GharBeti

Submitted in partial fulfillment of the requirement of

Project – IV (**BEG479CO**)

Of

Bachelor of Computer Engineering

Submitted to

Purbanchal University

Biratnagar, Nepal

Submitted By:

Bikash Gupta(382216)

Laxmi Gajurel (382218)

Pratik Subedi(382222)

KANTIPUR CITY COLLEGE

Putalisadak, Kathmandu

August 10, 2022

A Project Reports

On

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ACKNOWLEDGEMENT

ABSTRACT

Our Project is about "GharBeti" aimed at developing an application of "Property Rental Management System" for finding a place to rent. This system can be used to find the details of the rental place, update the rental detail, produce records of tenant payments and add, edit and remove the tenant and landlord detail, etc. This is one integrated system that contains both the user component (used by landlord, and tenant) and the admin component (used by the administrators for performing admin-level functions such as adding or removing landlord or room to the System, and verifying landlords) This system runs on multiple platforms, offers a GUI interface to its users, and connects to a common database.

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ABBREVIATIONS

KCC: Kantipur City Collage

PU: Purbanchal University

DFD: Data flow diagram

OS: Operating System

SQL: Structured Query language

UI: User Interface

UX: User Experience

IDE: Integrated Development Environment.

Chapter 1: Introduction

1.1. Introduction

As we, all know it is difficult to manage time for daily needs in this fast-moving world. In this case, there is a need for change in a technological field, there's an urgent must embrace and appreciate the power of innovative technology. So there is a vital situation to manage all the essential needs that are a shelter or home for survival. If we are not known to an individual in some cities and want to rent a house, room, apartment as well as shop then it's difficult to hunt out suitable aim time. Hence, there's a requirement to develop a "Gharbeti" App that will simplify the work for the rental managers and tenants so all their work is often done efficiently and effectively. It's also difficult to hunt out the renter on time, for the owner and property managers. This App will provide the whole knowledge about houses and apartment which is accessible for Rent. It will make it easy to hunt out the position of Houses, the need for rooms, and other facts by the renter. Using this app the Landlords even have the provision to post or update their property details whenever they want.

- GharBeti App is a fully static and effective app. It'll provide the knowledge to the tenants about the homes which are accessible for Rent. They can easily search for their needs using keywords like property type, location, etc.
- On the other side, the Landlord has the facility to post or modify their property details with admin approval.
- It can be helpful to easily upload the position, phone number, Expected rent, and No. of rooms, Facilities, and other information by the

Modules used in this project

This project has two major modules that are:

Landlord:

- Registration by the landlord: First, the owner of the house should register their land with their name, location, contact No, expected rent, No. of rooms, Facilities, and other information.
- Login by Landlord: the owner uses the app by login into the app with their login credentials.
- Add Tenants: New Tenant is added by the landlord by entering Tenant's personal details with a verification ID.

- Update Availability: The owner can moderate or update no. Of rooms, areas,
- Generate the rent invoice: Monthly bill is generated for the renters.
- Payment status: View payment status and easily detects which tenant has paid, not paid, and has balance.

Tenants:

Search property location: they will search for feasible lands and placement in their budget.

Payment: Payment details can be viewed.

1.2. Problem Statement

In Nepal, there are few online rental management systems for those who want to rent and get a lot of trouble finding a place for rent even if the place is available.

There is no properly allocated place and the system is not easily available according to their user interest. The rental management system is almost done through the manual system.

The administrative system does not have the facility to make a rental Management system online, most time the work is done through an illegal intermediate person without awareness of the administrative, and this makes it more complex and more costly to find room for the customer. This leads customers to face more trouble, cost, dishonesty, and time wastage. The problem found in the current system:

- The complexity of finding the property is not easy and more tedious.
- Need extra money to find the property.
- The user cannot get information about home when they need it.
- There is too time-consuming to find the property.
- An emergency repair is required when something in the rental unit has broken and the health or safety of the tenant is in danger or the building or property is at risk until repairs can make.

1.3. Objectives

- To search/post properties (room, Flat, apartment).
- To digitize the monthly rental report.

1.4. Significance of project

- It helps the owner to find the tenants easily.
- It helps the tenants to find the room easily without searching from one home to another.
- The owner are easily able to add, update, modify and delete their property details.
- We are able to contact the owner without the agent.

1.5. Project Feature

Some of the useful and important features of "GharBeti" are-

- It has the ability to add & remove different rental details.
- Admin, landlord and tenant panel.
- Landlord adds, updates, and removes personal as well as rent detail.
- Tenant can edit profile and book the available properties.
- Admin is able to manage landlords, tenants, and properties.
- Admin and landlord can view the report

1.6. Assignment of role and responsibility

We assigned the roles and responsibilities equally among all members of the group. There are various phases during the project such as analysis, coding, testing, debugging, documentation, etc. The coding phase itself involves frontend and backend development as well as data entry. As team members, we shared all the work and regularly communicated and helped each other for the successful completion of the project.

Role and responsibility	Bikash Gupta	Laxmi Gajurel	Pratik Subedi
Documentation chapter1	✓		
Chapter 2	✓		✓
Chapter 3	✓	✓	
Chapter 4	✓	✓	✓
Chapter 5		✓	
Chapter 6			✓
Sign up		✓	
Login		✓	
Type of room			✓
Book room			✓
User profile setting	✓		
Outlook	✓		

1.7. Project Documentation

Documentation is an important part of any software project. It informs both software developers and users. The documentation for our project was developed throughout the life cycle of the project. The documentation has been

Chapter 2: Literature Survey

2.1. Literature Review

A literature review is a text written by someone to consider the critical points of current knowledge including substantive findings as well as theoretical and methodological contributions to a particular topic. The main goals are to situate the current study within the body of literature and to provide context for the particular reader

DalayDai

It is an app for buying, selling, and renting houses, lands, and everything real estate. It is committed to posting and searching for a house or plot of land for Nepali people effortlessly.

Feature: Home, buy, rent, commercial, home loans, easy construction, search relevance properties, search properties according to budget range, type of property, search property according to address, town and property id etc.

99ACRES

Created by the popular property search portal 99acres.com, this app offers the same user experience as the website, on the go. The app, which is free for Android users, allows you to browse properties for rent, along with high-quality pictures, videos, and maps. It is best known for the numerous options it provides, with listings of around 10 lakh properties across the country. It also promises instant contact between landlords and interested tenants through phone calls, texts, or email.

Feature: search cities, localities, project etc., shortlisted, activities, profile, home, types of properties, recommended properties, buy and sell properties etc.

NOBROKER

This app stands for what everyone looking to rent wants to do: cut the broker out of the equation. It lets us find and rent a house without paying any brokerage. Most of us feel that having to pay a hefty brokerage fee is unfair. The No-Broker app resolves this by letting homeowners list their properties easily and then putting them in touch with potential tenants. We can contact the homeowner directly through the app after shortlisting a property.

Feature: Rent, Buy, Apartment type, Flat mate

FLATCHAT

This app provides a platform where homeowners and potential tenants can share their location, find contacts in their vicinity and chat with them. It also allows you to sign up to find suitable flat mates to share a rental with. This can make the otherwise difficult process hassle-free since you can find people with the same budget and location preference as you, as well as similar hobbies and habits. So far, the app is only functional in Bengaluru, Mumbai, Pune, and Delhi.

Feature: Tenant, seeker, owner, chat, login through Facebook, mobile app

NESTAWAY

This app's appeal lies in the fact that it offers many fully furnished rental options with standardized amenities, and Nest Away takes responsibility for making sure that these are in working order. Once we shortlist a property, we can schedule a visit through the app, saving the trouble of calling and coordinating with owner or agent. The app stores important documents like rental agreements and receipts for easy access. It also allows us to book prefer.

Feature: Tenant, Owner, Room with their price,

2.2. Existing System

1. Dalay Dai

2. NoBrokers

3.99Acres

4. Flatchat

2.3. Analysis of issue

. The problem found in the current system:

- The complexity of finding the property is not easy and more tedious.
- Need extra money to find the property.
- The user cannot get information about home when they need it.
- Digitization of monthly rental report is not available.

2.4. Solution

"GharBeti" app is the solution for the above issues as:

- Tenant can search for the property easily.
- There is no brokerage charge for finding property.
- User can view the property detail.
- Monthly rental report is digitized.

Chapter 3: System Analysis

3.1. System Development model

The system development methodology is a technique that is used to show how the proposed system will be developed. In this case, the methodology used will be a waterfall model.

Waterfall Model

It is comprised of the stages that the developer will use when developing the systems. It is a sequential model hence the name is a waterfall. The developer has to finish one stage before going to the next one. It comprises the feasibility study, analysis phase, design phase, coding phase, testing phase, implementation phase, and finally maintenance phase. It is a simple and easy model to use and understand. With waterfall development-based methodologies, the analysts and users proceed sequentially from one phase to the next. The deliverables from each phase are voluminous and are presented to the project sponsor for approval as the project moves from phase to phase. Once the sponsor approves the phase, it ends and the next phase begins.
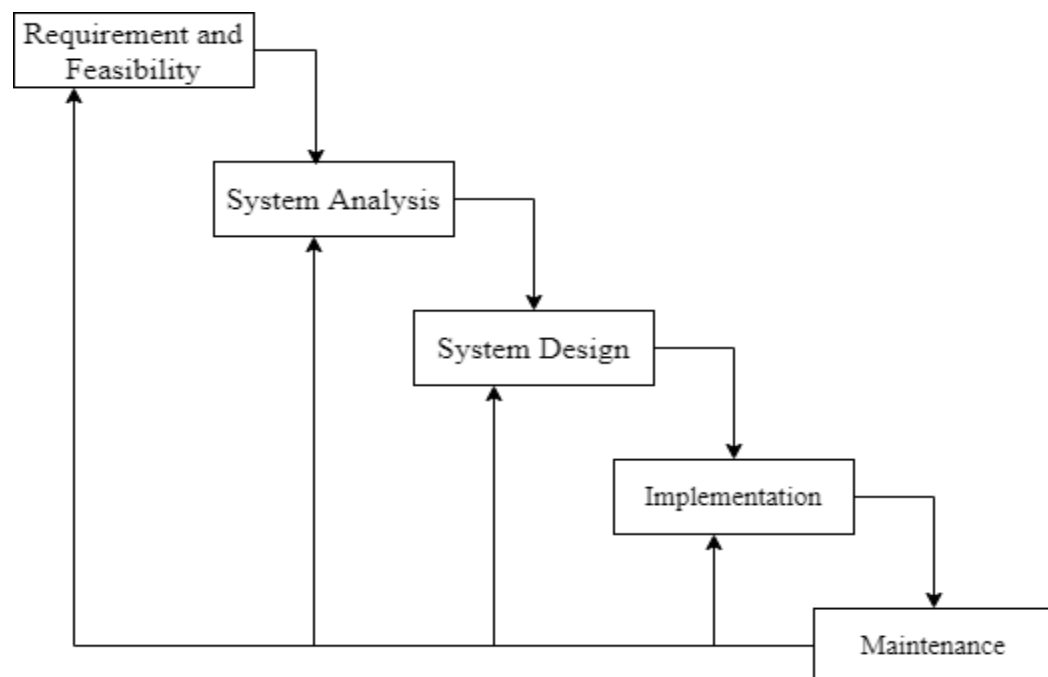

Figure 1: Waterfall model

1. **Requirement and feasibility:**

   To make this application, first we have to know the requirement and feasibility related to this system. So, that we had done the following tasks.

   i.   Study old system similar to our system.
   ii.   Use other's system to know more about their system.
   iii.   Study the feature of other's system.
   iv.   Study the problem of previous system.

2. **System Analysis:**

   After collecting the requirement and studying the feasibility, we analyzed the system as

   i.   We know all the requirement, feature and functionality, so that we use waterfall model.
   ii.   Defining consumer needs and objectives in the context of planned consumer use environments and identifying system characteristics.
   iii.   We list out the functional as well as non-functional requirement necessary for our system.
   iv.   Analyze how much our system is feasible when the end-user use this system.

3. **System Design:**

   After analyzing the system, then design the system as

   i.   Design system architecture that defines the structure, behavior and more views of a system.
   ii.   Design DFD using a standardized set of symbols and notations to describe a business's operations through data movement.
   iii.   Design use case diagram is a graphical depiction of a user's possible interactions with a system
   iv.   Design activity diagram to shows the control flow from one activity to another
   v.   Design ER diagram that displays the relationship of entity sets stored in a database.
   vi.   Construct data dictionary table that contains metadata i.e., data about the database.

4. **Implementation:**

   After designing system, then we performed implementation activity as

   i.   First, we sat the tools and technologies that are needed for developing our system.
   ii.   Then sat the operating environment to run the system.

iii.   Create the system step by step by testing and debugging.

5. Maintenance:

Maintenance is performed by continuous updating, analyzing, modifying, and re-evaluating of existing software applications. Maintenance must be an ongoing task to ensure your applications are always running to the best of their abilities.

3.2. Requirement Specification

Requirement specification involved defining consumer needs and objectives in the context of planned consumer use environments and identifying system characteristics to determine requirements for system functions.

3.2.1. Functional Requirement

This is a necessary task, action, or activity that was accomplished. The proposed system is able to:

i.   Allow admin to add a property, tenants, and landlord details.
ii.   Allow the user to delete property, tenants, and landlord details.
iii.   Allow the admin to search data in the database.
iv.   Allow admin to edit data in the database.

Table 1: Functional Table

Actor	Function
Landlord	- Advertise the property - Adding information about the property
Tenant	- Search the property - Select the property they want - Inquiry for the property

Admin	- Edit data in the database - Delete data in the database - Update data in the database

1. **Performance Requirements**

The system should respond within a short period. It depends on the performance of the hardware environment such as RAM and processor.

2. **Process Requirements**

The system should document expectations, targets, and specifications for business processes. They may be collected from multiple groups of stakeholders such as business units, customers, internal customers, users, and subject matter experts.

3. **Input Related Requirements**

The system should set all input bundles required to produce at least a given level of outputs.

4. **Output related Requirements**

The system should predominantly adopt performance-based requirements to define the project scope.

5. **Storage related Requirements**

The system should include any necessary periodic preservation or condition checks.

3.2.2. Non-Functional Requirement

Security: - Sensitive data used in our system are password, location. We use hashing to protect the password which maintains confidentiality.

Capacity: - Today we are using the basic free tier storage for storing the data and deploying the backend. In future, As the volume demands increase then we will use the larger and faster server.

Compatibility: - Our app is compatible for the Android version 4.0.0+ and iOS v.10+

Reliability and Availability: - Our System will be available 24/7 unless there is any software update or maintenance.

Maintainability and Manageability: - Depends upon the type of issues arise.

Scalability: - Currently our app is assumed to serve thousands of customers.

Usability: - Our app has user-friendly UI, which makes it easy to use.

3.3. Feasibility Study

The feasibility study is the preliminary study that determines whether a proposed system project is financially, technically, and operationally. The feasibility study is essential to evaluate the cost and benefits of the new system. The alternative analysis is usually included as part of the feasibility study and identifies viable alternatives for the system design and development.

3.3.1. Operational Feasibility

The system to be developed will provide accurate, active, secure service and decreases the labor of workers and it is not limited to particular groups or body. The system will easily be operational, as it does not affect the existing organizational structure and support the current system. Therefore, the system will be operationally feasible.

3.3.2. Technical Feasibility

The system is to be developed by using technologically system development technologies such as JavaScript, Flutter, and Strapi without any problems and the group members have enough capability to develop the project. Our focus is to develop a well-organized dynamic website that is technically effective for managing the Online Trade interaction system. Therefore, it can be concluded that the system is technically feasible.

3.3.3. Economic Feasibility

The system to be developed is economically feasible and the benefit is outweighing the cost. Since this project is already computerized, the existing system and more advanced than the current system and more advance than the current system reducing and changing the labor force to the computerized system. Reduces the cost of the material used.

3.3.4. Legal and Contractual Feasibility

The system is free from any legal and contractual risks

3.3.5. Scheduled Feasibility

The project will be completed according to a planned schedule. The planned schedule is displayed in the form of a Gantt chart.

Table 2: Gantt Chart

S. N	Tasks	Duration (in Week)-Starts From (13th Apr2022)												
		1	2	3	4	5	6	7	8	9	10	11	12	13
1	Concept submission	■												
2	Requirement Gathering		■											
3	Research and analysis			■	■									
4	System Design				■	■								
5	Coding					■	■	■	■	■	■	■		
6	Testing and debugging				■	■	■	■	■	■	■	■	■	
7	Documentation		■	■	■	■	■	■	■	■	■	■	■	■

Chapter 4: Design Specification and Implementation

4.1. System Architecture

A system architecture is the conceptual model that defines the structure, behavior and more views of a system. It is the structure of an IT system. The system architecture is based on the Dart and flutter architecture.
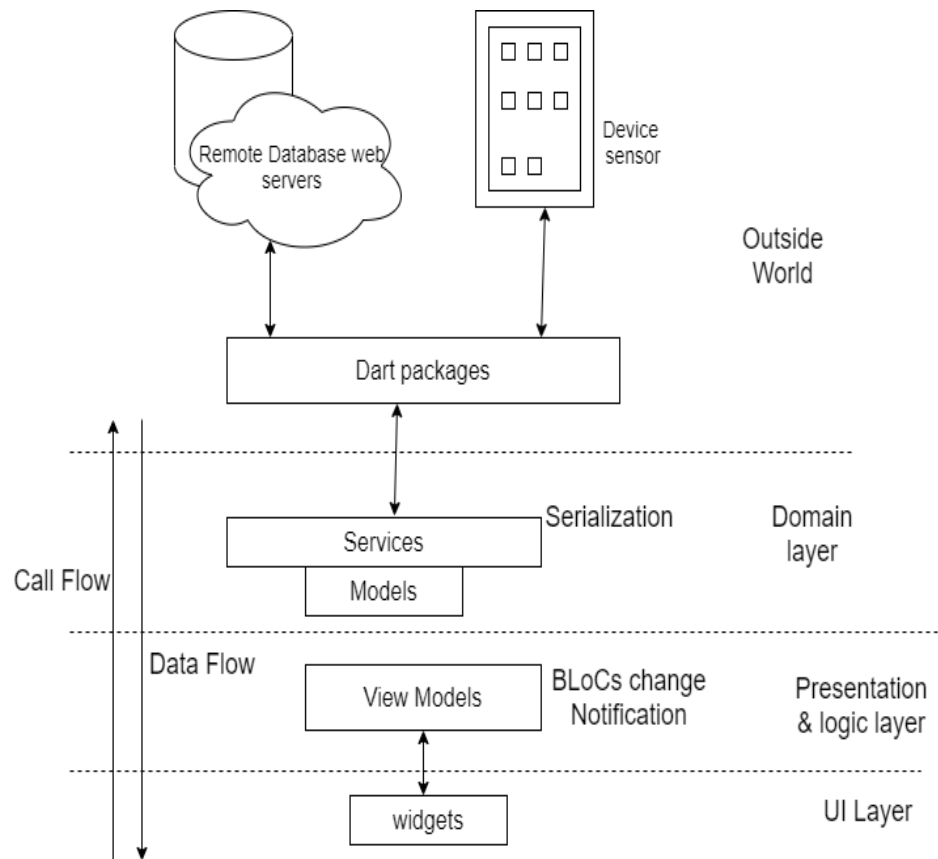

Figure 2: System Architecture

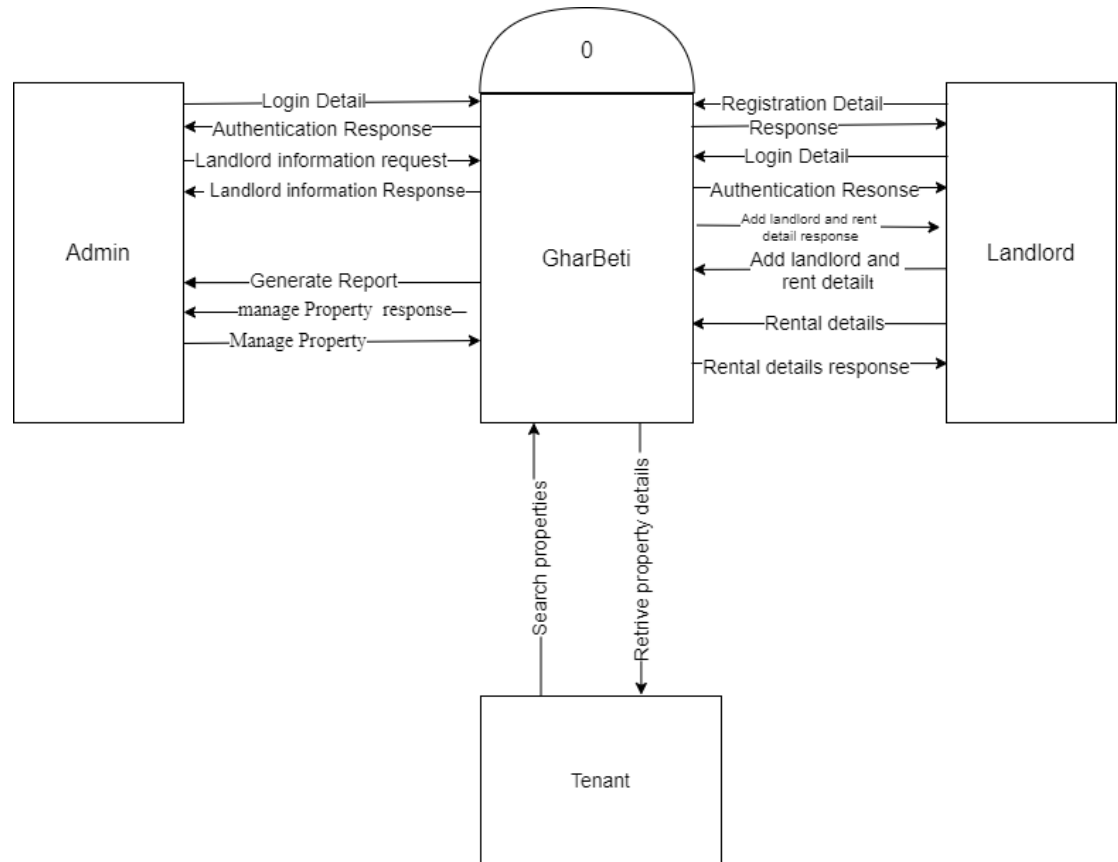# 4.2. Data Flow Diagram (DFD)

4.2.1. Context Diagram

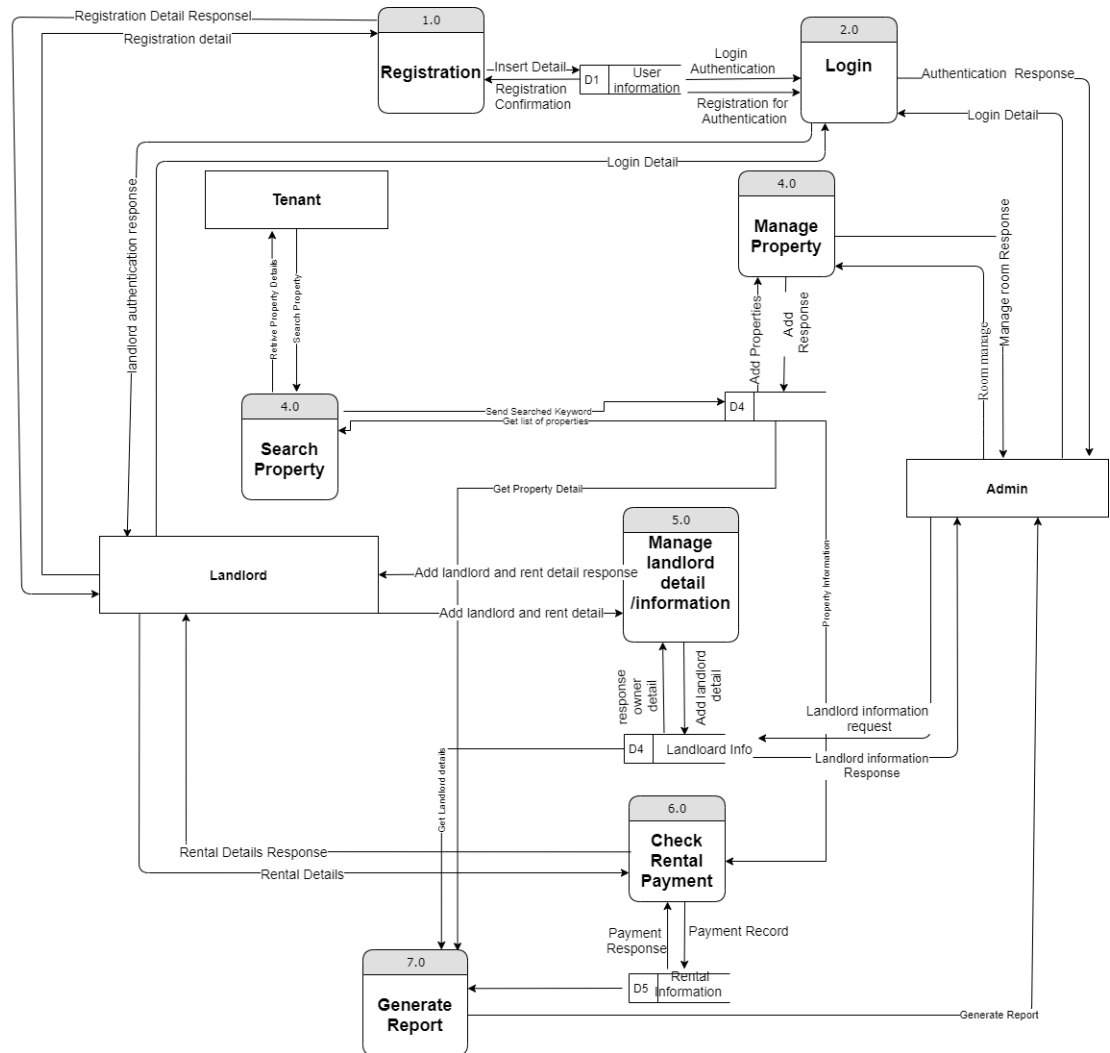*Figure 3: Context Diagram*

4.2.2. DFD Level 1

Figure 4: Level 1 DFD
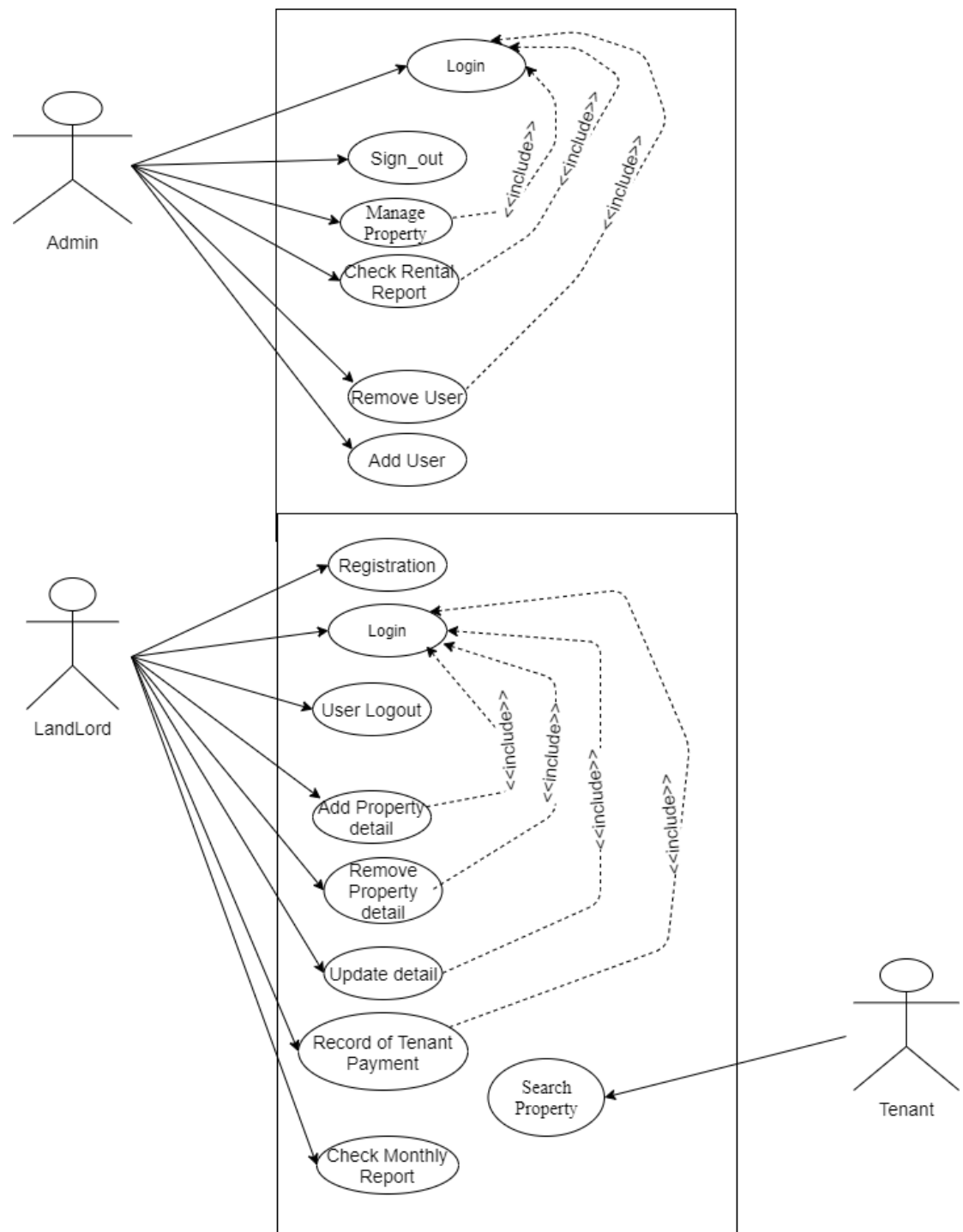
4.3. Use Case Diagram

3.4. Activity diagram

It shows the control flow from one activity to another. Activity diagram is another important diagram to describe dynamic behavior. Activity diagram consists of activities, links, relationships etc. It models all types of flows like parallel, single, concurrent etc. Activity diagram describes the flow control from one activity to another without any messages. These diagrams are used to model high-level view of business requirement.

Figure 6: Activity diagram for landlord

Figure 7:Activity diagram for tenant

3.5. Database Diagram

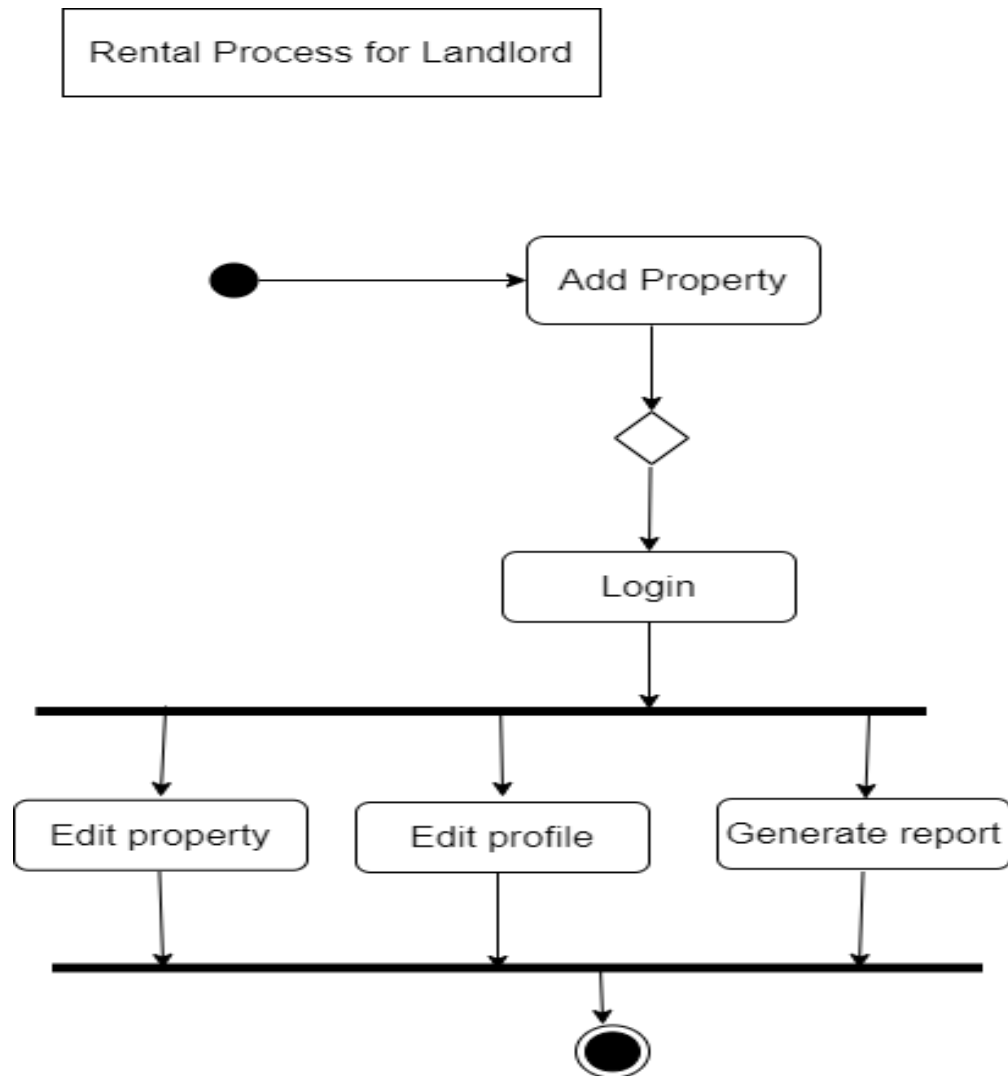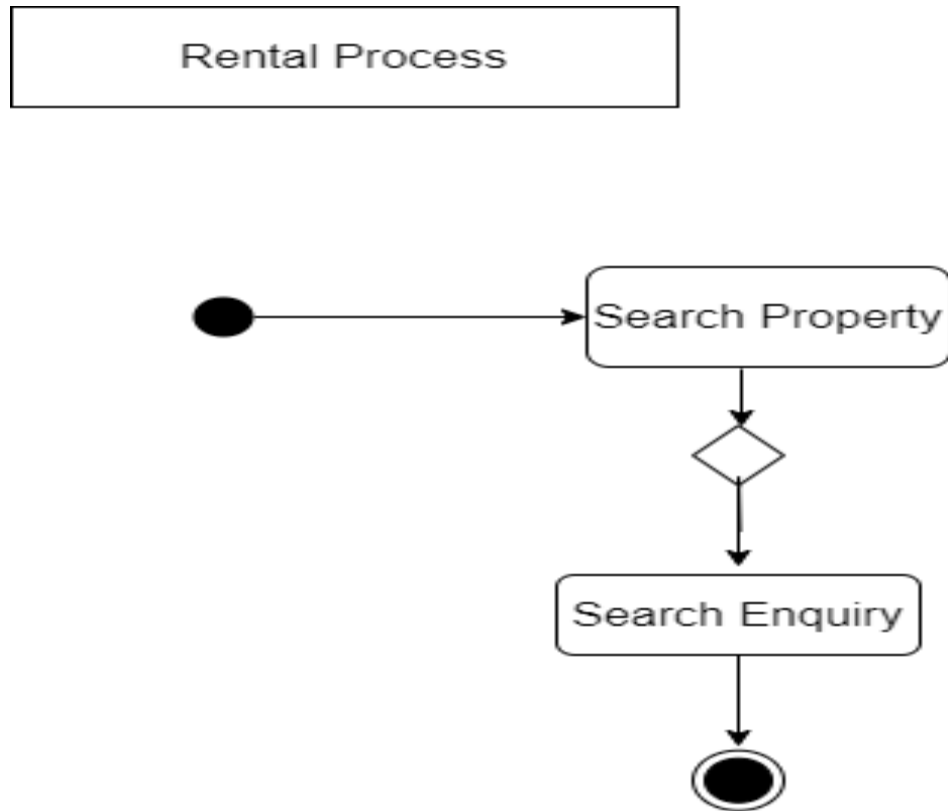The database stores most of the information required by the system. The database will be maintained by Strapi backend, which uses PostgreSQL as a relational database management system (RDBMS) that is based upon the Structured Query Language (SQL).

4.5.1. E-R Diagram
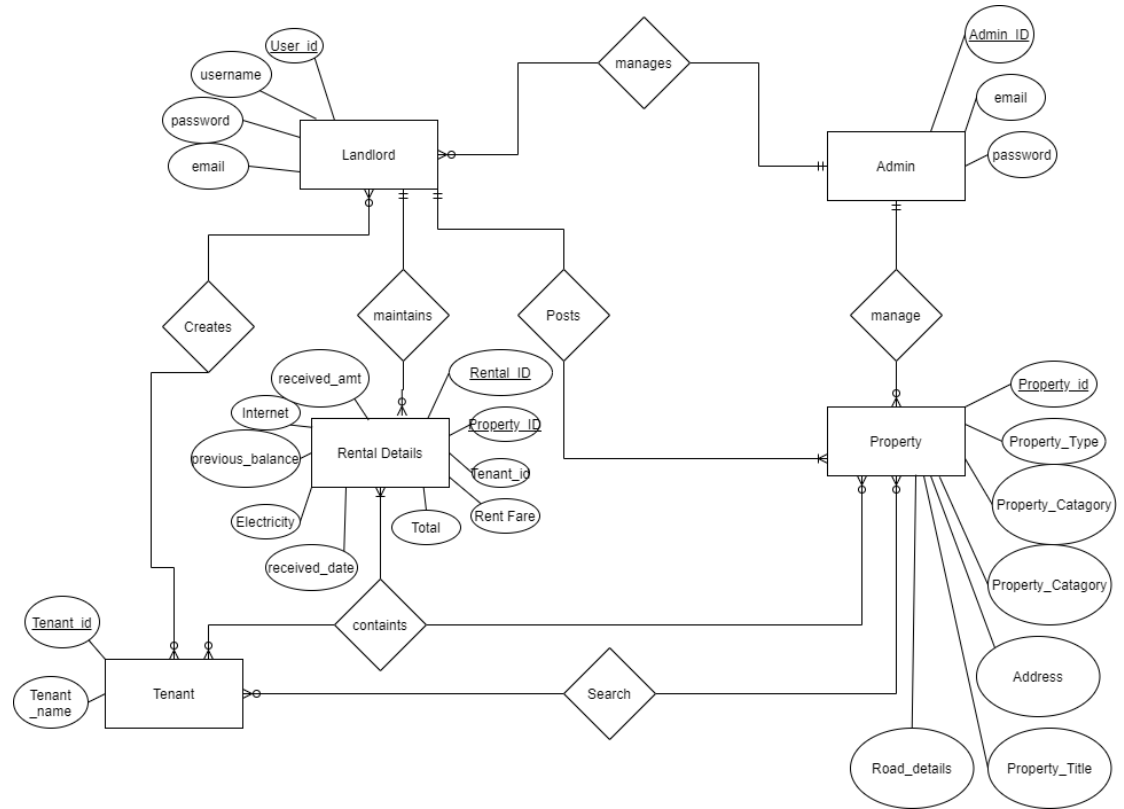
Figure 8: ER Diagram

4.5.2. Relational Data Structure

Table 3: Relational Data Structure

Fieldname	Data type	Length	Constraints
Admin ID	Integer	11	Not Null
Name	Varchar	225	Not Null
Email ID	Varchar	225	Not Null
Contact No.	Integer	11	Not Null
Address	Varchar	225	Not Null
User ID	Integer	11	Not Null
Name	Varchar	225	Not Null
Email ID	Varchar	225	Not Null
Contact No.	Integer	11	Not Null
Address	Varchar	225	Not Null
Property ID	Integer	11	Not Null
Owner ID	Integer	11	Not Null
Location	Varchar	225	Not Null
Status	Varchar	225	Not Null

				Not Null
Total value	Float			Not Null
Property ID	Integer		11	Not Null
Owner ID	Integer		11	Not Null
User ID	Integer		11	Not Null

4.5.3. Data Dictionary

The data dictionary is useful in the case of development.

Table Name: Admin, User, Property, Book

Primary Key: Admin ID, User ID, Property ID, Owner ID

Description: To store system detail

Table 4: Data Dictionary

Serial No.	Field	Datatype	Description
1.	Admin ID	Integer	Primary Key
2.	Name	Varchar	
3.	Email ID	Varchar	
4.	Contact No.	Integer	Multiple contacts can exist for a single admin
5.	Address	Varchar	
6	User ID	Integer	Primary Key
7	Name	Varchar	
8	Email ID	Varchar	
9	Contact No.	Integer	Multiple contacts can exist for a single admin
10	Address	Varchar	

11	Property ID	Integer	Primary Key
12	Owner ID	Integer	Foreign key to user master
13	Location	Varchar	
14	Status	Varchar	Available, rented, etc.
15	Total value	Float	
16	Property ID	Integer	Foreign key to Property Master.
17	Owner ID	Integer	Foreign key to Owner Master.
18	User ID	Integer	Foreign key to User Master.

4.6. UI/UX Mechanism

The development is based on a web application, so the UI is in the form of a web. To view different pages on the window, Linux or Mac there will be a navigation menu that offers drop-down menus. To provide a smooth user interface, we make use of buttons, form, graphics etc.
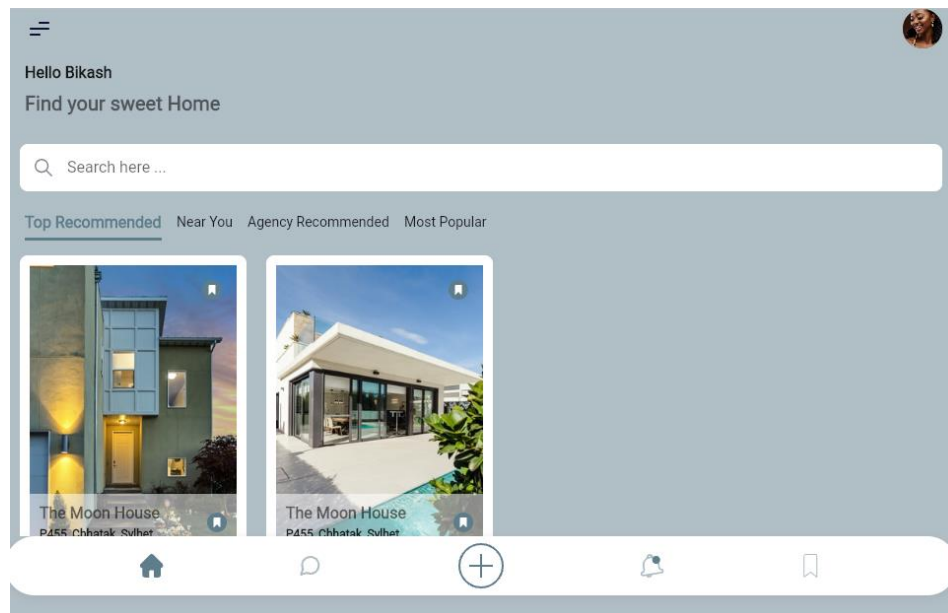
Chapter 5 Experimental Result and Analysis

5.1. Programming platform

The project is developed based on Application Development techniques. Data is stored in databases. The application uses the following platforms and technologies

- Strapi
- PostgreSQL
- Flutter
- Dart

We also used following tools or software for development of the application.

- Microsoft Word & PowerPoint (Documentation & Presentation)
- Visual Studio Code (IDE)
- Mobile app (Running, testing and debugging)
- Draw.io (Drawing & Figures)

5.2. Operating Environment

The "GharBeti" is internet based so it will run in any Operating System with internet access through Mobile Application.

- API
- Strapi server
- PostgreSQL Database.

5.3. Testing and Debugging

5.3.1. Testing

Each component is tested independently, without other system components interfering. This process is concerned with finding errors. It is also concerned with validating that the system meets its functional & non-functional requirements.

S.NO	Test Case	Expected Results	Actual Results
1	Sign in with empty admin name & password	Should display error message	Passed
2	Sign-in with invalid user name & password	Should display error message	Passed
3	Sign-in with valid user name & password	Should successfully Sign-in	Passed
4	Add a rental place with empty field	Should display error message	Passed
5	Add a rental place with Valid info	Should successfully add rental place	Passed
6	Landlord add place and personal detail with empty field	Should display error message	Passed

5.3. Experiment and Result Analysis

5.3.1. Experiment

The coding and testing process was completed successfully and the software behaves as desired. All the objectives of the project were met and we were able to provide all necessary features in the system.

Due to external issues, there was some difference with the time schedule specified in the analysis phase. The project completion Gantt chart is provided as an appendix in appendix 2

5.3.2. Expected Result

- Application will be a service, which will connect Renters and Landlords and vice versa.
- It will save the physical hard work and invaluable time to find room/flat/shop.

- It will save Resources for search the rooms/house/flats/shop.
- It will be an Open-Source Application which can be freely Install in android smart Phones.
- Application will make easy to find rooms/flats/houses/shops for the tenants and upload the location and other information by landlord/room-master.

Chapter 6: Conclusion and Future Enhancement

6.1. Conclusion

Online Property rental business has emerged with a new possibility compared to the experience where every activity concerning rental business was limited to a physical location only. Even though the physical search for houses has not been totally eradicated; the nature of functions and how these functions are achieved has been reshaped by the power of internet. Nowadays, renters can reserve houses online once the customer is a registered member of the application. The app-based property rental system has offered an advantage to both landlords as well as the tenants efficiently and effectively just with the click of a button.

6.2. Limitations

- Lack of insurance module
- No subscription features.

6.3. Future Enhancement

- Add the subscription feature
- Make more secure database

Reference

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3. Khalid Elshafie & Mozafar Haider. (February 2022). Designing Web APIs with Strapi
   Retrieve from:- http//www.bing,com/ Designing Web APIs with Strapi: Get started with the Str... (bookdownload.org)

Appendixes

Appendix1: Screenshot
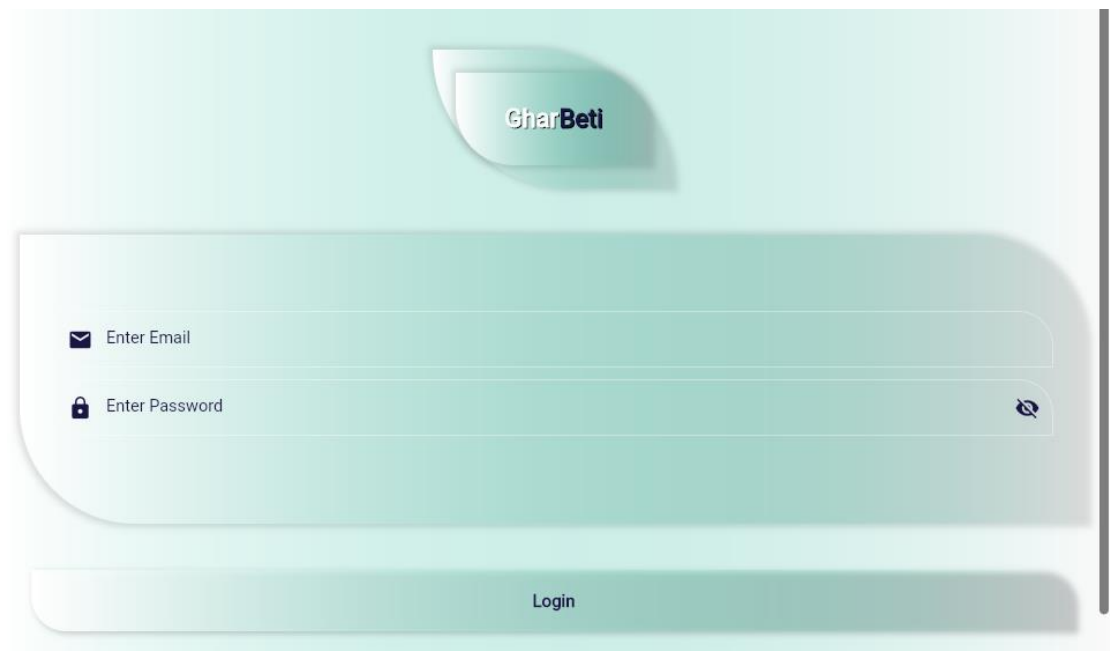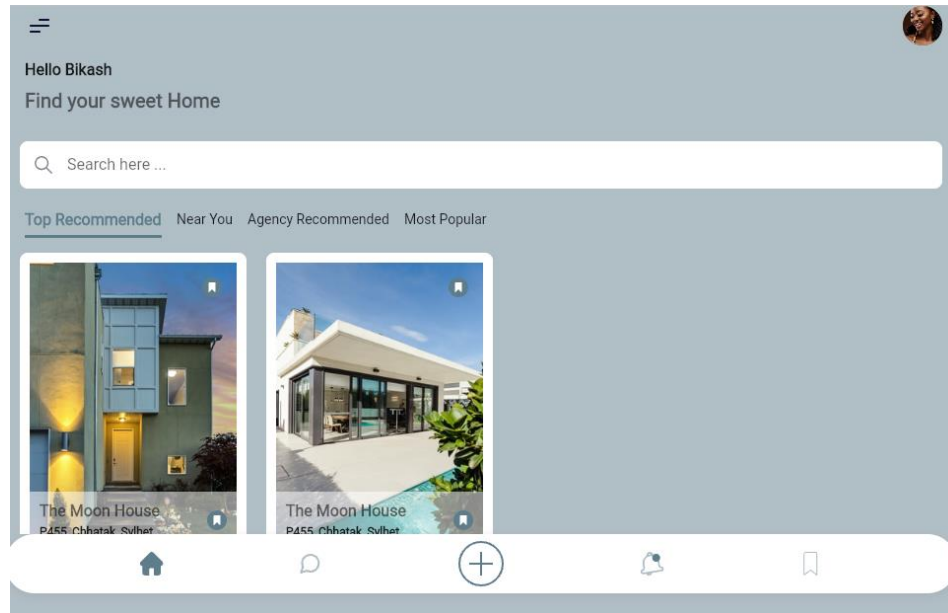
Appendix2: Project Completion Gantt chart

Figure 9: Project Completion Gantt Chart

S. N	Tasks	Duration (in Week)-Starts From (20th Aug2022)												
		1	2	3	4	5	6	7	8	9	10	11	12	13
1	Concept submission	■												
2	Resource collection		■											
3	Research and analysis			■	■									
4	System Design				■	■								
5	Coding				■	■	■	■	■	■	■			
6	Testing and debugging				■	■	■	■	■	■	■	■	■	
7	Documentation		■	■	■	■	■	■	■	■	■	■	■	■

Appendix3: User Manual

1.1.Manual for landlord

Sign up:

To sign up or register the user detail to the system,

i.   First click on the sign-up bottom
ii.   Then fill the detail.
iii.   Fill according to the instruction.
iv.   At last, submit the detail.

Sign in/login:

To sign in or login the user detail into the system,

i.   After sign up, that redirect to the sign in page.
ii.   Then, fill user name and password.
iii.   Click on the login bottom.

Update property detail

To update property detail,

i.   After enter into the home page, click on type of property.
ii.   Then, choose which type of property you belong.
iii.   There is update option then, click on it.
iv.   Change which details you want to update.

Update profile

To update profile detail,

i.   After enter into the home page, click on my profile.
ii.   Then, click on edit profile option.
iii.   Change which details you want to edit.
iv.   Click on save option.

Generate report

To generate monthly report,

i.   After enter into the home page, click on report.
ii.   Then, click on generate option

iii.   Monthly report is generated.

1.2.Manual for tenant

Search for the property:

To search for the property,

   i.   First click on the search bar at top of homepage
  ii.   Enter the desire Keywords.
 iii.   App will display the result property list with similar keywords.
  iv.   Click on the desire property to view the details of the selected property.

Appendix4: Revenue Model
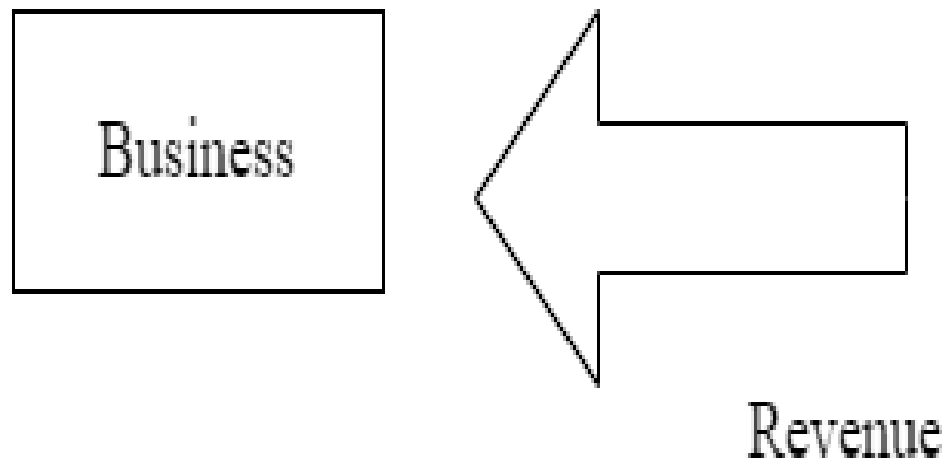
1. A revenue model is how a business makes money

Figure 10: Revenue Model

2. Customer pay for a solution to problem
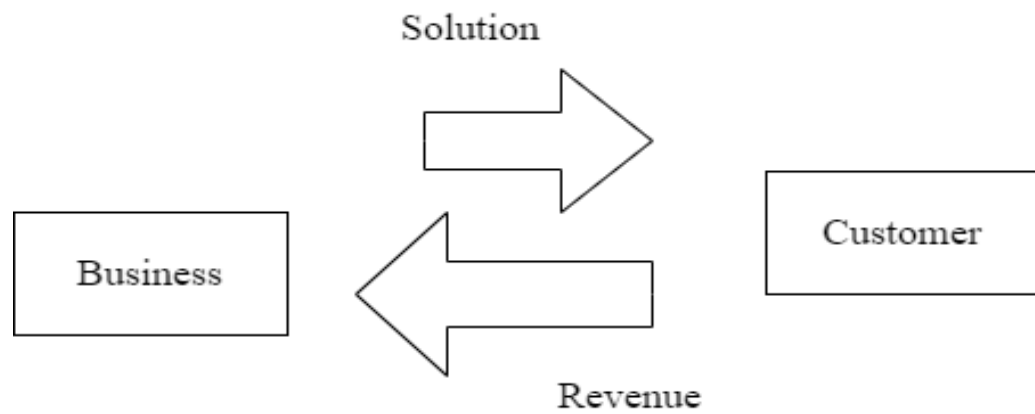
Solution

Business ← → Customer

Revenue

Figure 11: Customer pay for a solution

3. Revenue model is an exchange value

Solution value

Business ← → Customer

Revenue