

# Project Landmark

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## Milestone 1

Team 03

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**10/4/2017**

History Table	10/3/17	Rough Draft #1 Submitted
	10/4/17	Revised and addressed CEO's comments: <ul style="list-style-type: none"><li>• Use Cases changed to specify concrete examples for Henry.</li><li>• Data Definition changed to remove a non-variable and define the listing of a house more clearly.</li><li>• Functional section changed to group list by use.</li><li>• Competitive Analysis changed to add summary.</li></ul>
	10/7/17	Final Draft Submitted addressing the following comments: <ul style="list-style-type: none"><li>• Updated History Table with comments from CEO on 10/4/17.</li><li>• Buyer Use Case and Executive Summary changed to mention the Afford Button.</li><li>• Data Definition changed to clarify and remove trivial definitions.</li><li>• Functional section changed regarding grouping by users.</li><li>• Non-functional section changed to re-number list.</li><li>• Competitive Analysis reworked to focus more on the functionality rather than solely on the usability.</li><li>• High-level system section changed for ease of readability.</li></ul>
	10/11/17	FROZEN

## 1. Executive Summary

The website, currently codenamed, Project Landmark, is a real estate website looking to define a new way to search for a real estate while keeping the big picture in mind. Our website will have the basic functionality of a real estate website with search functions, a login capability, and a filter functionality for prospective buyers. Not only that, but our website will also feature a “Afford Button” function which would enable buyers to determine if they are able to purchase a real estate. For the prospective sellers who do not want to manage the business aspect of selling a house, they will be able to choose an agent of their choice to help them sell their house.

The website will have functionality for the prospective buyer, seller, and agent with three different components for each type of user. Buyers would have the convenience and simplicity of navigating through the website with ease. Agents would have the necessary tools to effectively carry out business requests. And, sellers would have a stress-free experience of selling their house.

We are seven students involved in a startup company with the goal of building a real estate website. We are looking for the funding that would allow our website to have the exposure that we need to jumpstart our very first website.

## 2. Use Cases

### Prospective Buyer

1. Henry is a prospective buyer that knows what he wants. Henry's experience in the website will be straightforward; the ease of use of the website will guide him to the listings of available **properties** in the area that he has searched through zip code or address. He will see the different images, prices, and addresses. He will then **filter** accordingly by price, house type, number of rooms, and number of floors, to find the perfect property for him. After Henry clicks on the desired property, Henry will be able to see a much more comprehensive detail of the property along with **comparisons** of nearby properties. Henry will also have access to an afford button which will help him determine a payment method. Once satisfied, Henry will have easy access to **contact** an agent by proceeding through a brief process of **registering** for a **buyer account**. By doing so, Henry will have easier, convenient access in the future by having a **dashboard** that will let him **track** new messages or suggestions all in one place.

### Seller

2. Sarah is a seller who is looking to sell her **property** and is unsure of where to start. She will select the seller option once she's on the website. Afterwards, she will have the prompt to verify that she is the owner of the property. After confirming so, she will be **registering** for a new **seller account** along with providing the information to verify ownership of her house. Once verified, Sarah will be able to **contact** through a list of different agents to see her options. After everything has been agreed upon, the agency will then manage everything for Sarah while giving her updates of which she can check regularly through her **dashboard** as a user.

### Agent

3. Mary is a real estate **agent** of one of the three companies, SFStateHomes, SJStateRealtor, and CSURealEstate. Because she is company agent, she will have familiarity (or at least trained) to work with websites in general. Once on the website, she needs to log into an account to check her **dashboard**. If she does not have an **agent account**, a prompt will appear to create a new account after being asked if she was a buyer, seller, or agent. Once she logs in, she will often check her dashboard for new requests from potential buyers and sellers. For new buyers, she will follow up on their requests and **contact** them to discuss more details. For new sellers, she will contact them back and list their house as an entry on the website.

### Admin

4. Alex is a system **admin** who is experienced and can be trained. He will be checking the website for any inappropriate and/or invalid listings. If he finds any such listings, he will be able to delete them from the website. If Alex finds that an agent has listed too many invalid listings, then he can revoke the agent's account and delete it from the website. All sellers and buyers who had contacted the agent will be notified of agent's removal from the site. Any sellers who had listings under that agent will also be removed from the website along with agent's account and will not be transferred to an existing agent to let the sellers re-select their agent.

### 3. Data Definition

*Admin:* user/users who can access all data and content. Can modify the database. Needs to login/register.

*Agent Account:* user/users who can view all listings and post their own. Can modify their listings. Can communicate with registered users and see their profile. Needs to login/register.

*Buyer account:* user/users who can view all listings and their agents' profiles. Can only communicate with agents. Needs to login/register.

*Registered User:* is either an admin, buyer, seller, or real estate agent.

*Seller account:* user/users who can view all listings and their agents' profiles. Can only communicate with agents. Needs to login/register.

*Unregistered user:* user/users who are not signed into an account on site. Can view listings. Cannot use chat system. Needs to register/login to buy or request an entry to be listed.

*Comparisons:* a list showing properties near the location of property the user is currently viewing

*Property:* price, description, keywords (e.g. parking availability, year built, heating and cooling, utilities etc.). photo (1 or more). Posted by real estate agent.

*Contact:* form of communication

*Dashboard:* a user interface that contains messages by/to user and contains listings attached to account.

*Filter:* narrows search results by price range, number of specific types of rooms (e.g. bathrooms, kitchens bedrooms), zip code, and number of floors.

*Register:* a process to get an account on site.

*Search:* an application that allows users to find specific content on site

*Track:* process to keep update on messages or listings

## 4. Initial list of functional requirements

### Prospective Buyer

1. A prospective buyer shall be able to browse the website for properties via the Search Bar.
2. A prospective buyer shall be able to filter properties.
3. A prospective buyer shall be able to check if they are able to purchase a property via the Afford Button.

### Registered Buyer

4. A registered buyer shall be able to contact agents via a messaging system.
5. When a registered buyer has logged, they shall be notified of new messages from their agent(s).

### Seller

6. A seller shall be able to browse the properties agents has posted.
7. To verify that the seller is the owner of the property they wish to sell, they shall be log in or register for an account.
8. To contact an agent, the seller shall log in or register for an account.
9. To check their dashboard for notifications from agents they a seller has contacted, they shall log into their account.
10. When a seller has logged in, the seller shall be notified of recent updates and/or changes to their property (which was posted by their agent) via the dashboard.

### Agent

11. To reply to the registered seller and/or registered buyer, the agent shall log in or register for an account.
12. To post a property with the information a seller has provided them, the agent shall log in.
13. When the agent has logged in, the agent shall be notified of new messages from their registered sellers and/or registered buyers via the dashboard.
14. The agent shall not be able to contact registered sellers or registered buyers unless the registered seller or buyer has made the first contact.

### Admin

15. Admin shall be able to delete an agent's account if the Admin finds more than 10 inappropriate and/or invalid entries.

### Search Bar

16. Search bar shall be shown on the main landing page which shall include buy or sell real estates.
17. Search filters shall filter through property title keywords such as price, location, covered area, and house type (e.g. house, condo, and apartment).
18. Specific real estate property search shall result in one thumbnail image with the property title.

### Filter

19. Filters shall work inside the search bar and on the explore page. Can be set to limit search results by price range, rooms, property type, and location or neighborhood.

### Afford Button

20. Afford Button shall pick up the property price from the currently opened property listing page.

21. Afford Button shall use an embedded algorithm to calculate the mortgage payments with a specific interest rate over a number of years.
22. Afford Button shall give back monthly installment as a result.
23. Afford Button shall take input in the form of interest rate and the number of years of the mortgage.

## 5. List of non-functional requirements

1. Application shall be developed and deployed using class provided deployment stack
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 Anthony Souza on a case by case basis
3. Application shall be hosted and deployed on Web Services by Google
4. 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. Data shall be stored in the MySQL database on the class server in the team's account
6. Application shall provide real-estate images and optionally video
7. Maps showing real-estate location shall be required
8. Application shall be deployed from the team's account on the Google Web Service.
9. No more than 50 concurrent users shall be accessing the application at any time
10. Privacy of users shall be protected and all privacy policies will be appropriately communicated to the users
11. The language used shall be English
12. Application shall be very easy to use and intuitive. No prior training shall be required to use the website.
13. Google analytics shall be added
14. 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
15. Pay functionality (how to pay for goods and services) shall not be implemented.
16. Site security: basic best practices shall be applied (as covered in the class)
17. Modern SE processes and practices shall be used as specified in the class, including collaborative and continuous SW development
18. 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

Competitive Features Table

Feature	Zillow	Redfin	Realtor	Project Landmark
UI Style	++	+	+	++
Key Screen Contents	++	+	+	+
Use of media, graphics, logos, colors, branding	+	+	+	+
User Interaction Techniques	+	+	+	+
Navigation Features	++	+	+	++
Saving Data	+	+	+	+

+ feature exists; ++ superior

### UI Style (input control, navigational components, informational components, container)

All three websites have significant implementation of the following UI: input controls such as button, text field, drop down menu; navigational components such as a search field, pagination; informational components such as tooltips, icons; and a container.

**Our product shall implement a correct and special UI style that makes our website stands out.**

### Key Screen Contents

All three websites contain and highlight important real-time housing information. For example, statistics provide for not only the first-time house buyers, but also for the investors. This gives the buyer an addition element to consider when they are deciding on a house along with price and location.

**Our product shall present correct home information, and selectively highlight the most valuable content. Zillow's idea is considerable and we shall focus on giving the buyer more resources.**

### Use of Media, Graphics, Logos, Colors, and Branding

All three websites provide social network connection, appealing homepage design, their unique logos, representation of color, and branding. Among these three sites, Zillow has a more meaningful logo compared to Redfin and Realtor.

**Our product shall provide social media connection and a nice graphics effect. And, it shall design a significant logo which is recognizable and clearly represents the company's culture and objective.**

## User Interaction Technique

All three websites generally have correct responses to user's requests. A well-defined solution was also implemented to address a specific user's problem.

**Our product shall correctly implement an interaction technique as a priority before adding addition features to highlight our site.**

## Navigation Features

Zillow and Realtor have a fixed navigation bar along the top of page along with mouse movement which gives users quick selection of their desired content. In contrast, Redfin users would only be able to do category selection on the navigation bar at the top. Zillow tends to collapse information unless users click or move their cursor over the icon while Redfin and Realtor prefer to show key elements without user interaction. When we browse Zillow's website, it automatically pre-fills the user's current location in search bar. This important feature makes their site more humanized.

**Our product shall implement a variety of navigational features over the different stages of our website browsing process according to the user experience report found online.**

## Saving Data

For all the users, there were a recently viewed history and similar house suggestions were provided on both the homepage and for further browsing. For registered users, their information was stored on their account including "liked", "disliked" houses, or side notes on particular houses.

**Our product shall store all users' information accurately and securely, and shall provide more suggestions to guest users who do not wish to sign up.**

## Content Organization

Zillow presents a more organized site compares to Redfin and Realtor. Zillow organizes the site in topical way versa the other two sites using a hybrid organization.

**Our product prefers to organize the site in an ambiguous way, which includes topical and task oriented.**

## Ease of Use

All 3 sites are: easy to use, the main page is apparent to see being given a larger size occupation and bold text. A first-time user is directed with sign-up pop-ups and tips.

**Our product shall give the ease of use as a priority in designing every webpage.**

## In Summary

**In term of our website's display, we shall implement a correct and special UI style which significantly inosculates to UI design standard. Our product shall present correct home information and selectively highlight the most valuable listing. Social media connection shall be provided, and the website's logo shall be designed which is recognizable and clearly represents the company's culture and objective. In term of the website's functionality, our product shall correctly implement an interaction technique as a priority before adding addition features to highlight our site. Navigational features shall be**



**implemented over the different stages of our website browsing process according to the user experience report found online. Our product shall store all the users' information accurately and securely, and shall provide more suggestions to guest users who do not wish to sign up. In term of site content organization, our product prefers to organize the site in an ambiguous way, which includes topical and task oriented. On top of all matrix entries, our product shall give the ease of use as priority in designing every webpage.**

## 7. High-level system architecture

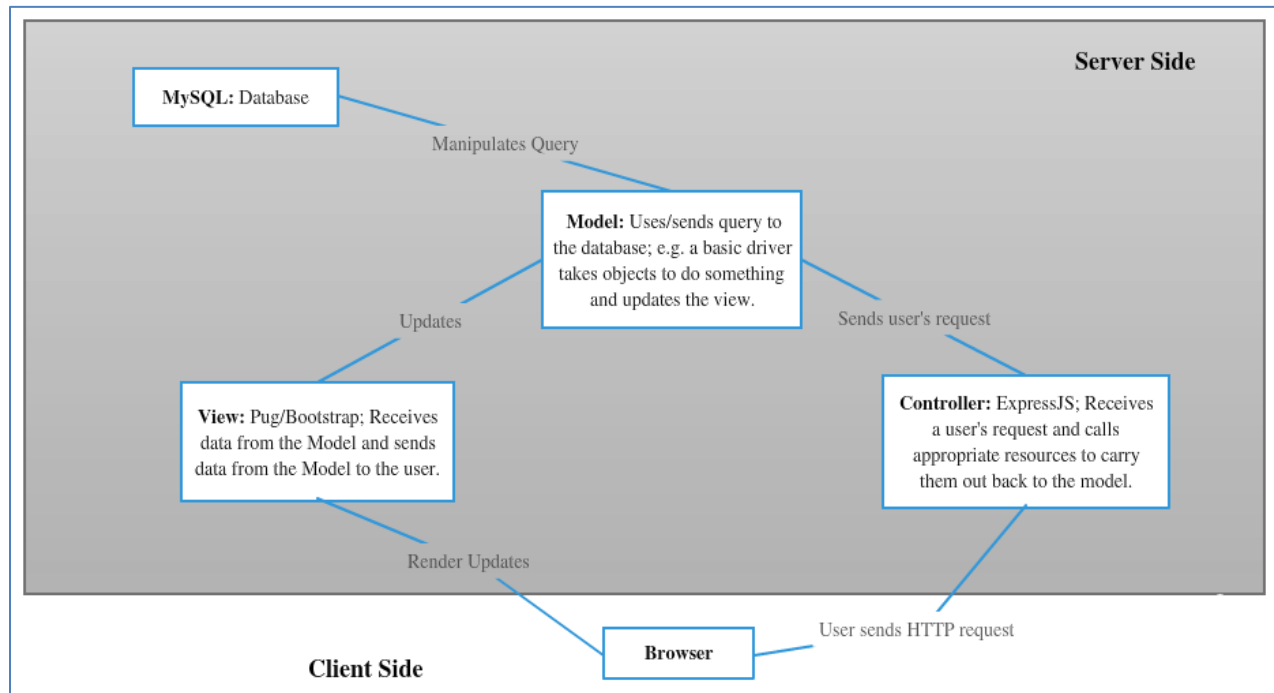
### Software Components

- NodeJS (version 8.6) as its platform.
- ExpressJS (version 4.16.0) as the back-end framework. Can be updated and kept to date with NPM (Node Package Manager).
- Bootstrap (version 4.0.0) as the front-end framework.
- MySQL (version 5.7) as the database.
- Pug (version 2.0.0-rc.4) as the template engine. Can be updated and kept to date with NPM (Node Package Manager).
- NodeJS will use various node modules. Can be updated and kept to date with NPM (Node Package Manager).
- AJAX and jQuery API via a CDN.
- Workbench (version 6.3.9) will be used to visually model the server's database.
- Nginx as the server.
- Supported by the latest version of Google Chrome (version 61.0.3163) and Mozilla Firefox (version 56.0).

### Architectural Design Pattern

- Application will use the MVC (Model-View-Controller) Pattern to reduce coupling.
- A model file will be our model. The model will take data from MySQL and manipulate that data for the user to view.
- Bootstrap will be our view that displays static HTML/CSS pages to the user.
- Pug will also be our view/template engine for our application's server-side/client-side rendering. Pug sends information out to our browser, filling out empty lines for dynamic HTML pages, but it still requires us to create HTML/CSS files in the back-end.
- ExpressJS will be our controller that processes a user's request.

## MVC Model



### Advantages/Disadvantages of MVC Pattern

- **Advantages:** Makes our model and possibly view be reusable. This makes implementing new features easy.
- **Disadvantages:** Back-end data transfer is inefficient.

## 8. Team

Team leader: Jesse Gabriel

Front End Developers:

- Avneesh Setia (Front End Team Lead)
- Huiliang Huang
- Yingjing Chen
- Jenny Ngo

Back End Developers:

- Matthew Berkman (Back End Team Lead)
- David Lau
- Jesse Gabriel

## 9. Checklist

- Team decided on basic means of communication. DONE
- Team found a team 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