017	Edited Competitive Analysis, Non functional Specs.
6	Milestone1, Version 1.5	05-11-2017	Edited functional specs.
7	Milestone1, Version 1.6	06-11-2017	Edited Executive Summary, High Level System Architecture and Team Roles

1. Executive Summary

Our web application **B i i G** alleviates customers and listing agents to find/rent most suitable properties. It will be exclusively used by real estate agents from the following three local real estate companies SFStateHomes, SJStateRealtors and CSURealEstate. They can post content and receive contacts/request from customers/buyers.

The title **B i i G** expresses the following component. Each team member comes from another country. “**B**” stand for Bangladesh, “**i**” for Indian, “**i**” for Iran and “**G**” for Germany. Diversity and the courage to think big are important features in our team that we also want to reflect with **B i i G**.

One unique feature for **B i i G** will be that we will cover not only residential but also commercial, industrial real estate properties through our application so that any people can get everything from our application. They don't need to go to other websites for buying, selling, renting, leasing commercial or industrial properties. Another unique feature will be that users can add reviews for property rentals which real estate companies are providing. This way other customers can see if the property has gotten good reputation or not.

Furthermore registered customers can mark any property as favorites to access on a later time. Real estate professionals can see their specific dashboard after user login. Using this dashboard, they can see their listing properties buy, sell, rent, mortgage statistics, messages from customers, communicate with customers, modify the profile of the company and the list of announcements. By using this they can decide their future movements for attracting new consumers/buyers.

In addition to our unique features, our website is based on the functional range of known real estates sites: For example this includes the search for a specific properties by price, size or number of rooms. Afterwards, the interested consumer/buyer can contact directly the corresponding listing agent for the property.

B i i G is based on the most up to date technologies and thus offers, with regard to performance, design and safety a real estate web application at the state of the art.

2. Use Cases

2.1. ***Listing Agent posts listings for sale***

Company A recently completed construction of new apartments near the university and would like to sell the apartments. Major steps identified are:

- A. Company creates an account if company is a new to the application.
- B. Company creates listing agents and listing agents create new advertisement in the application and add all new property details.
- C. After approval the properties are available to all users.

2.2. ***User browse, search and filter among all listed properties for buying***

Aleks moves to a city for his job. He wants to buy an apartment and wants to be sure that the apartment has stable internet. Major steps identified are:

- A. Aleks creates an account (if he doesn't have any) or logs in to the system.
- B. From all the properties available he would narrow down his search results with all the amenities he needed also sorts in such a way it's giving cheapest one first.

2.3. ***User wants to buy the user's preferred apartment***

An elderly couple (Mr. and Mrs. Müller) decided to move to a different city with better healthcare facilities. They would like to buy an apartment that is suitably located and elderly friendly. Major steps identified are:

- A. Mrs.Müller creates an account (if she doesn't have any) or logs in to the system.
- B. From all the properties available she would narrow down her search results to find one apartment near a hospital.
- C. Once she finds the right apartment for her, she would contact the listing agent using the messaging service of the application to finalize the deal.

2.4. ***Company wants to track sales for the last quarter***

Company A wants to track the sale for the last quarter and generate a report to submit to the auditors.

- A. Company's 'Administrator' logs in to the application.
- B. In the dashboard, the administrator will be able to see a visual representation of the sales for the last quarter.
- C. The administrator can use the "Generate Report" function to generate and download a pdf report.

3. Data Definitions

a. **Listing:**

A property (may be a house or an apartment) that is up for sale. A listing has several properties of its own (such as Name, Address, Price, Amenities etc).

b. **ListingAgent:**

A person who is allowed to create listings (properties for sale).

c. **Company:**

A real-estate company which has the right to add listing agents. This account is maintained by a designated person within the real-estate company, called the 'Administrator' for that company.

d. **Visitor:**

Any person who visits the website and does not have a registered account with us. A visitor can search for listings using the filters but cannot contact the listing agents.

e. **Customer:**

Any person who has a registered account with us.

f. **Reviews:**

A customer can provide a feedback and can rate a specific property.

g. **Favourites:**

A customer or a listing agent can add a property to their "Favourites" list, which is a list of properties in which the customer/agent is interested. This list is saved with their account and can be retrieved later

1 Real Estate Property:

Real estate property is the main data element of this web application. Almost every data flow is related to this element. Property has three categories. They are:

1.1 Residential:

Residential property is used for living purpose only. There are few types of residential property that are given bellow:

1.1.1 House:

The house is an abstract object and describes the relevant structural characteristics of the offered property. Maybe also features like images and custom properties for further object presentation (Example: room sizes, number of rooms, interior features, front and back yard facilities etc)

1.1.2 Apartment:

The apartment or its specialization as a shared room is an abstract object and describes the relevant structural characteristics of the offered property. Maybe also features like images and custom properties for further object presentation (Example: Internet availability and animal friendly etc.)

1.1.3 Townhome:

The townhome is an abstract object and describes the relevant structural characteristics of the offered property that located in city area or in the city center.

1.1.4 Land / Lots:

The land / lots is an abstract object and describes the relevant structural characteristics of the offered property that is undeveloped and free.

1.2 Commercial:

Commercial property is used for business purpose. There are few types of commercial property that are given below:

1.2.1 Office buildings:

The office buildings are an abstract object and describes the relevant structural characteristics of the offered property that are used as office and business meeting, conference places.

1.2.2 Warehouses:

The warehouses are an abstract object and describes the relevant structural characteristics of the offered property that are used as to store different goods and materials.

1.2.3 Retail store buildings:

The retail store buildings are an abstract object and describes the relevant structural characteristics of the offered property that are used super markets, shopping mall, shops, show rooms etc.

1.3 Industrial:

Industrial property is used for production purpose. There are few types of industrial property that are given bellow:

1.3.1 Factories:

The factories are an abstract object and describes the relevant structural characteristics of the offered property that are used to produce different products etc.

1.3.2 Mines:

The mines are an abstract object and describes the relevant structural characteristics of the offered property that are used collect different types of metal from ground.

1.3.3 Farms:

The mines are an abstract object and describes the relevant structural characteristics of the offered property that are used collect different types of metal from ground.

2 Real Estate Professional:

Real estate professionals are one of the main actors of this web application. They are some skilled and experienced persons who are waiting to help their clients. There are some types of real estate professionals given below:

2.1 Property Agent:

Property agent is skilled broker who helps customers in buying or selling their any kind of real estate properties. This agent has some unique specialties. There are three types of agents in our marketplace. They are:

2.1.1 Individual:

Individual agents has their own license from government authority.

2.1.2 Team:

Team is consist of two or more agents where team is operated by team lead and each team is situated within a company. Company has license and teams are using it.

2.1.3 Both:

Some agents can be act as individual and also a team member.

2.2 Property Improvement:

Property improvement professionals are ready to help their clients in improving their properties.

2.3 Property Manager:

Property manager professionals are ready to help their clients in renting, mortgage properties.

2.4 Property Builder:

Property builder professionals are ready to help their clients in giving innovative building ideas and pathways to build new constructions in land/lots .

2.5 Property Inspector:

Property inspector professionals are ready to help their clients in inspecting their properties to evaluate loan and mortgage value.

2.6 Property Photographer:

Property photographer professionals are ready to help their clients in taking clear 2D, 3D and 360 degree views of their properties.

3 Customer:

Customers are another main actors of this web application. There are several types of customers. They are as follows:

3.1 Buyer:

Buyers are willing to buy real estate properties.

3.2 Owner / Landlord:

Owner / Landlord are such kind of customers who wants to sell or rent their properties through real estate professionals.

3.3 Renter:

Renter are willing to take rent properties from owner / landlord. They are able to give feedbacks on rental properties so that next renter can get an overview on the property's actual condition and owner attitude.

2.4 Lessee:

Lessee can take lease of any properties from owner / landlord through real estate professionals.

4 Favorites:

A customer or a listing agent can add a property to their "Favourites" list, which is a list of properties in which the customer/agent is interested. This list is saved with their account and can be retrieved later.

5 Property Review / Feedback:

A customer can provide a feedback and can rate a specific property

4. Initial List of Functional Specs

1. **Customer Registration:**

Registration will be based on the First and Last name, CIN, Email address, Password, Secret Question, and Secret Answer (for security matters). In addition to the date of birth and gender.

2. **Real Estate Professionals Registration:**

Registration will be based on the First and Last name, company name, CIN, Email address, Password, Secret Question, and Secret Answer (for security matters). In addition to the date of birth and gender.

3. **Site User Login:**

Real estate professionals and customers can login in this web application using this function. Login will be based on the Email address with the Password. An error message will be displayed in case one of the two does not match.

4. **Buy:**

People can buy their dream houses / apartments / free lands etc. using this function. They can buy property from different categories like new constructions, old constructions, foreclosures, coming soon properties, low lands, high lands, plain lands etc.

5. **Sell:**

Property like newly build houses / apartments, old houses / apartments, lands etc. can be sold by listing agents using this function.

6. **Rent:**

With the help of this function, people who want to take rent a property, can find their desired houses / apartments etc.

7. **Mortgage:**

People can know and keep mortgage their properties in details through this function. In this case selected mortgage lender, consultants will show the right directions to get the best value of the property.

8. **Property Finder:**

Using this function, people can easily find their desired property for buying or rental purpose. There will be different types of filters which will make searching property more comfortable.

9. User Account and Password Recovery:

If user forgets his / her account login name / password, then he/she can easily recover his / her account and password through this function. Also he/she can reset password.

10. Delete User:

Using this function, user can delete his / her account. By deleting account, user can loose all his / her saved property listings, filters, favorites, contacts, messages, property buy-sell statistics and many more.

11. Unsubscribe User:

Using this function, user can unsubscribe himself / herself from web application's different types of mail listings.

12. Real Estate Professionals Dashboard:

Real estate professionals can see this dashboard after user login. Using this dashboard, they can see their listing properties buy, sell, rent, mortgage statistics, messages from customers, communicate with customers, modify the profile of the company and the list of announcements.

13. Customers Dashboard:

Customers can see this dashboard after user login. Using this dashboard, they can see their buying / rental / mortgage property status, selling statistics, messages from real estate professionals, communicate with agents, view the history of messages and modify their profile and view their selected favorites.

5. Initial List of Non-Functional Specs

- 5.1. Application shall be developed and deployed using class provided deployment stack
- 5.2. Application shall be developed using pre-approved set of SW development and collaborative tools provided in the class. Any other tools or frameworks must be explicitly approved by Prof. Todtenhoefer on a case by case basis.
- 5.3. Application shall be hosted and deployed on Amazon Web Services as specified in the class
- 5.4. Application shall be optimized for standard desktop/laptop browsers e.g. must render correctly on the two latest versions of all major browsers: Mozilla, Safari, Chrome.
- 5.5. Application shall have responsive UI code so it can be adequately rendered on mobile devices but no mobile native app is to be developed
- 5.6. Data shall be stored in the MySQL database on the class server in the team's account
- 5.7. Application shall provide real-estate images and optionally video
- 5.8. Maps showing real-estate location shall be required
- 5.9. Application shall be deployed from the team's account on AWS
- 5.10. No more than 50 concurrent users shall be accessing the application at any time
- 5.11. Privacy of users shall be protected and all privacy policies will be appropriately communicated to the users.
- 5.12. The language used shall be English.
- 5.13. Application shall be very easy to use and intuitive. No prior training shall be required to use the website.
- 5.14. Google analytics shall be added
- 5.15. Messaging between users shall be done only by class approved methods and not via e-mail clients in order to avoid issues of security with e-mail services.

5.16. Pay functionality (how to pay for goods and services) shall not be implemented.

5.17. Site security: basic best practices shall be applied (as covered in the class)

5.18. Modern SE processes and practices shall be used as specified in the class, including collaborative and continuous SW development

5.19. The website shall prominently display the following text on all pages "SFSU Software Engineering Project, Fall 2017. For Demonstration Only". (Important so as to not confuse this with a real application).

6. Competitive Analysis

Here we describe some competitive real estate sites and compare their features with our own upcoming real estate website.

Features	immowelt.de	realestate.com.au	zillow.com	Housing.com	B i i G (our web application)
Providing reviews for renting properties	Not available	Not available	Property review not available, only listing agent review available	Not available	Available
Apartment search & filter	Simple searchlist	search with simple filter options	Advance search and filter options available	Search with advanced filters	Available
Listing Commercial, Industrial and Residential properties	Not available	Not available	Not available	Not available	Available
E-Mail search agent (Subscription)	Looking for new offerings with your individual criteria	Available	Available	Available	Available
Wish list	Available	Available	Available	Available	Available
Apartment comparison	Not available	Not available	Available	Not Available	Available
Map View	Available	Available	Available	Available	Available
Consolidated Dashboard for buyers/sellers	Not available	Not available	Available	Not available	Available

The main advantage of our real estate web application is one stop solution for real estate professionals and customers. Using this website, real estate professionals can promote their

advertising on any kind of real estate properties. On the other hand, customer can easily find their dream property from this web application and they don't need to look up another real estate website because this website will guarantee the best optimal price among others. The key functionalities are property review for rental and listing of not only residential properties but also commercial and industrial properties.

7. High Level System Architecture

Our application will be created with the following software:

Program languages:

- HTML5 and Javascript for Webapplication desgin
- Javascript for Front-End Development
- Node.js for Back-End Development
- MySQL for Database storage

Frameworks/Libraries:

- Bootstrap Version 3.3.7 (For responsive design and CSS usage)
- Express.js 4.15.3 (Web-Framework for node.js)
- jQuery Version 3.2.1 (JavaScript Library)

Tools:

- Atom, Netbeans, and Sublime 2 IDEs (latest stable version)
- MySQL Workbench 6.3 CE

Clients:

- Google Chrome Version 64.0+
- Mozilla Firefox Version 56.0+
- Safari Version 5.1.7+

Team Communication:

- Trello (Project Management Application)
- Slack (Cloud-based team collaboration tool)
- Google Drive (Document administration)
- Screenhero (Collaborative screen sharing application)

8. Team Role

Members	Role
Aleksandar Mitkovski E-Mail: aleksandar.mitkovski@informatik.hs-fulda.de	Team Leader (Task Distribution) Frontend Development & Github master (jQuery, Bootstrap)
Swetaketu Majumder E-Mail: swetaketu.majumder@informatik.hs-fulda.de	Backend Leader Backend Development (Node.js & MySQL)
Mahdis Lohrasebynejad E-Mail: mahdis.lohrasebynejad@informatik.hs-fulda.de	Frontend Leader Frontend Development (HTML,CSS,javascript,jQuery)
Akhila Cyriac Panackal E-Mail: Akhila.cyriacanackal@informatik.hs-fulda.de	Frontend Development (jQuery, javascript, HTML,CSS3, Bootstrap, angularJS)
Mahbubur Rahman E-Mail: mahbubur.rahman@informatik.hs-fulda.de	Backend Development (Programming, Analysis, Data Flow Design, Database Design)

9. Checklist

- Team decided on basic means of communications **(DONE)**
- Team found a time slot to meet outside of the class **(DONE)**
- Front and back end team leads chosen **(DONE)**
- Github master chosen **(DONE)**
- Team ready and able to use the chosen back and front end frameworks **(DONE)**
- Skills of each team member defined and known to all **(DONE)**
- Team lead ensured that all team members read the final M1 and agree/understand it before submission **(DONE)**