# Table of Content


1. Introduction
1.1 ScholarHomes Overview…..……2
1.2 Validating the Market..……2
1.3 Market size.……..……..3
1.4 Business Model……..……...3

2. General Description
2.1 Product/System Function…….4-5
2.2 User Characteristics and Objectives……..6
2.3 Constraints..…….6

3. Function Requirements
3.1 Register……7
3.2 Log In……7
3.3 View Properties...……8
3.4 Apply for Rent……..8
3.5 View my Listings……..9
3.6 My applications……..……...…9

4. System Architecture
4.1 Architectural Diagram for the System……..10
4.2 Web Application……...10-11
4.3 MYSQL Database……11

5. High-Level Design
5.1 Site Map……12
5.2 User Flow……...13

6. Preliminary Schedule
6.1 Task List ……14
6.2 Kanban……..…….14-15

7. Appendices
7.1 References ……...….15
7.2 Resources…….…….15

# 1.) Introduction

## 1.1 ScholarHomes Overview

We've crafted the ScholarHomes system as a cutting-edge online platform that aims to bring together Landlords and Students, simplifying the tiresome process of searching for student accommodation and creating leasing. Our feature-rich portal is designed to not only facilitate a meaningful connection between landlords and students but also to empower students in making informed decisions about their accommodation choices. The platform is separated into two distinct sides, each catering to the specific needs and functionalities of both landlords and students. Landlords can effortlessly post and manage leasing through one interface, while students are provided with an intuitive portal to explore property listings and make well-informed selections that align with their preferences and requirements.

This application is designed to increase the number of accessible student accommodation by opening the market to private sectors that may have an interest in renting to students. For example, allowing Irish tenants such as families or fellow students to post listings that describe not only the accommodation type they have available e.g. a shared room or a single room; But also displays the type of tenant they are seeking. Families may seek a more introverted tenant to avoid disruptions in their household, whereas a shared student accommodation may be seeking a more extroverted tenant who can better integrate into a communal living environment. This also benefits students as it provides them with more context about the accommodation before committing to a lease. International students may seek to stay with an Irish family rather than a shared student accommodation to further immerse themself in Irish culture during their visit.

## 1.2 Validating the Market

We understand that there is a clear market for students who are seeking accommodation. This is evident by the current lack of available student accommodation in Ireland. There have been numerous attempts by students to get the government to invest in accommodation for students. This can be seen in a protest held in Dublin city centre on the 4th of October 2023 which approximately 300 students attended. These students demanded the government lower the student contribution fee and build student accommodation. This is a clear sign that there is a current need in the market for additional accommodation specifically for students. We believe our application fits this niche.[1]

We are confident that Irish landlords will be eager to welcome students into their homes. Currently, the average rent in Ireland surpasses the peak of the Celtic Tiger era by more than 50%. This presents a lucrative opportunity for landlords, as they can profit significantly by renting a single room to a student for the duration of an academic year, spanning 7 to 8 months. This is particularly noteworthy given that Ireland is currently one of the most expensive countries to reside in within Europe. To illustrate, Irish goods are 40% pricier than the average cost of goods in the EU[2].

[1] *RTE.ie, Students protest in Dublin over accommodation crisis*
[2] *Joe.ie, Average rent in Ireland is now 50% higher than Celtic Tiger levels*

### 1.3 Market size

Through rigorous research, we have determined the target market for students to be 202,100. This calculation involved subtracting the existing student accommodations from the total number of students enrolled in college annually. To uphold the accuracy and relevance of our findings, we relied on verified sources specialising in Irish student data. Additionally, we ensured that the statistics utilised were gathered within the last 3 years, emphasising the reliability of our analysis.

We used statistics directly taken from the higher education authority website. The higher education authority (HEA) is a government run organisation that works on researching and developing higher level education in Ireland. In 2021, the HEA recorded the number of students enrolled in college to be 245,600. This figure has shown itself to be increasing over time based on HEA statistics, meaning our target market may be even larger than predicted. The HEA also estimated that the number of student accommodation available for the year 2024 to be under 43,500. As this is an overestimation of the amount of student accommodation available, it can be presumed that our target market will be larger than the figure we predict. Through a methodical approach, we have calculated our target market by subtracting the available accommodation from the total number of enrolled students. This calculation indicates a substantial market size of at least 202,100 students[3].

### 1.4 Business Model

From a business perspective there are several income channels we intend to tap into in order to generate a profit. Firstly, we intend to allow third parties to pay for advertisements to be placed on the site. These ads will be designed to not be overly intrusive for the user. If we create advertisements that are too invasive, it may discourage users from using the application. We also intend to implement a freemium model, allowing users to pay a small fee to avoid seeing these ads. By paying this fee, users will also unlock additional features that are exclusive to premium users. Some potential premium features we're considering implementing after launching our first prototype are, priority listings or applications, being able to upload videos on a listing and being able to apply to have your accommodation or student account verified.

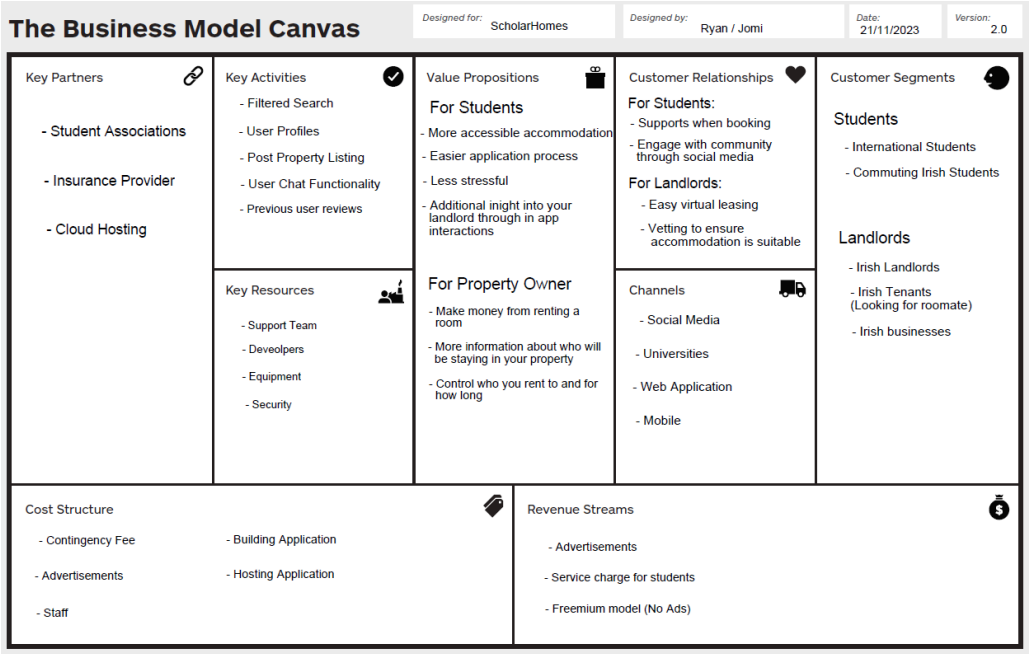


***Figure 1 - Business Model Canvas of ScholarHomes***

[3] *Higher education – key facts and figures 2020/2021*

## 2.) General Description

### 2.1 Core System Function

We have compiled a list of core functionalities we aim to implement in our initial prototype. These are the features that we are aiming to include in our initial prototype. We may make changes to these processes or omit certain functions due to constraints referenced in section 2.3.

User Functionalities

**Register**
In order to use our site's core functions, users will be required to register as either a student or landlord using the register function. This will require the user to set a username, password, name, etc. The type of user that the user is registered as will affect the functions they will have access to and their overall interaction with the system.

**Login**
This function will allow users to log into their personal profile using their credentials. They will then be directed to either the student or landlord homepage and have access to the core functions of that user type.

**View Profile**
This functionality allows users, particularly landlords and students, to effortlessly navigate and delve into the profiles of their peers. Through profiles, users will get the opportunity to express their personality. The main objective of this function is to facilitate a deep understanding of each other's character, empowering both landlords and students to make informed decisions when considering a lease commitment.

**Edit Profile**
Users will get the opportunity to update details on their profile using this function. This is a pivotal function in the event the user wants to update their details for example, to reflect a change in circumstances.

**Create Property Listing**
Landlords will be able to advertise property listings they have available provided they have registered as a landlord. Landlords can create multiple listings if they have multiple properties they wish to lease.

**View Properties**
This function will allow all users, including non registered users, to view the current properties listed on the system. It's important that this function is accessible to incentivise users to register and utilise the system. If we make registering a requirement to view listings we may be limiting the growth of our user base. The properties shown can be narrowed through a featured filtered function eg. filter to show properties located in Dublin.

**Search properties**
Users can use a search bar to search for a specific property. They can do this by typing the name of the property. The results of this search can also be narrowed through our filter function.

**View my Listings**
Here the landlord will be able to view all listings they have created. The details of the Students who have applied to each of these listings will also be displayed here.

**Edit Leasing**
The details of a leasing can be altered. This is vital as a change of circumstances may have occurred and the details may need to be updated.

**Apply to Property**
This feature is available to users provided they registered as a student. Users can apply to properties listed on the system. This function will allow users to fill out an application to be reviewed by the landlord and potentially could lead to the landlord offering a lease. The application will require the applicant to fill out a message and provide a phone number and/or email.

**View Applications**
This function will allow student users to view all their currently ongoing applications. This will give students a chance to reflect on any previous applications they have made

**Chat with User**
This functionality will provide users with a more flexible and direct method of communication. This allows students and landlords to discuss details of the lease and foster a sense of connection. The chat feature should be accessible when viewing a user's profile.

**Submit Proposal**
When a landlord wants to finalise a lease with an applicant and proceed to the payment stage, they can submit a proposal to the applicant which can be accepted or rejected. This proposal will detail the length of the lease, the payment amount and any additional details.

**Complete Payment**
Once a student user receives a proposal to rent a property that they applied to and choose to accept it, they can proceed to payment. This will prompt the user to insert their credit or debit card information for the transaction to occur. Once successful, both users will be updated on the success status of the application when they check the application. If an error occurs, the student will be notified that the transaction has failed.

<u>System Functionalities</u>

**Clear and easy to use User Interface**
Our goal is to design an intuitive interface that caters to users with varying levels of technological expertise, ensuring accessibility for both tech-savvy individuals and those less comfortable with technology.

**Database Connectivity**
Our database will be hosted alongside our application on the Django framework. This will allow us to easily manage our data and manipulate the structure of our database should any new requirements arise during the development stage that require a change in our architecture.

### 2.2 User Channels and Objectives

ScholarHomes will initially be launched as a web application that can be accessed online through a search browser. This is an extremely accessible platform for both our landlord and student demographic. This application is intended for students searching for accommodation within Ireland and Irish landlords or tenants who are seeking to lease out a room or property to University students.
Landlords achieve their goals by creating a property listing on ScholarHomes. This listing will state the rent of the property, a description of the type of tenant they are looking for and the house rules. The landlord will then have to wait a period of time for University students to apply to their listing, the time period for this process can vary based on students' interest in the property. Landlords can create multiple listings at any given time should they have multiple properties available.
Students achieve their goal by searching through the property listings available, successfully negotiating with the landlord and securing a lease. When a student has made an offer on a property and both parties have come to an agreement using the built in chat functionalities, they can proceed to the final stage of the application. The Landlord will send a proposal to the applicant to accept stating the duration of the lease, price and defining the start and end date. This proposal will then be received by the student to be reviewed, and if favourable accepted. Once accepted, the student will be directed to the payment process and prompted to insert their payment information. Once completed, the transaction shall occur and both parties will have successfully completed their goal of leasing or renting student accommodation.

### 2.3 Constraints

We have gathered a list of factors that we believe will have an impact on the development of our project which must be considered.

**Time**
As the completion date for this project is 19/04/2024, time is a major factor that must be considered. We have many other obligations such as career opportunities and other assignments that must be undertaken during this time. This will most likely affect the amount of content we can produce in our first prototype.

**Knowledge**
As our current development team consists of two developers who are new to the industry, we must limit development tools to services and programming languages we are familiar with. This has led to our decision to develop our application using the django framework which we are familiar with from our coursework. We will also be using languages we have previously interacted with such as SQL, HTML, Python, Javascript and CSS.

**Data**
As this is a prototype and we have no real users or leases as of yet, we will be creating a set of 'dummy data' which we will create based on real locations and properties in Ireland. We will create these data entries on our database that is hosted on the Django framework we are currently developing the application on.

**Ease of Use/UI Design**
To maximise accessibility and broaden our user base, we are committed to adhering to contemporary design guidelines that facilitate an intuitive User Interface. Our aim is to create an interface that is user-friendly, ensuring even those with limited tech exposure can navigate and use the app effortlessly. Inclusivity is a priority, and our design will consider factors like colour blindness, employing suitable colour schemes such as white and green to enhance usability for the visually impaired. This constraint limits our style options and will take time to flesh out.

## 3) Function Requirements:

### 3.1 Register

**Description:**The user's first step towards becoming a member is to use the 'Register' function. Our site has two kinds of registered-users: students and landlords. On the site's main page, there is a link that takes you to a registration form for either students or landlords. Any user who wants to use our site will have to sign up with their details. The user must enter their password, username, and email address when this form asks for them.

**Criticality:** Having separate user profiles for students and landlords in a student housing app makes the experience more personalised and quick, meeting the needs and expectations of everyone involved in the renting process.

**Technical issues:** The form for signing up will be made in HTML and will match the main style of the site. PHP functions will be used to handle the form entries and will connect to our MySQL database to store user data.

**Dependencies:** Not dependent on other features.

---

### 3.2 Log In

**Description:** This function is a simple script that asks the user for their username and password when they select to log in. This information is provided by the user when they register and stored in our database. When a user wishes to log in, they complete a form entering their username and password. This function then searches our database for the username and password entered by the user. If the user forgot their username or password, they can click the following link "I forgot my password" to receive an email containing the user's username and steps to reset their password.

**Criticality:** The ability to log in to our app is very important for many reasons. Firstly, it enhances the security of our system by having user authentication. It does this by protecting sensitive data and ensures that only people who are allowed to can access the platform. This feature also lets users customise their experiences, so students and landlords can easily handle their profiles, preferences, and interactions. Having system authentication is also critical to our business processes that require multiple users, e.g. property leasing between students and landlords.

**Technical Issues:** The system will need some kind of protection to keep people from getting in without permission. We will also need to ensure our site's urls are routed correctly and only users who are correctly authenticated with the correct permissions can access certain pages, functions and data.

**Dependencies:** For users to get in, they will need to use the correct information they gave when they registered.

### 3.3 View Properties function:

**Description:** The ‘View Properties’ function enables landlords to showcase and manage their rental properties. Landlords can create detailed listings that include property specifications, such as location, rental rates, amenities, and lease terms. This function allows for easy property management, enabling landlords to update availability status, upload images, and communicate directly with prospective student tenants. Users do not require authentication to see these listings.

**Criticality:** The ‘View Properties’ function is critical in a student accommodation app as it serves as the primary avenue for landlords to present their rental properties to potential student tenants. This feature streamlines the property management process, allowing landlords to provide comprehensive details about their listings which can be updated as needed. It is not only an efficient and direct way for landlords to communicate the details of the property to students, but also ensures a simple user-friendly experience for both parties. This function is also pivotal for enticing unregistered users to register by showing them the accommodation available on our application.

**Technical issues:** Details of each property listing will be stored on our SQL database. This function may pose technical challenges related to data management and scalability. As our system evolves and the scale of our application expands, we may need to consider migrating our database to a different platform.

**Dependencies:** Depends on landlord-users signing up to the app to post listings.

---

### 3.4 Apply for Rent function:

**Description:**
The ‘Apply for Rent’ function allows students to submit applications for renting specific properties listed on the platform. This feature streamlines the application process by providing a user-friendly interface for students to enter necessary information, upload required documents, and communicate their interest to landlords.

**Criticality**: The "Apply for Rent" function is of the utmost importance because it's where potential renters can show interest in a property and officially apply for it.

**Technical issues**: The form used to create the apply for rent function has to be fully functional or students will not be able to rent. These details require storage on our SQL database.

**Dependencies**: Depends properties being listed completely. Also dependent on registered student-users to apply for listings.

### 3.5 View my Listings function:

**Description:**
The ‘View my Listings’ function gives landlords a central, easy-to-use interface to govern their rental properties. This feature gives landlords the tools they need to oversee and make changes to property listings, keep track of tenant applications, talk to potential or current renters, and keep an eye on financial transactions like rent payments.

**Criticality:** The dashboard operates similarly to a command centre; it gives landlords the full scope of all of their properties and makes it easy to handle them, communicate with tenants, and keep track of payments all within the app.

**Technical Issues:** The issue we could face here is that there are a lot of steps that are regulated through this dashboard. We must ensure that all processes operate as intended and flow cohesively to ensure flawless functionality throughout the overall leasing process. This involves running multiple tests to find and patch exploits as soon as they arise.

**Dependencies**: Depends on property listings made by the landlord. Requires registered a landlord to view this interface.

---

### 3.6 My Applications function:

**Description:** This feature allows students to access a personalised portal where they can view the properties they have applied for and check the status of their applications for each property.

**Criticality:** This is important because it provides students a hub to keep track of their applications and to be able to get direct feedback from landlands. It is also pivotal that students can view the history of applications they have made to comply with modern design practices.

**Technical issues**: There are a lot of potential bugs that can arise due to the constant change in application status. We must ensure that the flow of our functional processes are cohesive and do not conflict with each other. For example, an exploit in the flow of the process within our code may cause a student's application to be halted and unable to proceed. The logic for these processes will be written in Python and contain elements of HTML to design the user interface.

**Dependencies:** depend on applications being made by students and also properties being listed. Additionally requires a registered student-user.

## 4.) System Architecture

### 4.1 Architectural Diagram for the System:

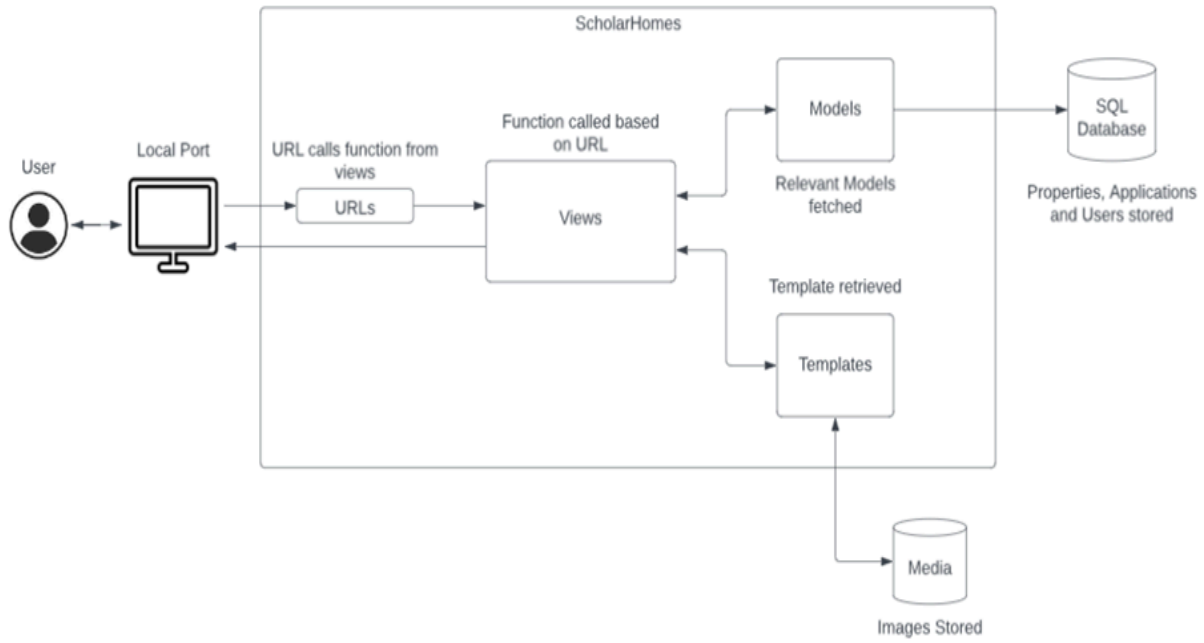


*Figure 2 - System Architecture Diagram*

### 4.2 Web Application:

**Browser to Urls.py:** This link makes sure that when a user interacts with the app in the browser by typing in a URL or clicking on buttons and links, the Django framework can connect these actions to the functions set out in the urls.py file. The urls.py file is like a router; it has patterns that match the URLs that people type in. In the views.py file, each URL pattern is linked to a different view. The logic and material that should be shown to the user are determined by these views. This link makes sure that when a user does something in the browser, the right views and functions are activated. This makes it possible for a well-organised and adaptable web app.

**Urls.py to the views.py:** The relationship between the urls.py and views.py files in the student accommodation app are crucial for coordinating the navigation and operation of the program. The urls.py file serves as a router, encompassing a mapping of URL patterns to certain views within the application. The connection is formed by utilising Django's URL patterns, where each pattern is linked to a particular view that is described in the views.py file. The views.py file contains the views that encapsulate the logic and behaviour associated with various components of the student accommodation app. For instance, when a user wants to find out about the accommodations that are available, the URL pattern in urls.py will guide the request to the appropriate view in views.py that is specifically built to handle queries related to accommodations.

**Views to the models.py and templates folder:** In the student accommodation app, the views.py file, the models.py file, and the template folder must all be linked in order for the app to be well-structured and work properly. The three parts work together to keep different issues separate, keep data safe, and give people clear information. The models.py file sets up the data models that describe the app's most important entities, like Student, Accommodation, and Reservation. These models are used by the views in views.py to get, make, update, or delete data based on what the user wants. To show this answer to the user, the views use HTML files that are kept in the template folder. The templates set the structure and layout of the user interface and include information that changes based on what the views do. The related view in views.py gets the information from models.py and sends it to the right template if a user wants to see more information about a certain room. The template then displays the data in an easy-to-use way, making sure that the user has a smooth and uniform experience.

**4.3 MYSQL Database:**

The MySQL database is crucial for storing and maintaining vital data pertaining to lodging listings. The database is organised using a table called 'accommodations,' which establishes the structure for each record related to accommodations. The fields 'name,' 'address,' 'rent,' 'description,' and 'created_at' are designated to capture pertinent information. The 'id' field functions as a primary key, automatically generating incremental values to guarantee that each lodging is assigned a distinct identity. Upon user interaction, the PHP script establishes a connection with the MySQL database to execute actions. The getAccommodations() function obtains the accommodation listings stored in the 'accommodations' table, enabling users to view and explore the available choices. The addAccommodation() function enables the inclusion of new records, capturing information such as the name, address, rent, and description of the accommodation, which are subsequently placed in the database. The 'created_at' timestamp indicates the exact time when each listing was added. The well-structured system enables quick and effective retrieval, insertion, and maintenance of data, ensuring smooth operation of the student accommodation app and provision of precise and current information about available accommodations to users. Moreover, MySQL provides functionalities like indexing, which helps optimise query performance, making it an appropriate selection for managing the data needs of our application. The student accommodation software would greatly benefit from MySQL's exceptional stability, scalability, robust querying capabilities, and advanced security features. The application's performance and adaptability enhance the user experience by effectively handling accommodation data, facilitating future expansion, and upholding robust data security.

## 5.) High-Level Design

### 5.1 Site Map

This site map illustrates the hierarchy of accessibility for each page and/or function included in or application. An unregistered user will initially be directed to the home page. Once Authenticated, they will be directed to either the student or landlord dashboard depending on what type of user they are. This will restrict certain user types from using functions they should not be able to use, e.g. a landlord applying for a property.

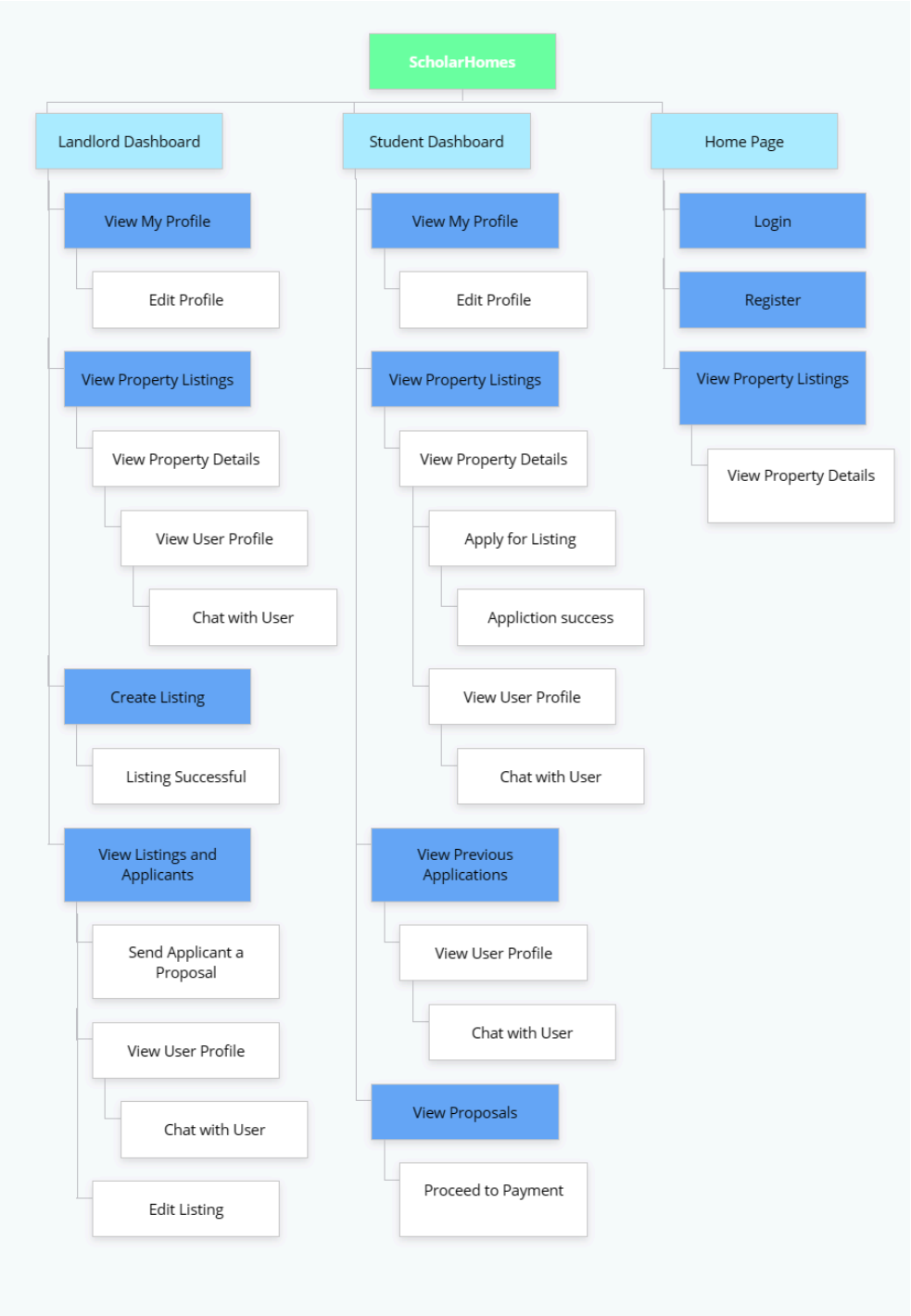


*Figure 3 - Site Map illustrating function hierarchy*

## 5.2 User Flow

This visualisation offers some insight into the business process that takes place between landlords and students. This diagram also provides some context into what happens when scenarios do not go entirely to plan, e.g. a student does not agree to the proposal the Landlord has made.

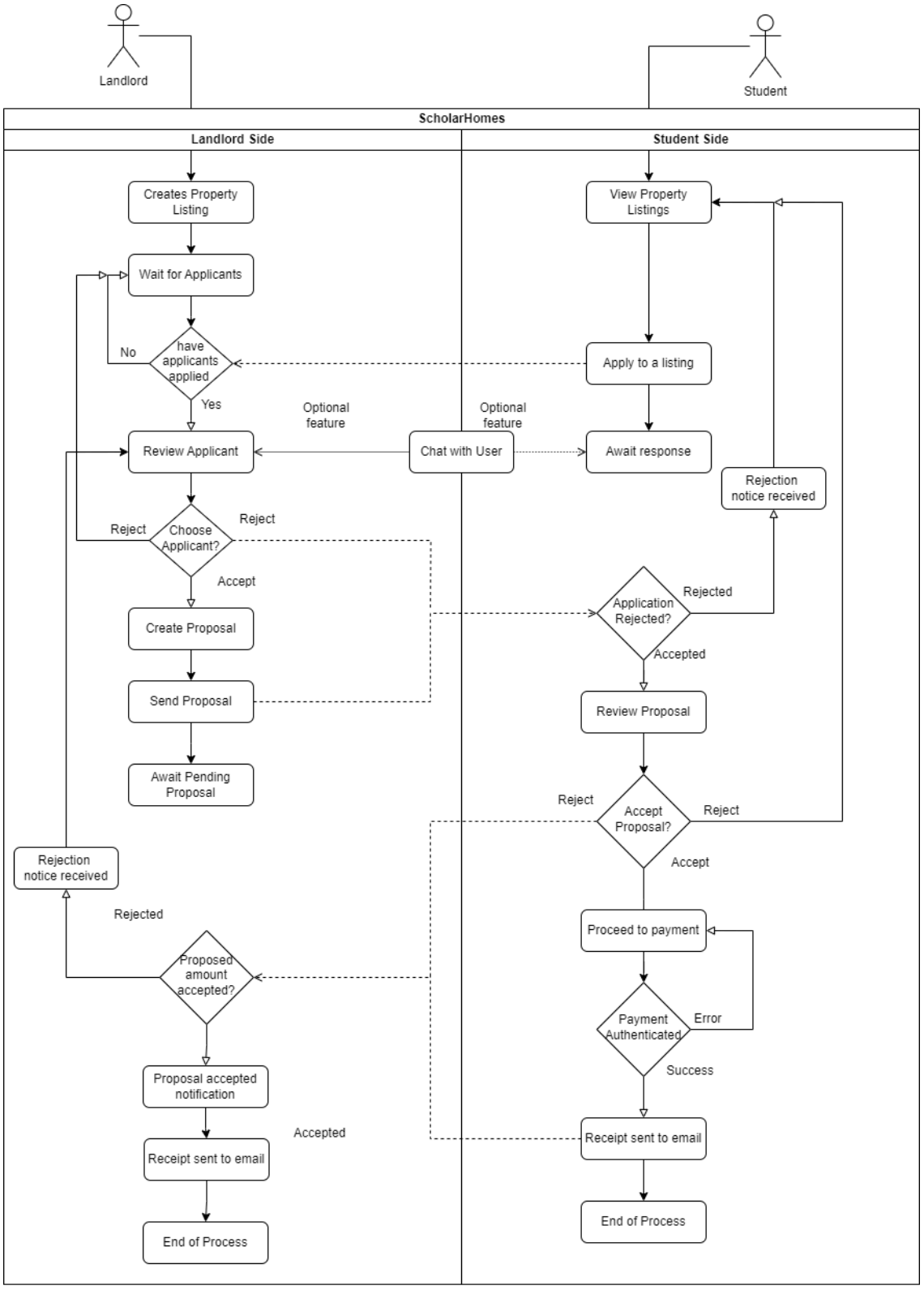


*Figure 4 - Flowchart Diagram illustrating property leasing process*

# 6.) Preliminary Design

## 6.1 Task List

| Project | Owner | Status | Date | Due date | Priority |
|---|---|---|---|---|---|
| Project idea & partner | | Done | 11 Sep, 2023 | ~~29 Sep, 20...~~ | Low |
| Project proposal | | Done | 30 Sep, 2023 | ~~20 Oct, 20...~~ | High |
| Project Approval | | Done | 20 Oct, 2023 | ~~16 Nov, 20...~~ | High |
| Functional specification | | Working on it | 8 Jan | 19 Jan | Medium |
| Mid term delivery | | Working on it | 10 Jan | 19 Jan | Medium |
| Supervisor | | Done | 29 Sep, 2033 | ~~30 Sep, 20...~~ | Low |
| Interface design | | Working on it | 15 Jan | 20 Jan | Medium |
| interface coding | | Not Started | 22 Jan | 3 Feb | High |
| Interface testing | | Not Started | 3 Feb | 7 Feb | Low |
| System Arthitecture | | Working on it | 15 Jan | 20 Jan | Medium |
| System coding | | Not Started | 8 Feb | 28 Feb | High |
| System tesing | | Not Started | 28 Feb | 4 Mar | Medium |
| Testing of all components | | Not Started | 4 Mar | 25 Mar | Critical |
| Final project delivery | | Not Started | 26 Mar | 4 Apr | Critical |

*Figure 5 - Task list of primary project objectives*

## 6.2 KanBan Board:

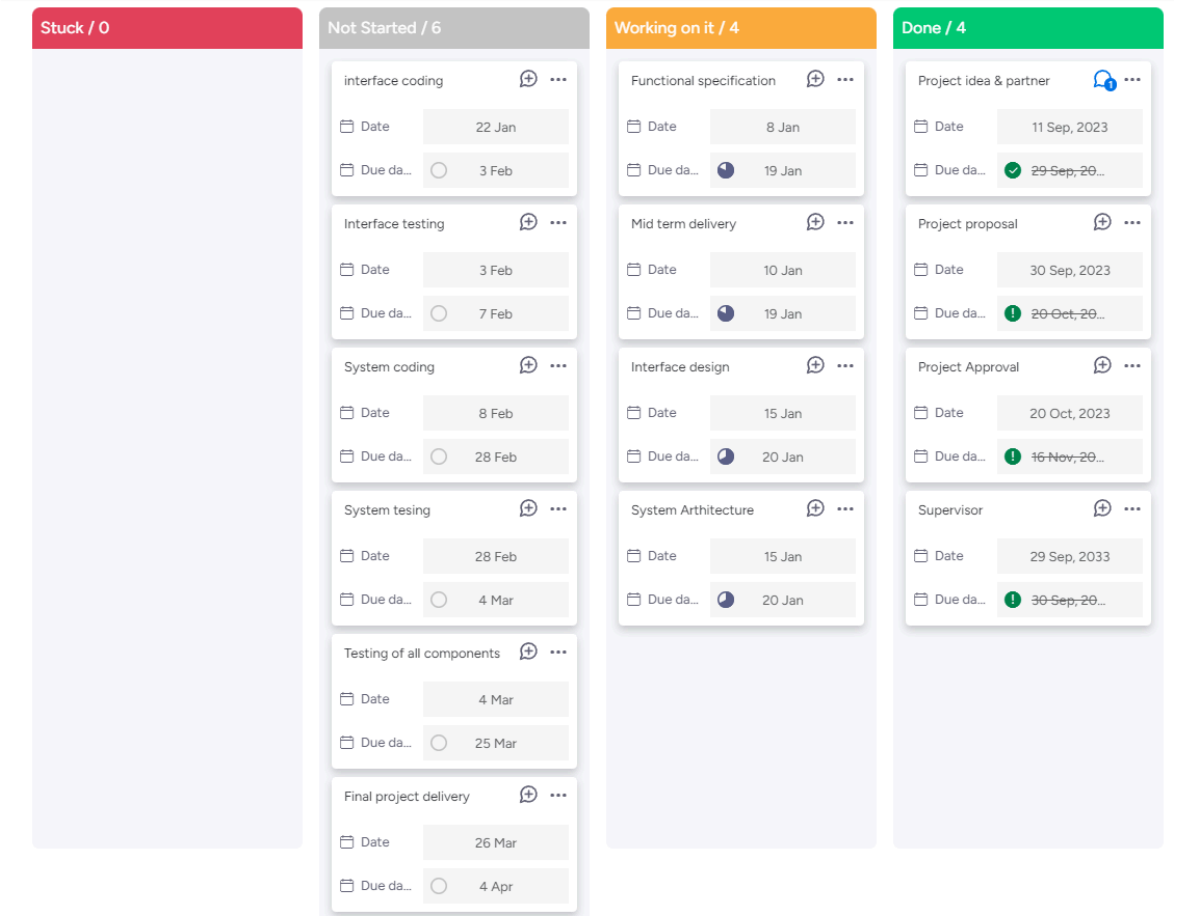


*Figure 6 - KanBan Board managing project objectives*

For project management, a Kanban board is very helpful because it shows jobs, workflows, and progress visually. Its main benefit is that it makes teams more open and collaborative. Team members can easily keep track of the progress of each task by dividing the project into separate tasks and arranging them in groups that show the different stages of completion. This visual clarity makes it easy to find problems quickly, manages work flows more efficiently, and helps everyone agree on what the project's goals are. Kanban also encourages a pull-based system, which lets team members take on new tasks as they finish old ones. This makes the best use of resources and keeps people from getting too busy. In the end, the Kanban board helps teams communicate in real time, boosts output, and gives them the tools to quickly adapt to changes, making it an important tool for project success.

## 7.) Appendice

### 7.1) References


1. Sullivan, C. (2023) *Students protest in Dublin over accommodation crisis*, *RTE.ie*.
   Available at:
   https://www.rte.ie/news/ireland/2023/1004/1408964-student-protest/
   (Accessed: 16 January 2024).

2. Hughcarrhere (2022) *Average rent in Ireland is now 50% higher than Celtic Tiger Levels*, *JOE.ie*.
   Available at:
   https://www.joe.ie/news/average-rent-ireland-2022-747992
   (Accessed: 16 January 2024).

3. O'Shea, M. (no date) *Higher education – key facts and figures 2020/2021*, *Higher Education Authority*.
   Available at: https://hea.ie/2021/10/11/higher-education-key-facts-and-figures-2020-2021/
   (Accessed: 17 January 2024).


### 7.2) Resources

1. Draw.io - https://app.diagrams.net/
2. www.w3cschools.com
3. https://www.google.ie/
4. https://docs.google.com/
5. https://monday.com/
6. Adobe Acrobat - https://www.adobe.com/ie/
7. https://www.gloomaps.com/

### 7.3) Figures

1. **Business Model Canvas of ScholarHomes - Created on Adobe Acrobat**
2. **System Architecture Diagram - Created on Draw.io**
3. **Site Map illustrating function hierarchy - Created on Gloomaps**
4. **Flowchart Diagram illustrating property leasing process - Created on Draw.io**
5. **Task list of primary project objectives - Created Monday.com**
6. **KanBan Board managing project objectives - Created Monday.com**