TENDER DOCUMENT ON HOME PLANTS E-COMMERCE MOBILE APPLICATION

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Executive Summary

This report intends to emphasise the response taken to the client's proposal for an e-commerce mobile application. Developed by a single software engineer, this document highlights the processes taken for solving the client's proposal. Specifically, the solution being a mobile application which has the functionality to login and buy/sell home plants. This system will provide the optimal choice for customers to achieve the core functionality with a range of features to accommodate this.

Revision History

Project Name: GreenHouse Application

VERSION 7.0

Prepared by Joshua Devine

For the Client Sharyn Devine

11/04/2022

Name	Date	Description	Version
Joshua Devine	11/04/2022	Initial Client and Engineer meeting	1.0
Joshua Devine	15/04/2022	Beginning of Tender Document	2.0
Joshua Devine	02/05/2022	Presentation of overall current progress	3.0
Sharyn Devine	02/05/2023	Review of the current progress	4.0
Joshua Devine	21/05/2022	Presentation of overall current progress	5.0
Sharyn Devine	21/05/2022	Review of the current progress	6.0
Joshua Devine	25/05/2022	Beta deployment of application	7.0

1.0 Introduction

1.1 Purpose

The purpose of this system is to provide consumers a central marketplace for dealing with plants of all kinds. Rather than using existing systems which provide the ability to market plants as well as other products, this application intentions are to provide a unique experience which is tailored to purely to the marketing of plants. The experience should encapsulate all the needs and expectations that a consumer has regarding buying and selling a plant on a platform/marketplace.

The software engineering firm has reached out to the client Sharyn Devine with a pitch to simplify her existing process of physically selling plants at a marketplace. Instead of physically exerting herself to move all her stock to an actual marketplace, sell what she can sell and then take all her remaining inventory back this platform will allow her to easily to do it from the comfort of the users own home. The application can be marketed like any normal application and deployed to either the android play store or ios application store or both depending on my client's specifications. This platform will essentially allow any home grower of plants to start their own business from the comfort of their own home.

1.2 Goals of the System

G1: To provide consumers a platform to buy plants.

Purpose: Allow users to explore a variety of inventories from home growers to larger businesses to satisfy their needs for the desired plant.

Fit Criteria: When the application is launched the application userbase should increase by 30-40%.

G2: To provide consumers a platform to sell plants on.

Purpose: Allow users to start their own business to sell their inventory of plants.

Fit Criteria: When the application is launched the application userbase should increase by 30-40%.

G3: To provide consumers a safe and secure platform to conduct business on.

Purpose: Users which use the platform to conduct business should feel reassured and confident that there are the appropriate systems to ensure data integrity.

Fit Criteria: A recent poll for a competitor application indicated that 60% of users believed their data was mishandled and potentially could result in data breaches. Since our application will have to gain user trust and confidence, we aim to bring the level of concern down to 10-20% by including proper indication of permissions, EULA and a clear privacy contract.

1.3 Scope

The intentions of this document are to provide the client with a clearly defined solution to a virtual marketplace for selling plants. This was be facilitated through the outlining of requirements, constraints, design choices made, the testing associated, and analysis of the risks present to the system. The document will initially define the problem that is trying to be solved before diving into the actual specifications and design of the system. The timeline has not been properly defined or agreed upon with the client and the developer however it has been agreed the MVP stage of the project will be in the first 6 weeks of development. Phases 1 and 2 have not been properly designated yet, but as of right now it is assumed that phase 1 will be year 1 and phase 2 being year 2.

2.0 Problem Definition

Existing e-commerce solutions provide users the ability to make listings for various products which can include plants of any nature. Whilst this does allow users to remotely purchase and sell plants it fails to meet those specific needs and questions that a consumer would expect from buying a plant. These existing e-commerce platforms aim to provide a general experience when buying/selling goods, thus sacrificing these unique experiences that would be expected when going to a flower shop or garden centre. Purchasing a bag of dog food would be same experience as the user trying to order a succulent. It's clear that consideration needs to account for whether the trade-off have a unique, tailored experience is more desirable than having the ability to order all kinds of products. Though its clear that customer satisfaction with their ordered products is not great as users of existing solutions would not use the service again to facilitate there purchasing needs for plants.

It's clear that the constraints of creating a system of this nature need to be considered, specifically:

- Achieving a desirable, unique experience which will entice users to use our platform compared to a platform which allows for a general, more convenient product choice experience.
- The new system must meet the design characteristics relating to the functional capability.
- The new system will be safe and secure.
- The new system will handle personal information properly.
- The new system will be easy to use and direct the user to where they desire to go.
- The new system will account for a regular maintenance plan, with regular updates achieved through appropriate means (i.e. over the air).
- The new system will be marketed and advertised through the necessary channels that the client desires
- The new system will adhere to the client's specifications.
- The new system will be developed within the specified timeframe and have deliverables met as specified by the client.

2.1 Assumptions

Table 2.1 describes and outline all the assumptions deduced throughout the document and creation of the system.

Table 2.1 – Table of assumptions

A.No.	Assumptions
A1	It is assumed that the application will meet the standard for applications as specified by either Google or Apple before being launched onto their store platforms.
A2	It is assumed that the user will have the appropriate hardware to use the application
A3	It is assumed that the user's devices will have the appropriate versions of software and firmware before using the application.
A4	It is assumed that the user would have read the EULA and/or privacy agreement before raising any discrepancies that corelate to any outlined area in these agreements.
A5	It is assumed the user will use platform for how it was intended.

A6	It is assumed that if a user has been found to breach the EULA they understand that their account will be terminated and will be restricted from using the platform.
A7	It is assumed as of right now that phase 1 will be year 1 of project development – will be confirmed by the client.
A8	It is assumed as of right now that phase 2 will be year 2 of project development – will be confirmed by the client.

2.2 Stakeholders

Table 2.2 – Table of Stakeholders

Serial NO.	Subsystems	Roles
S1	**Client**	The client is the individual who will be responsible for specifying what they expect from the system. They will do periodic reviews with the developer to see the progress made on the project and provide feedback.
S2	**Developer**	They are responsible for creating the documentation for the system as well as designing and creating the project. They will interface with the client regularly and ensure the users experience is optimal.
S3	**Users/Consumers**	The user will have access to the final product, where they will be able use the platform.
S4	**Google**	For android devices, users to gain access to the application, it will have to be approved by Google and then allowed to be uploaded onto the play store for users to access it.
S5	**Apple**	For ios devices, users to gain access to the application, it will have to be approved by Apple and then allowed to be uploaded onto the ios store for users to access it.
S6	**Expo**	The expo platform will allow for testing of the application during development and allow for a beta release of the application via expo go.

3.0 Deliverables

Throughout the course of the project timeline the expectation is to provide adequate documentation to support the delivered system. This documentation should justify the solution provided to the client by highlighting the decision making process for the system, design choices, what is required from the system and the planned testing for the system. Items expected to be delivered are:

A. Proposal

A proposal to the client highlighting the early conceptual design for the system and expectations from it, so that the client and developer can come to an initial agreement.

B. Tender Documentation for the System

This will be the supporting documentation that accompanies the system. It provides an overview of the whole project with key explanations on the system, scope of the project, how certain aspects were managed, the overall design for the system, testing and the assessment of risks associated with the project. This is an important deliverable as it is crucial to the progression of the project as it allows the developer to plan and respond to the client's requirements.

C. Gantt Chart

This important task/time scheduling tool will be displayed for the customer to review. This will be crucial in illustrating to the client the overall timeline of the project i.e., a visual summary of the scope. This will allow the client to determine when they will expect components of the project.

D. Resource Usage Sheet

For the client to clearly understand the reasoning behind the cost allocations for this project a resource usage sheet will be included with document. This will support the client understanding for certain project choices as it highlights key back-end components of the system, providing insight into how they are used, costs allocated to them and the kind of resource they are rather than providing just a high-level look of the whole system functionality. For instance, the cost associated with using external databases for user data.

E. System Design Figures

This deliverable is essential to providing a high-level overview of the system. Using UML diagram standards, a context diagram, state diagrams, class diagrams, system architecture diagram and many other diagrams will accompany the supporting documentation illustrating how the data will flow throughout the new system. These supporting figures are crucial to developing the client's understanding of the technologies implemented in the system and how the crucial data will move throughout it.

F. The System

A key deliverable of the project to the client. This will be the final product which is ready to be released to the consumer. This final product should satisfy all the specifications of the client with regards to meeting the requirements and expectation of the client.

G. Education Materials

These will be materials such as guidelines, documentation, video for helping users to perform/ explain certain functions of the system. This will be a post-launch deliverable which may or may not be required depending on user feedback. This could also be displayed via the application for first time users depending on user feedback.

H. Trello Board

The Trello board provides a constant look into the development of the system for the client and other interested stakeholders. Features which were initially agreed upon as well new features implemented later in the development cycle will be shown and tracked through this tool.

3.0 Requirements

3.1 Functional Requirements

The functional requirements outline how a system is supposed to be structured, and how it is eventually supposed to behave - not how well it is supposed to perform in these areas. The below table is the basis which our project must meet to be completed successfully, it includes the requirement, the phase at which it will be completed (from MVP, 1 or 2) and how important it is to the overall project using H, M and L which represents high, medium, and low importance, respectively.

Table 3.1 – Functional Requirements

Serial NO.	**Description**	**Phase**	**Importance**
FREQ001	The system will allow a user to login.	MVP	H
FREQ002	The system will allow a user to logout.	MVP	H
FREQ003	The system will allow a user who forgot their password to change it.	1	M
FREQ004	The system will have an initial splash screen to show the user before the data is loaded for the integral screens.	1	L
FREQ005	The system will allow users to read the agreement for using the application.	1	L
FREQ006	The system will allow users to read the privacy agreement.	1	L
FREQ007	The system will handle errors and display them to the user.	MVP	M
FREQ008	The system will allow the user to purchase items from the marketplace.	1	H
FREQ009	The system will allow the user to sell items through the marketplace.	1	H
FREQ010	The system will handle data through the backend.	1	H
FREQ011	The system should be able to register users to some sort of database.	1	H

3.2 Performance Requirements

3.2.1 Non-measurable Performance Requirements

In the non-measurable performance requirements, taking what was set up in the functional requirements and narrowing it down to see how well it should perform in these areas. In the initial non-measurable requirements, it is outlined how a section of the project should react to predictable pressures.

Table 3.2 – Performance Requirements (Non-Measurable)

Serial NO.	Description	Phase	Importance
PREQN001	The system will be flexible so that it can be incorporated into existing hardware infrastructure.	1	L
PREQN002	The system's components need to be clear and indicate to a user how they are meant to be used.	MVP	H
PREQN003	Within the first year of release the system should increase it userbase by 50%.	1	L

3.2.2 Measurable Performance Requirements

In the measurable performance requirements, building upon the previous table by listing the performance requirements which can be quantified and measured directly. It is outlined specifically how the system should perform using numerical requirements.

Table 3.3 – Performance Requirements (Measurable)

Serial NO.	Description	Phase	Importance
PREQM001	A user logging in should be responsive and achieved in <5 seconds.	MVP	H
PREQM002	A user registering themselves into the system should be responsive and achieved in <5 seconds.	MVP	H
PREQM003	A user who has forgot their password should be able to request a password change and update their details within 10-15 seconds.	1	M
PREQM004	The system should allow a user to create a product listing within <5 seconds.	1	M
PREQM005	The application should initially load within 10 seconds.	MVP	H
PREQM006	The system should allow a user to search for products and display results in <10 seconds.	2	L
PREQM007	A user logging out should be instant <1 second to respond.	2	L

3.3 Interface Requirements

The interface requirements outline how the system will interface or combine with the other sections in the system. It will outline how it links to previous requirements and who it is interfacing with from list of stakeholders as described in chapter 2.2 of this document.

Table 3.4 – Interface Requirements

Serial NO.	Description	Links to	Stakeholders Links to	Phase	Importance
IREQ001	The application will be functional on both android and ios devices.	PREQN001	S1, S2, S4, S5, S6	1	H
IREQ002	Users will be able to access the application from the google play store.	PREQN001, PREQN003	S2, S3, S4	1	M
IREQ003	Users will be able to access the application from the apple ios store.	PREQN001, PREQN003	S2, S3, S5	2	M
IREQ004	The application will utilise external database tools such as googles firebase platform to handle user data.	FREQ001, FREQ002, FREQ003, FREQ004, FREQ011, PREQM001, PREQM002, PREQM003, PREQM007	S2, S4	MVP	H
IREQ005	The system will be developed and tested using the Expo platform/ managed workflow.	PREQN001	S2, S6	MVP	H

3.4 Usability Requirements

The usability requirements outline how the system will be used by users. The system needs to be prepared to handle a variety of different users, each with different needs.

Table 3.5 – Usability Requirements

Serial NO.	Description	Phase	Importance
UREQ001	The system provides ease of access to all possible users i.e. young children, adults, elderly.	MVP	H
UREQ002	The application should be clear and easily direct users to where they need to go with no issue.	MVP	H
UREQ003	The application should clearly indicate where users can go for help.	1	H

UREQ004	The system will undergo necessary updates to keep it current with new standards, UI/UX design choices and other expected changes.	2	M

3.5 Operational Requirements

The purpose of operational requirements is to highlight how the system will perform when it is running normally. Specifically, these requirements should emphasise the expectations for the system when under pressure.

Table 3.6 – Operational Requirements

Serial NO.	**Description**	**Phase**	**Importance**
OREQ001	The system will function under large amounts of load and stress.	1	H
OREQ002	The application will not be region locked and can be used globally.	2	L
OREQ003	The application will properly respond to server issues on the backend of the application.	2	L
OREQ004	The system will be able to handle a large amount of newly registered users.	1	M

3.6 Benefits

The benefits section of the report aims to highlight how the users/ consumers will benefit from the availability of this system.

Table 3.7 – Benefits

Benefit NO.	**Description**	**Success Criteria/Metric**	**Links to**
BID001	A consumer will have a more enriching experience with the process of buying flowers.	User feedback suggests they are extremely pleased with the experience they had with purchasing a plant.	FREQ008, PREQM006
BID002	A consumer will have a more enriching experience with the process of selling a plant.	User feedback suggests they are extremely pleased with the experience they had with selling a plant.	FREQ009, PREQM004
BID003	The user was able to have a more personal experience with their favourite sellers, thus creating a relationship between the buyer and seller.	User feedback suggest that they really enjoy the ability to create a more personal connection with their favourite sellers.	FREQ008, FREQ009, PREQM004, PREQM006
BID004	Using an external database solution like googles firebase provides that level of data integrity/ security that might not be achievable through developing a personal solution.	Testing and reviews into the security of the application indicate a high security score meaning that the integrity of the data is ok and the best security practices are being implemented.	FREQ010, FREQ011, IREQ004, OREQ003, OREQ004

BID005	The platform will provide a mobile, ease of access solution to individuals who grow their own plants and are interested in selling them.	Regardless of wherever a user is or even if they do not feel confident to physically sell plants, they now can do it through their mobile devices.	FREQ009, PREQM004
BID006	The user can now remotely get the best experience of buying plants without having to go to a store or sacrifice these options for a poorer experience on a competitor platform.	User feedback indicates that users enjoy all the options and choices they have with purchasing a plant.	FREQ008, FREQ009, PREQM004, PREQM006

3.7 Benefits Realisation Plan

The benefits realisation plan is key to highlighting the effective delivery of benefits and ensures they are properly managed during the project timeline. This approach highlights which stakeholders are tied to each benefit, how prioritised the benefit is and when it will be completed by. The plan also highlights the status of the benefit, whether it requires more development time or completed i.e. WIP or if it is a completed design. The due dates are set between the MVP phase and end of phase 2.

Table 3.8 – Benefits Realisation Plan

Benefit	Owner	Priority	Due Date	% Complete	Status
BID001	S1 S2 S3	H	Q4 of 2022	25%	Work in Progress
BID002	S1 S2 S3	H	Q4 of 2022	25%	Work in Progress
BID003	S2	L	Q2 of 2023	25%	Work in Progress
BID004	S1 S2 S4 S6	H	Q2 of 2022	100%	Completed
BID005	S2 S3	M	Q1 of 2022	75%	Work in Progress
BID006	S2 S3	M	Q4 of 2023	0%	Work in Progress

4.0 System Design

This section of the report aims to highlight the design choices taken to create the desired system. Since a system of this nature has lots of components and interactions with other sub-systems the proper analysis and consideration needs to happen to highlight the design choices made.

4.1 System Architecture

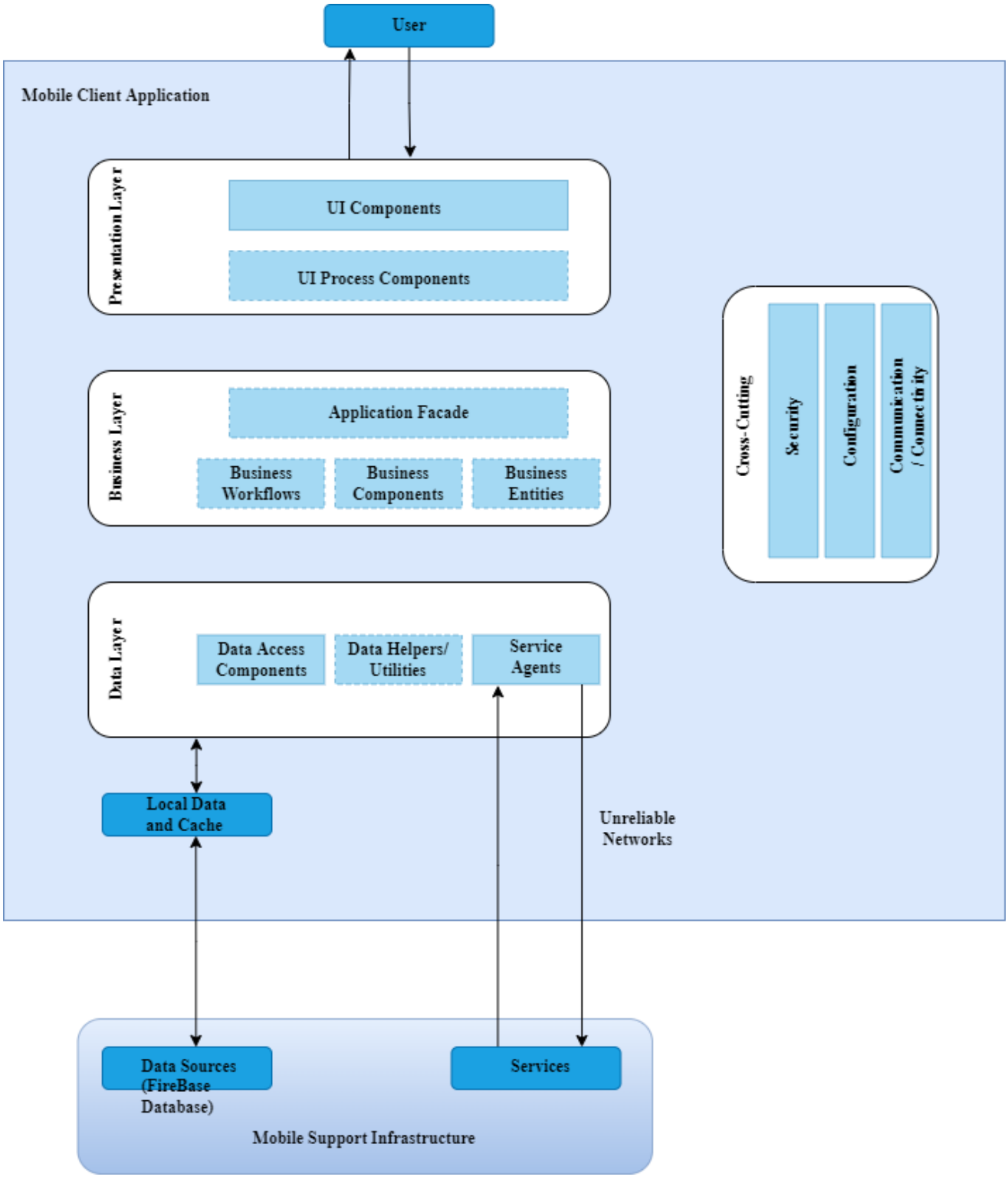

Figure 4.1 – Mobile Application System Architecture

As seen in figure 4.1 a mobile application architecture needs to account for three different layers the data layer, business layer and the presentation layer. These layers all work interchangeably to provide the user with their desired experience. The bottom data layer handles all the data that passes through the application and in this system design, is passed through to support services to handle the backend storge of it i.e. firebase. The business layer is responsible for handling all the logic of the platform that solves the problem, logic which creates the GreenHouse experience such as the persistence of data through screens. Finally, the presentation layer is the layer that the user interacts with the components and how those interactions are processed and passed to the lower layers. Of course, there also must be great consideration into the security of the application as well, mobile devices contain a lot of personal data which could compromise an individual if it were to be exposed. The GreenHouse application wouldn't want to be responsible for creating a vulnerability in devices so as seen in figure 4.1 the cross-cutting between each layer is responsible for handling security across the application as well as other items.

4.1.1 Android Mobile Architecture

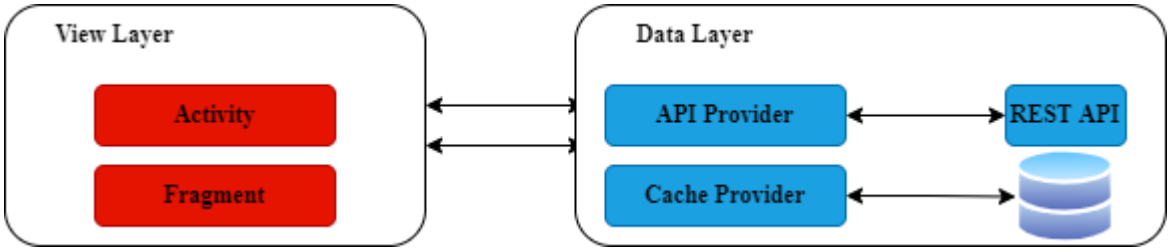

Figure 4.2 – Android Mobile Architecture

4.1.2 IOS Mobile Architecture

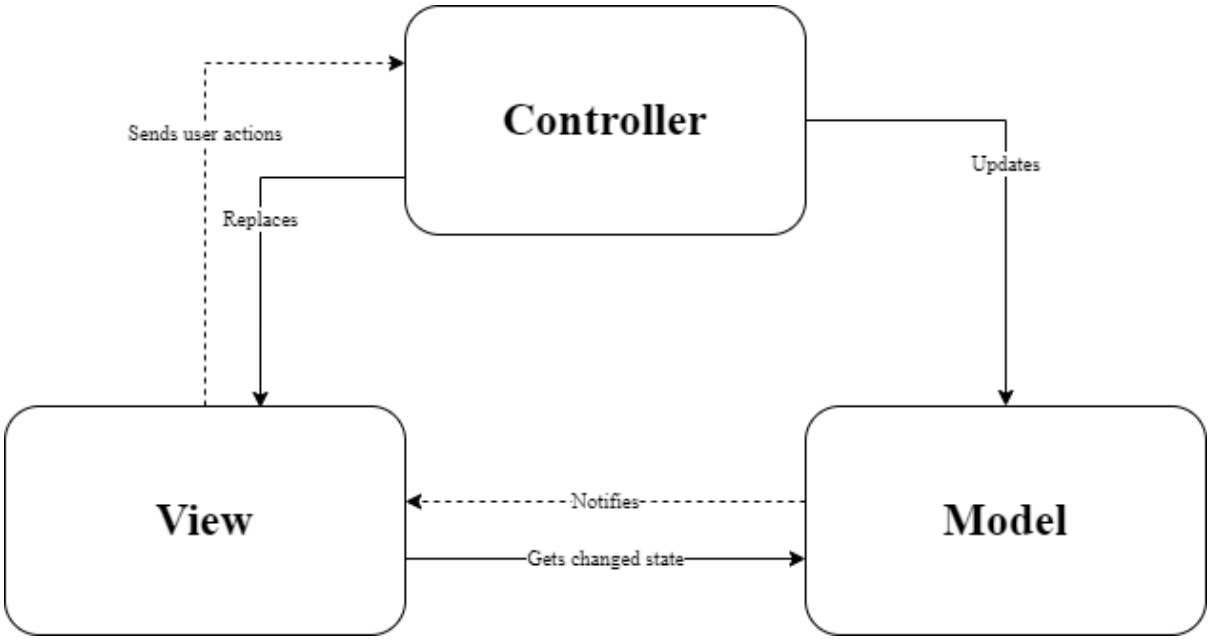

Figure 4.3 – IOS Mobile Architecture

4.1.3 System Software Architecture

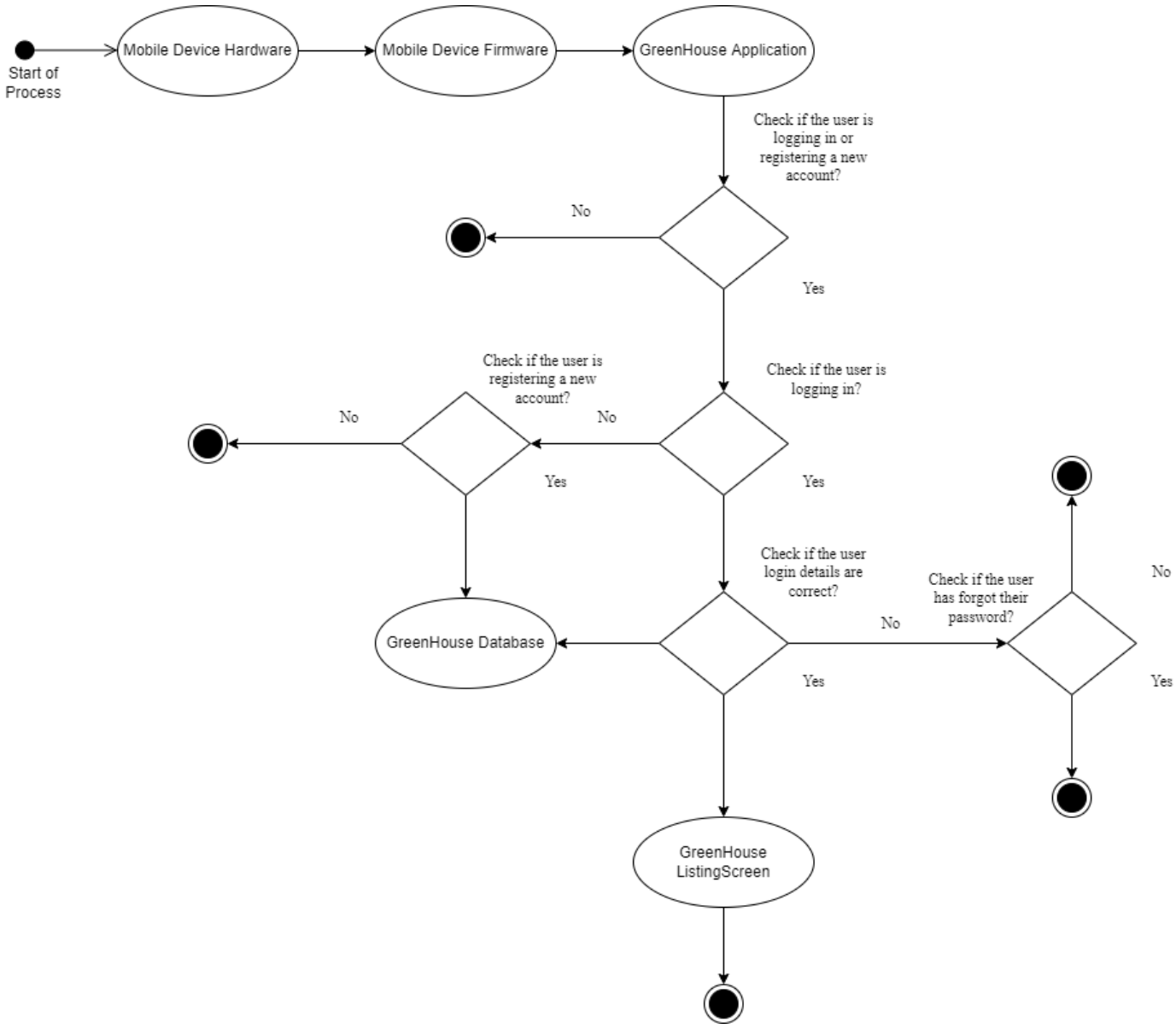

Figure 4.4 – Activity Diagram of Application Runtime when a User is Logging in

Figure 4.4 illustrates the systems response to a user logging in during the initial runtime of the application and all the possible ways the process can end. As of right now the software development methodology has been approached in an incremental model. Screens and their associated core components have been completed developed and then the next stage of development will begin. Whilst this may not be the most efficient method as a lot of screens/ components rely upon each other developing the next component may impact a previously developed area, resulting in more development time for already completed component. However, for a solo developer this seems to be the most effective approach still.

4.1.4 Package Diagram of Subsystems Interacting when Retrieving User Data

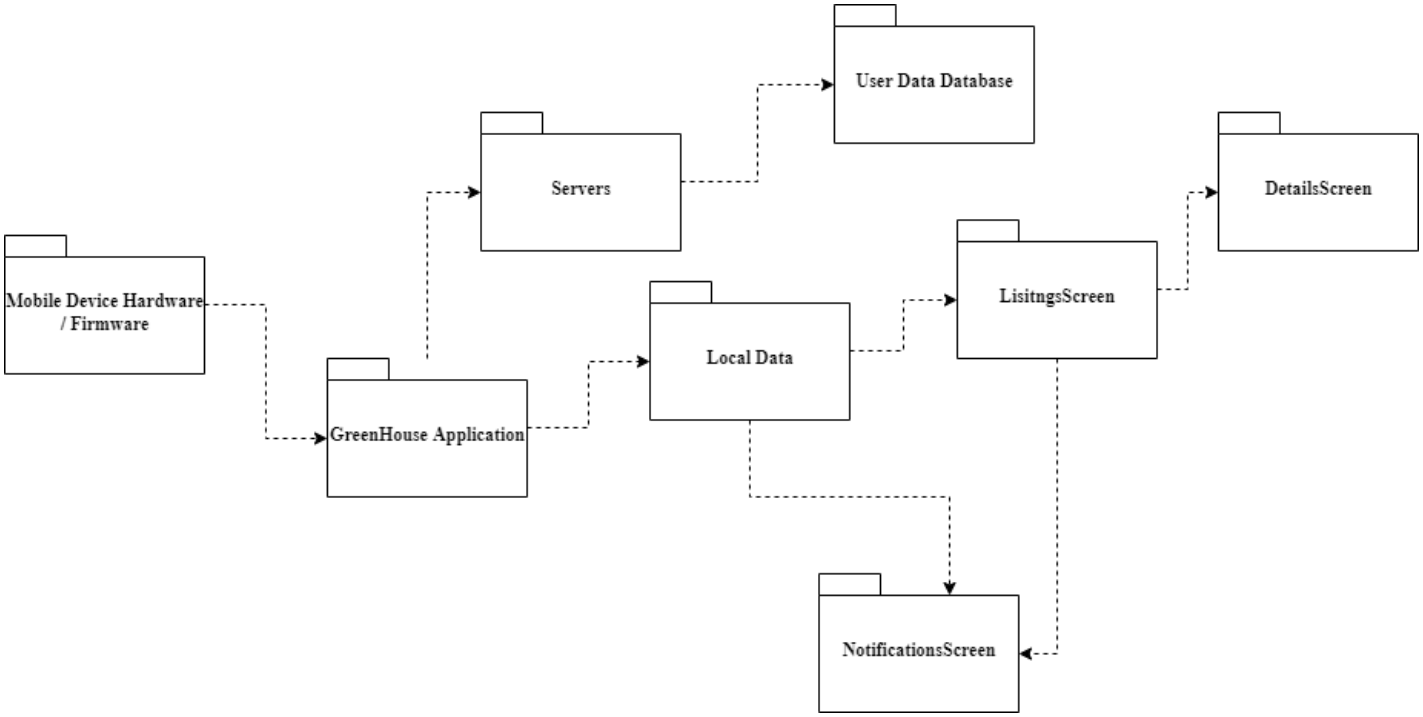

Figure 4.5 – Package Diagram of Subsystems Interacting when Retrieving User Data

4.2 Conceptual Design

During the initial stages of development designs for the application were conceptualised using the Figma tool. They allowed for high fidelity designs to be created to highlight to the client the intended UI/UX design for the application.

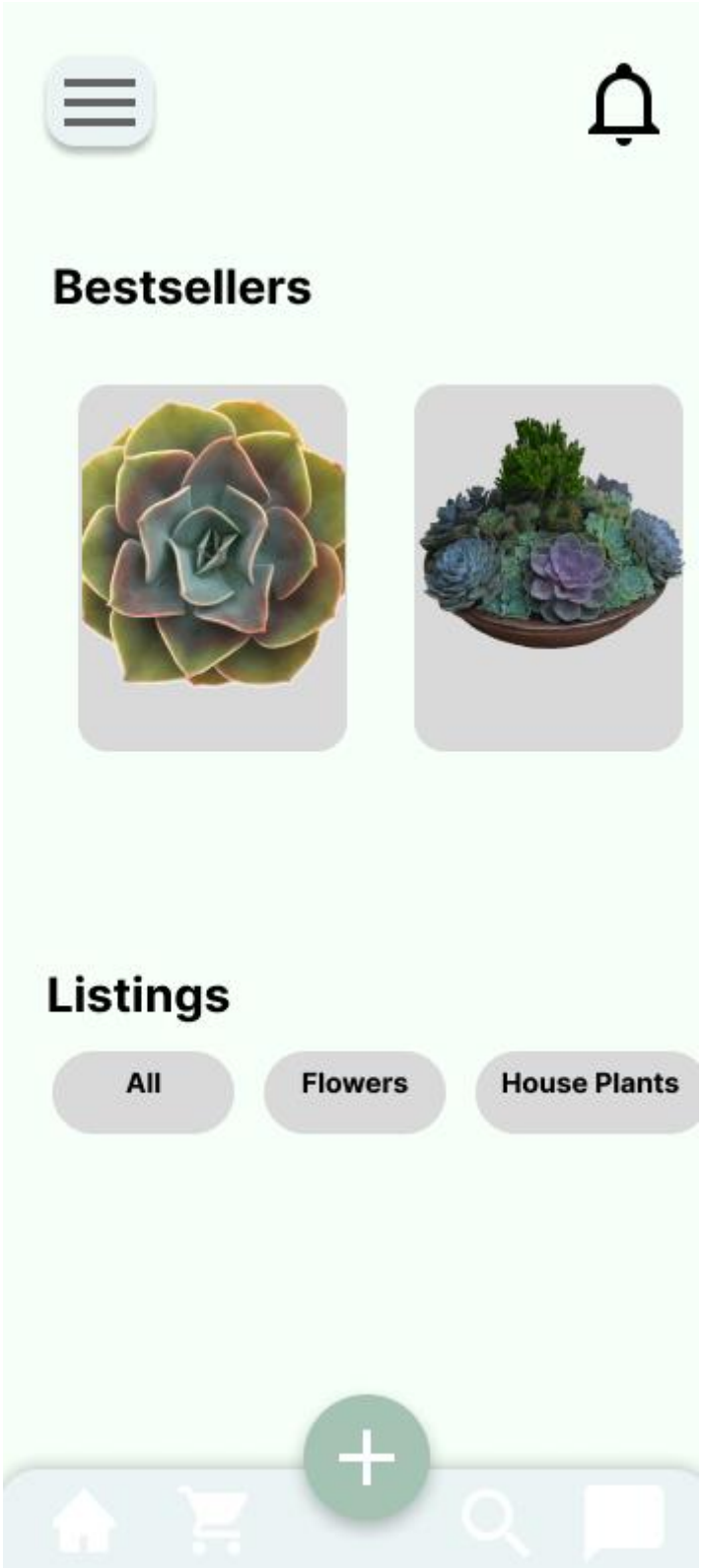

Figure 4.6 – Listing Screen Conceptual Design

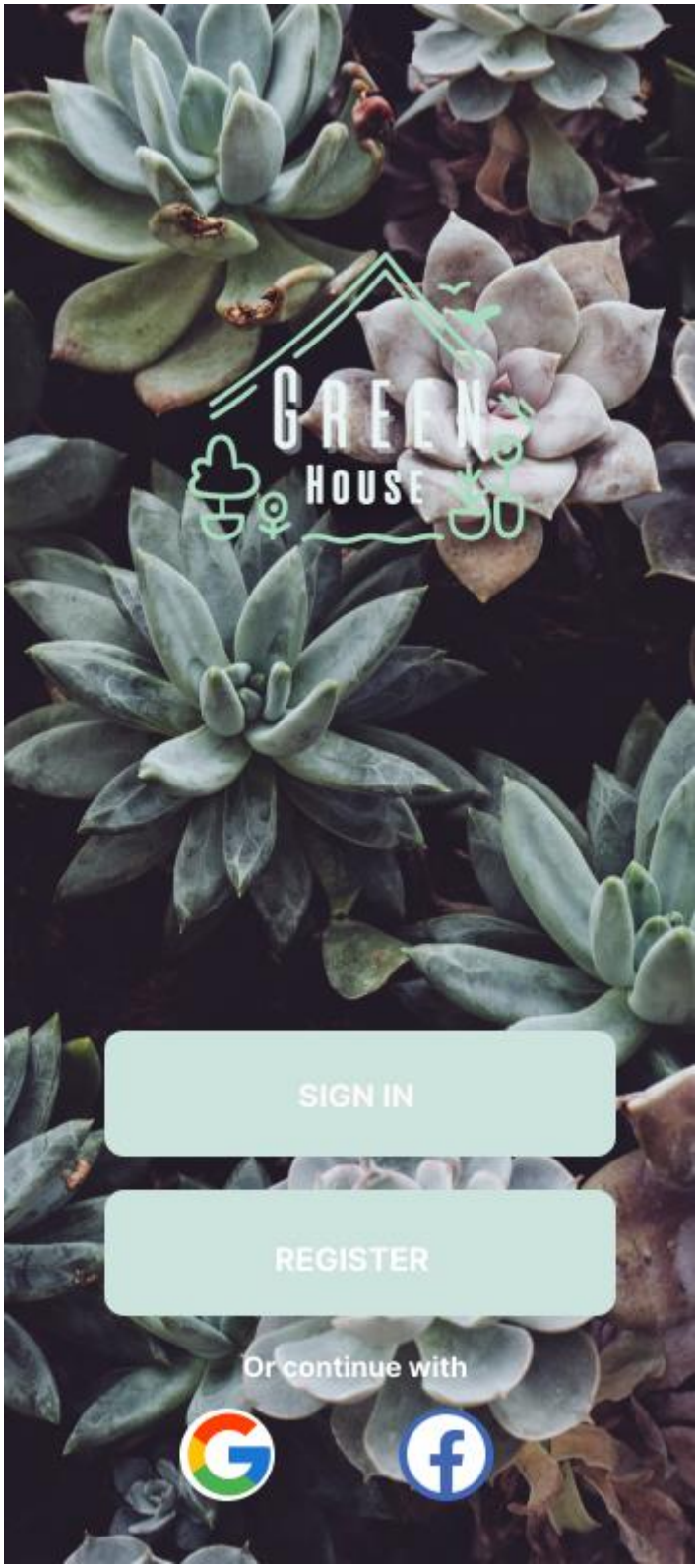

Figure 4.7 – Welcome Screen Conceptual Design

5.0 Test Plan Structure

5.1 Brief Test Overview

This section of the report will highlight the intended testing measures that will be performed on the system. This could be during development, but mainly during later phases when the system is more robust.

Table 5.1 – A Brief Overview of the Testing Plan

Requirement Name	Requirement ID	Requirement Description	Test Details
User Login	FREQ001	The system will allow a user to login.	• Unit Testing • System Testing • Integration Testing
User Logout	FREQ002	The system will allow a user to logout.	• Unit Testing • System Testing • Integration Testing
Forgot Password	FREQ003	The system will allow a user who forgot their password to change it.	• Unit Testing • System Testing • Integration Testing
Splash Screen Load	FREQ004	The system will have an initial splash screen to show the user before the data is loaded for the integral screens.	• Unit Testing • System Testing • Integration Testing
User Data Database	FREQ010, FREQ011	The system will handle data through the backend, The system should be able to register users to some sort of database.	• Smoke Testing • Alpha Testing • Beta Testing • Security Testing
General Data Database	FREQ010, FREQ011	The system will handle data through the backend, The system should be able to register users to some sort of database.	• Smoke Testing • Alpha Testing • Beta Testing • Security Testing
System Shall be Easy to Understand	PREQN002, UREQ001	The system's components need to be clear and indicate to a user how they are meant to be used, The system provides ease of access to all possible users i.e. young children, adults, elderly.	• Accessibility Testing • Graphical User Interface (GUI) Testing • Usability Testing
System Shall be Flexible for Integrating into Existing Systems	PREQN001	The system will be flexible so that it can be incorporated into existing hardware infrastructure.	• Compatibility Testing
System Shall be Maintained Regularly	UREQ004	The system will undergo necessary updates to keep it current with new standards, UI/UX design	• Benchmark Testing

		choices and other expected changes.	
Users will have a Sense of Direction when using the Application	UREQ002	The application should be clear and easily direct users to where they need to go with no issue.	• Load Testing • Stress Testing • Usability Testing
Error Handling	FREQ007	The system will handle errors and display them to the user.	• Load Testing • Stress Testing • White-box Testing
The system will perform as intended under a high load of users	OREQ001	The system will function under large amounts of load and stress.	• Load Testing • Stress Testing

Appendices

Appendix A – Risk Assessment Matrix

	Consequences				
Likelihood	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Almost Certain 5	5	10	15	20	25
Likely 4	4	8	12	16	20
Possible 3	3	6	9	12	15
Unlikely 2	2	4	6	8	10
Rare 1	1	2	3	4	5

Appendix B – Consequence Table for Risk Assessment

Severity	Category	Impact
1	Safety	Potential damages or threats to a person, persons data or business data but have had no noticeable impact
	Quality	A comment observation from a QA regulatory body or very minor QA issue caused
	Schedule	<1% extension of original planned project duration
	Cost	<2% reduction of budget contingencies
	Business Case	<10% reduction in project NPV
2	Safety	Potential damages or threats to a person, persons data or business data which have had some noticeable impact
	Quality	A minor observation from a regulatory body or minor QA issue caused
	Schedule	1% - 4% extension of original planned project duration
	Cost	2% - 7% reduction of budget contingencies
	Business Case	10% - 25% reduction in project NPV
3	Safety	Potential damages or threats to a person, persons data or business data which have had very noticeable impact resulting in people's data being exposed and businesses having to stop trading temporarily
	Quality	A major observation from a regulatory body relatively major QA issue caused
	Schedule	4% - 6% extension of original planned project duration
	Cost	7% - 14% reduction of budget contingencies
	Business Case	25% - 50% reduction in project NPV
4	Safety	Damages or threats to a person, persons data or business data which have had a great impact resulting in people's data being exposed/ compromising them and businesses having to stop trading permanently
	Quality	Major QA issue caused. It will not be possible to supply for 1 - 3 months
	Schedule	6% - 9% extension of original planned project duration
	Cost	14% - 20% reduction of budget contingencies
	Business Case	50% - 90% reduction in project NPV
5	Safety	Damages or threats to a person, persons data or business data which have had a unimaginable impact resulting in people's data being exposed/ compromising them and businesses having to stop trading permanently, as well as the application shutting down

	Quality	Failure to comply will result in a warning letter or prohibition notice from a regulatory body or very major QA issue caused
	Schedule	10% extension of original planned project duration
	Cost	>20% reduction of budget contingencies
	Business Case	90% - 100% reduction in project NPV