

**Capstone Project Report**

**Report 2 – Project Management Plan**

– Hanoi, December 2022 –

**Table of Contents**

[I. Record of Changes 3](#_Toc116259005)

[II. Project Management Plan 4](#_Toc116259006)

[1. Overview 4](#_Toc116259007)

[1.1 Scope & Estimation 4](#_Toc116259008)

[1.2 Project Objectives 6](#_Toc116259009)

[1.3 Project Risks 7](#_Toc116259010)

[2. Management Approach 7](#_Toc116259011)

[2.1 Project Process 7](#_Toc116259012)

[2.2 Quality Management 8](#_Toc116259013)

[2.3 Training Plan 8](#_Toc116259014)

[3. Project Deliverables 8](#_Toc116259015)

[4. Responsibility Assignments 9](#_Toc116259016)

[5. Project Communications 9](#_Toc116259017)

[6. Configuration Management 10](#_Toc116259018)

[6.1 Document Management 10](#_Toc116259019)

[6.2 Source Code Management 10](#_Toc116259020)

[6.3 Tools & Infrastructures 10](#_Toc116259021)

# I. Record of Changes

|  |  |  |  |
| --- | --- | --- | --- |
| Date | A\* M, D | In charge | Change Description |
| 07/10/2022 | A | HuyenBN | Responsibility Assignments, Project Communications, and Configuration Managements |
| 09/10/2022 | A | AnNT | Overview; Management Approach; Deliverables |
| 09/10/2022 | M | GiangNT | Review all Document; Change “Configuration Management” |
| 16/10/2022 | M | AnNT | Project Process |
| 08/12/2022 | M | GiangNT | Project Process; Project Communications; Project Objectives |
| 10/12/2022 | M | GiangNT | Scope & Estimation |
| 14/12/2022 | M | GiangNT | Project Risks |
| 15/12/2022 | M | GiangNT | Quality Management; Tools & Infrastructure; Project Deliverables |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

\*A - Added M - Modified D - Deleted

# II. Project Management Plan

## 1. Overview

### 1.1 Scope & Estimation

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **WBS Item** | **Complexity** | **Est. Effort**  **(man-days)** |
| ***1*** | ***Login*** |  | **29** |
| 1.1 | (ADMIN / STAFF) Login with email & password | Medium | 3 |
| 1.2 | (LANDLORD / STUDENT) Login with Facebook | Complex | 13 |
| 1.3 | (LANDLORD / STUDENT) Login with Google | Complex | 13 |
| ***2*** | ***LANDLORD - Sign Up*** |  | **21** |
| 2.1 | Sign Up with Facebook | Complex | 9 |
| 2.2 | Sign Up with Google | Complex | 9 |
| 2.3 | Upload ID Card | Simple | 2 |
| 2.4 | Provide Basic Information | Simple | 1 |
| ***3*** | ***GUEST - List of Houses*** |  | **30** |
| 3.1 | View House - Room Statistic | Simple | 1 |
| 3.2 | View List of Available Houses | Medium | 7 |
| 3.2.1 | View House Information | Medium | 2 |
| 3.2.2 | Paginate List of Houses | Complex | 5 |
| 3.3 | Filter House | Complex | 16 |
| 3.3.1 | Filter by Name | Simple | 2 |
| 3.3.2 | Filter by Campus | Simple | 2 |
| 3.3.3 | Filter by Region | Simple | 2 |
| 3.3.4 | Filter by Distance | Simple | 2 |
| 3.3.5 | Filter by Price | Simple | 2 |
| 3.3.6 | Filter by Room Type | Simple | 2 |
| 3.3.7 | Filter by House Utility | Simple | 1 |
| 3.3.8 | Filter by Room Utility | Simple | 1 |
| 3.3.9 | Filter by Rate | Simple | 2 |
| 3.4 | Order Houses | Medium | 6 |
| 3.4.1 | Order by Price | Simple | 2 |
| 3.4.2 | Order by Distance | Simple | 2 |
| 3.4.3 | Order by Rate | Simple | 2 |
| ***4*** | ***STUDENT – Create Order*** |  | **3** |
| 4.1 | Create Order | Simple | 3 |
| ***5*** | ***GUEST - House Detail*** |  | **23** |
| 5.1 | House detail information | Simple | 3 |
| 5.2 | Landlord Information | Simple | 1 |
| 5.3 | Google Map position | Complex | 6 |
| 5.4 | List of Rate & Comment | Simple | 3 |
| 5.5 | Create Rate & Comment | Medium | 4 |
| 5.6 | List of Available Rooms | Medium | 4 |
| 5.7 | View Room - Capacity Statistics | Simple | 2 |
| ***6*** | ***GUEST - Room Detail*** |  | **2** |
| 6.1 | View Room Detail Information | Simple | 2 |
| ***7*** | ***STUDENT – Send Report*** |  | **3** |
| 7.1 | Send Report violation of House | Simple | 3 |
| ***8*** | ***LANDLORD - Manage Houses*** |  | **37** |
| 8.1 | View List of Houses | Medium | 4 |
| 8.1.1 | View Information of Houses | Simple | 2 |
| 8.1.2 | House – Room Statistics | Simple | 2 |
| 8.2 | Add new House | Complex | 16 |
| 8.2.1 | Provide basic information | Simple | 1 |
| 8.2.2 | Upload house images | Medium | 4 |
| 8.2.3 | Choose Google Map location | Complex | 10 |
| 8.3 | Update House | Complex | 12 |
| 8.3.1 | Update basic information | Simple | 1 |
| 8.3.2 | Update house images | Medium | 4 |
| 8.3.3 | Update Google Map location | Complex | 6 |
| 8.4 | Delete House | Simple | 2 |
| 8.5 | View House’s Rates & Comments | Simple | 2 |
| 8.6 | Reply to Rates & Comments | Medium | 3 |
| ***9*** | ***LANDLORD - Manage Rooms of House*** |  | **42** |
| 9.1 | View List of Rooms | Simple | 2 |
| 9.2 | View Room – Capacity Statistics | Simple | 2 |
| 9.3 | Change Room status | Medium | 3 |
| 9.4 | Add Single Room | Medium | 5 |
| 9.4.1 | Provide basic information | Simple | 1 |
| 9.4.2 | Upload room images | Medium | 3 |
| 9.5 | Add Multiple Room | Complex | 21 |
| 9.5.1 | Download Templates | Medium | 2 |
| 9.5.2 | Import Data | Complex | 10 |
| 9.5.3 | Upload room images | Complex | 9 |
| 9.6 | Update Room | Medium | 5 |
| 9.6.1 | Update basic information | Simple | 1 |
| 9.6.2 | Update room images | Medium | 3 |
| 9.7 | Delete Room | Simple | 2 |
| ***10*** | ***LANDLORD - Profile*** |  | **5** |
| 10.1 | View Profile | Medium | 2 |
| 10.2 | Update Profile | Medium | 3 |
| ***11*** | ***STAFF - Dashboard*** |  | **13** |
| 10.1 | View Numerical Statistics | Medium | 5 |
| 10.2 | View Graphical Statistics | Complex | 8 |
| ***12*** | ***STAFF - Manage Landlords*** |  | **30** |
| 12.1 | View List of Landlords | Medium | 8 |
| 12.1.1 | View Landlord Information | Simple | 2 |
| 12.1.2 | Search Landlord by Name | Simple | 2 |
| 12.1.3 | Paginate List of Landlords | Medium | 4 |
| 12.2 | View House – Room Statistics | Simple | 2 |
| 12.3 | Change Landlord Active Status | Simple | 3 |
| 12.4 | Landlord Details | Complex | 17 |
| 12.4.1 | View Landlord’s Details information | Simple | 3 |
| 12.4.2 | View Landlord’s List of Houses | Medium | 5 |
| 12.4.3 | View House Detail information | Simple | 3 |
| 12.4.4 | View House’s List of Rooms | Medium | 4 |
| 12.4.5 | View Room Detail information | Simple | 2 |
| ***13*** | ***STAFF – List of Houses*** |  | **13** |
| 13.1 | View List of Houses | Medium | 8 |
| 13.1.1 | View House Information | Simple | 2 |
| 13.1.2 | Search House by Name | Simple | 2 |
| 13.1.3 | Paginate List of Houses | Medium | 3 |
| 13.2 | View House – Room Statistics | Simple | 1 |
| 13.3 | View House Details | Medium | 5 |
| 13.3.1 | View House Detail information | Simple | 2 |
| 13.3.2 | View House’s List of Rooms | Simple | 2 |
| 13.3.3 | View Room Detail information | Simple | 1 |
| ***14*** | ***STAFF – List of Reports*** |  | **37** |
| 14.1 | View List of all Reports | Complex | 18 |
| 14.1.1 | View List of Reports | Simple | 2 |
| 14.1.2 | Filter List of Reports | Complex | 7 |
| 14.1.3 | Paginate List of Reports | Medium | 4 |
| 14.1.4 | View Report Detail | Medium | 3 |
| 14.1.5 | Change Status of Report | Medium | 2 |
| 14.2 | View Reports by House | Complex | 19 |
| 14.2.1 | View List of Reported Houses | Simple | 3 |
| 14.2.2 | Filter List of Repoted Houses | Complex | 7 |
| 14.2.3 | Paginate List of Reported Houses | Medium | 4 |
| 14.2.4 | View List Reports of a House | Medium | 3 |
| 14.2.5 | Change Status of House | Medium | 2 |
| ***15*** | ***STAFF - Landlord Sign Up Requests*** |  | **6** |
| 15.1 | View List of Sign Up Request | Simple | 2 |
| 15.2 | Approve/Reject Sign Up Request | Medium | 4 |
| ***16*** | ***STAFF – Manage Orders*** |  | **25** |
| 16.1 | View Numerical Statistics | Medium | 4 |
| 16.2 | View Graphical Statistics | Medium | 5 |
| 16.3 | View List of Orders | Complex | 17 |
| 16.3.1 | View List of Orders | Simple | 2 |
| 16.3.2 | Filter List of Orders | Complex | 6 |
| 16.3.3 | Paginate List of Orders | Medium | 3 |
| 16.3.4 | View Orders Detail | Medium | 3 |
| 16.3.5 | Change Status of Orders | Medium | 2 |
| ***17*** | ***STAFF - Profile*** |  | **5** |
| 17.1 | View Profile | Medium | 2 |
| 17.2 | Update Profile | Medium | 3 |
| ***18*** | ***STAFF – Change Password*** |  | **3** |
| 18.1 | Change Password | Medium | 3 |
| ***19*** | ***ADMIN - Manage Staff Accounts*** |  | **10** |
| 19.1 | View List of Staffs | Simple | 2 |
| 19.2 | Add new Staff | Simple | 3 |
| 19.3 | Update Staff | Simple | 3 |
| 19.4 | Delete Staff | Simple | 2 |
| ***Total Estimated Effort (man-days)*** | | | ***337*** |

### 1.2 Project Objectives

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **#** | **Testing Stage** | **Test Coverage** | **No. of Defects** | **% of Defect** | **Notes** |
| 1 | Reviewing | 100% | 20 | 45% |  |
| 2 | Unit Test | 100% | 9 | 20.5% |  |
| 3 | Integration Test | 100% | 9 | 20.5% |  |
| 4 | System Test | 100% | 3 | 7% |  |
| 5 | Acceptance Test | 100% | 3 | 7% |  |

**Milestone Timelines (%): 100**

**Allocated Effort (man-days): 337**

### 1.3 Project Risks

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **#** | **Risk Description** | **Avoidance plan** | **Contingency plan** | **Status** |
| 1 | Failure to meet deadline | * Plan and develop schedule carefully * Assign tasks carefully | * Find the root cause of the problem * Reassign tasks * Change project scope | Closed |
| 2 | Change in requirements | * The supervisor and the entire team must review any new updates to requirements | * All changes in requirements will be announced in the next daily team meeting | Closed |
| 3 | Misunderstanding of requirements | * Discuss requirements carefully with the customer * Any ambiguity in understanding requirements of team members will be recorded and handed to supervisor to clarify with customer | * Update code and documentation to adapt with actual requirements | Closed |
| 4 | Illness or absence of team members | * Provide meeting schedules in advance * Team member must announce absence in advance | * All meetings with supervisor will be recorded for absent members * Assign the tasks of absent member to other members * Work overtime if necessary | Closed |
| 5 | Conflict between team members | * Everything must be documented * Every team member has to express clearly and carefully | * Make sure any miscommunication will be resolved | Closed |
| 6 | Data loss | * Use GitHub for version control * Train team members on Git usage and conflict resolution | * Restore backup data from GitHub | Closed |
| 7 | Internet connection issue in Capstone project defense | * Prepare personal wireless internet connection | * Demo project on localhost * Record demo video before the Capstone project defense | Closed |
| 8 | Server failure | * Use paid and certified servers | * Use a different server | Closed |

## 2. Management Approach

### 2.1 Project Process



*Figure 2-1: Iterative and Incremental Software Process Model*

down and

team

members

cannot

submit work

or merge

code.

isolated

development

environment and

have an offline copy

of the

documentation.

such as 3G, 4G.

2. Management Approach

2.1 Project Process

After researching the software development model carefully, the project will use the

Iterative and Incremental Software Process Model. In an Iterative & Incremental model, initially, a

partial implementation of a total system is constructed so that it will be in a deliverable state. The

Iterative & Incremental model is mostly used when the scope of the project is big, the major

requirements are defined clearly, some more details will be added later in software development.

By using this software process model, we break down the developing system task into a series of

smaller tasks which will be completed separately, allowing us to take advantage of what was

learned during the development of earlier parts of the system. The reasons for the project to

choose this model are:

Based on recommendation of supervisor and actual situation of the project, the FHF Project team chooses to use the Iterative and Incremental Software Process Model. In an Iterative and Incremental model, initially, a partial implementation of a total system is constructed so that it will be in a deliverable state. The Iterative and Incremental model is mostly used when the scope of the project is big, the major requirements are defined clearly, some more details will be added later in software development, which is the case of this project. By using this software process model, we break down the developing system task into a series of smaller tasks which will be completed separately, allowing us to take advantage of what was learned during the development of earlier parts of the system.

The reasons for the project to choose this model are:

* You can develop some main functions that prioritize requirements first.
* Requirements changes can be easily accommodated.
* Testing and debugging during smaller iterations is easy.
* Client can give input to every item increment, accordingly maintaining a strategic distance from differences toward finish of improvement.

### 2.2 Quality Management

#### 2.2.1 Code Review

* Any contribution of team members will be reviewed by team leader before merging into main branch.
* If team leader finds any defect or ambiguity in code or document, he will discuss directly with the author the clarify problems and give instruction on how to fix them.

#### 2.2.2 Unit Testing

* As each team member will be not only a developer but also a tester, each person will be testing for what the part they code.
* Any defects found will be recorded on GitHub Issues as a bug tracking software, with details and images for evidence.
* That team member will then be responsible for repairing those defects.

#### 2.2.3 Integration Testing

* All Integration test cases will be recorded into a spread sheet, divided by feature. The team member who developed the feature will perform Integration test for that feature.
* Any defects found will also be recorded on GitHub Issues and will be fixed by that team member.

#### 2.2.4 System Testing

* In the team meeting at the end of each Iteration, all team will discuss to write some System test cases that can cover all features.
* Any defects found will also be recorded on GitHub Issues and will be fixed by the team member who is responsible for the feature to which it belongs.

#### 2.2.5 Acceptance Testing

* At the end of each Iteration, system will be deployed on the Internet and team members will contact directly with actual landlords and students to use.
* Any feedbacks and comments from the client will be recorded and bring to discuss with whole team and supervisor to decide what should be done to imporve the system.

### 2.3 Training Plan

|  |  |  |  |
| --- | --- | --- | --- |
| Training Area | Participants | When, Duration | Waiver Criteria |
| Angular 12 | All Member | 11/09/2022 - 17/09/2022 | Mandatory |
| Git, Github | All Member | 09/09/2022 | Mandatory |

## 3. Project Deliverables

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Deliverable** | **Due Date** | **Notes** |
| 1 | Product Vision  Basic Use case  System actors  Report 1 | 10/09/2022 | Initiate Project |
| 2 | Project Scope  Requirements Business Rules | 15/09/2022 | Customer Meeting  Functional Requirements  Non-functional Requirements |
| 3 | Plan and Schedule Report 2 | 08/10/2022 |  |
| 4 | System Design Report 3  Report 4 | 15/10/2022 | Screen Design  Architectural Design  Database Design  Etc. |
| 5 | Code & Implement Iteration 1 | 30/10/2022 | Code Unit Test Integration Test System Test |
| 6 | Code & Implement Iteration 2 | 18/12/2022 | Code Unit Test Integration Test System Test User Acceptance Test |
| 10 | Final Report  Final Product  User Guides  Presentation | 19/12/2022 |  |

## 4. Responsibility Assignments

*D~Do; R~Review; S~Support; I~Informed; <blank>- Omitted*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Responsibility** | **GiangNTHE153046** | **HuyenBNHE150346** | **ThongPQHE150340** | **AnNTHE150432** | **KienNTHE150160** |
| Collect Requirements | R,D | D | D | D | D |
| Prepare Project Introduction Document | R,D | I | D | I | I |
| Prepare Project Management Plan | R | D | I | D | R |
| Prepare SRS Document (User Requirements) | R,D | I | I | I | D |
| Create Screen Mockups | R,D | D | D | D | D |
| Design Database | R,D | D | D | D | D |
| Collect Administrative Unit Data | D | I | I | I | I |
| Draw Use Case Diagram | R | D | I | I | I |
| Coge Function Login | R | I | I | D | I |
| Dram Entity Relationship Diagram | R | D | I | I | I |
| Draw Screen Flow Diagrams | D | I | I | I | I |

## 5. Project Communications

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Communication Item** | **Who/ Target** | **Purpose** | **When, Frequency** | **Type, Tool, Method(s)** |
| Daily Meeting | All team members | - Checking progress of assigned tasks  - Finding solutions for difficult problems | 9 p.m everyday | Discord |
| Assign Tasks | All team members | - Project Manager assigns tasks to other team members | Everyday | Jira |
| Weekly Meeting With Supervisor | All team members, supervisor | - Checking progress of project  - Plan upcoming tasks  - Update requirements | Once a week | Offline |
| Meeting with Supervisor and University Staffs | All team members, supervisor, Staffs | - Clarify user requirements, roles & project scope | 16/09/2022  13/09/2022 | Offline |
| Meeting with Landlords to collect data | All team members, supervisor, Landlords | - Clarify user requirements | 12/12/2022 | Offline |

  
*Meeting with Supervisor and Staffs of the University (13/09/2022)*

*   
Meeting at the University’s Enrollment day (16/09/2022)*

   
*Meeting with Landlords to collect data (12/12/2022)*

## 6. Configuration Management

### 6.1 Document Management

* Management Tools:
  + Google Drive
  + OneDrive
  + GitHub
* Team leader assigns and describes tasks through Facebook & Discords. All Documents will be submitted to management tools to keep track of changes. Team leader then collects them all to submit to the mentor.

### 6.2 Source Code Management

* Management Tools:
  + GitHub
* Team leader assigns and describes tasks through Facebook & Discords. All source code will be pushed to Github for version control. Team leader then pull it back to run on deployment environment.

### 6.3 Tools & Infrastructures

|  |  |
| --- | --- |
| **Category** | **Tools / Infrastructure** |
| **Technology** | Angular 12 (Front-end); ASP.NET 5 (Back-end) |
| **Database** | Microsoft SQL Server 2019 |
| **IDEs/Editors** | Visual Studio Code; Visual Studio |
| **Diagramming** | DrawIO; Mindmeister |
| **Documentation** | Google Docs; Microsoft Office |
| **Version Control** | GitHub (Source Codes); Google Drive (Documents); OneDrive (Documents) |
| **Deployment server** | Amazon S3; Vercel |
| **Project management** | Jira (Schedule, Tasks, Defects) |
| **UI/UX Design** | Figma; Adobe XD; Adobe Photoshop |
| **Development tools** | MkCert; MobaXterm |
| **Communication tools** | Discord; Facebook; Messenger; Google Meet; Zalo |
| **Test tools** | NUnit; Postman |