Affordable Housing Search Application

Technical Design Document

Group 1

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Table of Contents

[Objective 4](#_Toc106346723)

[Considerations 4](#_Toc106346724)

[Legend 5](#_Toc106346725)

[Product Requirements 5](#_Toc106346726)

[Affordable Housing Search landing page 5](#_Toc106346727)

[Affordable Housing Search page 6](#_Toc106346728)

[Housing Filters 7](#_Toc106346729)

[Housing Details 8](#_Toc106346730)

[Google Maps 10](#_Toc106346731)

[Technical Requirements 11](#_Toc106346732)

[Affordable Housing Search landing page 11](#_Toc106346733)

[Affordable Housing Search page 11](#_Toc106346734)

[Housing Filters 13](#_Toc106346735)

[Housing Details 13](#_Toc106346736)

[Technical Design 14](#_Toc106346737)

[Implementation 14](#_Toc106346738)

[Testing 14](#_Toc106346739)

[Communications Plan 15](#_Toc106346740)

[Communications Plan 15](#_Toc106346741)

[Objectives 15](#_Toc106346742)

[Expected Outcomes 16](#_Toc106346743)

[Project Plan 18](#_Toc106346744)

Document Changes

|  |  |  |  |
| --- | --- | --- | --- |
| Revision # | Date | Author | Comments |
| 1.0 | 5/19/2022 | Joanna Smith | Original Document Creation |
| 2.0 | 5/22/2022 | Joanna Smith  Gary Johnston  Natalie Ayala  Devante McFarlane  Octavian Carteleanu | Product Requirements and Technical Requirements |
| 2.1 | 5/21/2022 | Devante McFarlane | Added Abstract, Added U1.1, Added D1.1 - 1.7, Added U3.5 - U3.9 |
| 2.2 | 5/23/2022 | Natalie Ayala | Added Landing page and Search Page requirements |
| 2.3 | 6/16/2022 | Octavian Carteleanu  Joanna Smith | Modified for adjusted scope.  Modified and expanded timeline. |
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Abstract

## Objective

To provide a website application available to the residents of Orange County, FL to search for affordable housing in their area. The main focus of the application is showing the energy efficiency of residences in comparison of rent costs to allow the user to apply this knowledge in making decisions about resident searches. A secondary goal is to have the application influence the residence owners to update facilities to manage energy inefficiencies (such as new AC, new water heater, etc.). Outside of rent costs, affordable housing should include additional costs, such as electricity, gas, water, cable, fees, transportation, and food. Search results should also provide information about nearby schools, restaurants, shopping, and transit options. The application should be easy to access, user-friendly and provide quick results.

## Considerations

Client should consider costs such as web hosting, database hosting, and any developer fees, such as Google API costs. Data to be provided by the client. Editing the data through the website is not in scope of this project. Developers should consider the design being able to be used on mobile devices.

The application will not be available to outside parties until all stakeholders in the project have approved the final product.

Requirements

# Legend

|  |  |
| --- | --- |
| **Term** | **Definition** |
| Actor | Defines who the requirement pertains to |
| User | Client-side actor that will access the web application |
| Dev | Server-side actor that develops the web application |
| Client | Actions taken by the client or stakeholders of the application |
| U#.# | Requirement ID pertaining to Actors of type “User” |
| D#.# | Requirement ID pertaining to Actors of type “Dev” |

# Product Requirements

|  |  |  |
| --- | --- | --- |
| Requirement ID | Requirement | Actor |
| U1.0 | Affordable Housing Search landing page | User |
| U1.1 | *Header* | User |
| U1.1.1 | *Navigation Menu* | User |
| U1.1.1.1 | Home | User |
| U1.1.1.2 | About | User |
| U1.1.1.3 | Search Page | User |
| U1.1.1.4 | Contact/Feedback Link | User |
| U1.2 | *Main Content* | User |
| U1.2.1 | Feature Image | User |
| U1.2.2 | Brief Site description | User |
| U1.2.3 | Button that links to interactive map/housing search | User |
| U1.3 | *Footer* | User |
| U1.3.1 | *Navigation Menu* | User |
| U1.3.1.1 | Home | User |
| U1.3.1.2 | About | User |
| U1.3.1.3 | Search Page | User |
| U1.3.1.4 | Contact/Feedback Link | User |
| U1.3.2 | Terms of Service | User |

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| --- | --- | --- |
| Requirement ID | Requirement | Actor |
| U2.0 | Affordable Housing Search page | User |
| U2.1 | *Header* | User |
| U2.1.1 | *Navigation Menu* | User |
| U2.1.1.1 | Home | User |
| U2.1.1.2 | About | User |
| U2.1.1.3 | Search Page | User |
| U2.1.1.4 | Contact/Feedback Link | User |
| U2.2 | *Main Content* | User |
| U2.2.1 | Map Filters (U2.0) | User |
| U2.2.2 | **Interactive map** **to display location dots of the housing search results** |  |
|  | Clicking on the dot on the map will bring up details page for housing option selected (see Details Page U3) | User |
| U2.2.3 | Display search results list with Housing Details (U3.0) | User |
| U2.2.4 | Default display top (5) most affordable housing results or Rely on applied filters (see U2) | User |
|  | Sorted by rent ascending |  |
| U2.2.5 | **Each result will display the following:** |  |
| U2.2.5.1 | Display housing picture (if available, if not generic image) |  |
| U2.2.5.2 | Name |  |
| U2.2.5.3 | Address |  |
| U2.2.5.4 | Number Bed/Bath |  |
| U2.2.5.5 | Square feet ranges |  |
| U2.2.5.6 | # units available |  |
| U2.2.5.7 | Rent |  |
| U2.2.5.8 | Click to view more information | User |
|  | Clicking on the button will bring up details page for housing option selected (see Details Page U3) | User |
| U2.2.6 | Quickly find affordable housing with predefined searches | User |
| U2.2.7 | Display average utility pricing in Orlando | User |
| U2.2.8 | Display average housing pricing in Orlando by type | User |
| U2.2.9 | Display histogram of previous average utility and housing prices | User |
| U2.2.10 | Housing affordability rating based on all other Orlando housing  (E.G. 4 out of 5 with related icon that may be tree, windmill, sun  symbol, etc.) | User |
| U2.3 | *Footer* | User |
| U2.3.1 | *Navigation Menu* | User |
| U2.3.1.1 | Home | User |
| U2.3.1.2 | About | User |
| U2.3.1.3 | Search Page | User |
| U2.3.1.4 | Contact/Feedback Link | User |
| U2.3.2 | Terms of Service | User |

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| **Requirement ID** | **Requirement** | **Actor** |
| **U3.0** | Housing Filters | **User** |
| U3.1 | “Filters” button opens filters form | User |
| U3.1.1 | “Filters Button shows running total of filter selections. | User |
| U3.1.2 | “X” button or icon to close the “Filters” form. | User |
| U3.2 | Pet Policy Options: | User |
| U3.2.1 | Pet Friendly | User |
| U3.2.2 | No Pets | User |
| U3.2.3 | Cats | User |
| U3.2.4 | Dogs | User |
| U3.3.6 | High Speed Internet | User |
| U3.3.7 | Wheelchair Access | User |
| U3.4 | Price Range | User |
| U3.4.1 | Units under $1000 | User |
| U3.4.2 | Units $1001 - $1500 | User |
| U3.4.3 | Units $1501 - $2000 | User |
| U3.4.4 | Units $2001 + | User |
| U3.5 | Property by Property Name from Dropbox | User |
| U3.5.1 | List of all properties in Database | User |
| U3.6 | Bedrooms | User |
| U3.6.1 | Studio | User |
| U3.6.2 | 1 | User |
| U3.6.3 | 2 | User |
| U3.6.4 | 3+ | User |
| U3.7 | Bathrooms | User |
| U3.7.1 | 2 | User |
| U3.7.2 | 2 1/2 | User |
| U3.7.3 | 3+ | User |
| U3.8 | Energy Efficiency \*Total utility costs | User |
| U3.8.1 | < $100 | User |
| U3.8.2 | $101 - $150 | User |
| U3.8.3 | $150 - $200 | User |
| U3.8.4 | $200 + | User |
| U3.9 | “Appy Filters” Button to apply the selected filters | User |
| U3.10 | “Clear Filters” Button to clear the form. | User |
| U3.11 | If filter selections return 0 results “User sees “No Matches Found” | User |
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| **Requirement ID** | **Requirement** | **Actor** |
| U3.0 | Housing Details | User |
| U3.1 | *Business requirements* | Sponsor |
| U3.1.1 | Offer easy access to users to all the apartments’ details |  |
| U3.1.2 | Attract a great numbers of visitors based on the information provided |  |
| U3.2 | *Housing seekers requirements* | User |
| U3.2.1 | Display clearly the features of the apartment |  |
| U3.2.2 | Possibility to compare different options on the same page |  |
| U3.2.3 | Fast access to the apartment’s contact information |  |
| U3.2.4 | Smooth navigation from mobile devices |  |
| U3.3 | *Functional requirements* | User |
| U3.3.1 | Show the number of bedrooms, bathrooms, and total square footage |  |
| U3.3.2 | Display the address of the apartment/building |  |
| U3.3.3 | Inform about the floor the apartment is located on when it applies |  |
| U3.3.4 | Show the minimum income requirements for future residents |  |
| U3.3.5 | Display the application fee, deposits and rent amount |  |
| U3.3.6 | Show availability date |  |
| U3.3.7 | *Utilities cost* |  |
| U3.3.7.1 | Electricity |  |
| U3.3.7.2 | Gas |  |
| U3.3.7.3 | Water |  |
| U3.3.7.4 | Sewer |  |
| U3.3.7.5 | Cable |  |
| U3.3.7.6 | Internet |  |
| U3.3.8 | *Miscellaneous* |  |
| U3.3.8.1 | Languages spoken in the community |  |
| U3.3.8.2 | Air quality in the area |  |
| U3.3.9 | Pet policy |  |
| U3.4 | *Non-functional requirements* | Dev |
| U3.4.1 | Images and maps are loading fast and transitions from picture to picture are smooth |  |
| U3.5 | Display rent for month (and year for convenience) | User |
| U3.6 | Display average utility prices by available vendor | User |
| U3.7 | Display internet and cable prices by available vendor | User |
| U3.8 | Field to enter weekly average driving mileage then multiplied by current gas price to quickly calculate driving expenses | User |
| U3.8.1 | Option to add additional vehicles to calculate additional driving expenses | User |
| U3.8.2 | Field to enter amount of vehicles for apartments that charge per vehicle | User |

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| **Requirement ID** | **Requirement** | **Actor** |
| U4.0 | Google Maps | User |
| U4.1 | Nearby Routes | User |
| U4.11 | Location of the house/apartment is set by default |  |
| U4.111 | User can enter a work or destination of choice | User |
| U4.112 | Map provides route options with time and miles | User |
| U4.1121 | Car | User |
| U4.1122 | Bus | User |
| U4.1123 | Bike | User |
| U4.1124 | Walk | User |
| U4.1125 | Ride share | User |
| U4.113 | Calculate Route Costs | User |
| U4.1131 | Once the route option is selected the route cost can be calculated |  |
| U4.2 | The map on Housing Details page a radio button is available to select: | User |
| U4.21 | Nearby Schools | User |
| U4.22 | Nearby Shopping | User |
| U4.23 | Nearby Restaurants | User |

# Technical Requirements

|  |  |  |
| --- | --- | --- |
| Requirement ID | Requirement | Actor |
| D1.0 | Affordable Housing Search landing page | Dev |
| D1.1 | *Non-functional Requirements* | Dev |
| D1.1.1 | Mobile Responsiveness | Dev |
| D1.1.2 | Meet Web Content Accessibility Guidelines | Dev |
| D1.1.3 | Obtain permission for any copyrighted material | Dev |
| D1.1.4 | Cross-Browser compatibility |  |
| D1.1.5 | Page must load within 2 seconds |  |
| D1.2 | *Links - General* | Dev |
| D1.2.1 | Use an exit notification to identify and disclaim links to external sites. | Dev |
| D1.2.2 | Provide a user-friendly message for 404-error a page. | Dev |
| D1.3 | *Header* |  |
| D1.3.1 | Feature site logo/title |  |
| D1.4 | *Navigation Menu* | Dev |
| D1.4.1 | Text Hyperlink to an About page that explains the sites use, purpose, and partners. | Dev |
| D1.4.2 | Text Hyperlink to a Search page that features interactive map | Dev |
| D1.4.3 | Hyperlink to contact form that routes to appropriate contact | Dev |
| D1.5 | *Main Content* | Dev |
| D1.5.1 | Button that links to interactive map/housing search | Dev |
| D1.6 | *Footer* |  |
| D1.6.1 | Hyperlink to Terms of Service page | Dev |
| D1.6.2 | Display a statement of content ownership or management | Dev |

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| --- | --- | --- |
| Requirement ID | Requirement | Actor |
| D2.0 | Affordable Housing Search page | Dev |
| D2.1 | *Non-functional Requirements* | Dev |
| D2.1.1 | Mobile Responsiveness | Dev |
| D2.1.2 | Meet Web Content Accessibility Guidelines | Dev |
| D2.1.3 | Obtain permission for any copyrighted material | Dev |
| D2.1.4 | Cross-Browser compatibility | Dev |
| D2.1.5 | Page must load within 2 seconds | Dev |
| D2.2 | *Links - General* | Dev |
| D2.2.1 | Use an exit notification to identify and disclaim links to external sites. | Dev |
| D2.2.2 | Provide a user-friendly message for 404-error a page. | Dev |
| D2.3 | *Header* | Dev |
| D2.3.1 | Feature site logo/title | Dev |
| D2.4 | *Navigation Menu* | Dev |
| D2.4.1 | Text Hyperlink to an About page that explains the sites use,  purpose, and partners. | Dev |
| D2.4.2 | Text Hyperlink to a Search page that features interactive map | Dev |
| D2.4.3 | Hyperlink to contact form that routes to appropriate contact | Dev |
| D2.5 | *Main Content* | Dev |
| D2.5.1 | See Map Filters Technical Requirements (D3.0) | Dev |
| D2.5.21 | Once the filters are selected, the data will be filtered in database or array to limit the results returned |  |
| D2.5.3 | **Return search results based on filters selected by the user** | Dev |
| D2.5.4 | **Pull information from selected data results using these fields:** |  |
| D2.5.41 | Img (or url) If none available – show generic image |  |
| D2.5.42 | HousingName |  |
| D2.5.43 | HousingAdddress |  |
| D2.5.44 | HousingCity |  |
| D2.5.45 | HousingState |  |
| D2.5.46 | HousingZip |  |
| D2.5.47 | NumBeds |  |
| D2.5.48 | NumBaths |  |
| D2.5.49 | SqFt |  |
| D2.5.49 | # units available |  |
|  | Query returning results against separate listing for unit specific information |  |
| D2.5.49 | Rent |  |
|  | Button: Click to view more information | Dev |
|  | Clicking on the button will bring up details page for housing option selected (see Details Page U3) | Dev |
| D2.6 | **One map to display location dots of the housing search results** |  |
| D2.61 | Clicking on the dot on the map will bring up details page for housing option selected (see Details Page U3) | Dev |
| D2.62 | See GoogleMaps API requirements (D4) |  |
|  |  |  |
| D2.7 | Landing Page: Default display top (5) most affordable housing results | Dev |
| D2.71 | Landing Page: Define search criteria for pre-defined search selections | Dev |
| D2.72 | Landing Page: Calculate average utility pricing in Orlando | Dev |
| D2.73 | Landing Page: Calculate average housing pricing in Orlando by type | Dev |
| D2.74 | Landing Page: Display histogram of previous average utility and housing prices | Dev |
| D2.8 | *Footer* | Dev |
| D2.8.1 | Hyperlink to Terms of Service page | Dev |
| D2.8.2 | Display a statement of content ownership or management | Dev |

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| **Requirement ID** | **Requirement** | **Actor** |
| D3.0 | Housing Filters | Dev |
| D3.1 | “Filters” Button opens the Filters form | Dev |
| D3.1.1 | Keep running total of filters selected displayed inside “Filters” selector.  (On landing page) | Dev |
| D3.1.2 | An icon or Button “X” will close the form. | Dev |
| D3.2 | Selector type for Pet Policy U3.2.1 – U3.2.4 , medium buttons | Dev |
| D3.5 | Selector type for Price Range U3.5.1 – U3.5.4 , dropbox | Dev |
| D3.6 | Selector type for Property U3.6.1 , dropbox | Dev |
| D3.7 | Selector type for Bedrooms U3.7.1 – U3.7.4 , dropbox | Dev |
| D3.8 | Selector type for Bathrooms U3.8.1 – U3.8.3 , dropbox | Dev |
| D3.9 | Selector type for Energy Efficiency U3.9.1 – U3.9.4 , dropbox | Dev |
| D3.10 | “Apply Filters” button will incorporate filters and initiate search. | Dev |
| D3.11 | “Clear Filters” button will reset the Filters form to an empty state. | Dev |
| D3.12 | If filter selection returns 0 results | Dev |
| D3.12.1 | AlertBox “No Matches Found” | Dev |
| D3.12.2 | Clear Filters Form | Dev |

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| **Requirement ID** | **Requirement** | **Actor** |
| D4.0 | Housing Details | Dev |
| D4.1 | Fetch JSON from APIs and display the data on the website |  |
| D4.2 | Create an JavaScript Array |  |
| D4.3 | Create an HTML list from the JavaScript array |  |
| D4.4 | Create slideshow with the apartements’ photos in JavaScript |  |
| D4.5 | Place an “X” button to close the slideshow |  |
| D4.6 | Create a button under the apartment title that will open the floor plan |  |
| D4.7 | Create a link between the map and each apartment |  |

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| **Requirement ID** | **Ref #** | **Requirement** | **Actor** |
| **D5.0** |  | **Retrieve a Google Maps API key** | **Dev** |
|  |  | Client to set up Google API account for paid services | Client |
| D5.1 |  | Reference Google Maps API documentation | Dev |
| D5.2 | U4.21-U4.23 | Download [Places API](https://console.cloud.google.com/apis/library/places-backend.googleapis.com?project=api-project-659912771265&supportedpurview=project) | Dev |
| D5.3 |  | Download [Maps JavaScript API](https://console.cloud.google.com/apis/library/maps-backend.googleapis.com?project=api-project-659912771265&supportedpurview=project) | Dev |
| D5.4 | U4.1121- U4.1125 | Download [Directions API](https://console.cloud.google.com/apis/library/directions-backend.googleapis.com?project=api-project-659912771265&supportedpurview=project) |  |
| D5.5 | U4.113 | Download [Distance Matrix API](https://console.cloud.google.com/apis/library/distance-matrix-backend.googleapis.com?project=api-project-659912771265&supportedpurview=project) |  |
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# Technical Design

## Implementation

* **Framework: Angular**
  + Preferred framework front end web application
  + Note: Spring Boot can be implemented as an alternative framework that can be used for development pending discussion with project sponsor and consideration of future development teams.
* **Language(s):**
  + TypeScript / HTML / CSS
* **Database:**
  + Firebase

## Testing

# Communications Plan

|  |  |
| --- | --- |
| Communications Plan | |
| **Project:** Energy Efficient Apartment Search | Start Date: 5/9/2022 |
| **Project Managers:**  Joanna Smith  Gary Johnston  Natalie Ayala  Octavian Carteleanu  Devante McFarlane | Estimated Completion Date: |
| **Methods of Communications:** | Valencia email, Discord for chat discussions, ClickUp for Project Management, Zoom |
| **Weekly Zoom Meetings** | Discuss updates to the project. Review problems discovered, announce successes, discuss new assignments.  Start Date: 5/23/2022  Mondays at 7:00 pm |
| Objectives | |
| Establish report with team members |  |
| Meet with professor for project requirements |  |
| Develop Technical Requirements Document |  |
| Develop database |  |
| Design web application |  |
| Develop web application |  |
| Test web application |  |
| Revise web application |  |
| Deploy web application |  |
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# Expected Outcomes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Type | Date | Assignees | Method | Time | Purpose |
| Project Requirements Meeting | 5/18/2022 | Project Team  Project Stakeholders | Zoom | 1 hour | To discuss with the stakeholders what the requirements of the project are. |
| Scrum Meeting | Weekly on  Mondays at 7:00 pm | Project Team | Discord or Zoom | 30 min | Discuss progress, establish and assign tasks during next sprint. |
| Informal Progress Updates | Asynchronous | Project Team | Discord | N/A | Discuss and development milestones, issues, complications, etc. |
| Planning Documentation Submission | 5/23/2022 | Joanna Smith | Canvas Submission |  | Establish project tasks, set deadlines and assign team members |
| Prototype Submission Alfa | Summer Semester |  | Canvas Submission |  |  |
| Test Plan Alfa Submission | Summer Semester |  | Canvas Submission |  |  |
| Technical Documentation Submission Alfa | Summer Semester |  | Canvas Submission |  |  |
| Alfa Version Submission | Summer Semester |  |  |  |  |
| Alfa Test and Revision Report Submission | Summer Semester |  | Canvas Submission |  |  |
| Beta Revision | Fall Semester |  |  |  |  |
| Update Tech Doc and Test Plan | Fall Semester |  |  |  |  |
| Beta Version Submission | Fall Semester |  |  |  |  |
| Beta v2 Revision | Spring Semester |  |  |  |  |
| Beta v2 Submission | Spring Semester |  |  |  |  |
| Update Tech Doc and Test Plan | Spring Semester |  |  |  |  |
| User Documentation | Spring Semester |  | Canvas Submission |  |  |
| Developer Documentation | 7/17/2022 |  |  |  |  |
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# Project Plan

Graphical user interface, text, application, email

Description automatically generatedGraphical user interface

Description automatically generated

Graphical user interface, application

Description automatically generated