

Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System

A Information Assurance and Security II Presented to the Faculty of the College of Arts and Sciences

Information Technology Education Department

Eulogio "Amang" Rodriguez

Institute of Science and Technology

Nagtahan, Sampaloc, Manila

In Partial Fulfillment

of the Requirements for the degree of

Bachelor of Science in Information Technology

By:

Alimoot, Jerrecho T.

Del Pilar, Rovic S.

Panotes, Miguelle E.

Puno, Mark Wilson N.

Tulalian John, Roland P.

June 2022

## APPROVAL SHEET



Republic of the Philippines  
EULOGIO "AMANG" RODRIGUEZ  
INSTITUTE OF SCIENCE AND TECHNOLOGY  
Nagtahan Manila, Philippines

### College of Arts and Sciences

April 28, 2022

Dr. Joseph Tesoro  
CEO of Dental Expert

University Tower 2 office 11, Galacia St.  
corner Espana St. Sampaloc 1008  
Manila, Philippines

Dear Dr. Joseph Tesoro,

Good day!

We, the 3<sup>rd</sup> Year students from Eulogio "Amang" Rodriguez Institute of Science and Technology (EARIST) in support of College of Arts and Science Department (CAS), currently enrolled in the subject entitled "*System Architecture I*", would like to ask for permission to conduct a research study in **Dental Experts by Dr Tesoro Dental Clinic**

The permit will allow the researchers to perform an interview and gather information for further knowledge and understanding in the **Dental Clinic** operations on data gathering and other related processes that are considered useful for the completion of the project especially in the design and development of possible system to meet research goals.

We rest assured that all the data gathered will be treated with the utmost confidentiality and for academic purposes only.

Thank you very much to your cooperation with us, it was a pleasure to serve you with our credibility and integrity.

Members and Signature

Respectfully yours:

*J. Roland* Tulalian, John Roland  
*M. Wilson N.* Puno, Mark Wilson N.  
*Miguelle* Panotes, Miguelle  
*Rovic S.* Del Pilar, Rovic S.  
*Jeriko T.* Alimoot, Jeriko T.

Noted by:

*Ms. Merlita C. Latip*  
Subject Professor

*Joseph Paulo D.*  
TESORO, JOSEPH PAULO D.

**ABSTRACT**

The purpose of this study is to implement an online appointment system that provides a registration and login for patients and a login for admin. The admin can login by giving a username and password. Patients can register by giving their necessary details. After successful registration, the patient can log in by giving their username and password. Both admin and patient registration and login require verification for security purposes. QR code for admin and captcha for patients.

The patients can only view their home page, profile, and a preview of their dental contract. If they received a reminder from the admin, they can schedule their appointment and then send their payment. They can also leave a message for the admin if they have any queries. The patient can also view the status in the Status tab and also get an e-mail stating that the booking is confirmed.

On the admin side, they can access the entire website where they can remind the patients of their upcoming clinic visits. They can approve or decline the patient reservation requests and view, edit, and attach files to the patient

information. The admin can also leave a message for the patient. The backup data can be downloaded if needed.

#### **ACKNOWLEDGEMENT**

We would want to express our deepest gratitude to all those who morally support us; without their guidance, the completion of this project would not be possible, and would not want anyone else to lose hope.

We'd like to express our thanks to our respected professors, **Mrs. Merlita P. Latip** and **Ms. Joeelyn Fajardo**, for their patience, enthusiasm, and sharing of their expertise.

To our family, who help us financially and physically in various ways. Thank you for the unending support.

To our classmates and friends who cheered us on and assisted us when we needed it.

To Dr. Joseph Tesoro, Chief dentist, and CEO of Dental Experts for allowing us to make them our beneficiaries. We would like to give thank all the staff of the Dental Clinic for their great effort to give all the information that the proponent needs.

Above all, we praise our Almighty God for providing us with determination, knowledge, and wisdom, as well as His unconditional love. All praise to God!

**DEDICATION**

This project study is gratefully dedicated to our parents, beneficiary, and teachers who serve as our inspiration and motivation when in times we felt like giving up. To our parents who gave us physical, emotional, and financial support, thank you for being our support system.

To our friends and classmates who give advice and support to finish this study.

To our Almighty God, who serves as a source of power and wisdom, for without his guidance everything is worthless.

### **Table of Contents**

APPROVAL SHEET.....	i
ABSTRACT.....	ii
ACKNOWLEDGEMENT.....	iv
DEDICATION.....	v
LIST OF TABLES / FIGURES / NOTATION.....	x
CHAPTER 1: INTRODUCTION.....	1
1.1 Historical Background.....	1
1.2 Organizational Chart .....	3
1.2.1 Company as Whole .....	3
1.3 Statement of the Problem .....	4
1.4 Scope and Delimitation .....	10
CHAPTER 2: SYSTEM ANALYSIS.....	11
2.1 System Name and Background .....	11
2.2 System Analysis Tools .....	12
2.2.1 System Outline .....	12
2.2.2 Existing System Flowchart of Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System .....	13
2.2.3 Proposed System Flowchart for Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System .....	14
2.2.4 Gantt Chart for Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System ....	15
2.2.5 Existing Context Diagram in Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System .....	16
2.2.6 Context Diagram for Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System .....	17

2.2.7 Existing Data Flow Diagram in Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System .....	18
2.2.8 Data Flow .....	19
Diagram for Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System .....	19
2.2.9 Data Dictionary of Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System .....	20
2.2.10 User Requirements Personnel: .....	21
CHAPTER 3: GENERAL DESIGN.....	23
3.1 General Objectives .....	23
3.2 Specific Objectives .....	23
3.3 Presentation of Alternatives .....	24
3.3.1 Alternative No. 1 Mobile Application Setup .....	24
3.3.1.1 System Flowchart (Mobile Application Set-up) .....	26
3.3.1.2 Physical Elements.....	27
3.3.1.2.1 Network Layout .....	27
3.3.1.2.2 Database/Tables (Mobile Application Set-Up) .....	28
3.3.1.2.3 Reports (Mobile Application Setup) .....	30
3.3.1.2.4 Manual Process (Mobile Application Setup) .....	30
3.3.1.2.5 Tangible and Intangible Benefits (Mobile Application Setup) .....	30
3.3.1.3 Requirements Definitions (Mobile Application Setup) .....	31
3.3.1.4 Cost and Benefits Analysis (Mobile Application Setup) .....	32
3.3.1.7 Graphical User Interface (Mobile Application Setup) .....	35

3.1.2 Alternative No. 2 Centralized Setup .....	51
3.3.2.1 System Flowchart (Centralized Setup) .....	53
3.3.2.2 Physical Elements (Centralized Setup) .....	54
3.3.2.2.1 Network Layout (Centralized Setup) .....	54
3.3.2.2.2 Database/Tables (Centralized Set-Up) ....	55
3.3.2.2.3 Reports (Centralized Setup) .....	58
3.3.2.2.4 Manual Process (Centralized Setup) .....	58
3.3.2.2.5 Tangible and Intangible Benefits (Centralized Setup) .....	59
3.3.2.3 Require Definition (Centralized Setup) .....	60
3.3.2.4 Cost and Benefits Analysis (Centralized Setup) .....	61
3.3.2.5 Computation for Payback Period (Centralized Setup) .....	62
3.3.2.6 Graphical User Interface (Centralized Setup)	63
3.3.3.1 System Flowchart (Web Application Setup) ....	85
3.3.3.2 Physical Element (Web Application Setup) ....	86
3.3.3.2.1 Network Layout (Web Application Setup) ..	86
3.3.3.2.2 Database / Tables (Web Application Setup)	87
3.3.3.2.3 Reports (Web Application Setup) .....	90
3.3.3.2.4 Manual Process (Web Application Setup) ..	90
3.3.3.2.5 Tangible and Intangible Benefits (Web Application Setup) .....	91
3.3.3.3 Requirements Definition (Web Application Setup) .....	92
3.3.3.4 Cost and Benefits Analysis (Web Application Setup) .....	93

3.3.3.5 Computation for Payback Period (Web Application Setup) .....	95
3.3.6.6 Mockup Design for Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System.....	96
CHAPTER 4: METHODOLOGY.....	112
4.1 Research and System Development Method .....	112
4.2 Data Collection .....	114
4.3 Ethical Issues .....	115
4.4 Compliance Requirements .....	117
4.5 Analysis of Data .....	120
4.6 Project Plan Deliverables .....	123
4.7 Work Breakdown Structure .....	127
4.8 Risk Analysis .....	128
4.9 Duration .....	130

**LIST OF TABLES / FIGURES / NOTATION**

1.2 Organizational Chart.....	3
1.2.1 Company as Whole.....	3
2.2.2 Existing System Flowchart.....	13
2.2.3 Proposed System Flowchart.....	14
2.2.4 Gantt Chart .....	15
2.2.5 Existing Context Diagram .....	16
2.2.6 Context Diagram .....	17
2.2.7 Existing Data Flow Diagram.....	18
2.2.8 Data Flow Diagram.....	19
2.2.9 Data Dictionary.....	20
3.3.1.1 System Flowchart (Mobile Application Set-up) .....	26
3.3.1.2.1 Network Layout.....	27
3.3.1.2.2 Database/Tables (Mobile Application Set-Up) .....	28
3.3.1.3 Requirements Definitions (Mobile Application Set-up) .....	31

3.3.1.4 Cost and Benefits Analysis (Mobile Application Set-up) .....	32
3.3.1.7 Graphical User Interface (Mobile Application Setup) .....	35
3.3.2.1 System Flowchart (Centralized Set-up) .....	53
3.3.2.2.1 Network Layout (Centralized Set-up) .....	54
3.3.2.2.2 Database/Tables (Centralized Set-Up) .....	55
3.3.2.3 Requirements Definition (Centralized Set-up) .....	60
3.3.2.4 Cost and Benefits Analysis (Centralized Set-up).....	61
3.3.2.5 Computation for Payback Period (Centralized Setup) .....	62
3.3.2.6 Graphical User Interface (Centralized Setup) .....	63
3.3.3.1 System Flowchart (Web Application Setup) .....	85
3.3.3.2.1 Network Layout (Web Application Setup) .....	86
3.3.3.2.2 Database / Tables (Web Application Setup) .....	87
3.3.3.3 Requirements Definition (Web Application Setup) .....	92

3.3.3.4 Cost and Benefits Analysis (Web Application Setup) .....	93
3.3.3.5 Computation for Payback Period (Web Application Setup) .....	95
3.3.6.6 Mockup Design for Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System.....	96

## CHAPTER 1: INTRODUCTION

### 1.1 Historical Background

Dental Expert by Dr. Tesoro Dental Clinic is owned by Joseph Paulo Tesoro who graduated in the year 2014 from Centro Escolar University. Before he put up his own Dental Clinic, he gained experience first where he used to work in 8 different clinics. His Specialization is specialists in Orthodontics, Cosmetic Surgery, TMJ, and so on. The said Clinic was established on June 5, 2016, and it is located at University Tower 2 office 11, Galacia St. corner España Sampaloc Manila. which is almost about 6 years now.

Ever since he graduated as a dentist he has been trusted by his patients because of his alleged excellence in his profession. His patients follow him even though he works in the various dental clinics until he can open his own. Until now, he is followed by patients due to the help of the recommendation of his current patients because of his good service and his workers.

#### *Services Offered:*

Dental Expert by: Dr. Tesoro Dental Clinic offered all dental services but most are the following:

#### **1. General Procedure**

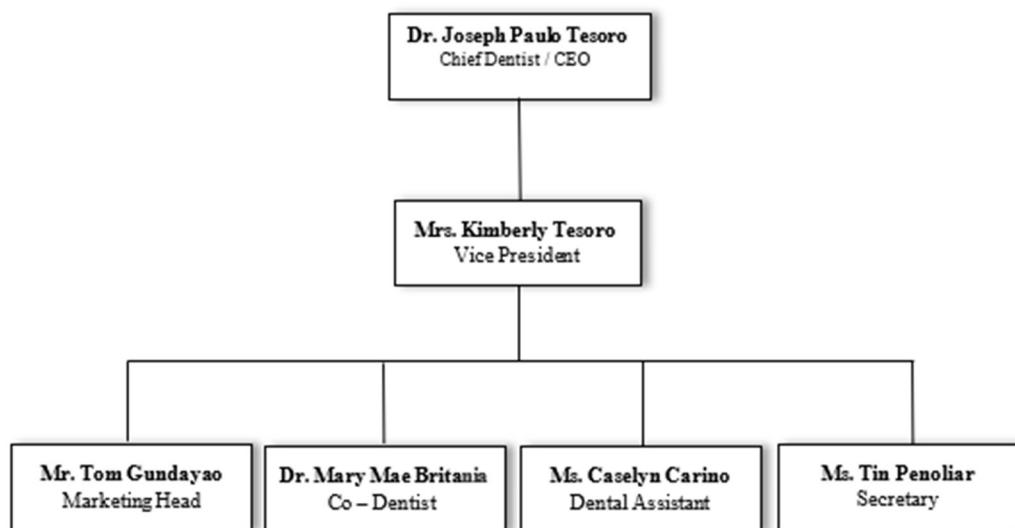
- 1.1 Oral Prophylaxis or Cleaning in Layman's term.
- 1.2 Restoration or Pasta.
- 1.3 Extraction or Bunot.
- 1.4 Root Canal Treatment
- 1.5 Orthodontic Adjustment

**2. Cosmetic Dentistry**

- 2.1 Veneers
- 2.2 Crown
- 2.3 Fixed Bridge
- 2.4 Implant
- 2.5 Gum Treatment
- 2.6 Whitening

## 1.2 Organizational Chart

### 1.2.1 Company as Whole



### **1.3 Statement of the Problem**

**Problem 1: Redundancy in patient's record and inability to check large number of files.**

**Documents involved:**

- Patient information for Orthodontic Adjustments that contains their name, age, contact no. and procedure
- File records for medical history.

**Scenario:**

New patient appointments arrive one after the other, along with newly made records, which are then placed in matching envelopes. The secretary keeps track of each patient's records and updates the files every time they have a session. Therefore, sometimes, she has difficulties in finding patient files because of these different scenarios:

Secretary Penoliar has difficulty in her job of finding the patient file since many records are hidden and added every time a patient is coming especially when they are making orthodontic adjustments. Orthodontic adjustments are the process wherein the dentist adjusts the braces every month.

In this scenario where some of the patients have the same name that causes the secretary to be confused about putting their files in their correct folder. Sometimes the secretary puts the same file of a different person in the same folder.

**Cause:**

- Manual File System.
- Same patient name.

**Impact:**

- Time-consuming.
- The wrong folder was added to the same patient

**Quantification:**

- If there are 14 patients every weekday, there are 15 minutes of finding one patient record.

Therefore, 14 patients times 15 minutes is equal to 3 hours and 30 minutes consumed by finding the records of 14 patients every weekday.

- If there are 30 patients every weekend, there are 15 minutes of finding one patient record.

Therefore, 30 patients times 15 minutes is equal to 7 hours and 30 minutes consumed by finding the records of 30 patients every weekend.

**Breakdown of the time consumed:**

- Finding one patient's record is = 15 minutes

**Problem 2: Inability to monitor and confirm patients booking in advance.****Documents Involved:**

- Text Confirmation from the patients.

**Scenario:**

In this case, the possible scenario is some patients didn't confirm if they will appear at that certain appointment. Sometimes, the clinic cannot authenticate the said schedule if it's valid or not.

For example, Mr. John, went to the clinic to have an appointment for his check-up. The said schedule is on May 24, 2022, at 8 AM. After 1 week, the clinic emailed the patient asking if he will continue his appointment for them to be able to prepare the needs for that consultation. Unfortunately, after 24hrs, Mr. John didn't respond. And the next day, he came to the dental clinic and wish to consult him immediately, but because Mr. John miss out on his respective schedule the patient needs to wait until all the scheduled patients are done.

**Cause:**

- There's no automatic system that updates the patients about their appointment so that, they can't confirm if they will continue on their consultation or not.
- Some of the patients just don't come because they think they have nothing to lose.

**Impact:**

- An uncertain number of patients in a day.
- Loss of profit.

**Quantification:**

- If there are 14 confirmed patients every weekday and 7 of them are late or did not show up there are 1 hour of waiting for the patient to show up.  
Therefore, 7 patients times 1 hour is equal to 7 hours consumed waiting for a patient to arrive.

**Breakdown of the time consumed:**

- Total of 1-2 hours will be consumed waiting for patients to arrive.

**Problem 3:** Due to the large number of patient, Secretary experiencing difficulties to remind their patients regards on their dental schedule since they are using text messages to remind them.

**Documents Involved:** List of Patients that need to remind.

**Scenario:**

Patients' timetables are not easy to handle especially when there are a lot of patients. The order of Dr. Tesoro to her secretary is to update the patients one day before their schedule. But sometimes, the secretary can only update 80% of their patients.

In this scenario, one of the patients, namely Mark, needs to have brace adjustments last April 5, 2022. But due to the number of patients that needed to be updated that day, some of the patients including Mark didn't receive the text message from the secretary

**Cause:**

- A huge number of patients to update in a day.
- manually updating the patients to their appointment.

**Impact:**

- Time-consuming for both the clinic and the patients
- Loss of profit
- Conflict of schedule

**Quantification:**

- If there are 50 patients that need to remind there are 10 minutes of time consumed to remind 1 patient. Therefore, 10 minutes times 50 patients is equal to 8 hours and 30 minutes total time consumed reminding the patients to regard their schedule.

**Breakdown of the time consumed:**

- Updating the patients one by one = 10-15 minutes.

#### **1.4 Scope and Delimitation**

The scope of this study is to make an appointment scheduling system that will help the clinic personnel and patients of Dental Expert by Dr. Tesoro Dental Clinic. Patients can access the system through their devices using their smartphones, laptops, and tablets with an internet connection. They will need to register on our system which will ask for their information such as Full name, Age, Birthdate, Gender, Contact, address, email address, as well as their username, and passwords. They can book an appointment by requiring to pay a reservation fee that serves as their advanced payment thru Gcash. This system is accessible wherever they are, as long as they have an internet connection. The clinic's personnel, especially the secretary, will also be essential to this system. It will become easier to access the list of scheduled patients and more convenient in informing every upcoming patient. This system also provides an online file management system where it automatically stores patient records after they register.

As of now, the system is not supported by paying through debit/credit card, Paymaya, Paypal, and other online modes of payment. Internet connection is also important to this system because it is not accessible without a LAN or WIFI.

## CHAPTER 2: SYSTEM ANALYSIS

### 2.1 System Name and Background

Dental Expert by Dr. Tesoro wants to have a system where their patient can easily book an appointment online and where they can also remind them about their dental schedule. They also want to have features of the system where they can easily access the record of their patients.

Researchers interviewed the owner and the chief dentist of the said dental clinic about their setting appointment, finding patients' records, and reminding them regarding their schedule. According to Dr. Joseph, finding their patient records took a lot of time because they only used the manual way. He also stated that they face difficulties in terms of reminding and setting appointments for their patient. This is the reason why researchers created the Web-based Scheduling system for Dental Experts by Dr. Tesoro.

Internal entities of the system include the Booking of Appointments, Patients account, and all about the dental clinic.

## **2.2 System Analysis Tools**

### **2.2.1 System Outline**

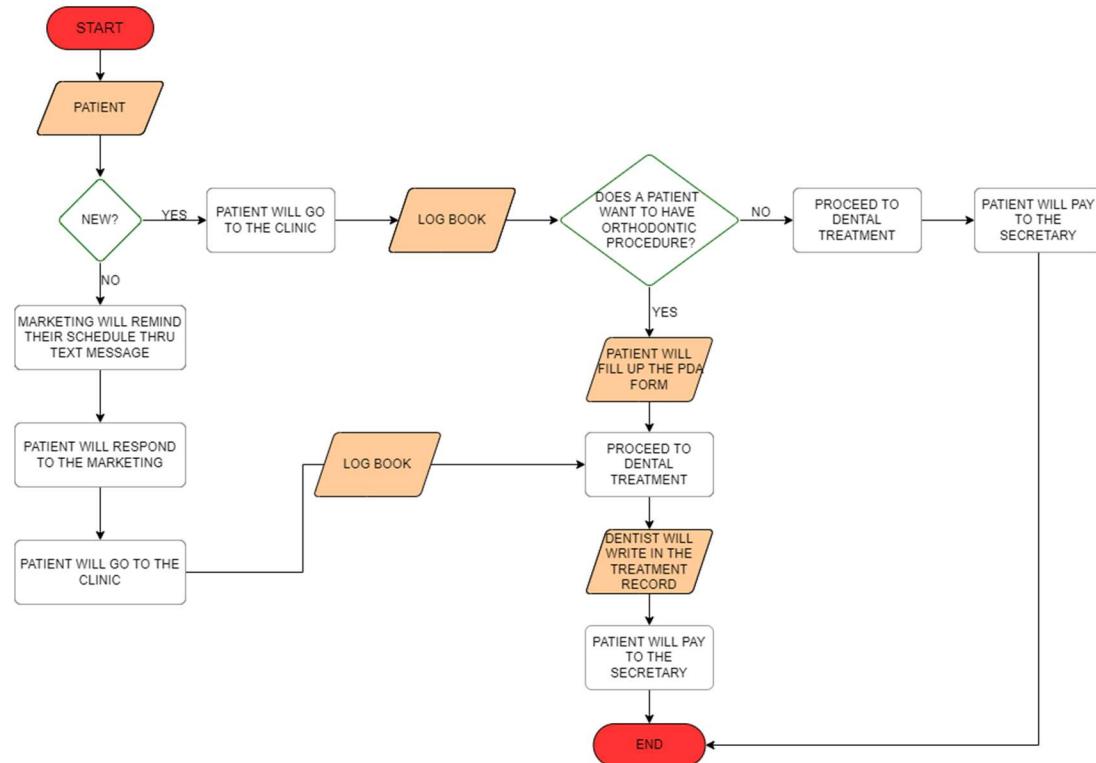
#### **Manual Processing**

In terms of handling patient records, the secretary has to find the brown envelope of the patients on the shelves and it cost a lot of time because they need to check the envelope one by one. Next, is when they are reminding their patient with regards to their appointment. The marketing team needs to text one by one of their patients which is why sometimes they forget some of their patients.

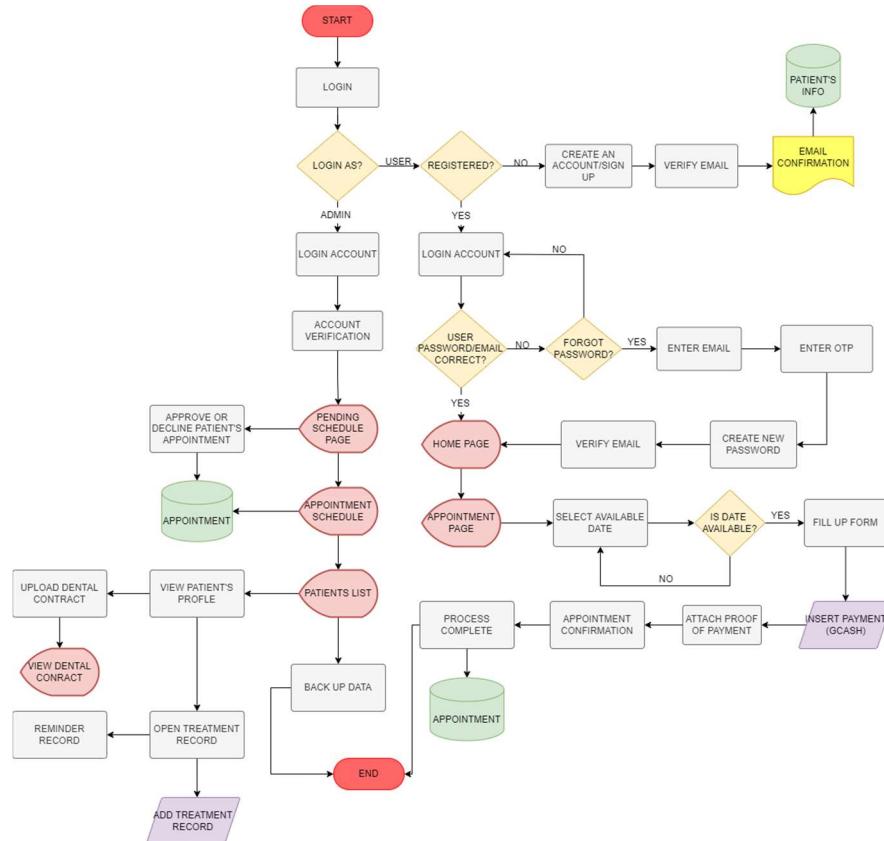
#### **System Processing**

Staff must use the system to find the records of patients and they can also use it to send an automated email that contains the next schedule that the patients need to book. The patient should use the system to book an appointment. The patient needs to fill up the form on the website to set the appointment.

**2.2.2 Existing System Flowchart of Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System**

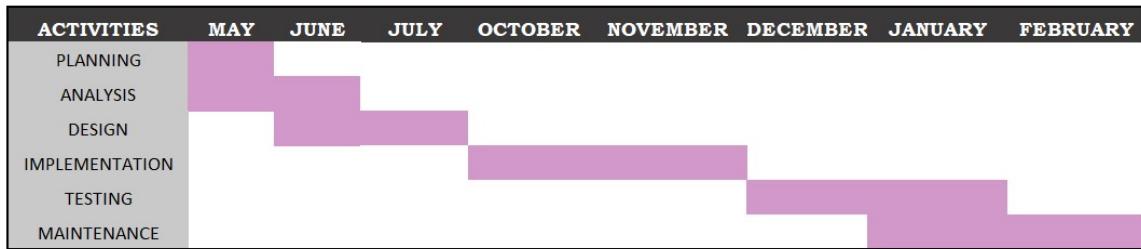


## 2.2.3 Proposed System Flowchart for Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System



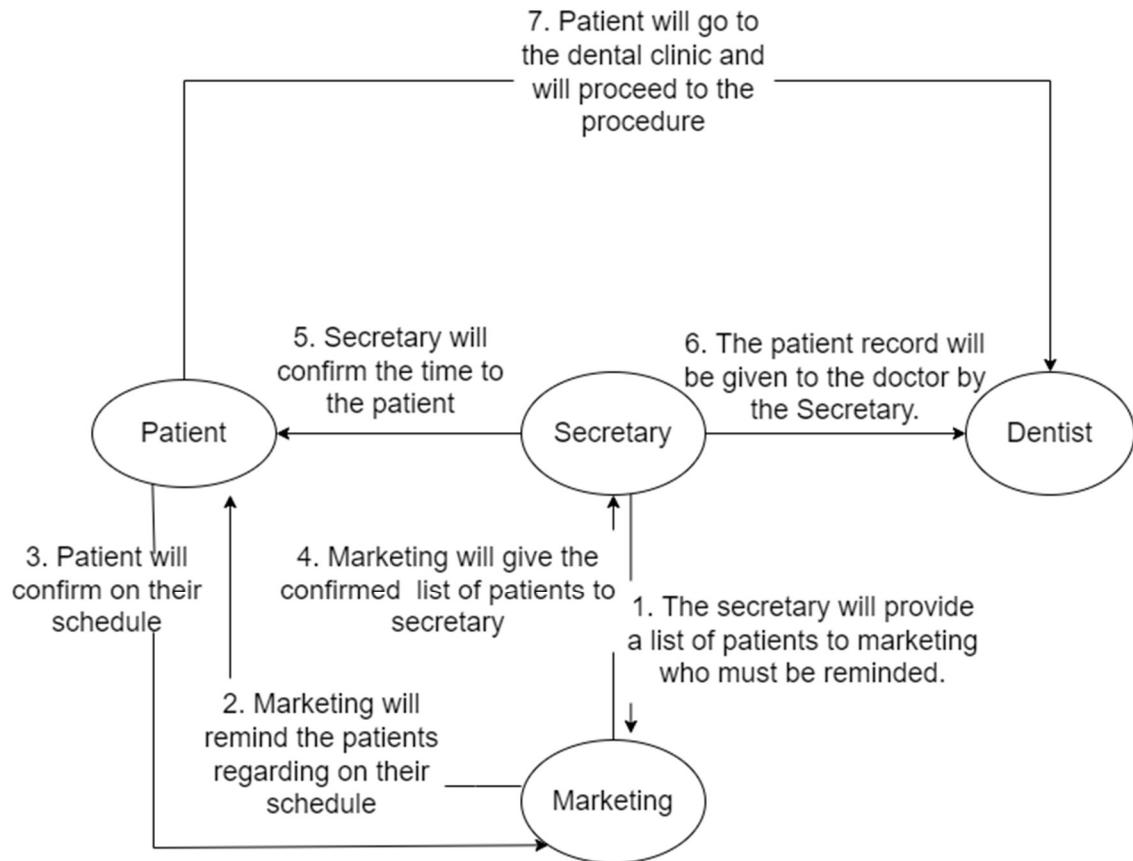
It is a graphical representation of a program logic sequence. A flowchart is displaying the sequential sequence of the different processes. In this diagram, the flowchart displays the individual steps, such as creating an account, signing an account, booking an appointment, and checking and adding the records.

#### 2.2.4 Gantt Chart for Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System

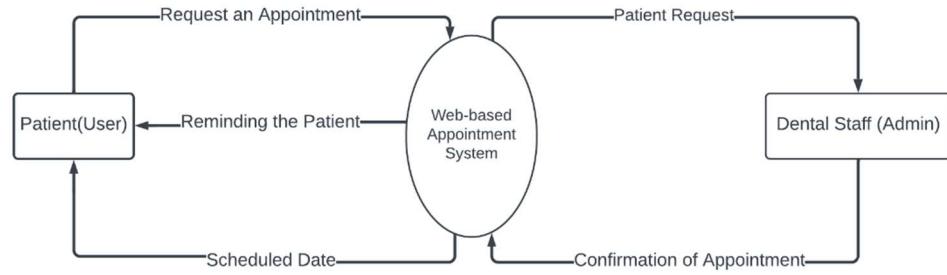


A Gantt chart is a graphical representation of the timetable of the project. It's a type of bar chart that shows the beginning and the finish month of the different project elements such as the Planning, Analysis, Design, Implementation, Testing, and Maintenance stages.

**2.2.5 Existing Context Diagram in Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System**



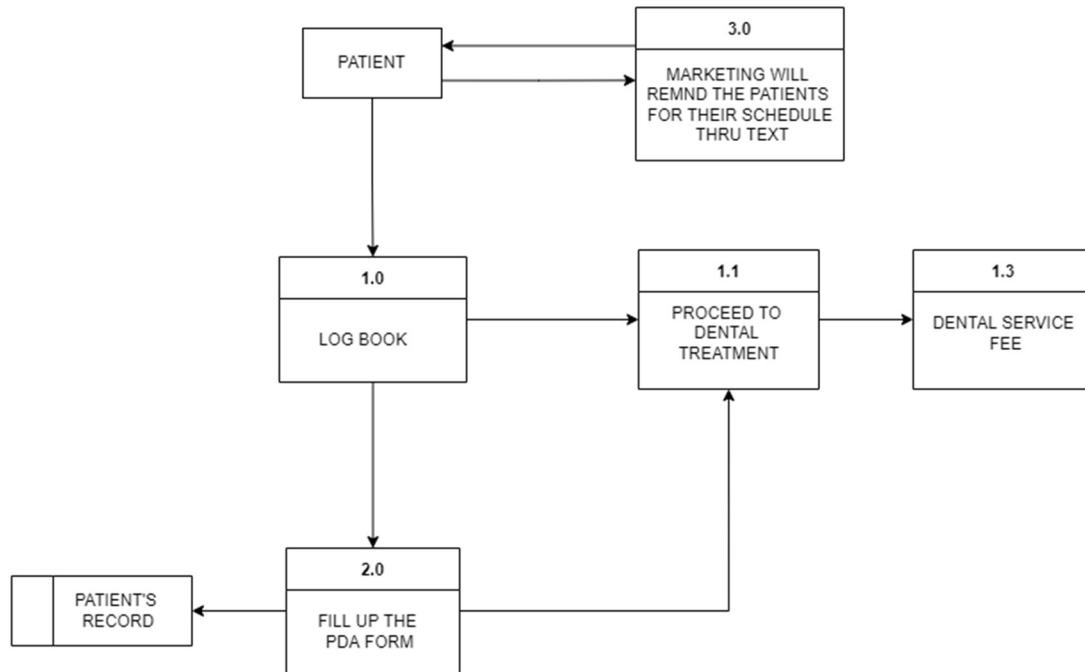
### 2.2.6 Context Diagram for Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System



Context Diagram

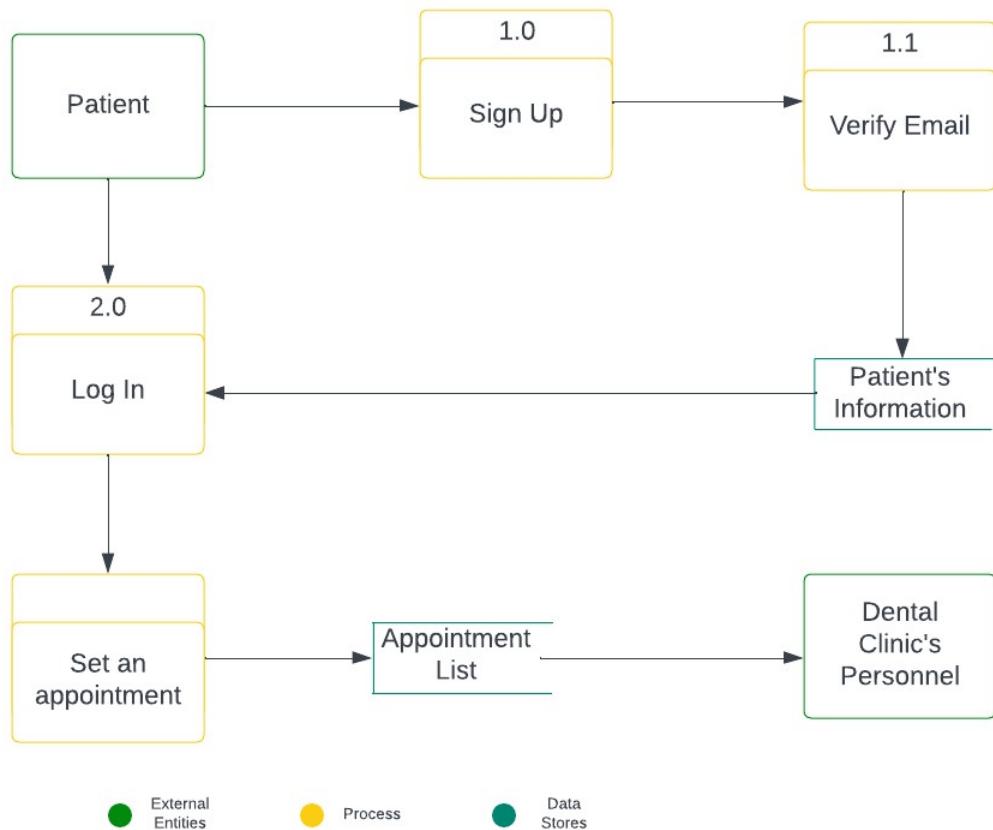
This high-level representation of the organizational system depicts the system border, external entities that interact with it, and the primary flows between the entities and the system. A context diagram sometimes called a level 0 data-flow diagram, is drawn to define and clarify the boundaries of the software system. It identifies the flows of information between the system and external entities. The entire software system is shown as a single process.

**2.2.7 Existing Data Flow Diagram in Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System**



#### 2.2.8 Data Flow

**Diagram for Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System**



Data Flow Diagram

This is the graphical representation of the flow of the data and logic within the system. A data flow diagram is the movement of data through a process or system. It also contains information about each entity and the price

**2.2.9 Data Dictionary of Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System**

**Request Form**

<b>FIELD NAME</b>	<b>FIELD TYPE</b>	<b>FIELD LENGTH</b>	<b>DECIMAL</b>	<b>DESCRIPTION</b>
<b>First name</b>	Alphanumeric	20	0	Patient's First name
<b>Last name</b>	Alphanumeric	20	0	Patient's Last name
<b>Middle name</b>	Alphanumeric	20	0	Patient's Middle name
<b>Address</b>	Alphanumeric	30	0	Patient's address
<b>Civil Status</b>	Alphanumeric	10	0	Patient's Status
<b>Religion</b>	Alphanumeric	9	0	Patient's Religion
<b>Date of Birth</b>	Datetime	10	0	Patient's Birthday
<b>Place of Birth</b>	Alphanumeric	20	0	Patient's Place of Birth
<b>Age</b>	Numeric	2	0	Patient's Age
<b>Contact Number</b>	Numeric	11	0	Patient's Contact Number
<b>Gender</b>	Alphanumeric	7	0	Patient's identity
<b>Contact person in case of emergency</b>	Alphanumeric	20	0	Patients Relative

**2.2.10 User Requirements Personnel:****President**

Joseph Tesoro is the clinic's general chief dentist, specializing in orthodontics, cosmetic surgery, TMJ surgery, and many more procedures.

**Vice President**

If the President is absent, Kimberly Tesoro will serve as the overall head dentist.

**Co-dentist**

Handled the clinic's outgoing costs, invoices, and armamentarium while also assisting in the treatment of patients.

**Secretary**

Tin Penoliar was in charge of file organization, document preparation, office supply inventory management, and appointment scheduling.

**Marketing head**

Tom Gundayao is responsible for developing strategies for all Marketing teams, including Digital, Advertising, Communications, and Creative. Preparing and administering the Marketing department's weekly, quarterly, and yearly budgets. Goals for the team must be set, monitored, and reported on.

**Dental assistant**

Caselyn Carino Assists with infection control by sterilizing and sanitizing tools, preparing materials, and aiding with dental treatments. Assisting dentists with medical and dental crises when needed.

**Patients**

a person receiving or registered to receive medical treatment.

## CHAPTER 3: GENERAL DESIGN

### 3.1 General Objectives

The primary goal of this research is to develop an appointment scheduling system that will allow arriving patients to simply make an appointment. In addition, the finding records of the patient will be easier, and also in reminding their patient will be faster. This would also assist the staff at Dental Expert by Dr. Tesoro Dental Clinic in managing patient records and reminding patients of their next appointment.

### 3.2 Specific Objectives

These are the specific objectives of the study based on the problems stated:

- To reduce the number of patients who do not come and do not take the scheduled slot seriously.
- To keep updated all upcoming patients about their next schedule automatically.
- To prevent mishandling of records and to reduce working time in finding a specific folder.
- To book an appointment easier and efficiently.

### **3.3 Presentation of Alternatives**

#### **3.3.1 Alternative No. 1 Mobile Application Setup**

The Mobile Application Set up is one of the alternative set-ups that was decided by the proponents of this study. A mobile application, sometimes known as an app, is a computer program or software application that is meant to operate on a mobile device, such as a phone, tablet, or watch. Mobile apps are frequently distinguished from desktop programs, which are intended to operate on desktop computers.

This alternative is known as a Mobile Application Set up. A mobile application, also known as a mobile app or just an app, is a computer program or software application that is meant to operate on a mobile device such as a phone, tablet, or smartwatch. The proposed mobile application setup can be used the major benefit of cell phones is their mobility; they may be carried in your pockets wherever you go. With the development of mobile applications, smartphones provided the service industry with a new face. Mobile apps are programs that are built to accomplish a certain job. With the rise of mobile applications, time consumption has decreased, and products and services are now at the tip of one's fingers.

**For this alternative, here are the advantages of this proposed system:**

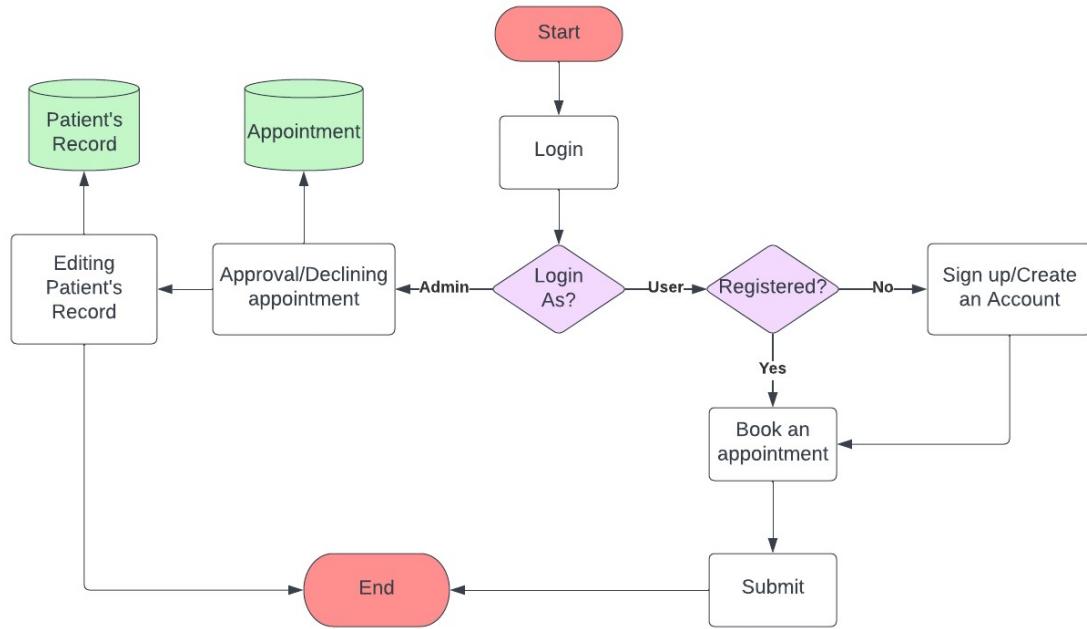
Convenience - As long as the dental clinic staff is logged on the system, they can access it 24 hours o day or 365

days a year. The full database is always accessible, especially for the dental clinic secretary.

Data security - Data is safer in the case of a possible system failure; data in the online application service is well protected.

Portability - The system will function as long as users are logged in and connected to the internet.

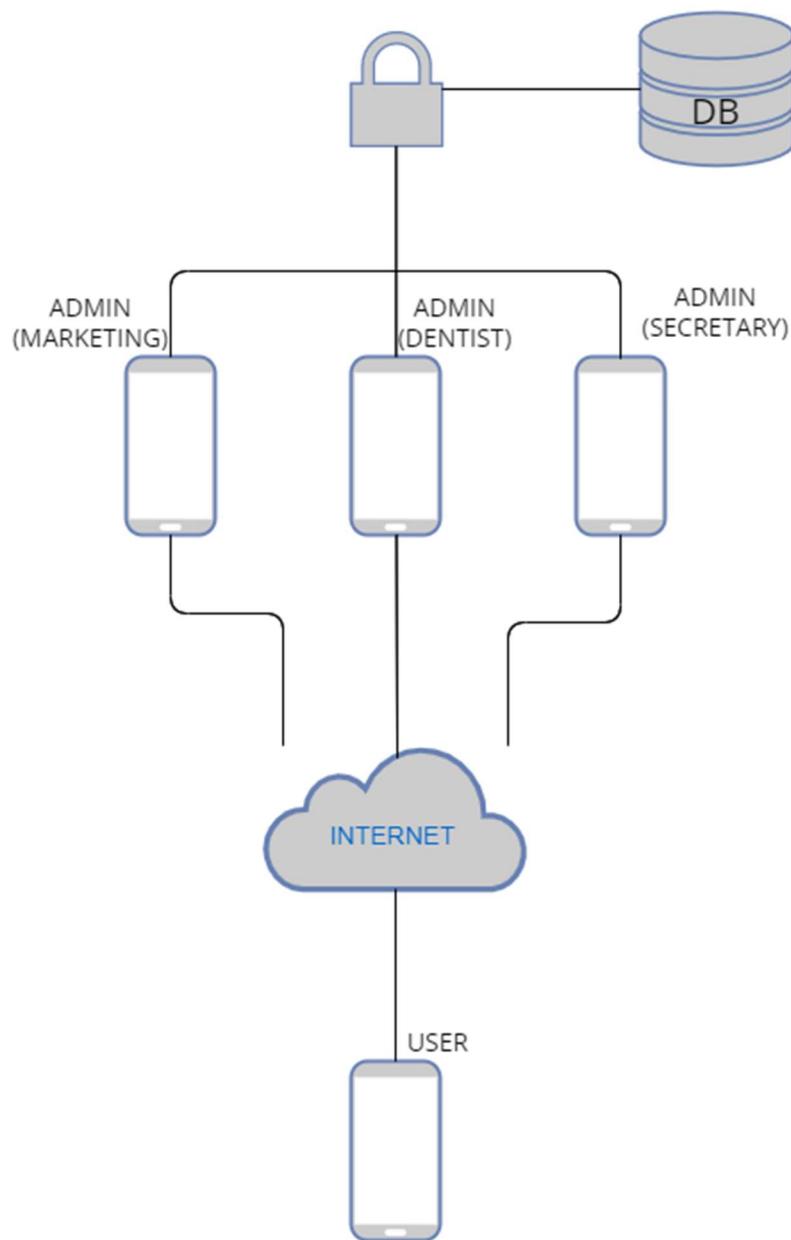
### 3.3.1.1 System Flowchart (Mobile Application Set-up)



It is a formalized representation of the program logic;  
it also represents the sequence and process of the  
proposed alternative.

### 3.3.1.2 Physical Elements

#### 3.3.1.2.1 Network Layout



### 3.3.1.2.2 Database/Tables (Mobile Application Set-Up)

#### Sign up Form

FIELD NAME	FIELD TYPE	FIELD LENGTH	DECIMAL	DESCRIPTION
First name	Alphanumeric	20	0	Patient's first name
Middle name	Alphanumeric	20	0	Patient's middle name
Last name	Alphanumeric	20	0	Patient's last name
Age	Numeric	2	0	Patient's age
Birthdate	Datetime	10	0	Patient's birthdate
Gender	Alphanumeric	10	0	Patient's gender
Contact Number	Numeric	20	0	Patient's contact number
Address	Alphanumeric	30	0	Patient's address
Email Address	Alphanumeric	20	0	Patient's email address
Username	Alphanumeric	20	0	Patient's username
Password	Alphanumeric	20	0	Patient's password

**User account**

<b>Field Name</b>	<b>Field Type</b>	<b>Size</b>	<b>Decimal</b>
Username	Alphanumeric	20	0
Password	Alphanumeric	20	0

**Admin account**

<b>Field Name</b>	<b>Field Type</b>	<b>Size</b>	<b>Decimal</b>
Username	Alphanumeric	20	0
Password	Alphanumeric	20	0

**Appointment Form**

<b>FIELD NAME</b>	<b>FIELD TYPE</b>	<b>FIELD LENGTH</b>	<b>DECIMAL</b>	<b>DESCRIPTION</b>
Name	Alphanumeric	30	0	Patient's name
Age	Numeric	2	0	Patient's age
Gender	Alphanumeric	10	0	Patient's gender
Contact Number	Numeric	20	0	Patient's contact number
Address	Alphanumeric	30	0	Patient's address
Date and Time	Datetime	10	0	Patient's date and time of schedule
Type of service	Alphanumeric	30	0	Services booked

#### **3.3.1.2.3 Reports (Mobile Application Setup)**

**The following are the reports generated by the proposed system:**

- Scheduling - report for the appointments of the patients.
- Admin - the ones who handle the system.
- User - the person who needs to appoint a schedule.

#### **3.3.1.2.4 Manual Process (Mobile Application Setup)**

- One by one reminds the patients through text.
- Manually finding the patient's folder of records.

#### **3.3.1.2.5 Tangible and Intangible Benefits (Mobile Application Setup)**

- Easy to use
- Portability

**3.3.1.3 Requirements Definitions (Mobile Application Setup)**

ITEMS	REQUIRED	EXISTING	NEEDED
<b>Hardware</b> 6 inches screen display, Dual SIM (Nano- SIM, dual standby), microSD	2	2	2
<b>Software</b> Android 9 up to Android 10	2	2	2

### **3.3.1.4 Cost and Benefits Analysis (Mobile Application Setup)**

#### **COST**

<b>ITEMS</b>	<b>COSTS</b>
<b>ONE TIME COST</b>	
<b>Hardware</b> 6 inches screen display, Dual SIM (Nano-SIM, dual standby), microSD, 3GB ram/64GB storage	<b>PHP 8 ,999.00</b>
<b>Software</b> Android 9 up to Android 10, Bluetooth 5.0	
<b>Storage Back Up</b> Firebase 10GB	<b>PHP2 , 337.5/46.75USD</b>
<b>TOTAL</b>	<b>PHP 11 ,336.50</b>

<b>RECURRING COST</b>	
Maintenance	<b>PHP 2,500.00</b>
Electricity Cost	<b>PHP 500.00</b>
Employee Personnel	
• Secretary	<b>PHP 15,000.00</b>
• Marketing	<b>PHP 15,000.00</b>
Broadband Internet cost per month  (Converge)	<b>PHP 1,500.00</b>
<b>TOTAL RECURRING COST</b>	<b>PHP 34,200</b>
<b>TOTAL COSTS</b>	<b>PHP 45,536.50</b>

#### **BENEFITS**

<b>ITEMS</b>	<b>COSTS</b>
Folders/Envelop	<b>PHP 300.00</b>
Lessen the use of:	
Paper	<b>PHP 205.00</b>
Ballpen	<b>PHP 100.00</b>
<b>TOTAL SAVINGS</b>	<b>PHP 605.00</b>

**3.3.1.5 Computation for Payback Period (Mobile Application Setup)**

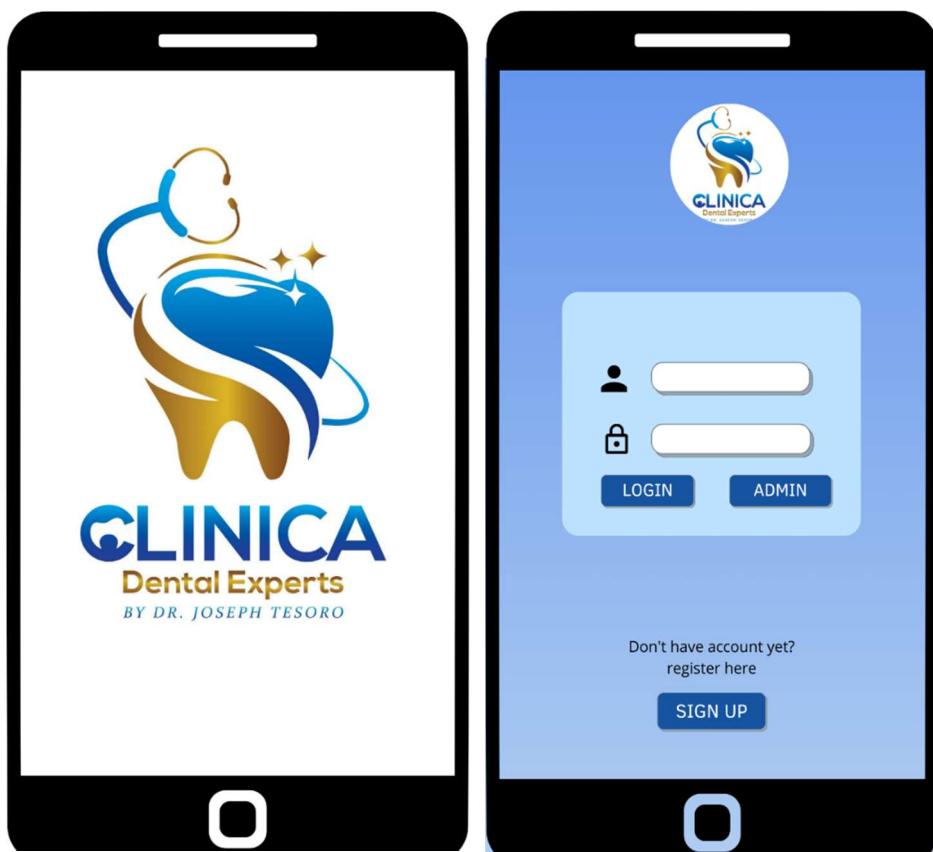
<b>Total Costs:</b>	<b>PHP 45,536.50</b>
<b>Total Savings:</b>	<b>PHP 605.00</b>

Payback Period = Total Costs/Total Savings

$$= \text{PHP } 45,536.50 / \text{PHP } 605.00$$

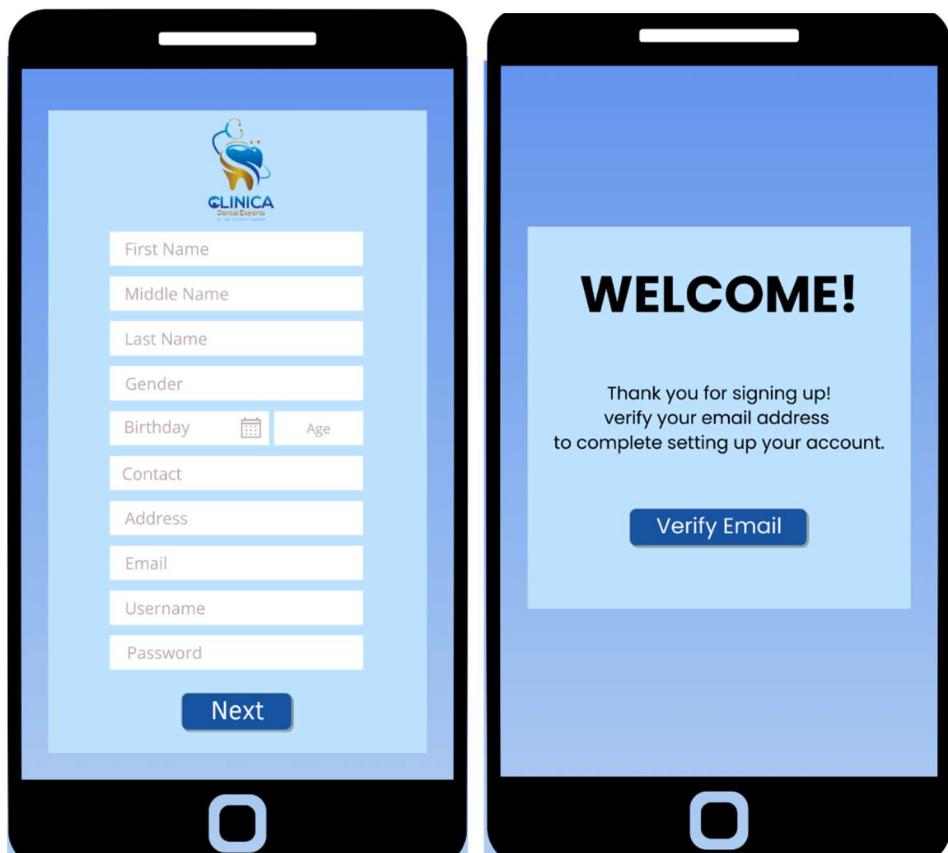
$$= \textbf{75.26 per year}$$

### 3.3.1.7 Graphical User Interface (Mobile Application Setup)



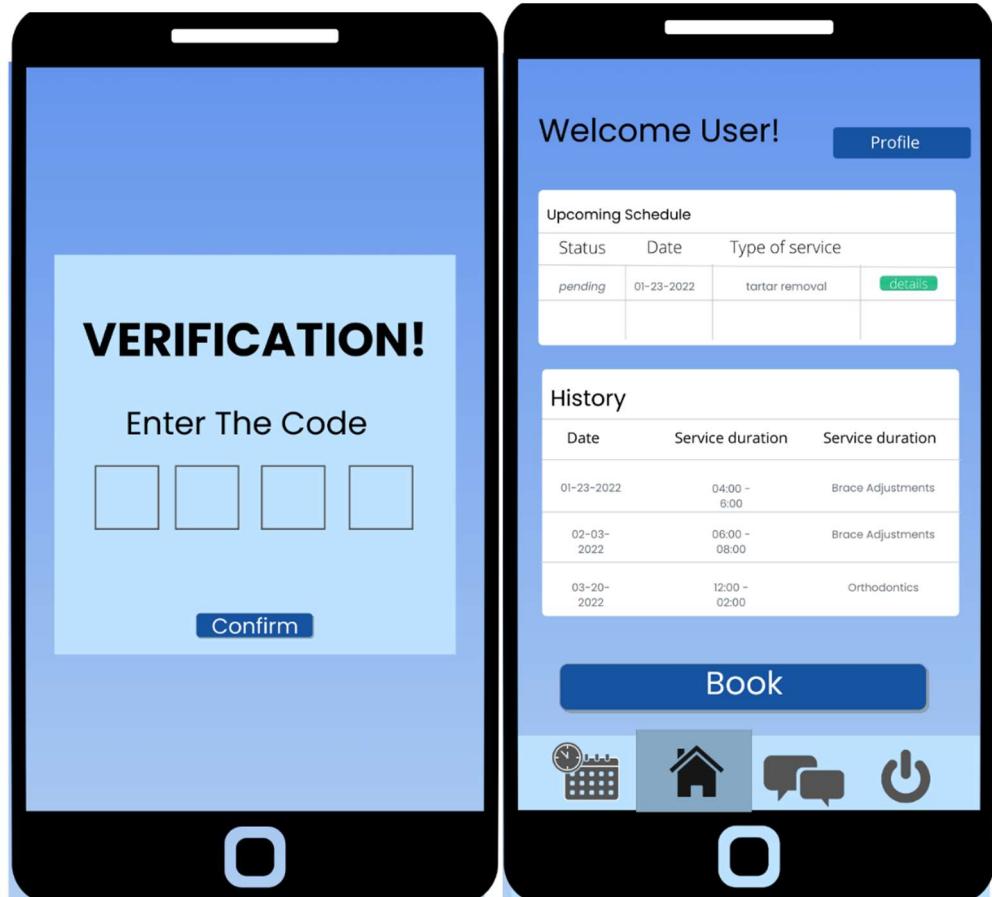
Front Image

Login Form



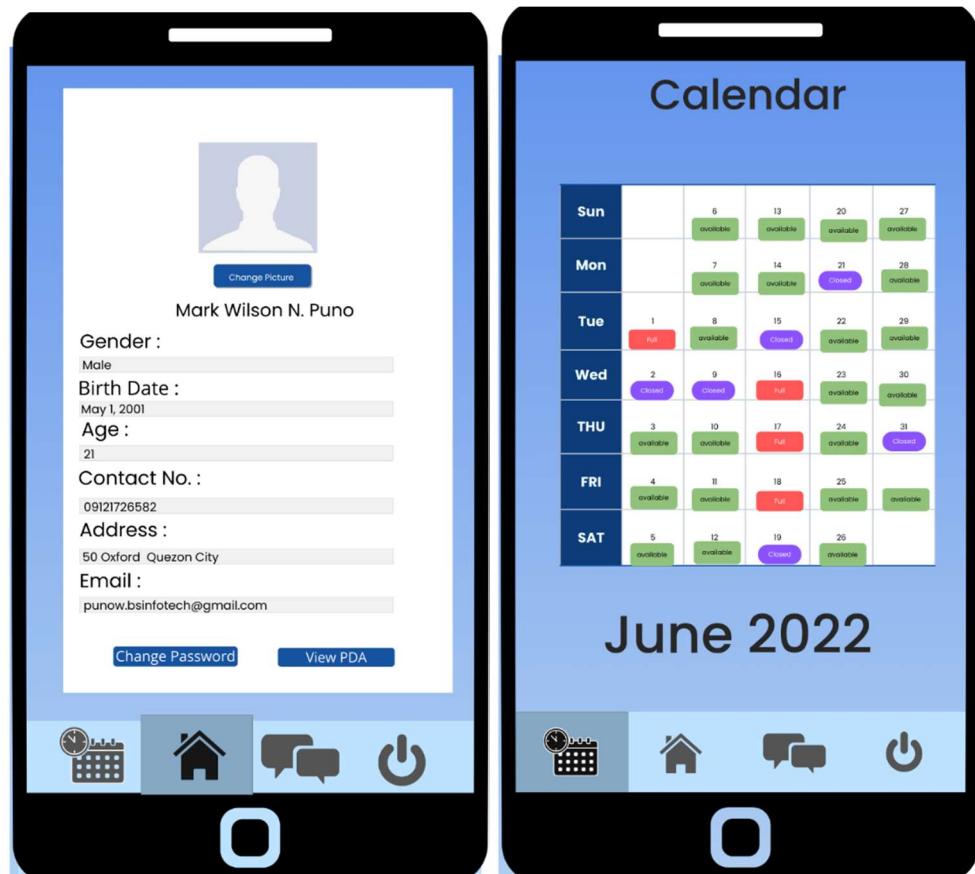
Sign up form

Email Verification



Enter Verification Code

Home Page



Users Profile

Available Schedule

The image displays two side-by-side mobile phone screens. Both phones have a black border and a blue background. The left phone shows a 'RESERVATION FORM' with fields for Lastname, Firstname, Email, Contact number, Age, and Date Scheduled. The right phone shows a 'RESERVATION FEE' section with Gcash numbers and a placeholder for a receipt. Both screens include navigation icons at the bottom.

**RESERVATION FORM**

Please fill the form below accurately to enable us serve you better! Thank you!

Lastname

Firstname

Email  Ex: JuanCruz@gmail.com

Contact number

Age

Date Scheduled  June 20, 2022 Monday

Informations  
● ● ●

**RESERVATION FEE**

Please select only one number to send in

Gcash number 1: 0917-943-2322

Gcash number 2: 0943-287-2838

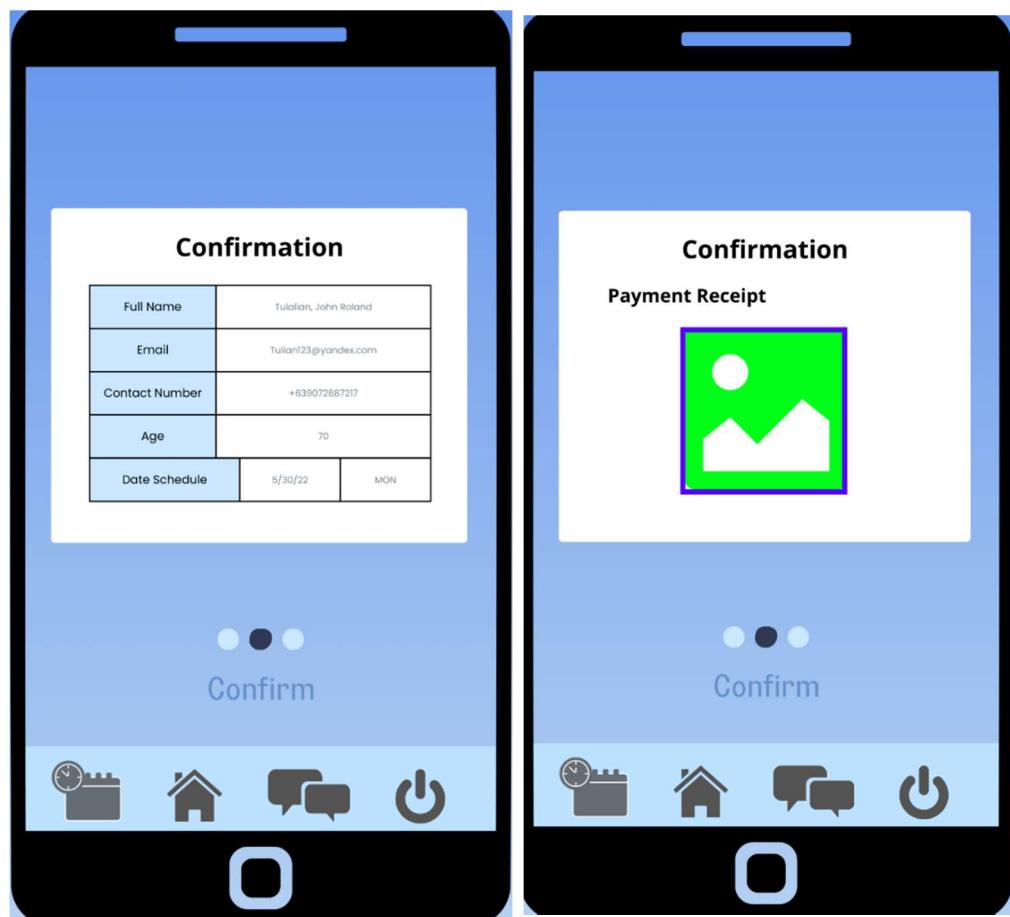
Screenshot Gcash receipt and attach it here.

Attach Image

Payment  
● ● ●

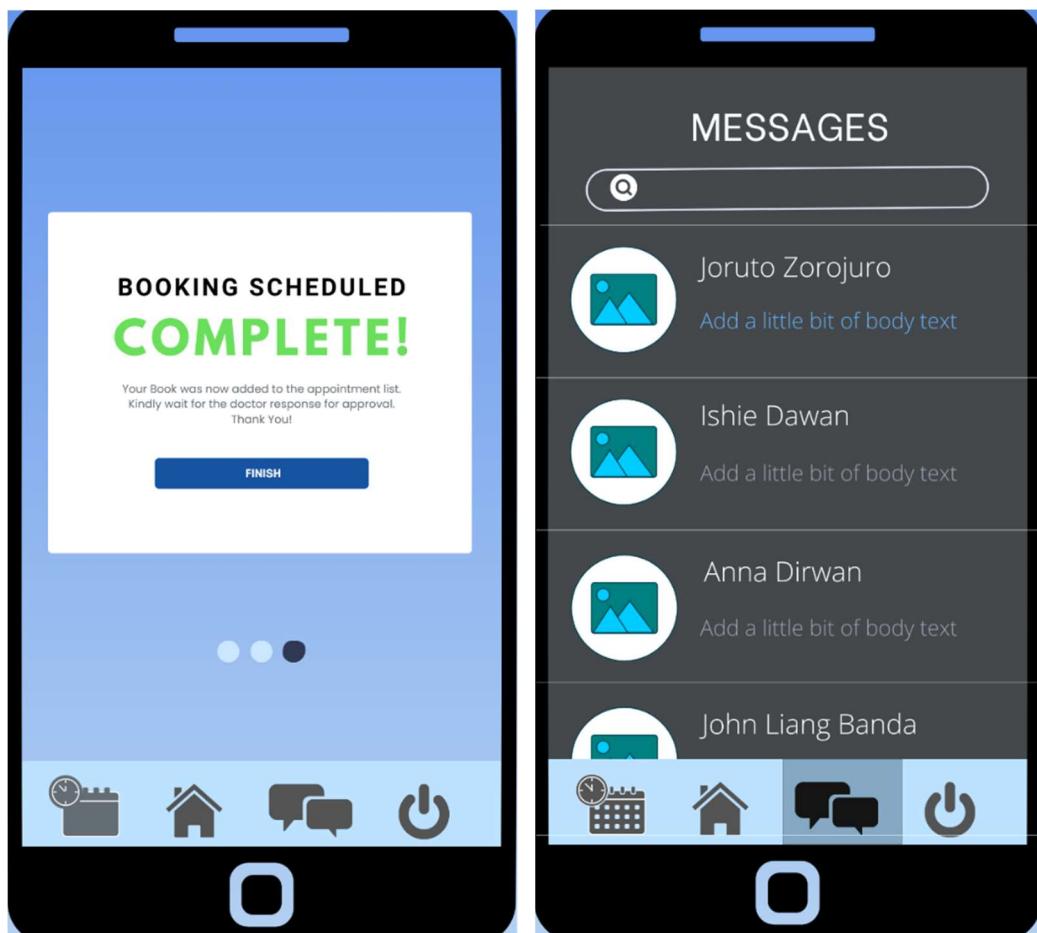
**Reservation**

**Payment for reservation**



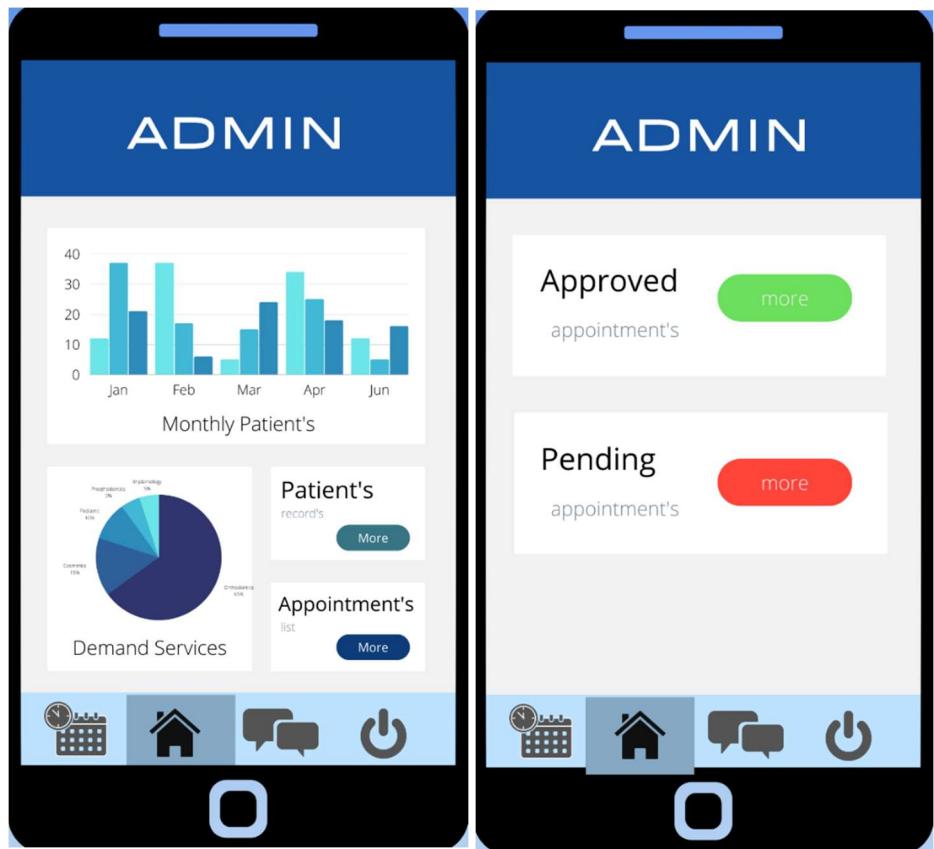
Confirmation for Booking

Receipt Confirmation



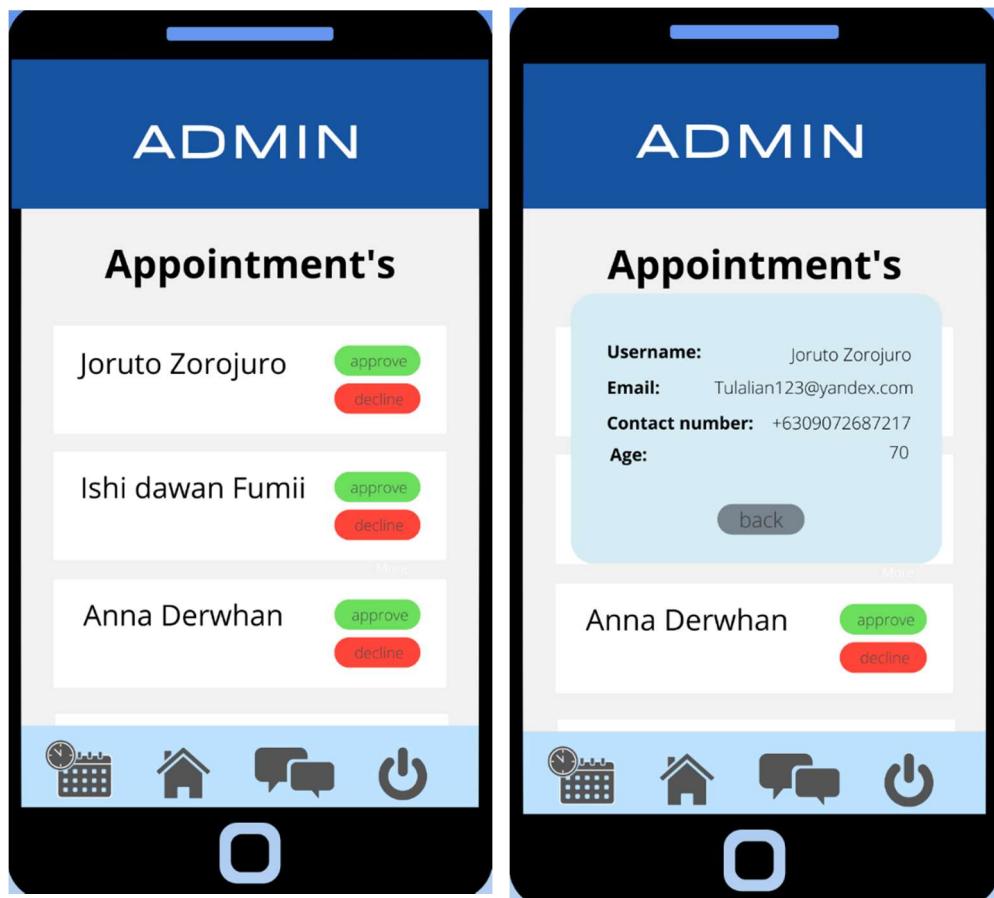
Scheduled Booking

Messages

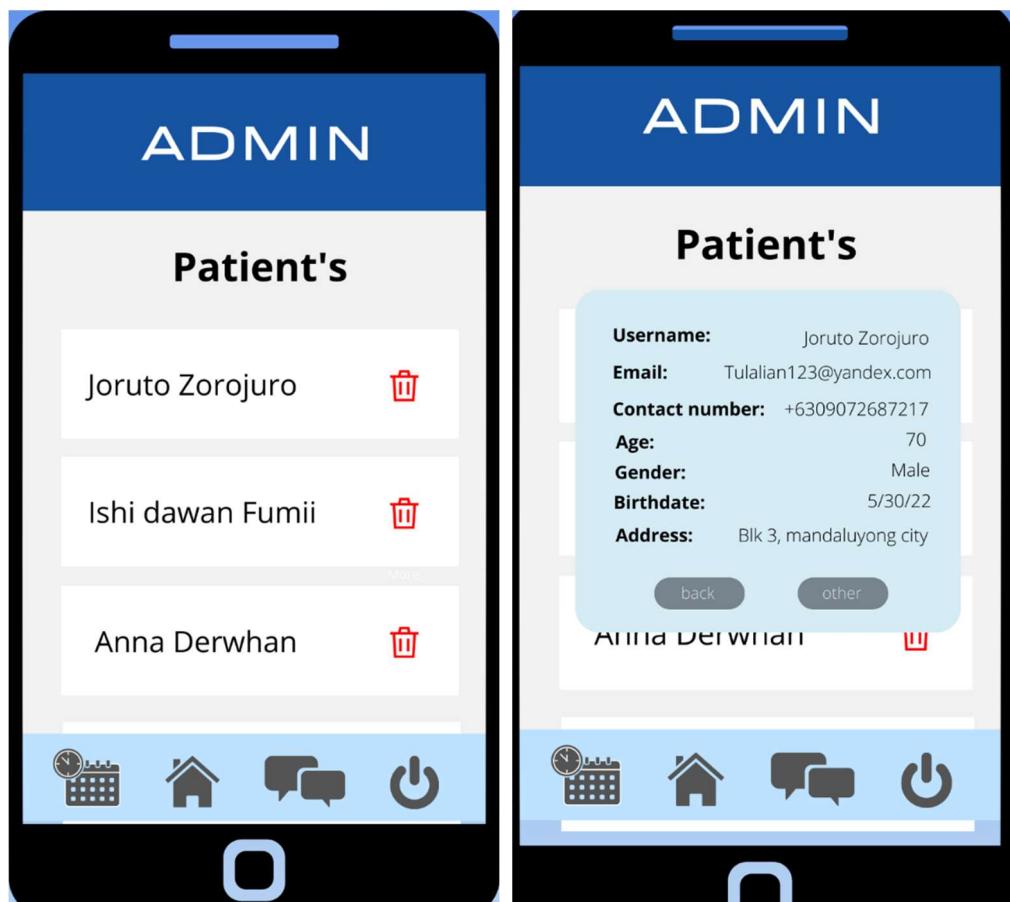


Admin Dashboard

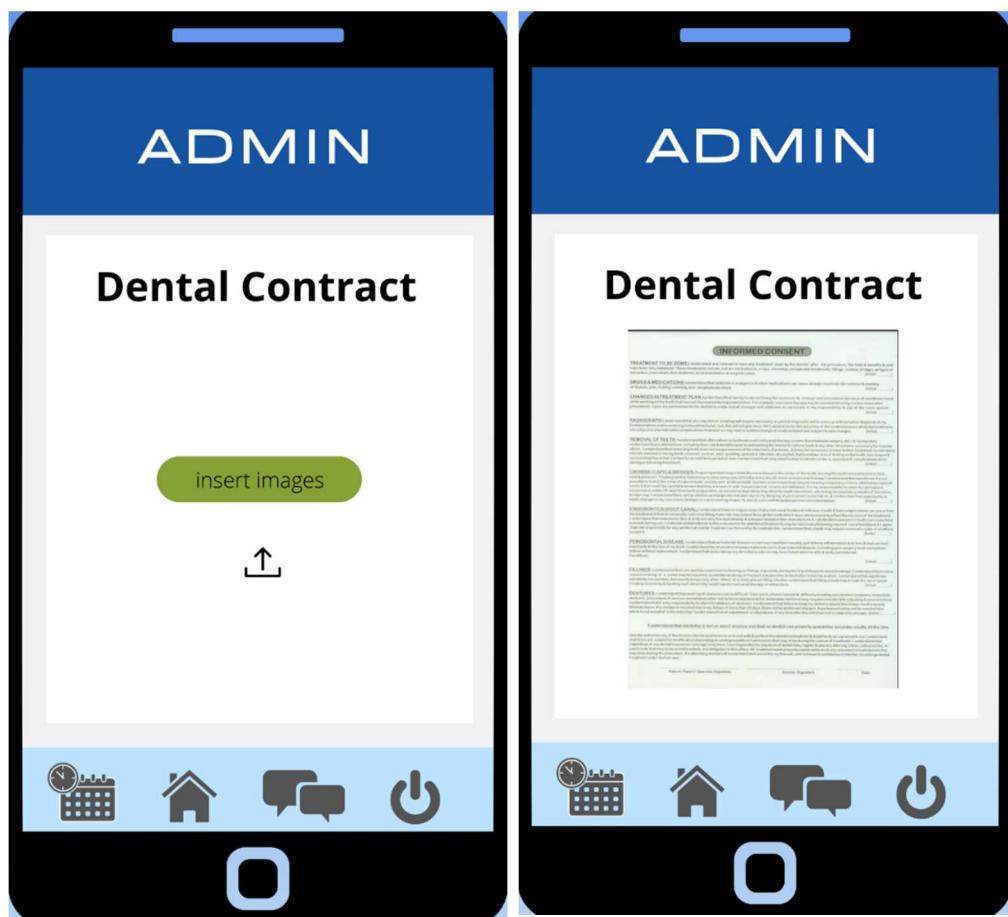
Dashboard



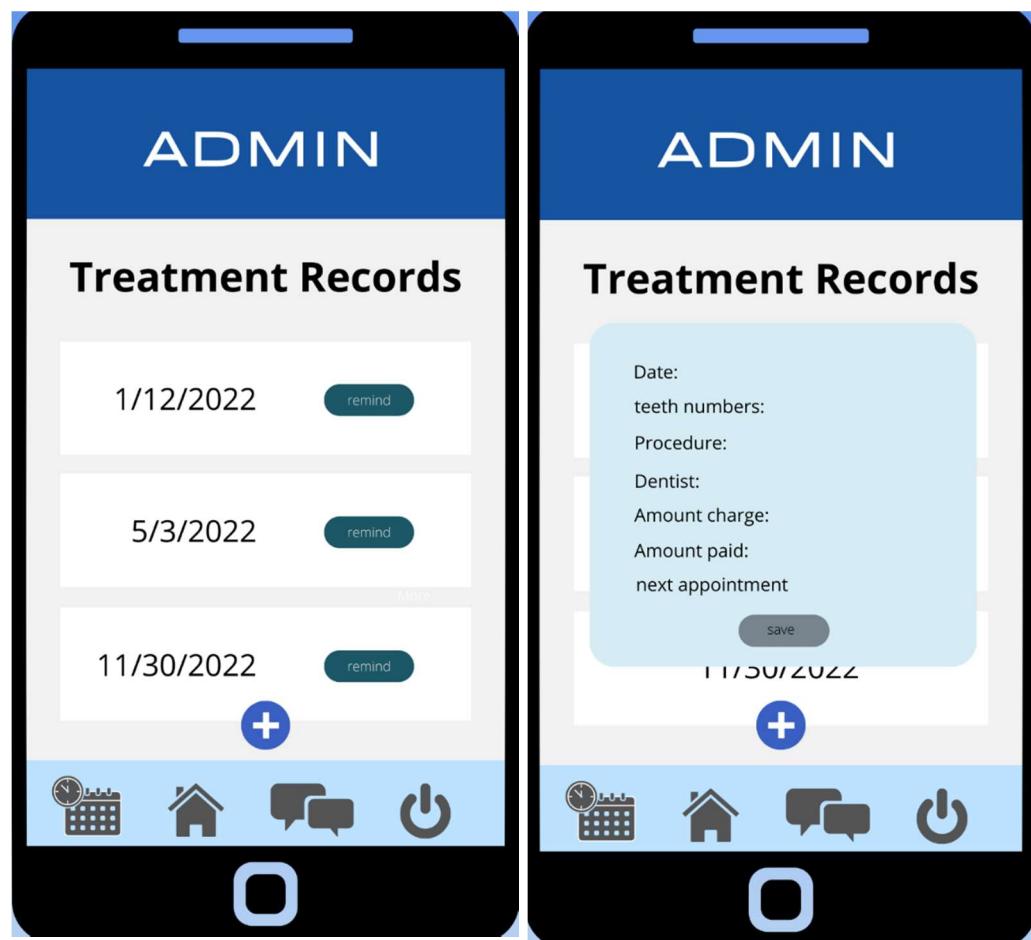
Appointment List



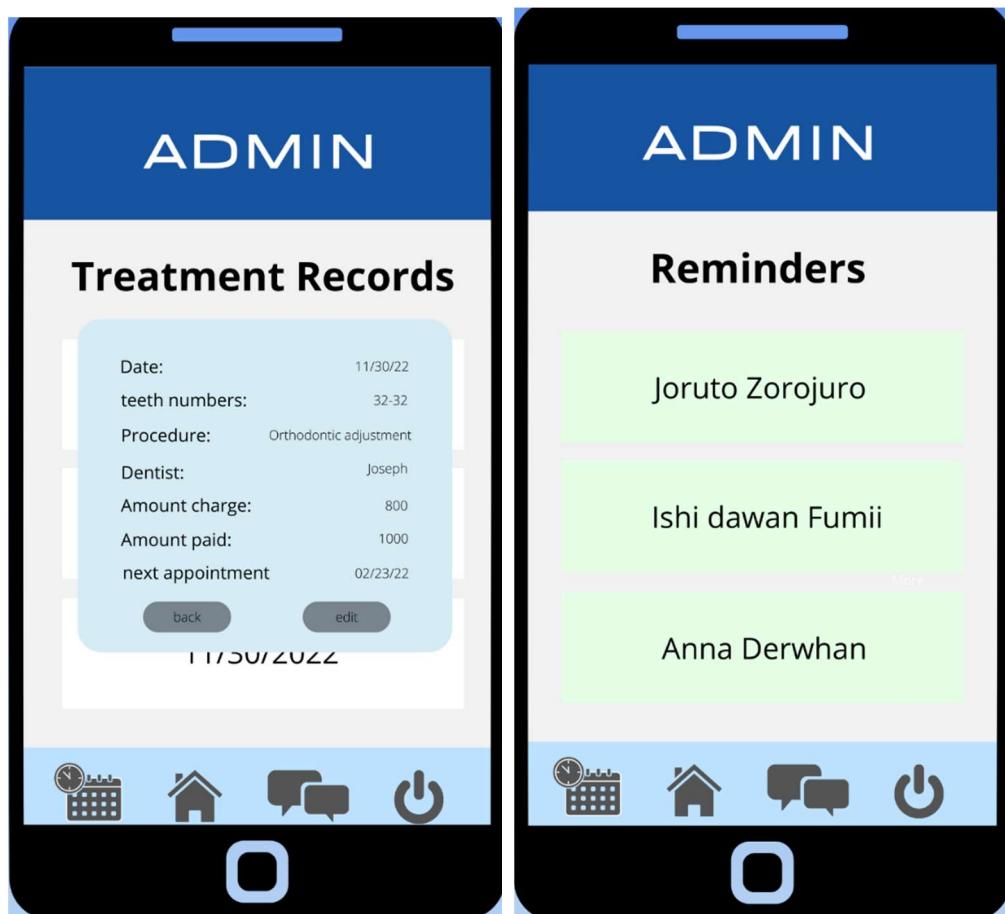
Patients Record



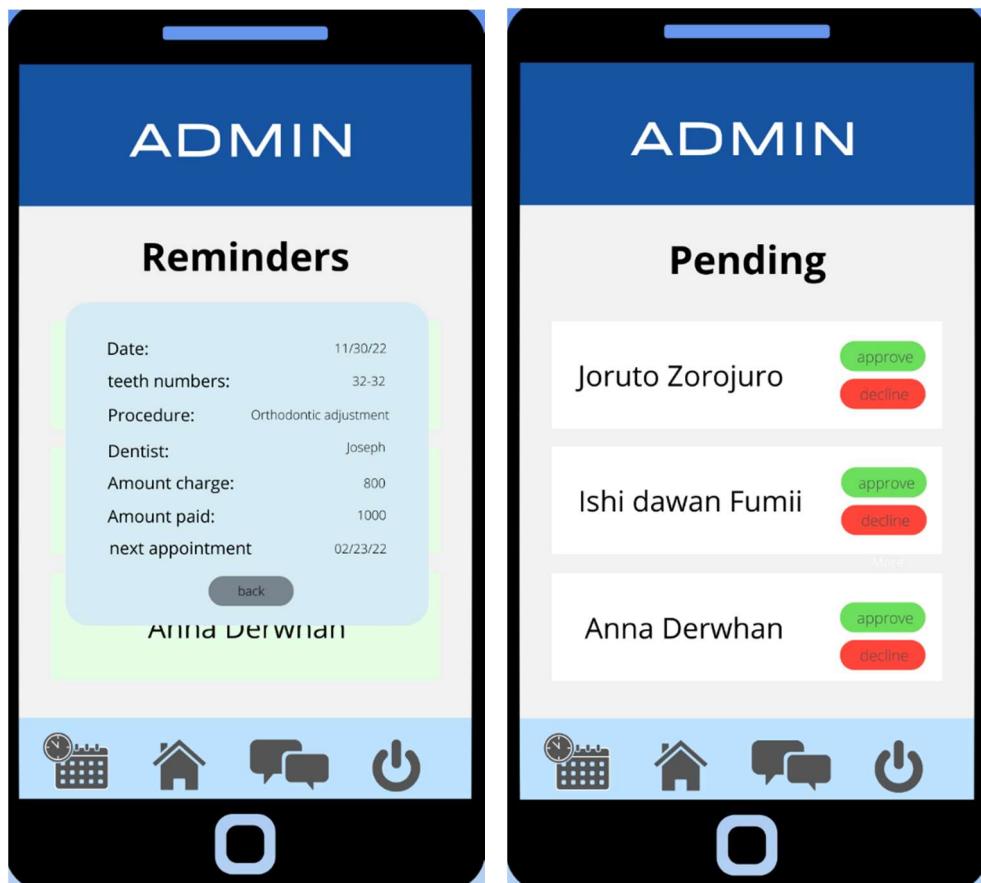
Patients Contract



**Treatment Record**

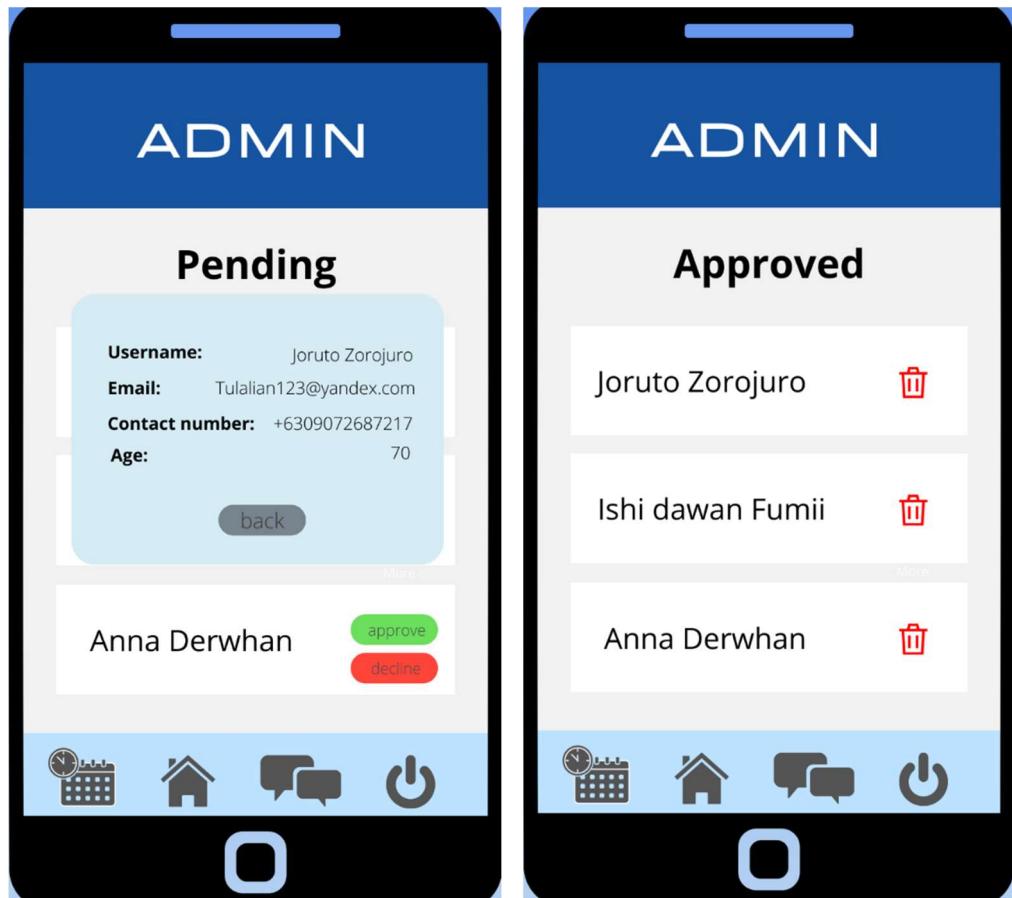


List of Pending Page



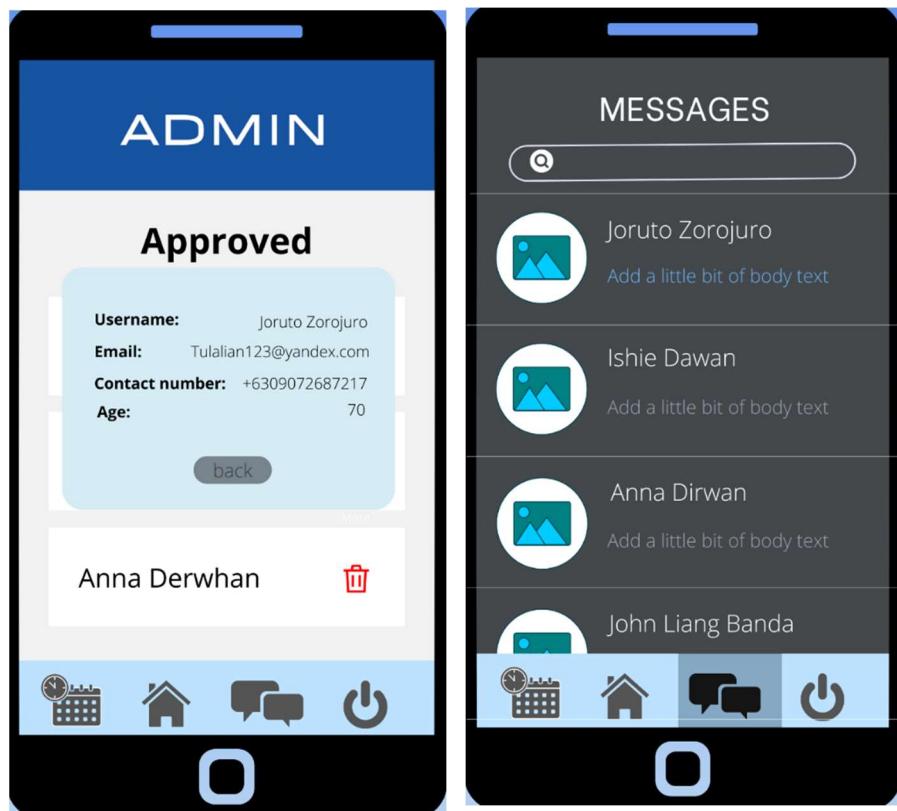
Reminders

List of Pending Appointment



Pending Appointment

Approved Appointment



Pop-up approve

Leave a message / Note

### **3.1.2 Alternative No. 2 Centralized Setup**

The third alternative is the centralized set-up of Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System where there is an interconnection between the secretary, marketing, the dentist, and also the patients, and it is connected through a central server that handles the data of the whole system.

For this alternative, we offer one computer for the Secretary, Marketing and Dentist. Employees will have their username and password. These accounts will determine the access level of information.

Patients, Secretary, Marketing, and Dentist can utilize the proposed system as long as they are connected to the internet. All of them will use their username and password to have access to the system. New users or patients will be requested to provide their basic information to have their accounts.

**For this alternative, here are the advantages of this proposed system:**

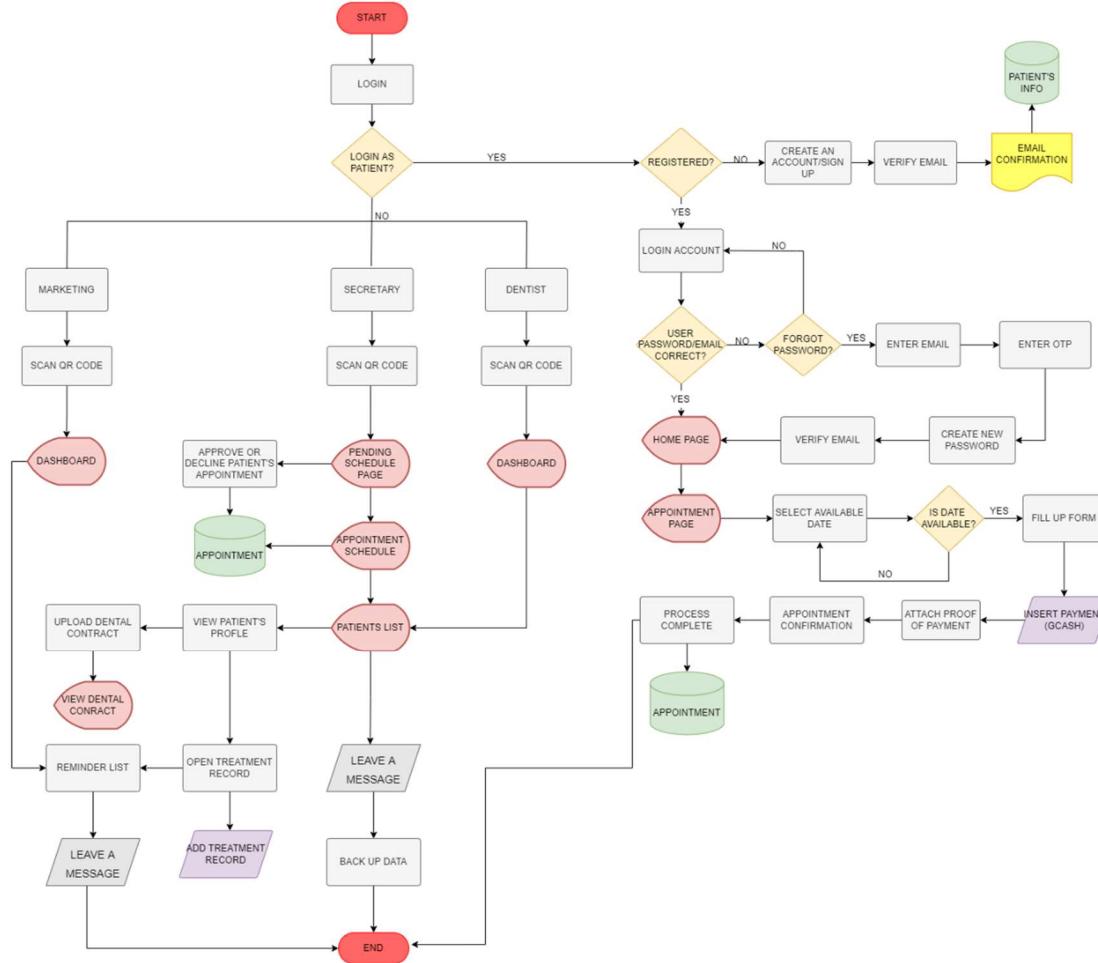
Data Integrity - The single most important benefit of centralizing data management in a company is data integrity.

One of the fundamental concepts of database design is that there should be no redundancy. That is, no data inside the database should be duplicated. Each member has a single primary record with a single point of contact in a centralized database.

Data Integration - data and records are consolidated in a database, it is simple to integrate them.

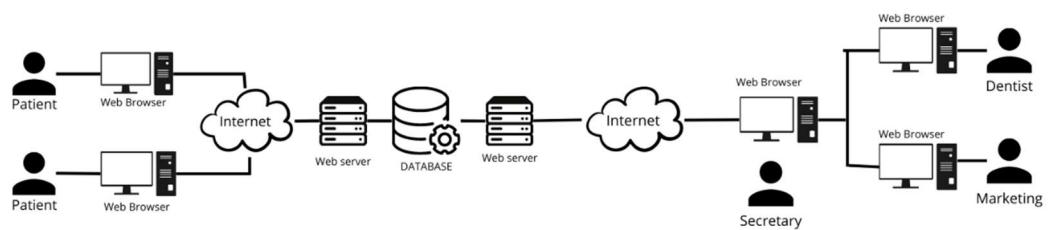
Portability - The system will function as long as users are logged in and connected to the internet. Patients can attach files of their issues.

### 3.3.2.1 System Flowchart (Centralized Setup)



### 3.3.2.2 Physical Elements (Centralized Setup)

#### 3.3.2.2.1 Network Layout (Centralized Setup)



### 3.3.2.2.2 Database/Tables (Centralized Set-Up)

#### Sign Up Form

FIELD NAME	FIELD TYPE	FIELD LENGTH	DECIMAL	DESCRIPTION
First Name	Alphanumeric	20	0	Patient's first name
Middle name	Alphanumeric	20	0	Patient's middle name
Last name	Alphanumeric	20	0	Patient's last name
Age	Numeric	2	0	Patient's age
Birthdate	Datetime	10	0	Patient's birthdate
Gender	Alphanumeric	10	0	Patient's gender
Contact Number	Numeric	20	0	Patient's contact number
Address	Alphanumeric	30	0	Patient's address
Email Address	Alphanumeric	20	0	Patient's email address
Username	Alphanumeric	20	0	Patient's username
Password	Alphanumeric	20	0	Patient's password

**User account**

<b>Field Name</b>	<b>Field Type</b>	<b>Size</b>	<b>Decimal</b>
Username	Alphanumeric	20	0
Password	Alphanumeric	20	0

**Admin account**

<b>Field Name</b>	<b>Field Type</b>	<b>Size</b>	<b>Decimal</b>
Username	Alphanumeric	20	0
Password	Alphanumeric	20	0

**Appointment Form**

<b>FIELD NAME</b>	<b>FIELD TYPE</b>	<b>FIELD LENGTH</b>	<b>DECIMAL</b>	<b>DESCRIPTION</b>
Name	Alphanumeric	30	0	Patient's name
Age	Numeric	2	0	Patient's age
Gender	Alphanumeric	10	0	Patient's gender
Contact Number	Numeric	20	0	Patient's contact number
Address	Alphanumeric	30	0	Patient's address
Date and Time	Datetime	10	0	Patient's date and time of schedule
Type of service	Alphanumeric	30	0	Patient's type of service

### **3.3.2.2.3 Reports (Centralized Setup)**

**The following are the reports generated by the proposed system:**

Daily Schedule / Appointment - This report is the list of the patient who requested an appointment.

Records - This is the list of the records of patients and the list of a patient who has a schedule on a specific date.

User - The one who books an appointment.

Admin 1 - The one who handles the list of the confirmed appointment of the patient.

Admin 2 - The one who handles and manipulates the records.

### **3.3.2.2.4 Manual Process (Centralized Setup)**

Reminding the Patient regarding their schedule through text messages.

The patient will confirm the schedule through text messages.

The Patient will log in to the logbook.

The secretary will use a manual way to find the patient record.

The dentist will fill out the patient record.

**3.3.2.2.5 Tangible and Intangible Benefits (Centralized Setup)**

It will lessen the number of patients who forgot to remind them of their schedule.

It will become easier in terms of finding the patient's record.

It will be easy to identify who are the expected patient on a specific day.

Recording of assessment by the dentist and payables of the patient will become easier.

### 3.3.2.3 Require Definition (Centralized Setup)

ITEMS	REQUIRED	EXISTING	NEEDED
<b>Hardware</b> 4GB ram AMD Ryzen 5 500 SSD	2	0	2
<b>Software</b> Visual Studio Sublime Xampp Windows 10 / Windows 11	1	0	1

### 3.3.2.4 Cost and Benefits Analysis (Centralized Setup)

#### Cost

ITEMS	COSTS
<b>ONE TIME COST</b>	
<b>HARDWARE (2)</b> 4GB ram AMD Ryzen 5 500 SSD	<b>PHP 30,000</b>
<b>Software</b> Visual Studio Sublime Xampp Windows 10 / Windows 11	
<b>Storage Back-Up / Firebase</b> Firebase Realtime Database Documents write, read and delete	<b>PHP2, 337.5/46.75USD</b>
<b>TOTAL</b>	<b>PHP 62,337.5</b>

RECURRING COST	
Maintenance (IT Personnel)	<b>PHP 3000</b>
Software and Hardware Problem	<b>PHP 3,5000</b>
Employee Cost <ul style="list-style-type: none"> <li>• Secretary</li> <li>• Marketing</li> </ul>	<b>PHP 15 000</b> <b>PHP 15 000</b>
Electricity Cost (Monthly)	<b>PHP 1500</b>
Internet Cost (Converge)	<b>PHP 1500</b>
<b>TOTAL RECURRING COST</b>	<b>PHP 39, 500</b>
<b>TOTAL COST</b>	<b>PHP 99, 500</b>

**BENEFITS**

Supplies (Logbook, Brown Envelope, Bond paper, Ballpen)	<b>PHP 1500</b>
Hiring more clinic personnel	<b>PHP 15000</b>
TOTAL SAVINGS	<b>PHP 16 500</b>

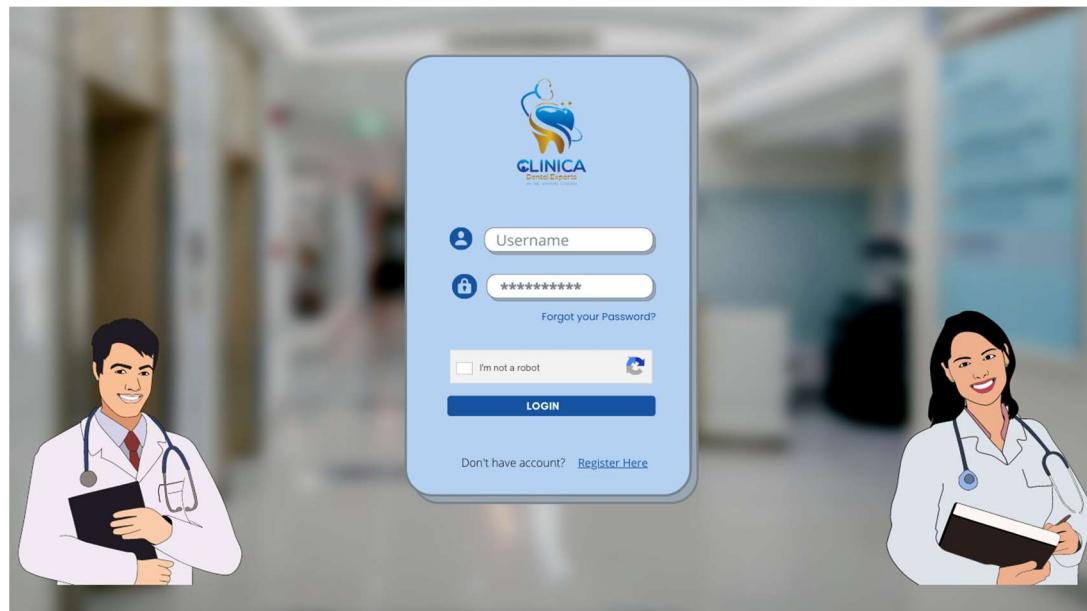
**3.3.2.5 Computation for Payback Period (Centralized Setup)**

<b>Total Cost:</b>	<b>PHP 101, 837.5</b>
<b>Total Savings:</b>	<b>PHP 16, 500</b>

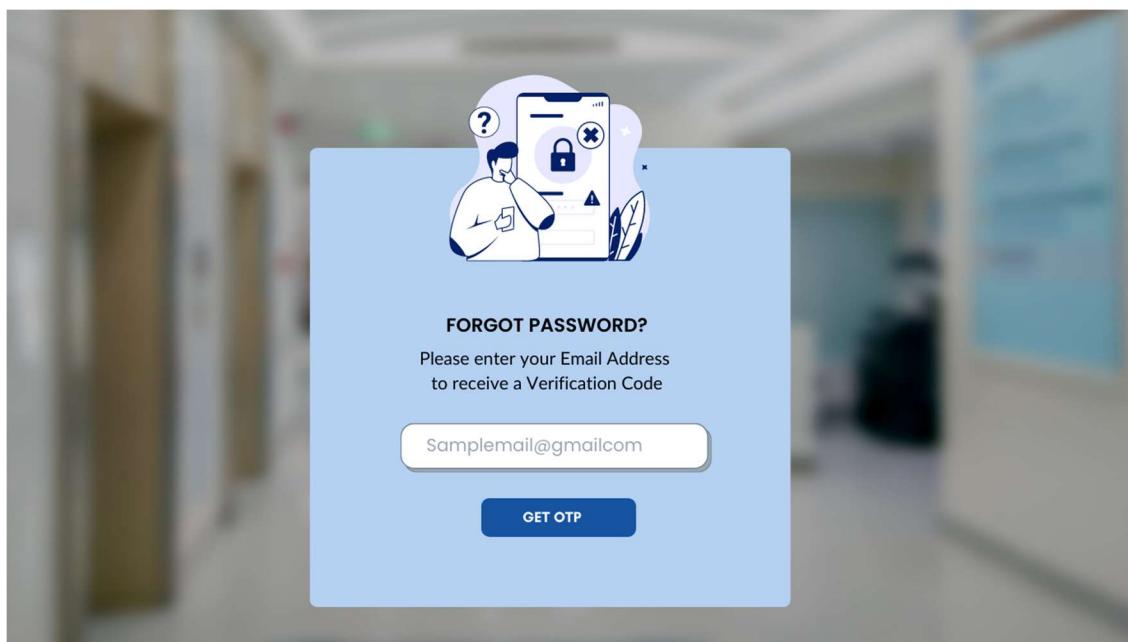
**Payback Period = Total Cost / Total Savings**

$$\begin{aligned}
 &= \text{PHP } 101, 837.5 / \text{PHP } 16, 500 \\
 &= 6.17 \text{ Per year}
 \end{aligned}$$

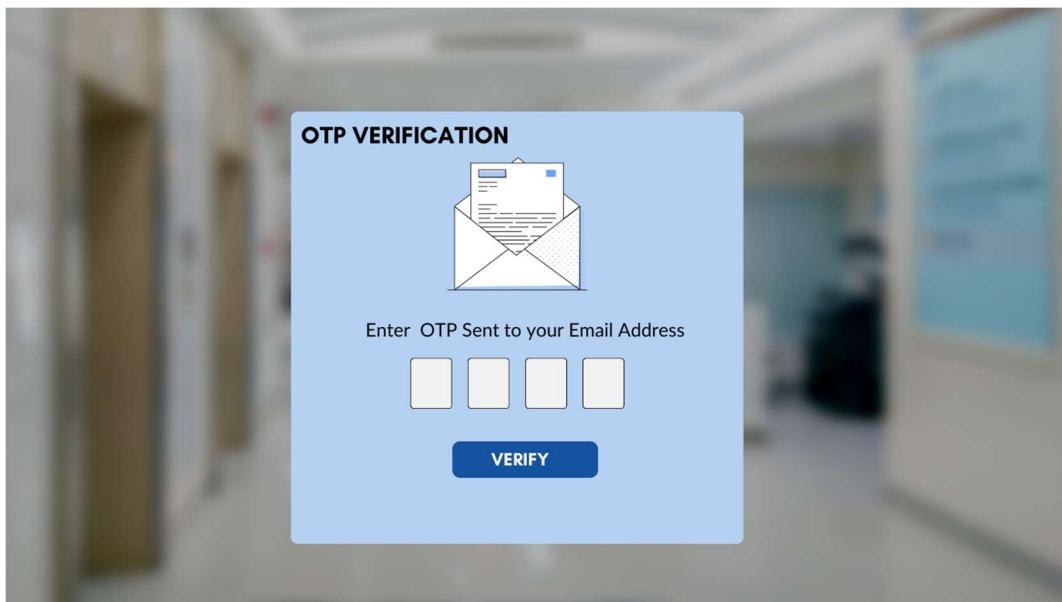
### 3.3.2.6 Graphical User Interface (Centralized Setup)



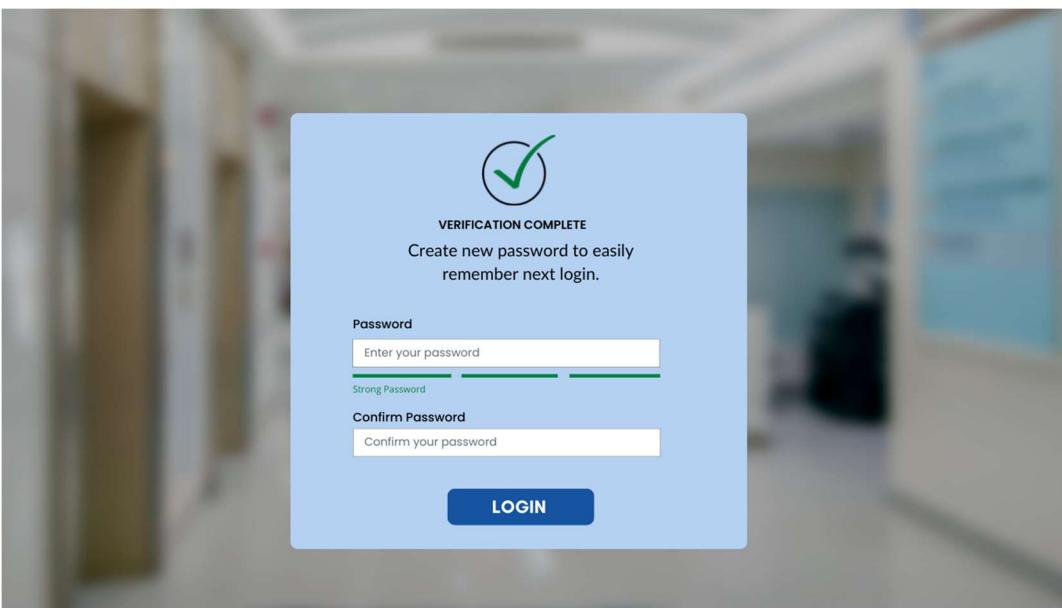
**Patients Login**



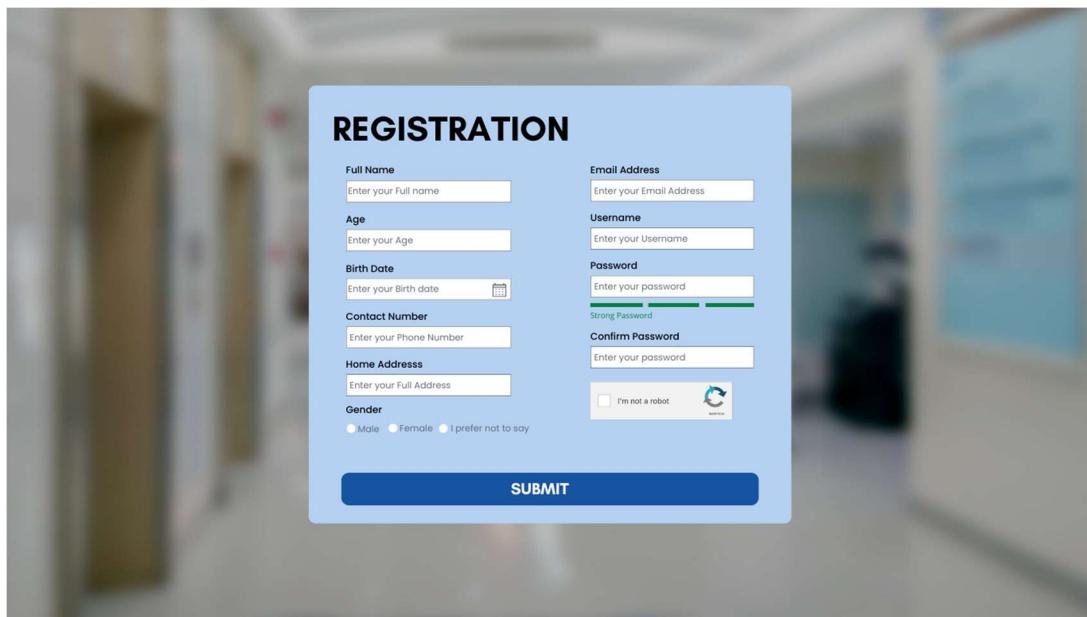
**OTP for forgot password**



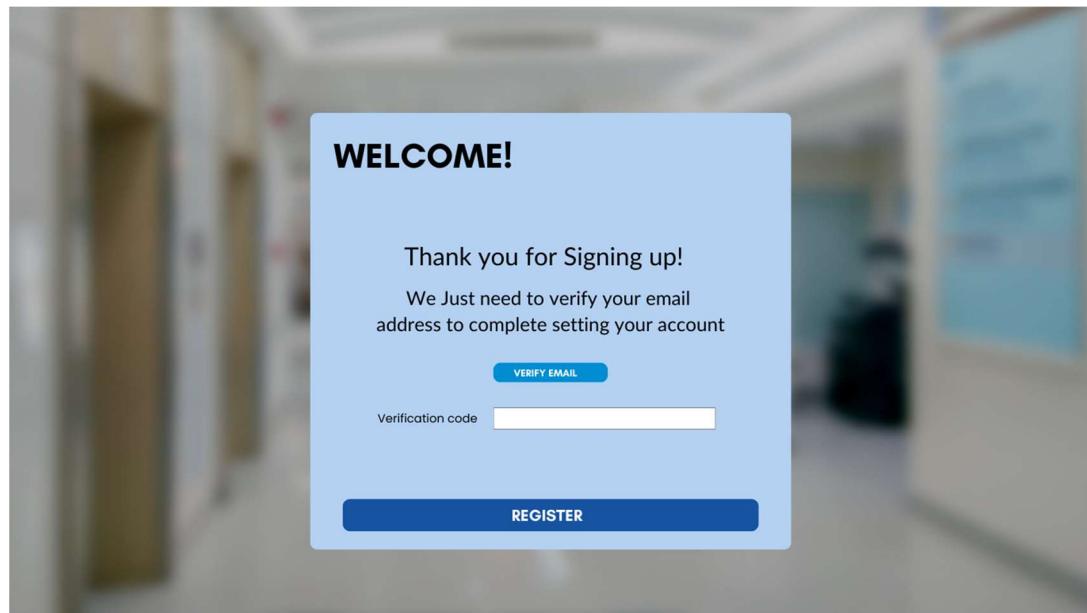
**OTP for verification**



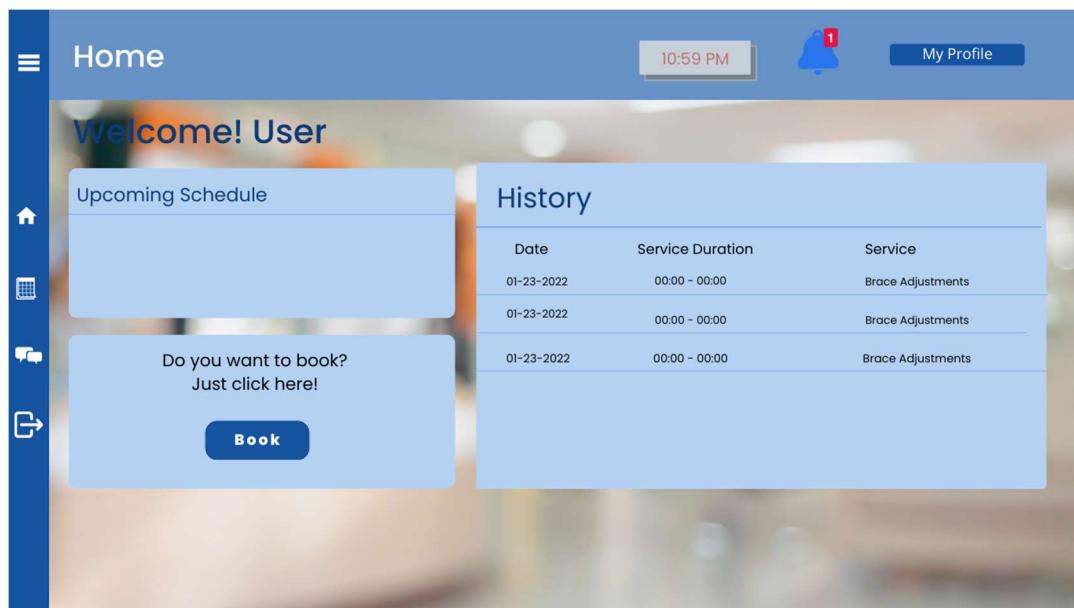
**Change Password**



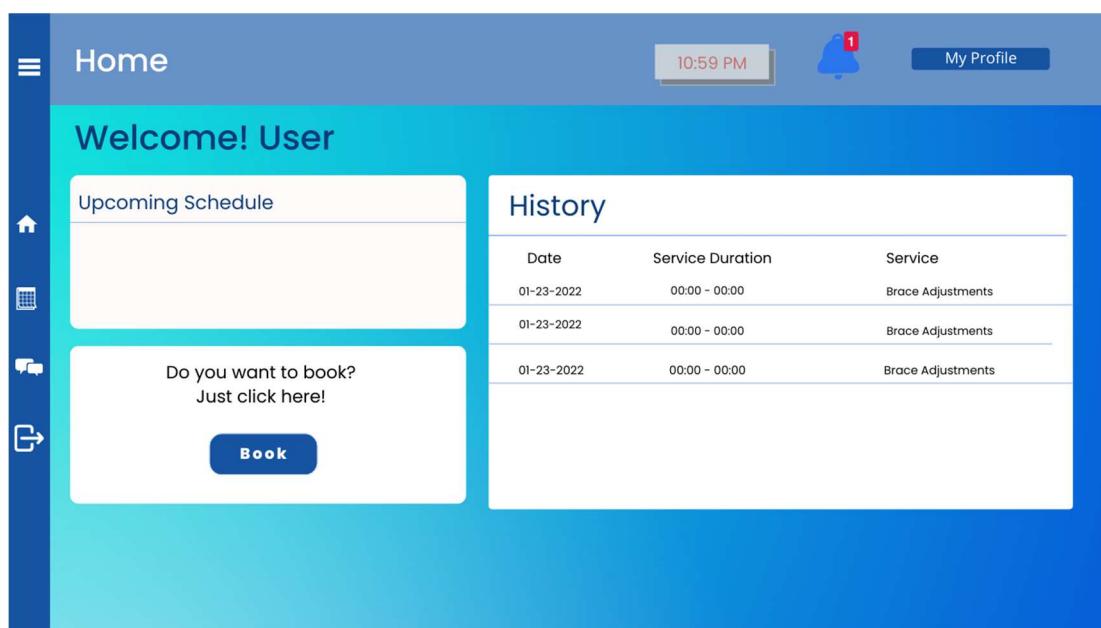
Registration form for new patient



Email authentication



Home Page



Patient History

# Users Profile

10:59 PM

Go Back

Change Picture

John Roland Tulalian

Birth Date: January 23, 2001 Age: 21

Contact Number: 09512123124

Address: Block 2 Lot 2 Barangay San Isidro Antipolo City Rizal

Email Address: 09512123124

Gender: Male

Username: Bhoxz\_Mhalatek

Change Password

View PDA

## Patient Profile

## Patient Dental Contract



### List of available schedules

**Reservation Form**

10:59 PM My Profile

Informations      Payment      Confirmation

**RESERVATION FORM**

Please fill the form below accurately to enable us serve you better! Thank you!

**Full Name \***  First Name  Last Name

**Email \***  Ex: JuanCruz@gmail.com

**Phone Number \***

**Age**

**Date Scheduled:**  June 20, 2022 Monday

**NEXT**

### Reservation Form

**Reservation Fee**

10:59 PM My Profile

Informations Payment Confirmation

### RESERVATION FEE

Please select only one number to send in

Gcash number 1:	0917-943-2322
Gcash number 2:	0943-287-2838

Screenshot Gcash receipt and attach it here.

Attach Image

BACK NEXT

### Reservation Fee

**Confirmation**

10:59 PM My Profile

Informations Payment Confirmation

### CONFIRMATION

Full Name:	John Roland Tulalian	
Email:	Tulalian.j.bsinfotech@gmail.com	
Phone Number:	09179432322	
Age:	21 years old	

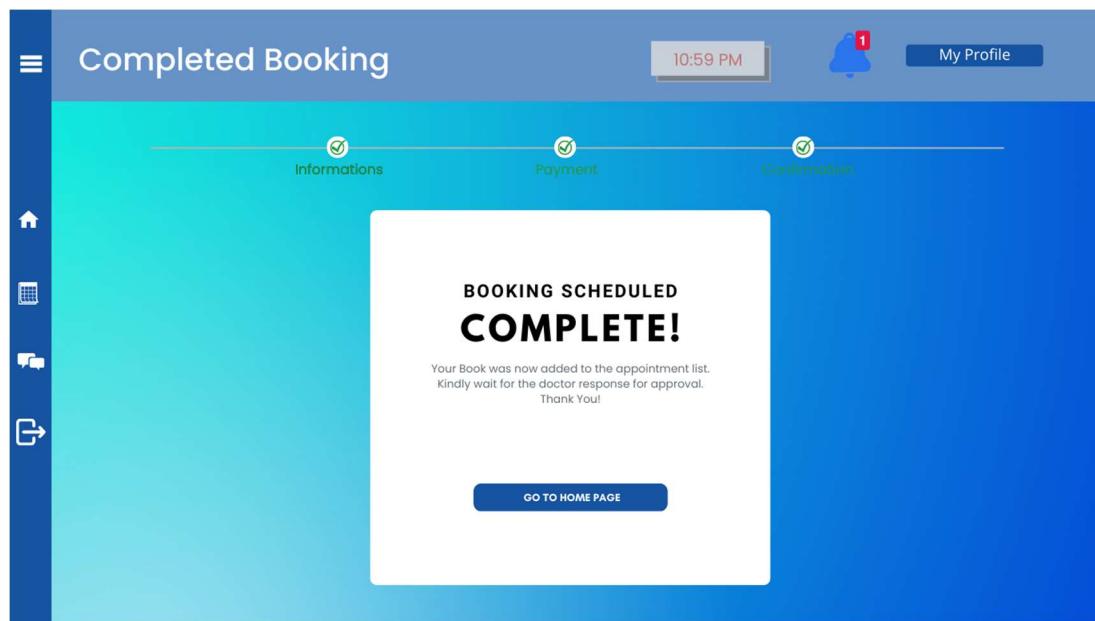
Date Scheduled:	June 23, 2022	Monday
-----------------	---------------	--------

Payment Receipt

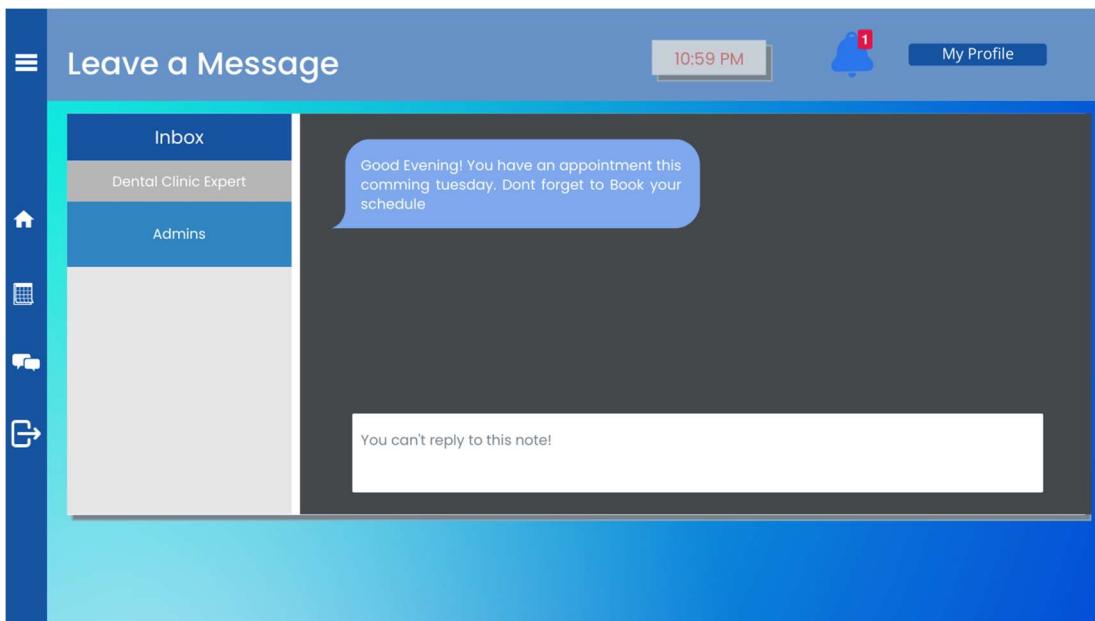
BOOK APPOINTMENT

BACK

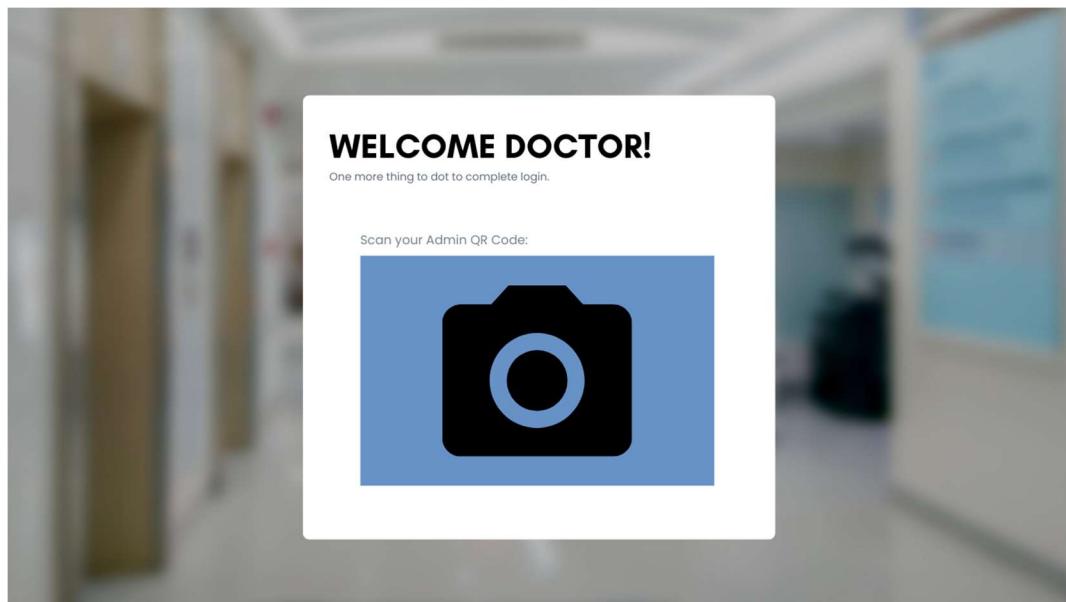
### Booking Confirmation



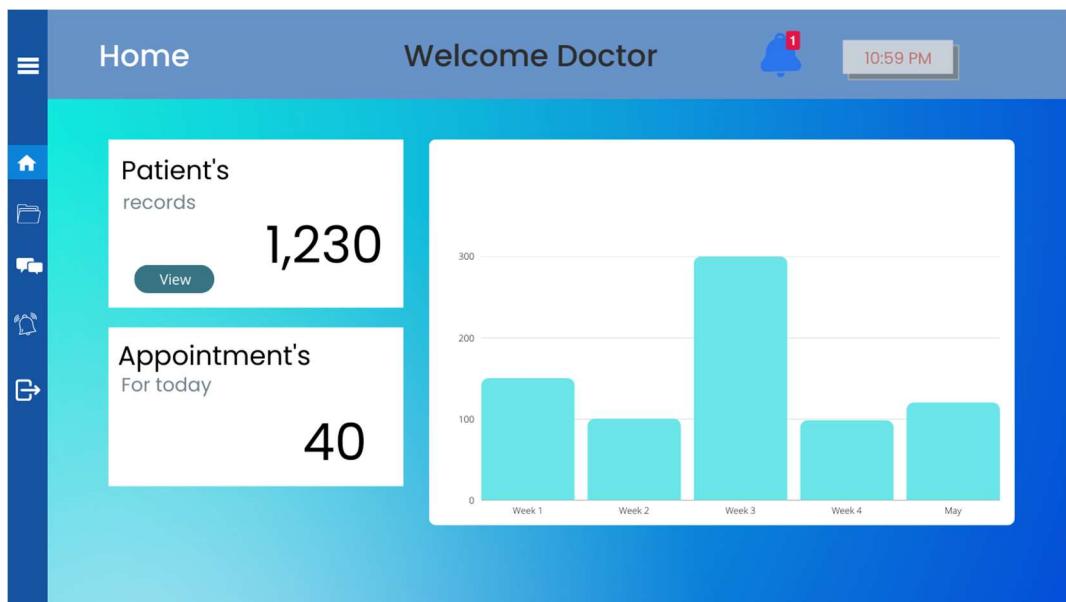
Appointment Successfully book



Leave a message



Dentist Login Page



Dentist Home Page

**Dental Contract**

The screenshot shows a mobile application interface for a dental contract. On the left is a vertical navigation bar with icons for Home, File, Chat, and Email. The main content area has a blue header "Dental Contract". Below the header are two forms: a "PATIENT INFORMATION RECORD" from the Philippine Dental Association and an "INFORMED CONSENT" document. The "INFORMED CONSENT" document includes sections for TREATMENT TO BE DONE, DRUGS & MEDICATIONS, CHANGES IN TREATMENT PLAN, RISKS OF TEETH, DENTAL HISTORY, ENDODONTIC TREATMENT, PERIODONTAL DISEASE, PALLIATIVE TREATMENT, and DENTURES. A blue notification icon with the number "1" is visible in the top right corner.

### Dental Contract of Patient

**Treatment Record**

The screenshot shows a treatment record table. The top row contains headers: Id, Surname, Date, Tooth Number/s, Procedure, Dentist/s, Amount Charge, Amount Paid, Balance, and Next Appointment. Below the headers is a table with five rows of data. The last row has a red "End of Contract" button. The table shows treatments for patient Tulalian, including Orthodontic Placement, Adjustment, and Cleaning sessions, with various dentists and payment amounts.

ID	Surname	Date	Tooth Number/s	Procedure	Dentist/s	Amount Charge	Amount Paid	Balance	Next Appointment	Action
1	Tulalian	06/2/22	09-16	Orthodontic Placement	Dr. Tesoro	34000	5000	29000	07/2/22	<button>Done</button>
2	Tulalian	07/2/22	10-17	Orthodontic Adjustment & Pasta	Dr. Britania	1500	1500+340	26500	08/2/22	<button>Add to Reminder</button>
3	Tulalian	08/2/22	11-18	Orthodontic Adjustment	Dr. Tesoro	5000	5000	21500	09/2/22	<button>Add to Reminder</button>
4	Tulalian	09/2/22	12-19	Orthodontic Adjustment & Cleaning	Dr. Tesoro	10000	10000+500	11500	10/2/22	<button>Add to Reminder</button>
5	Tulalian	10/2/22	13-20	Orthodontic Adjustment	Dr. Britania	11500	11500	Paid	None	<button>End of Contract</button>

### Treatment record of patient

Add Treatment Record

ADD TREATMENT RECORD

Date	
Tooth no/s.	
Procedure:	
Dentist:	
Amount Charged	
Amount Paid	
Balance	

Next Appointment

Add note:

BACK

Add treatment record

Leave a Message

Inbox

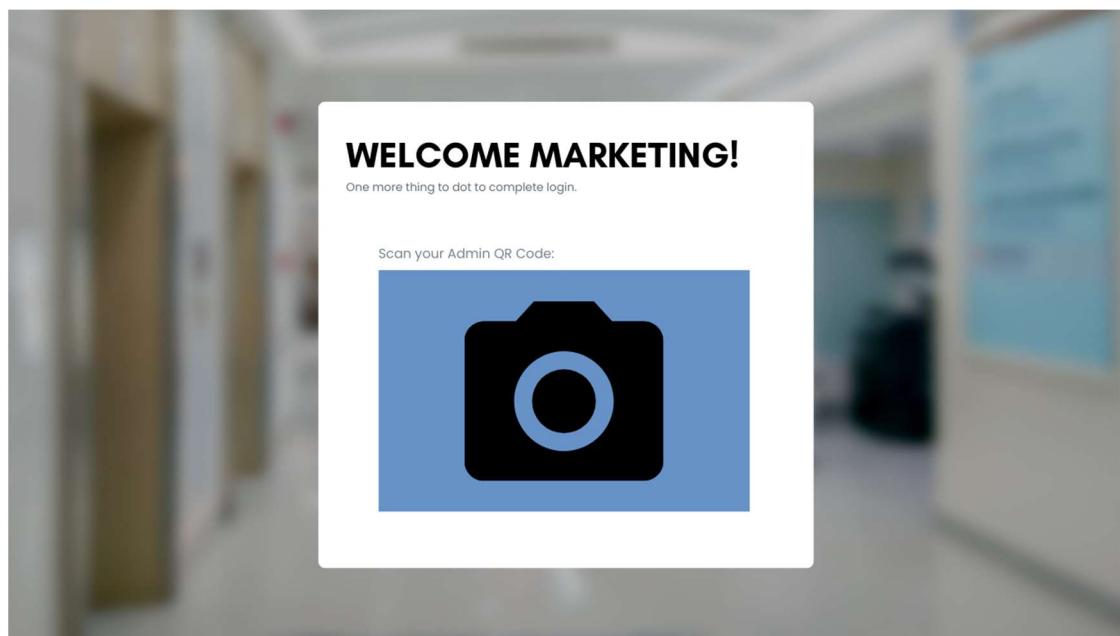
Dental Clinic Expert

Search Patient

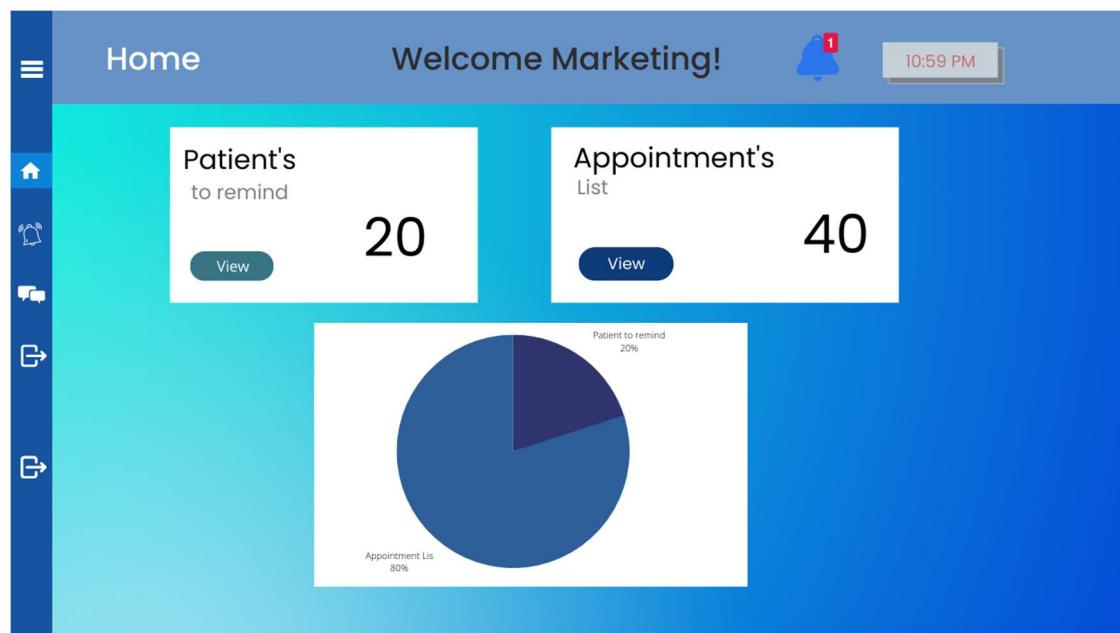
Good Evening! You have an appointment this comming tuesday. Dont forget to Book your schedule

Enter your message here!

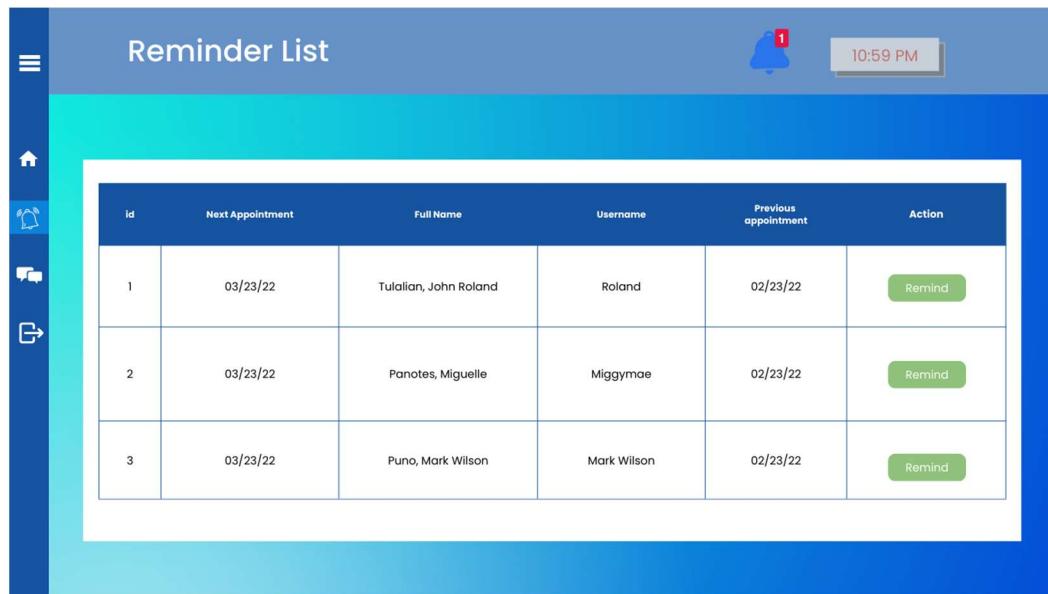
Leave a message



**Marketing Login Page**



**Dashboard**

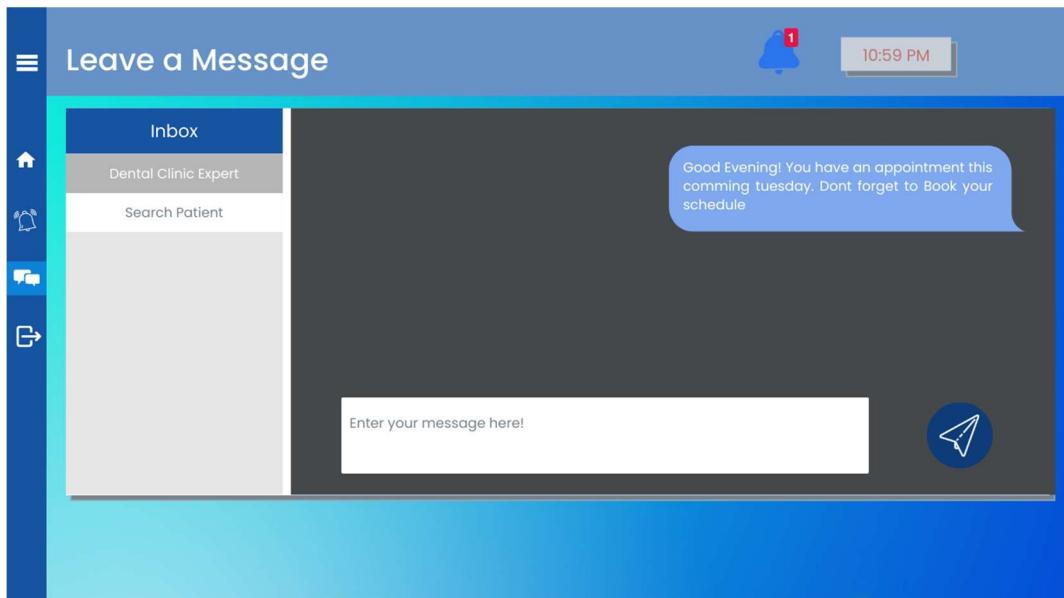


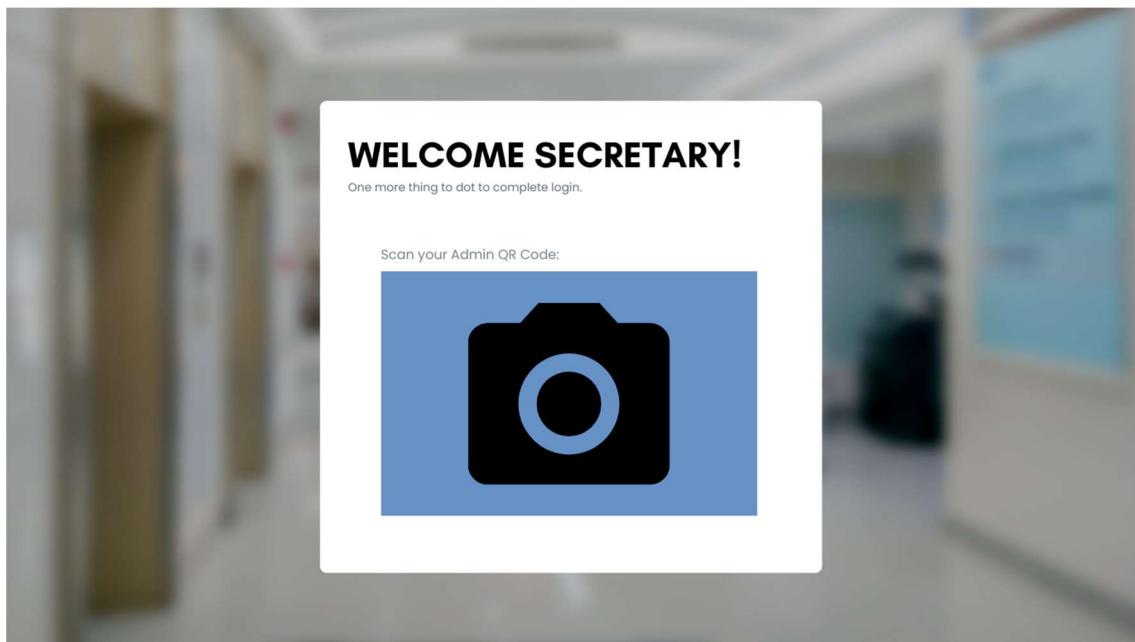
**Reminder List**

10:59 PM

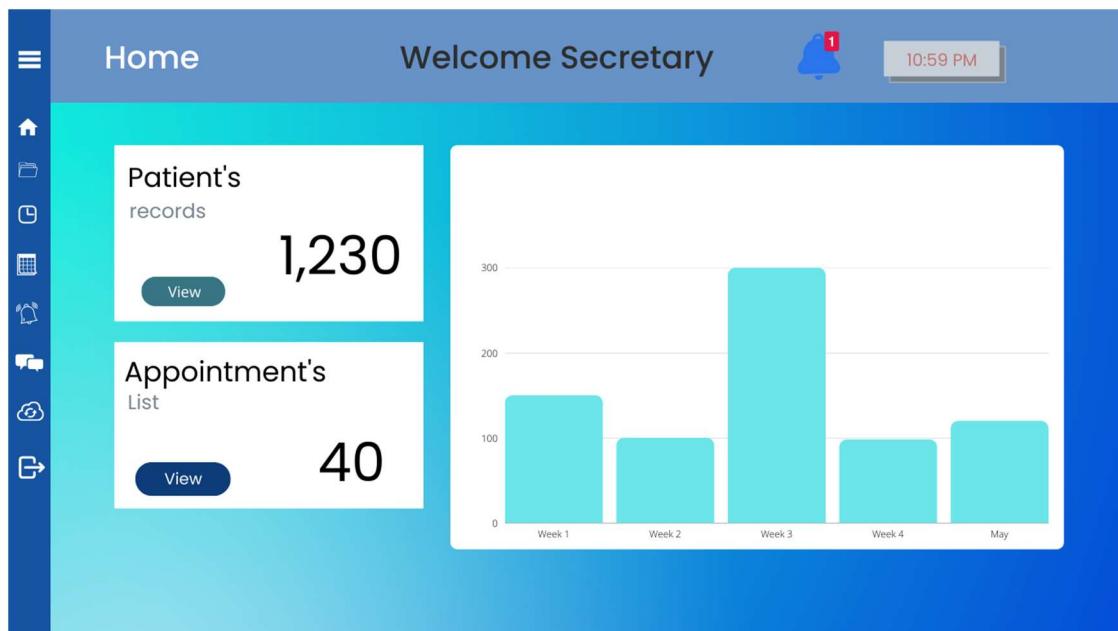
ID	Next Appointment	Full Name	Username	Previous appointment	Action
1	03/23/22	Tulalian, John Roland	Roland	02/23/22	<button>Remind</button>
2	03/23/22	Panotes, Miguelle	Miggymae	02/23/22	<button>Remind</button>
3	03/23/22	Puno, Mark Wilson	Mark Wilson	02/23/22	<button>Remind</button>

List of the patient that is needed to remind





**Secretary Login Page**



**Secretary's Home Page**

Pending Schedule

PENDING APPROVED DECLINED

ID	Username	Email	Contact	Age	View	Status	Status
1	Roland	tulalian.j.bsinfotech@gmail.com	09179432322	21	<button>View</button>	<span>Approved</span>	<span>Declined</span>
2	Miggymae	Panotes.M.bsinfotech@gmail.com	09179432322	22	<button>View</button>	<span>Approved</span>	<span>Declined</span>
3	Mark Wilson	Puno.w.bsinfotech@gmail.com	09179432322	21	<button>View</button>	<span>Approved</span>	<span>Declined</span>

### List of Pending Schedule

Appointment Schedule

INFORMATION

Full Name:	John Roland Tulalian
Email:	Tulalian.j.bsinfotech@gmail.com
Phone Number:	09179432322
Age:	21 years old

Date Scheduled: June 23, 2022 Monday

BACK

Payment Receipt

### Booking details

**Appointment Schedule**

June 21, 2022

ID	Username	Email	Contact	Age	Mark as Done
1	Roland	tulalian.j.bsinfotech@gmail.com	09179432322	21	<button>Done</button>
2	Miggymae	Panotes.m.Bsinfotech@gmail.com	09654651311	22	<button>Done</button>
3	Mark Wilsom	Puno.w.bsinfotech@gmail.com	091234565	21	<button>Done</button>

### List of confirmed schedules

**Patient Lists**

Excel PDF Print

ID	Last name	First name	Email	Contact	Username	Action
1	Tulalian	John Roland	tulalian.j.bsinfotech@gmail.com	09179432322	Roland	<button>View Profile</button>
2	Panotes	Miguelle	Panotes.m.Bsinfotech@gmail.com	09654651311	Miggymae	<button>View Profile</button>
3	Puno	Mark Wilson	Puno.w.bsinfotech@gmail.com	0912312332	Mark Wilson	<button>View Profile</button>

### List of Patients

# Patient Informations

10:59 PM



John Roland Tulalian

[Change Picture](#)

**Birth Date:** January 23, 2001 **Age:** 21

**Address:** Block 2 Lot 2 Barangay San Isidro Antipolo City Rizal

**Gender:** Male

**Contact Number:** 095121231

**Email Address:** 095121231

**Username:** Bhoxz\_Mhalatek

[Open Treatment Record](#)

[Upload Dental Contract](#)

[View Dental Contract](#)

## Patient Information

## Patient Dental Contract

**Treatment Record**

10:59 PM

Print ADD RECORD

ID	Surname	Date	Tooth Number/s	Procedure	Dentist/s	Amount Charge	Amount Paid	Balance	Next Appointm ent	
1	Tulalian	06/2/22	09-16	Orthodontic Placement	Dr. Tesoro	34000	5000	29000	07/2/22	<button>Done</button>
2	Tulalian	07/2/22	10-17	Orthodontic Adjustment & Pasta	Dr. Britania	1500	1500+340	26500	08/2/22	<button>Add to Reminder</button>
3	Tulalian	08/2/22	11-18	Orthodontic Adjustment	Dr. Tesoro	5000	5000	21500	09/2/22	<button>Add to Reminder</button>
4	Tulalian	09/2/22	12-19	Orthodontic Adjustment & Cleaning	Dr. Tesoro	10000	10000+500	11500	10/2/22	<button>Add to Reminder</button>
5	Tulalian	10/2/22	13-20	Orthodontic Adjustment	Dr. Britania	11500	11500	Paid	None	<button>End of Contract</button>

### Patient treatment record

**Treatment Record**

10:59 PM

Excel PDF Print ADD RECORD

Full Name	Date	Tooth Number/s	Procedure	Dentist/s	Amount Charged	Amount Paid	Balance	Next app't.	Action
									<button>Done</button>
									<button>Add to Reminder</button>
									<button>Add to Reminder</button>
									<button>Ended</button>
Tulalian, John Roland	04/23/22	10-11	Orthodontic Placement	Dr. Tesoro	34000	5000	29000	05/23/22	<button>Done</button>
Tulalian, John Roland	05/23/22	09-12	Orthodontic Adjustment & Pasta	Dr. Britania	1000	1350	28000	06/23/22	<button>Done</button>
Tulalian, John Roland	05/23/22	09-13	Orthodontic Adjustment	Dr. Tesoro	1000	1000	2700	07/23/22	<button>Add to Reminder</button>
Tulalian, John Roland	03/23/22	09-13	Orthodontic Adjustment	Dr. Tesoro	1000	1000	2700	Done Contract	<button>Ended</button>

**Reminder List**

10:59 PM

ID	Next Appointment	Full Name	Username	Previous appointment	Action
1	03/23/22	Tulalian, John Roland	Roland	02/23/22	<button>Remind</button>
2	03/23/22	Panotes, Miguelle	Miggymae	02/23/22	<button>Remind</button>
3	03/23/22	Puno, Mark Wilson	Mark Wilson	02/23/22	<button>Remind</button>

### Reminder List

**Leave a Message**

10:59 PM

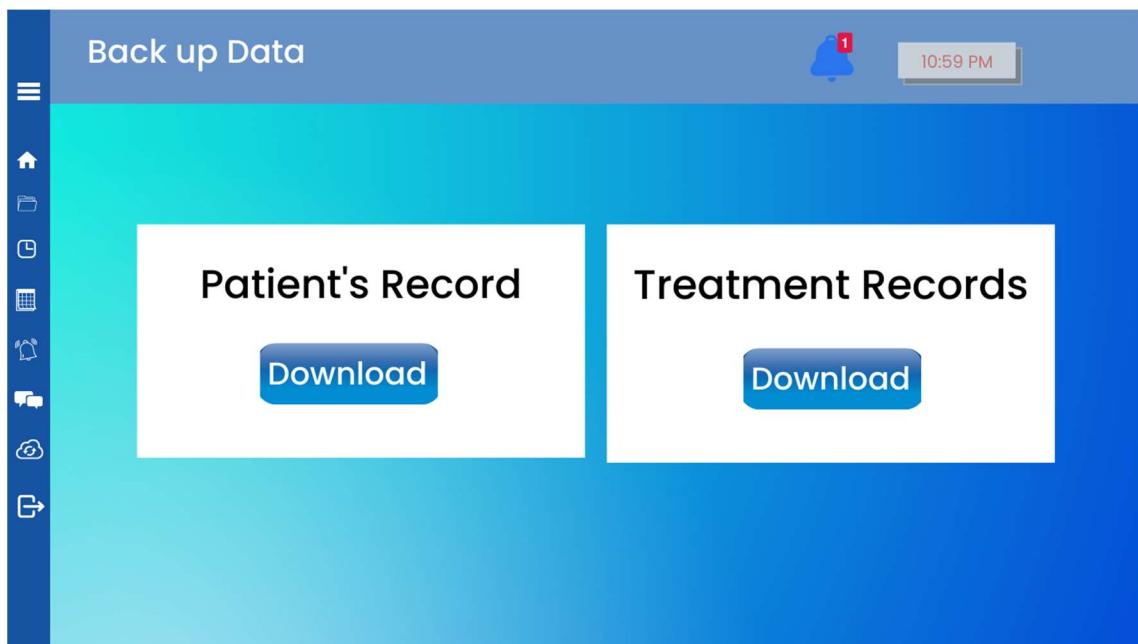
- [Inbox](#)
- [Dental Clinic Expert](#)
- [Search Patient](#)

Good Evening! You have an appointment this comming tuesday. Dont forget to Book your schedule

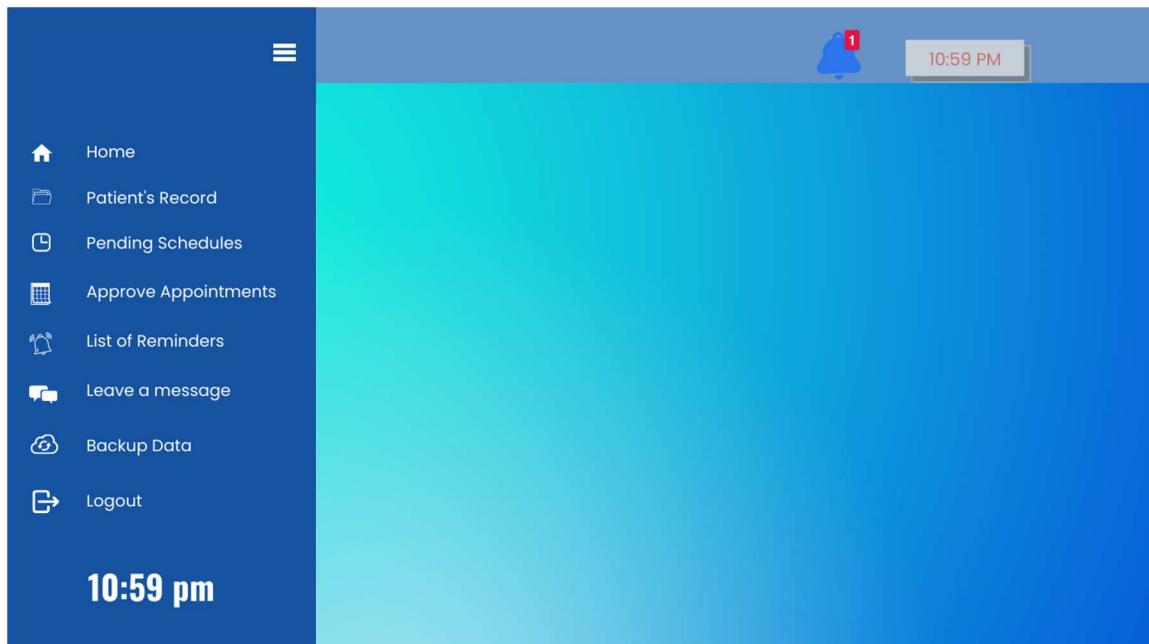
Enter your message here!

Send

### Leave a message



**Backup**



**Sidebar menu**

### **3.3.3 Alternative No. 3 (Web Application Setup)**

A Web application (Web app) is software that is stored on a distant server and distributed through the Internet using a browser interface. Web services, by definition, are Web applications, and many, but not all, websites feature Web apps. Web apps may be built for a wide range of purposes and utilized by anybody, from businesses to individuals, for several reasons. Webmail, online calculators, and e-commerce stores are examples of commonly used Web apps. Some Web applications are exclusively accessible through a certain browser; however, the majority are accessible through any browser.

Patients (users) and the dental clinic secretary (admin) can both utilize the proposed system as long as they are logged in and connected to the internet. Both administrators and users (patients) will use their login and password to access the system, and new users will be requested for basic information such as their name, age, phone number, and so on. The appointment calendar as well as the patient record are accessible to the admin. Users can utilize the system to make appointments for their next schedule.

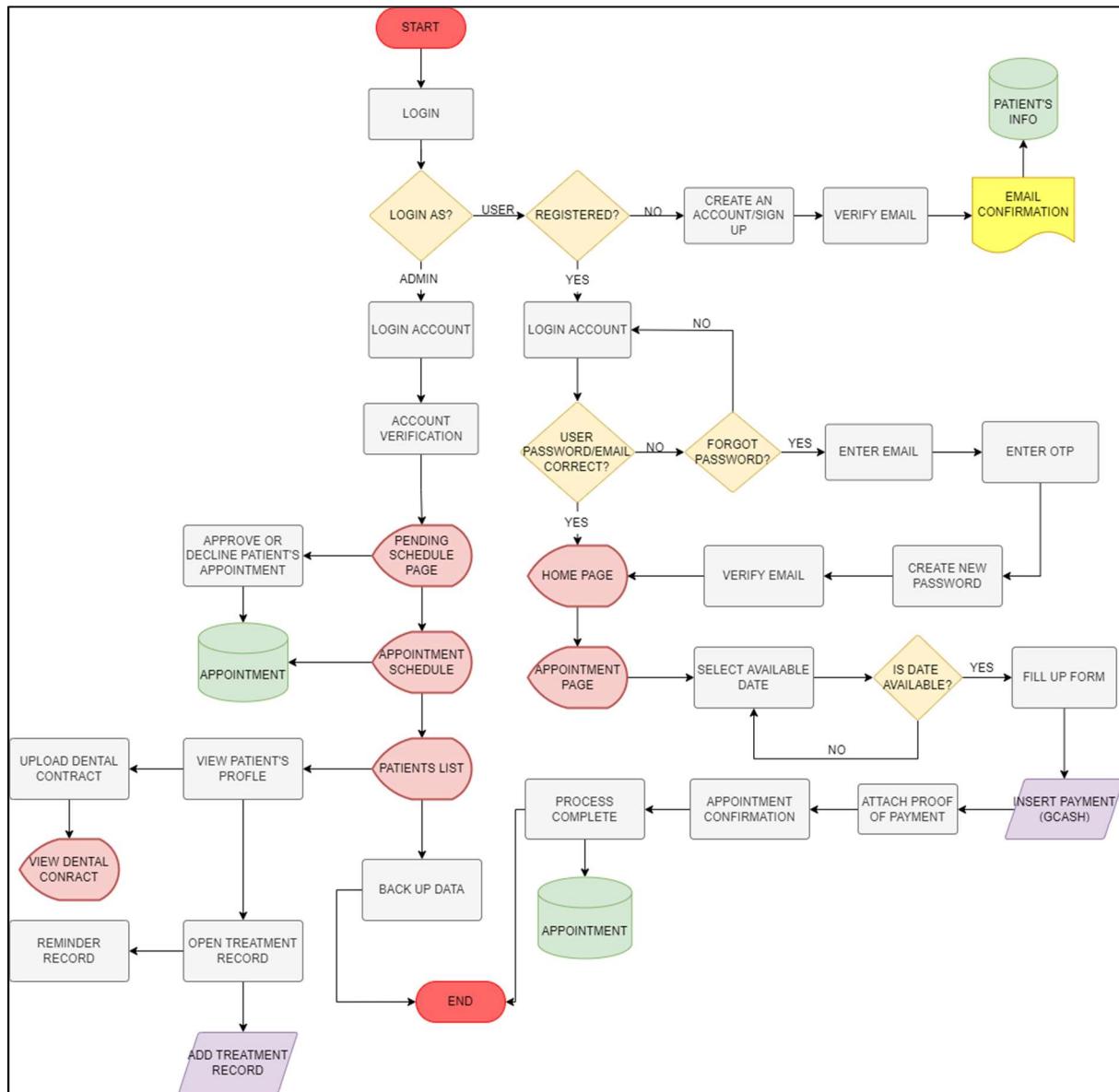
For this alternative, here are the advantages of this proposed system:

1. Convenience - As long as the dental clinic staff is logged on to the system, they can access it 24 hours a day or 365 days. The full database is accessible to the

dental clinic's secretary. Patients can schedule services in a familiar space. Individuals or patients can schedule appointments at any time using an online appointment management system.

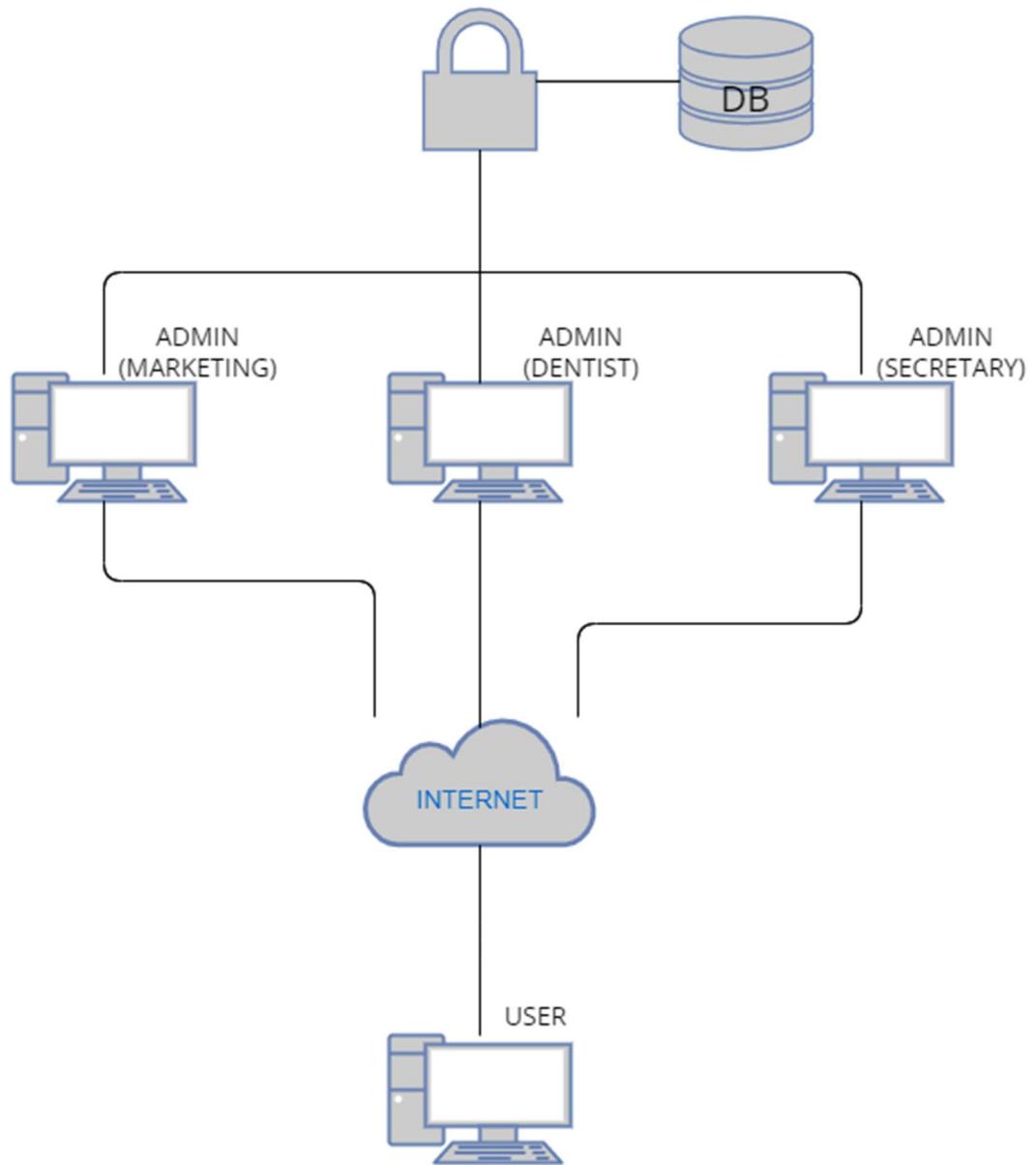
2. Data security - data is safer in the case of a possible system failure; data in the online application service is well-protected.
3. Portability - The system will function as long as users are logged in and connected to the internet. Patients can attach files of their issues.
4. Revenue - Patient no-shows and last-minute cancellations void appointments, resulting in lost income and stifling practice development. Patients seeking a time-sensitive appointment may quickly check your practice's current availability online, frequently selecting appointment spaces that might otherwise go unfilled or be lost due to a no-show.
5. Information System - Patient management is made easier and more efficient using online technologies. Recording, reporting, and evaluating such data aids in the effective management of a patient's case file. All routinely documented patient data, as well as a history of check-ups and related medical testing, may be utilized to make informed, well-considered healthcare decisions.

### 3.3.3.1 System Flowchart (Web Application Setup)



### 3.3.3.2 Physical Element (Web Application Setup)

#### 3.3.3.2.1 Network Layout (Web Application Setup)



**3.3.3.2.2 Database / Tables (Web Application Setup)**  
**Sign Up Form**

FIELD NAME	FIELD TYPE	FIELD LENGTH	DECIMAL	DESCRIPTION
First Name	Alphanumeric	20	0	Patient's first name
Middle name	Alphanumeric	20	0	Patient's middle name
Last name	Alphanumeric	20	0	Patient's last name
Age	Numeric	2	0	Patient's age
Birthdate	Datetime	10	0	Patient's birthdate
Gender	Alphanumeric	10	0	Patient's gender
Contact Number	Numeric	20	0	Patient's contact number
Address	Alphanumeric	30	0	Patient's address
Email Address	Alphanumeric	20	0	Patient's email address
Username	Alphanumeric	20	0	Patient's username
Password	Alphanumeric	20	0	Patient's password

**User account**

<b>Field Name</b>	<b>Field Type</b>	<b>Size</b>	<b>Decimal</b>
Username	Alphanumeric	20	0
Password	Alphanumeric	20	0

**Admin account**

<b>Field Name</b>	<b>Field Type</b>	<b>Size</b>	<b>Decimal</b>
Username	Alphanumeric	20	0
Password	Alphanumeric	20	0

**Appointment Form**

<b>FIELD NAME</b>	<b>FIELD TYPE</b>	<b>FIELD LENGTH</b>	<b>DECIMAL</b>	<b>DESCRIPTION</b>
Name	Alphanumeric	30	0	Patient's name
Age	Numeric	2	0	Patient's age
Gender	Alphanumeric	10	0	Patient's gender
Contact Number	Numeric	20	0	Patient's contact number
Address	Alphanumeric	30	0	Patient's address
Date and Time	Datetime	10	0	Patient's date and time of schedule
Type of service	Alphanumeric	30	0	Patient's type of service

### **3.3.3.2.3 Reports (Web Application Setup)**

**The following are the reports generated by the proposed system:**

Daily Schedule / Appointment - This report is the list of the patient who requested an appointment.

Records - This is the list of the records of patients and the list of a patient who has a schedule on a specific date.

User - The one who books an appointment.

Admin 1 - The one who handles the list of the confirmed appointment of the patient and the one who handles and manipulates the records.

### **3.3.3.2.4 Manual Process (Web Application Setup)**

Reminding the patient regarding their schedule through text messages.

The patient will confirm the schedule through text messages.

The patient will log in to the logbook.

The secretary will use a manual method to find the patient's record.

The dentist will fill out the patient record.

### **3.3.3.2.5 Tangible and Intangible Benefits (Web Application Setup)**

It will reduce the number of patients who forgot to remind them of their schedule.

It will become easier in terms of finding the patient's record.

It will be easy to identify who the expected patient is on a specific day.

Recording of assessment by the dentist and payables of the patient will become easier.

Since scheduling is often a patient's first interaction with a healthcare practice, it's critical to present a seamless, convenient process that makes a great first impression.

When your office is closed and your phone lines are busy, online scheduling is a logistical lifesaver. However, it also benefits patients who prefer the flexibility and convenience of online scheduling, regardless of the time of day.

### 3.3.3.3 Requirements Definition (Web Application Setup)

ITEMS	REQUIRED	EXISTING	NEEDED
<b>Hardware</b> 4GB ram AMD Ryzen 5 500 SSD	1	0	2
<b>Software</b> Visual Studio Sublime Xampp Windows 10 / Windows 11	1	0	1

### 3.3.3.4 Cost and Benefits Analysis (Web Application Setup)

<b>Cost</b>	
<b>ITEMS</b>	<b>COSTS</b>
<b>ONE TIME COST</b>	
<b>HARDWARE (1)</b>  4GB ram AMD Ryzen 5 500 SSD	<b>PHP 30,000</b>
<b>Software</b>  Visual Studio Sublime Xampp Windows 10 / Windows 11	
<b>Storage Back-Up / Firebase</b>  Firebase Realtime Database Documents write, read and delete	<b>PHP2, 337.5/46.75USD</b>
<b>TOTAL</b>	<b>PHP 32,337.5</b>

<b>RECURRING COST</b>	
Maintenance (IT Personnel)	<b>PHP 3,000</b>
Software and Hardware Problem	<b>PHP 3,500</b>
Employee Cost	
• Secretary	<b>PHP 15,000</b>
• Marketing	<b>PHP 15,000</b>
Electricity Cost (Monthly)	<b>PHP 1,500</b>
Internet Cost (Converge)	<b>PHP 1,500</b>
<b>TOTAL RECURRING COST</b>	<b>PHP 39,500</b>
<b>TOTAL COST</b>	<b>PHP 71,837.5</b>

**BENEFITS**

Front Desk Supplies	<b>PHP 2000</b>
Information Records	<b>PHP 3000</b>
Staffing (Front Desk and Logistics)	<b>PHP 30 000</b>
<b>TOTAL SAVINGS</b>	<b>PHP 35,000</b>

### 3.3.3.5 Computation for Payback Period (Web Application Setup)

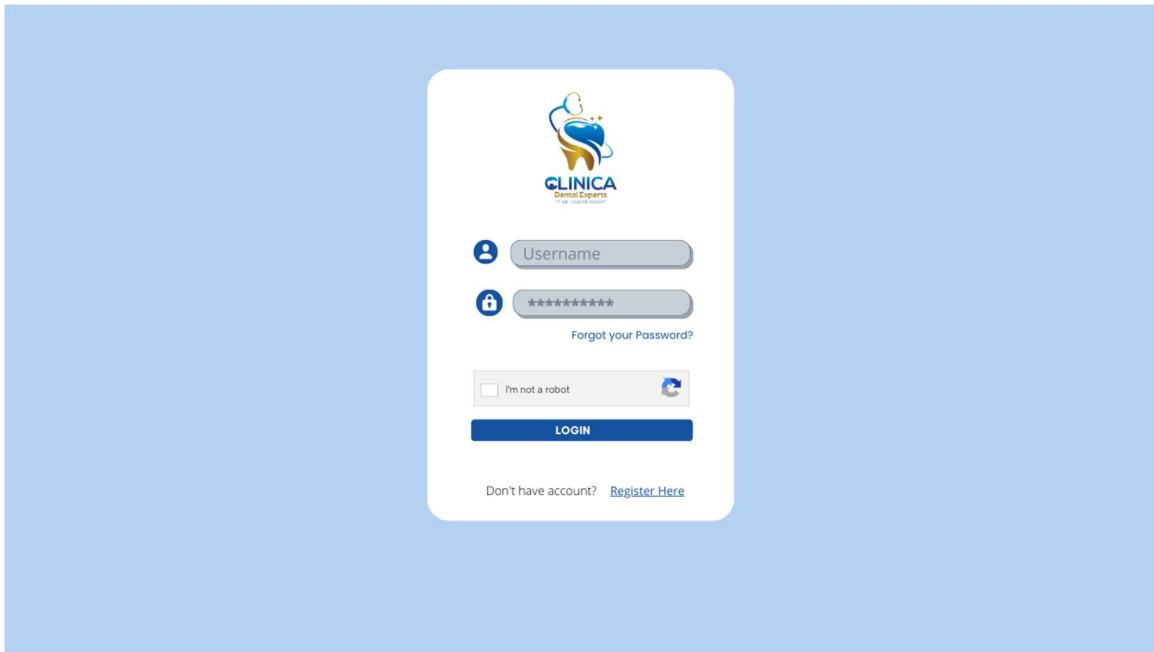
Total Cost:	PHP 71,837.5
Total Savings:	PHP 35,000

**Payback Period = Total Cost / Total Savings**

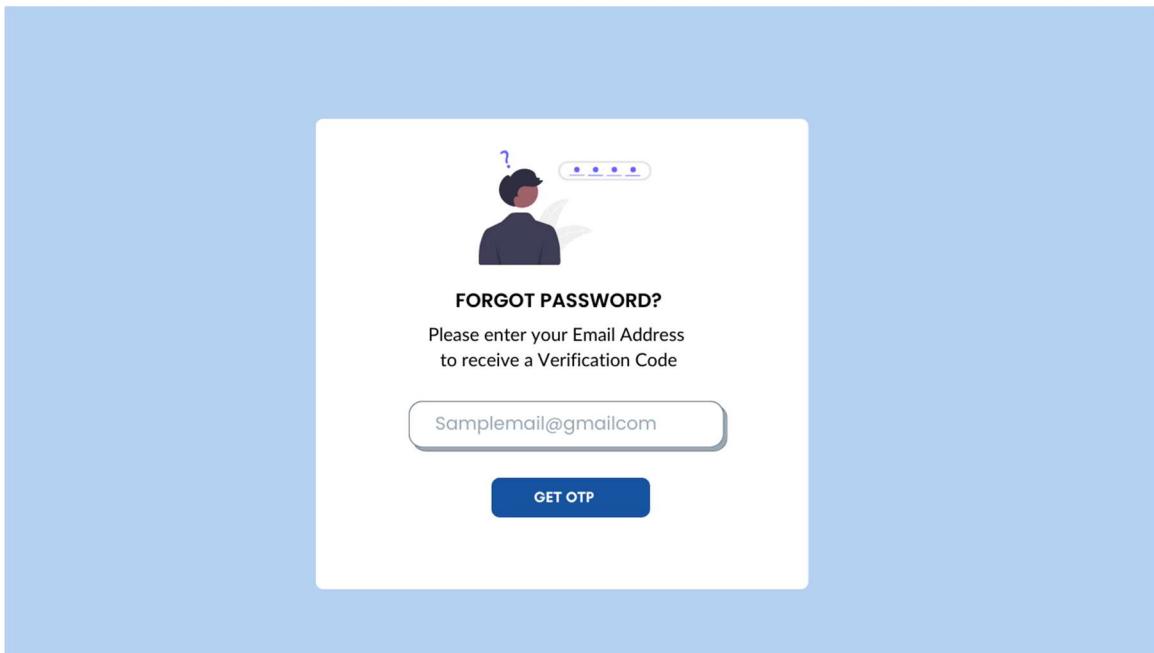
$$= \text{PHP } 71,837.5 / \text{ PHP } 35,000$$

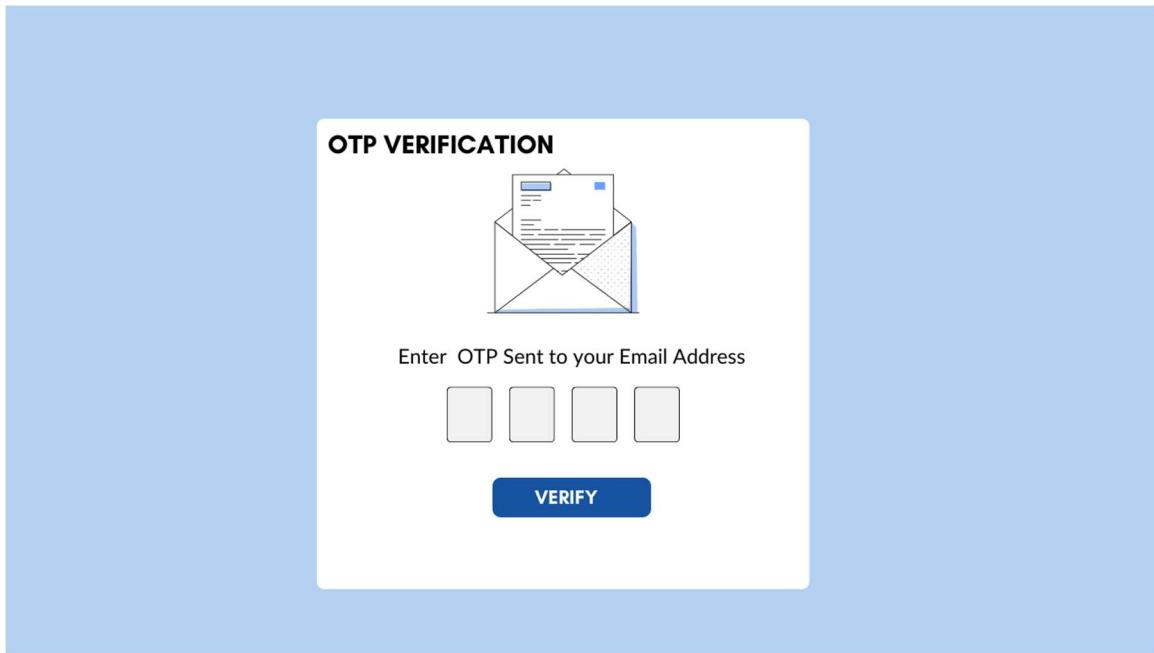
$$= 2.05 \text{ Per year}$$

### 3.3.6.6 Mockup Design for Dental Expert by Dr. Tesoro Dental Clinic: A web-based Appointment Scheduling System

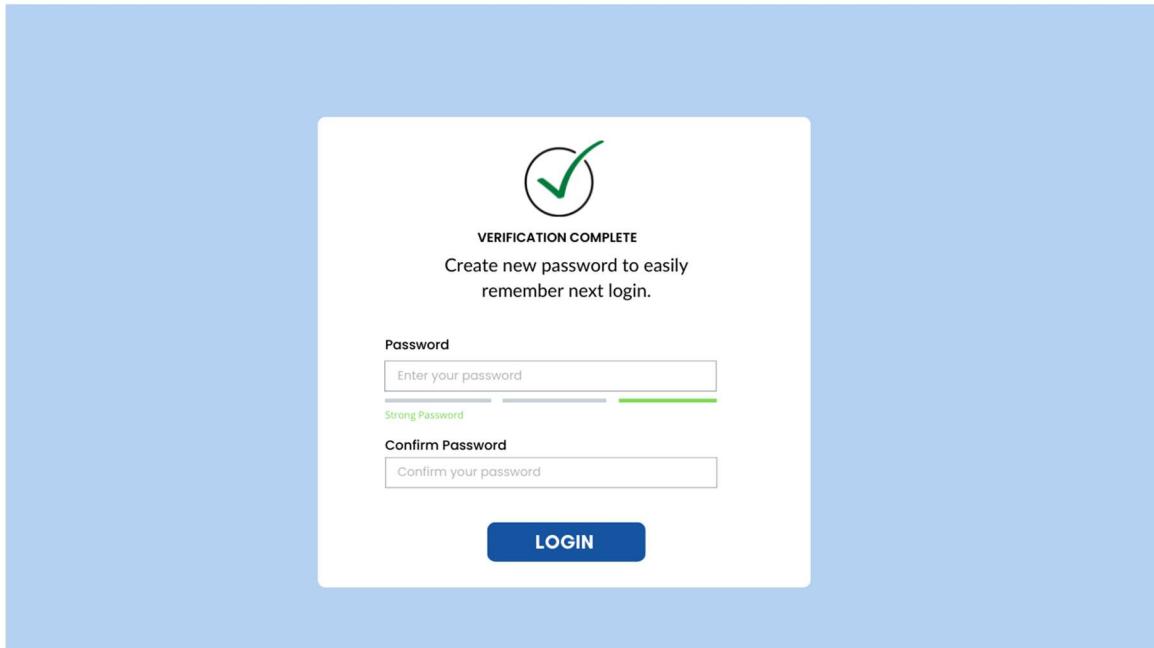


**Login Form**

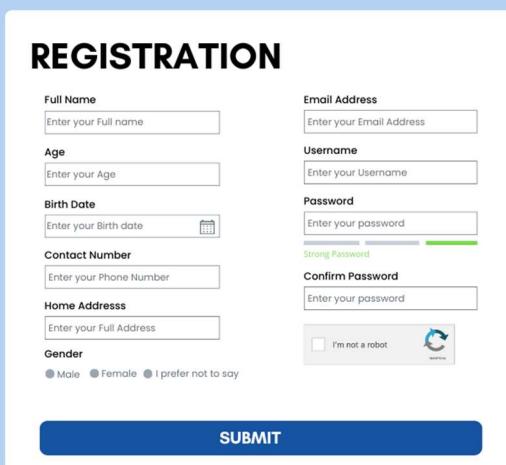




### Email Verification



Verification Completed



**REGISTRATION**

**Full Name**

**Age**

**Birth Date**  
 

**Contact Number**

**Home Address**

**Password**  
   
Strong Password

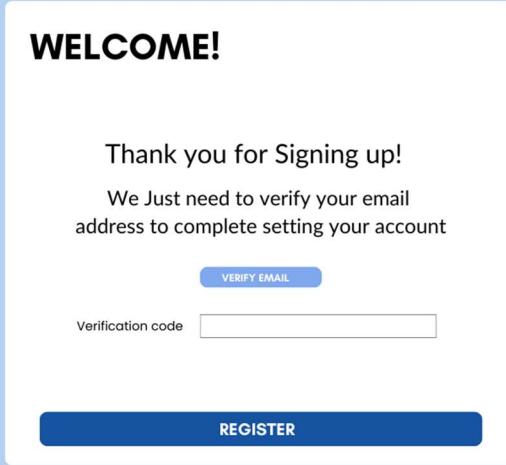
**Confirm Password**

I'm not a robot 

**Gender**  
 Male  Female  I prefer not to say

**SUBMIT**

### Sign up / Registration Form



**WELCOME!**

Thank you for Signing up!

We Just need to verify your email address to complete setting your account

**VERIFY EMAIL**

Verification code

**REGISTER**

**Enter Verification Code**

The screenshot shows the 'Home' screen of a mobile application. At the top, there's a blue header bar with the word 'Home' on the left, a timestamp '10:59 PM' in the center, a notification icon with a red '1' on the right, and a 'My Profile' button. Below the header is a large white section with the heading 'Welcome! User'. This section contains two boxes: 'Upcoming Schedule' (empty) and 'History' (listing three service entries). A central message says 'Do you want to book? Just click here!' with a blue 'Book' button. On the far left is a vertical blue sidebar with icons for Home, Calendar, Chat, and Log Out.

Date	Service Duration	Service
01-23-2022	00:00 - 00:00	Brace Adjustments
01-23-2022	00:00 - 00:00	Brace Adjustments
01-23-2022	00:00 - 00:00	Brace Adjustments

### Users Home Page

The screenshot shows the 'Users Profile' screen. At the top, it has a blue header bar with the title 'Users Profile', a timestamp '10:59 PM', and a 'Go Back' button. The main content area features a user profile card for 'John Roland Tulalian'. It includes a placeholder profile picture, a name field, and a 'Change Picture' button. Below this are several input fields: 'Birth Date' (January 23, 2001), 'Age' (21), 'Address' (Block 2 Lot 2 Barangay San Isidro Antipolo City Rizal), 'Gender' (Male), 'Contact Number' (09512123124), 'Email Address' (09512123124), 'Username' (Bhoxz\_Mhalatek), and two buttons: 'Change Password' and 'View PDA'. The left side of the screen has a vertical blue sidebar with icons for Home, Calendar, Chat, and Log Out.

### Users Profile

## Preview of PDA Form/Dental Contract

# Schedule

10:59 PM

My Profile

< >

## June 2022

SUN	MON	TUE	WED	THU	FRI	SAT
1 available	2 available	3 Full	4 available	5 Full	6 available	7 available
8 Full	9 available	10 available	11 Full	12 Full	13 Full	14 available
15 Full	16 Full	17 Full	18 available	19 available	20 available	21 available
22 available	23 available	24 available	25 available	26 available	27 Full	28 Full
29 Full	30 available	31 Full	1	2	3	4

### Calendar for Available Schedule

**Reservation Form**

10:59 PM My Profile

Informations Payment Confirmation

### RESERVATION FORM

Please fill the form below accurately to enable us serve you better! Thank you!

Full Name *	<input type="text"/> First Name	<input type="text"/> Last Name
Email *	<input type="text"/> Ex: JuanCruz@gmail.com	
Phone Number *	<input type="text"/>	
Age	<input type="text"/>	
Date Scheduled:	<input type="text"/> June 20, 2022 Monday	

**NEXT**

### Reservation Form

**Reservation Fee**

10:59 PM My Profile

Informations Payment Confirmation

### RESERVATION FEE

Please select only one number to send in

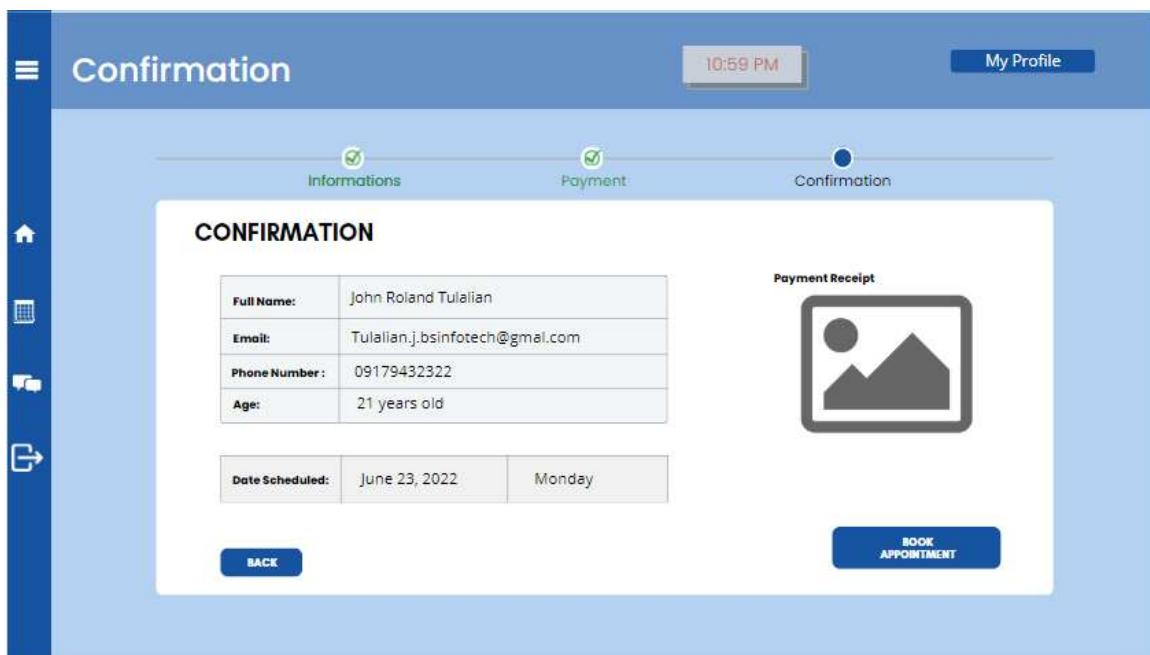
Gcash number 1:	0917-943-2322
Gcash number 2:	0943-287-2838

Screenshot Gcash receipt and attach it here.

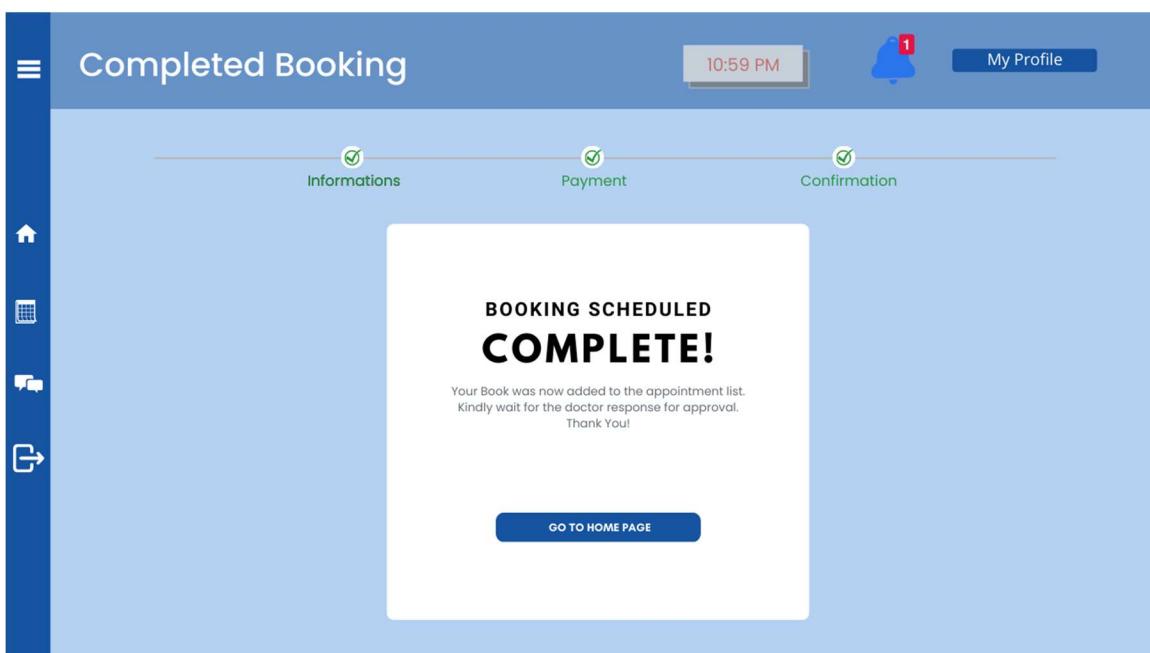
**Attach Image**

**BACK** **NEXT**

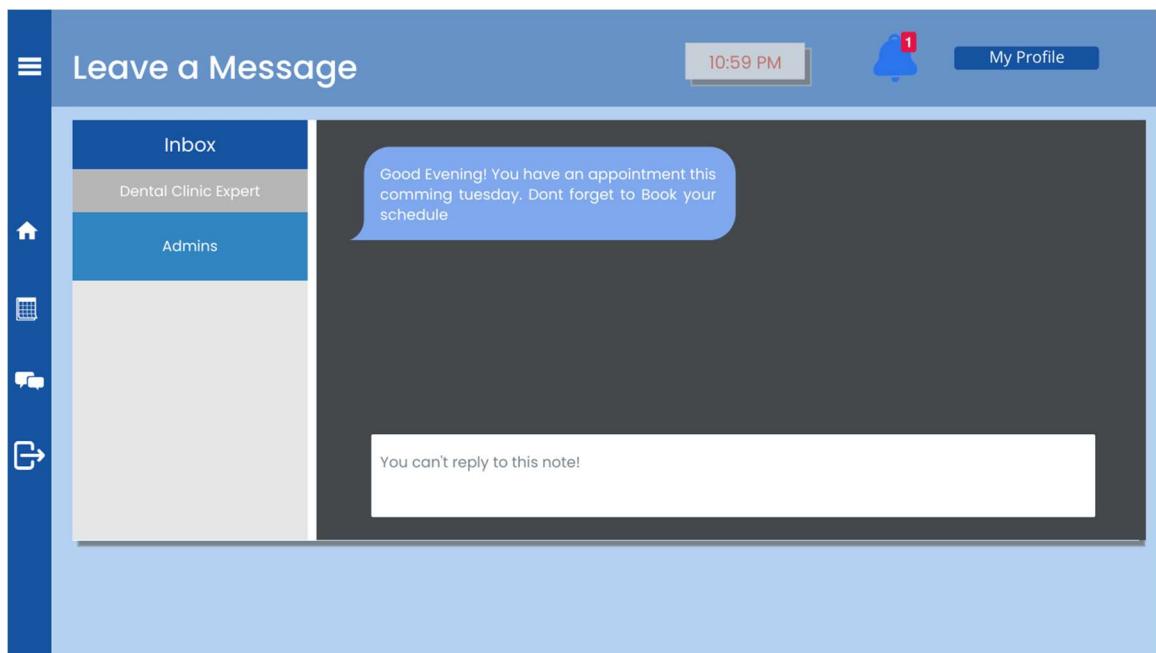
### Payment Section



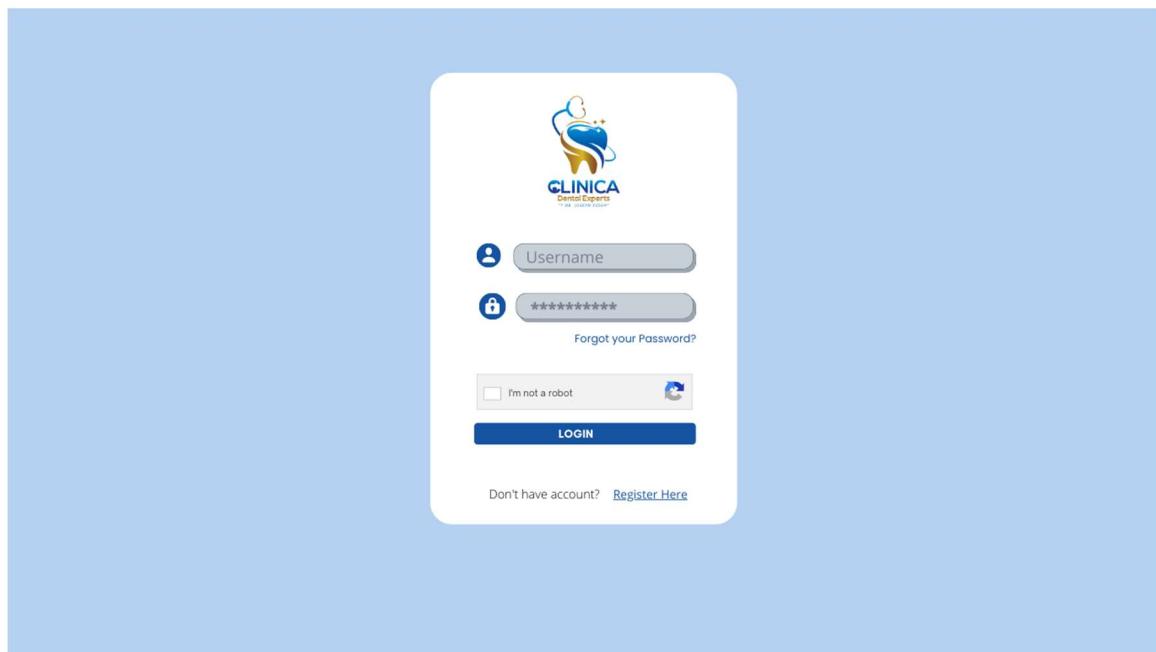
### Confirmation Section



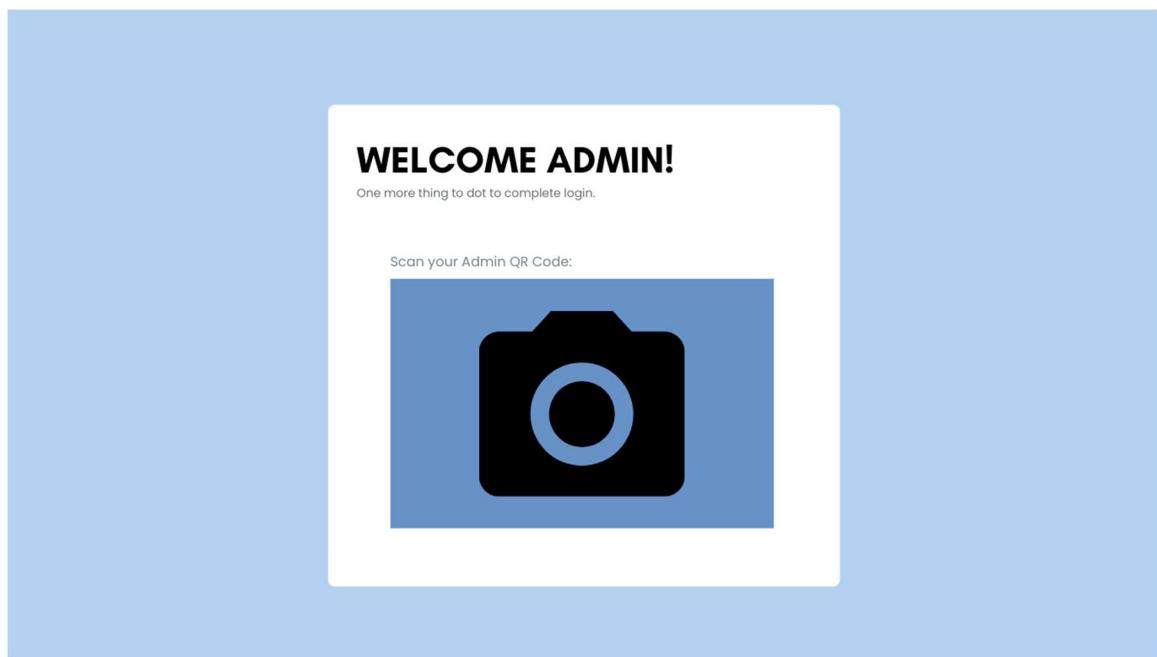
### Completed Booking



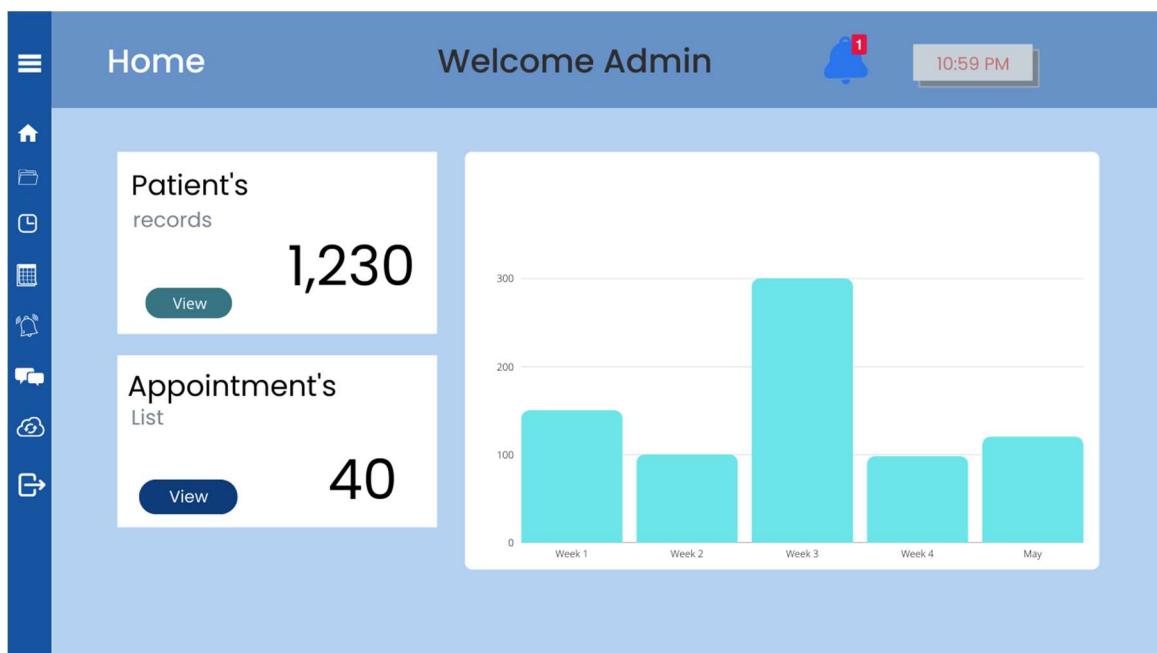
**Note / Message Section**



**Login Form (Admin)**



### Verification for Admin



### Admin Dashboard

**Pending Schedule**

10:59 PM

PENDING	APPROVED	DECLINED
1 Roland tulalian.j.bsinfotech@gmail.com 09179432322 21 View Approved Declined	2 Miggymae Panotes.M.bsinfotech@gmail.com 09179432322 22 View Approved Declined	3 Mark Wilson Puno.w.bsinfotech@gmail.com 09179432322 21 View Approved Declined

### List of Pending Schedule

**Appointment Schedule**

10:59 PM My Profile

**INFORMATION**

Full Name:	John Roland Tulalian
Email:	Tulalian.j.bsinfotech@gmail.com
Phone Number:	09179432322
Age:	21 years old

Date Scheduled:	June 23, 2022	Monday
-----------------	---------------	--------

**Payment Receipt**

BACK

### Appointment Schedule

**Appointment Schedule**

10:59 PM

June 21, 2022

ID	Username	Email	Contact	Age	Mark as Done
1	Roland	tulalian.j.bsinfotech@gmail.com	09179432322	21	<button>Done</button>
2	Miggymae	Panotes.m.Bsinfotech@gmail.com	09654651311	22	<button>Done</button>
3	Mark Wilson	Puno.w.bsinfotech@gmail.com	091234565	21	<button>Done</button>

### List of Approve Scheduled Appointments

**Patient Lists**

10:59 PM

Excel PDF Print

ID	Last name	First name	Email	Contact	Username	Action
1	Tulalian	John Roland	tulalian.j.bsinfotech@gmail.com	09179432322	Roland	<button>View Profile</button>
2	Panotes	Miguelle	Panotes.m.Bsinfotech@gmail.com	09654651311	Miggymae	<button>View Profile</button>
3	Puno	Mark Wilson	Puno.w.bsinfotech@gmail.com	0912312332	Mark Wilson	<button>View Profile</button>

### List of Patients

**Patient Informations**

John Roland Tulalian

Change Picture

Birth Date: January 23, 2001 Age: 21

Address: Block 2 Lot 2 Barangay San Isidro Antipolo City Rizal

Gender: Male

Contact Number: 095121231

Email Address: 095121231

Username: Bhoxz\_Mhalatek

Open Treatment Record

Upload Dental Contract

View Dental Contract

This screenshot shows a patient information form. It includes fields for birth date (January 23, 2001), age (21), address (Block 2 Lot 2 Barangay San Isidro Antipolo City Rizal), gender (Male), contact number (095121231), email address (095121231), and username (Bhoxz\_Mhalatek). There are also buttons for 'Open Treatment Record', 'Upload Dental Contract', and 'View Dental Contract'.

**Patient Information**

**Dental Contract**

Back

1

10:59 PM

PHILIPPINE DENTAL ASSOCIATION

PATIENT INFORMATION RECORD

DENTAL HISTORY

MEDICAL HISTORY

INFORMED CONSENT

FOLLOW UP

DENTURES

DENTAL CONTRACT

This screenshot shows a dental contract form. It includes sections for 'PATIENT INFORMATION RECORD', 'DENTAL HISTORY', 'MEDICAL HISTORY', 'INFORMED CONSENT', 'FOLLOW UP', 'DENTURES', and 'DENTAL CONTRACT'. The 'INFORMED CONSENT' section contains detailed text about treatment, treatment plan, risks, and informed consent. The 'DENTAL CONTRACT' section contains a signature field.

**Dental Contract**

**Treatment Record**

10:59 PM

Back Print ADD RECORD

ID	Surname	Date	Tooth Number/s	Procedure	Dentist/s	Amount Charge	Amount Paid	Balance	Next Appointm ent	
1	Tulalian	06/2/22	09-16	Orthodontic Placement	Dr. Tesoro	34000	5000	29000	07/2/22	Done
2	Tulalian	07/2/22	10-17	Orthodontic Adjustment & Pasta	Dr. Britania	1500	1500+340	26500	08/2/22	Add to Reminder
3	Tulalian	08/2/22	11-18	Orthodontic Adjustment	Dr. Tesoro	5000	5000	21500	09/2/22	Add to Reminder
4	Tulalian	09/2/22	12-19	Orthodontic Adjustment & Cleaning	Dr. Tesoro	10000	10000+500	11500	10/2/22	Add to Reminder
5	Tulalian	10/2/22	13-20	Orthodontic Adjustment	Dr. Britania	11500	11500	Paid	None	End of Contract

**Treatment Record**

10:59 PM

Excel PDF Print ADD RECORD

Full Name	Date	Tooth Number/s	Procedure	Dentist/s	Amount Charged	Amount Paid	Balance	Next appt.	Action
									Done
									Add to Reminder
									Add to Reminder
									Ended
Tulalian, John Roland	04/23/22	10-11	Orthodontic Placement	Dr. Tesoro	34000	5000	29000	05/23/22	Done
Tulalian, John Roland	05/23/22	09-12	Orthodontic Adjustment & Pasta	Dr. Britania	1000	1350	28000	06/23/22	Done
Tulalian, John Roland	05/23/22	09-13	Orthodontic Adjustment	Dr. Tesoro	1000	1000	2700	07/23/22	Add to Reminder
Tulalian, John Roland	03/23/22	09-13	Orthodontic Adjustment	Dr. Tesoro	1000	1000	2700	Done Contract	Ended

### Treatment Record

Add Treatment Record

10:59 PM

**ADD TREATMENT RECORD**

Date	
Tooth no/s.	
Procedure:	
Dentist:	
Amount Charged	
Amount Paid	
Balance	

BACK

SAVE

Add note:

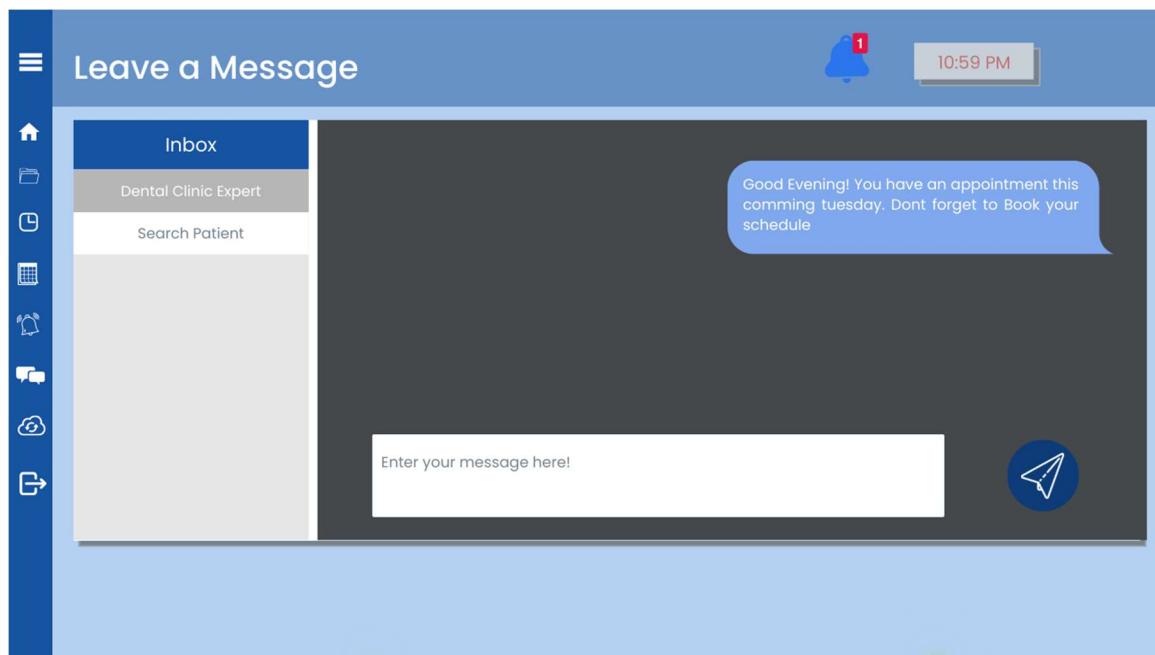
### Add Treatment Record Form

Reminder Record

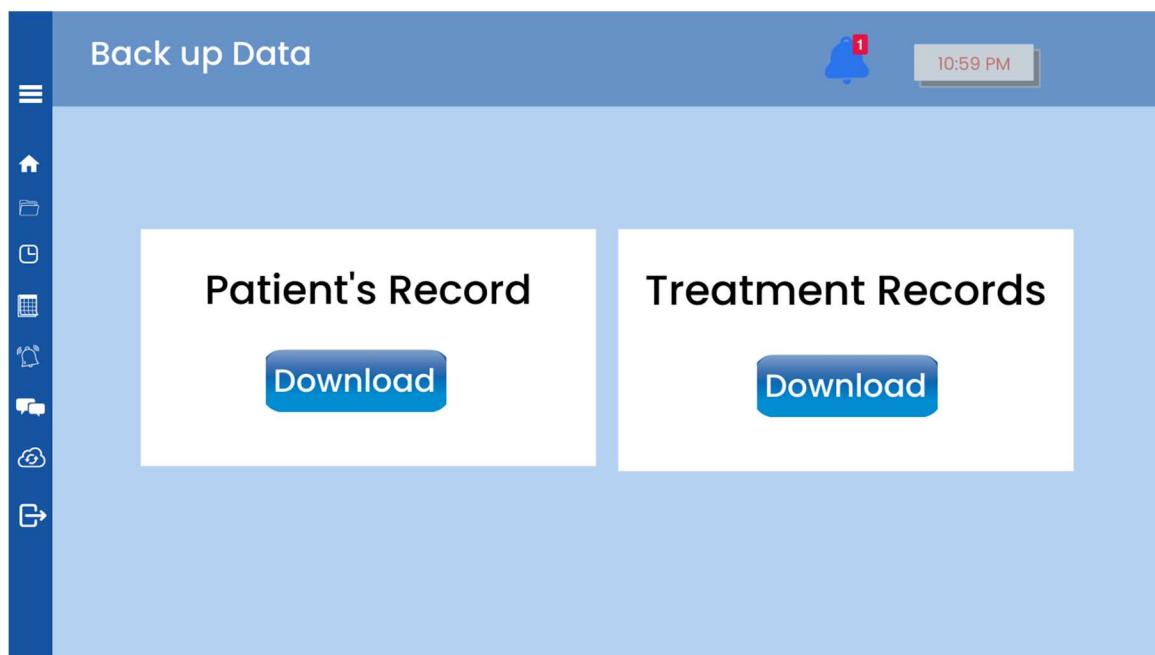
10:59 PM

ID	Next Appointment	Full Name	Username	Previous appointment	Action
1	03/23/22	Tulalian, John Roland	Roland	02/23/22	<button>Remind</button>
2	03/23/22	Panotes, Miguelle	Miggymae	02/23/22	<button>Remind</button>
3	03/23/22	Puno, Mark Wilson	Mark Wilson	02/23/22	<button>Remind</button>

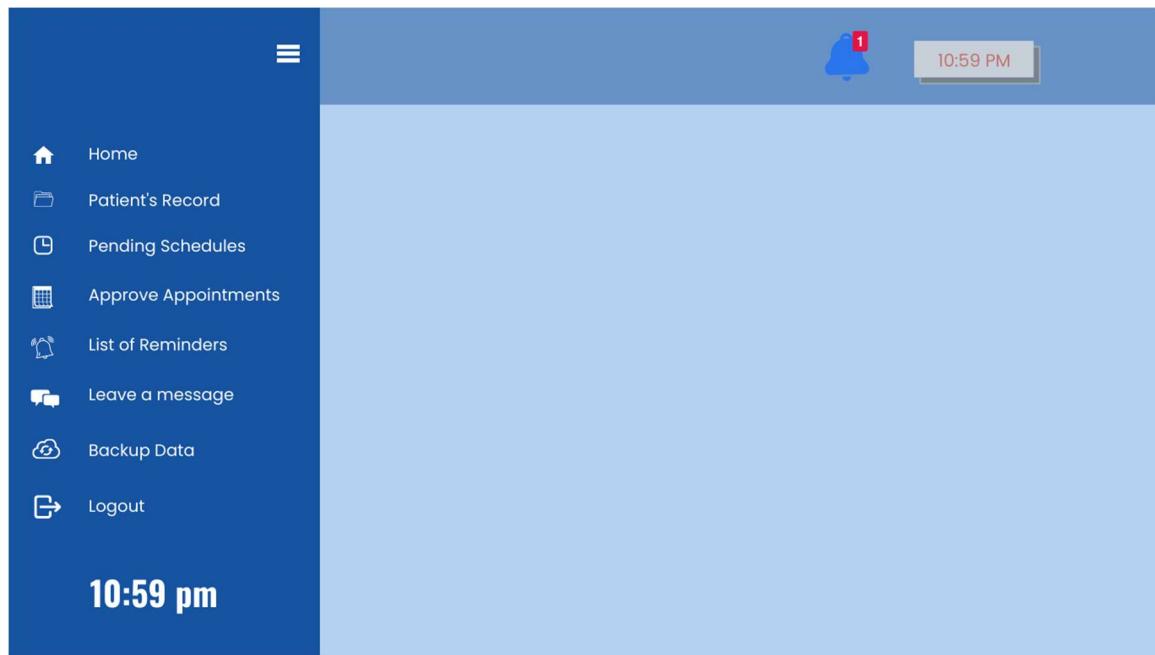
### Reminder Record



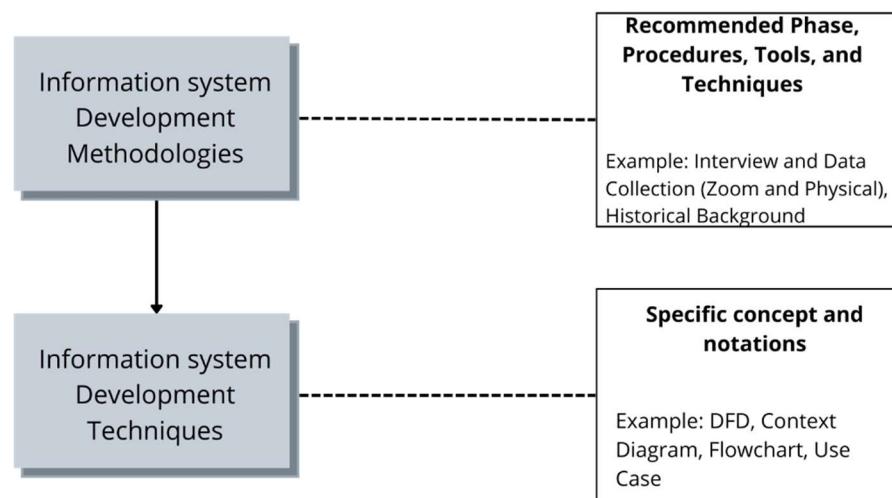
#### Leave a note for a patient

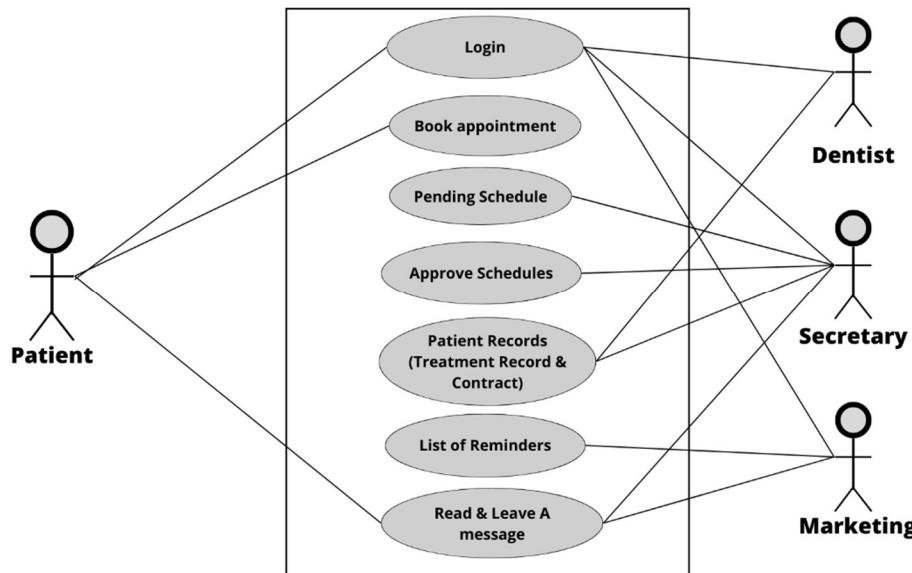


#### Back-Up Data



**Sidebar Menu**

**CHAPTER 4 : METHODOLOGY****4.1 Research and System Development Method**



A use case diagram is a graphical representation of how a user could interact with technology. A use case diagram depicts the different use cases and user types that exist in the system and is frequently supported by other types of diagrams. The use cases are illustrated by circles or ellipses.

#### 4.2 Data Collection



To know what the problem of the dental clinic proponents conducted a zoom and physical interview with the CEO and Chief Dentist of the Dental Clinic to gather all the facts such as the history of the company, how they started, and information that is needed to proceed with the documentation of the study. They also talk about the procedure to get a better understanding what is the existing system that they are using. After that, proponents proceed to the discussion on what system they are going to propose to the dental clinic.

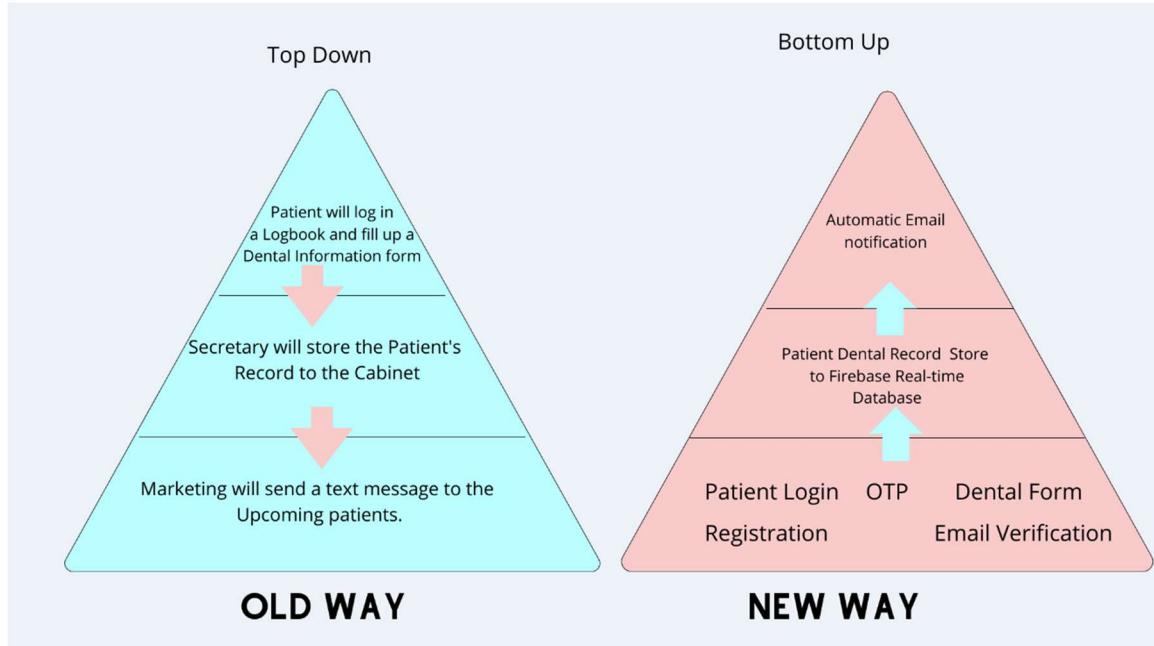
#### **4.3 Ethical Issues**

The success of this study will benefit the User (Patient), the owner, and the dental clinic itself. The system will make the booking of an appointment easier, the checking and finding of the patient record, and remind the patient regards their schedule. Nowadays, most individuals have access to the internet, the patient will book an appointment by utilizing the internet, as opposed to when they needed a regular load to book their dental appointment. The system will help the admin to remind their patient easily because proponents included a feature where the admin can update the patient with the help of remind button. The system will also help the admin to find the records of the patients because the system has the feature of a patient list and it becomes easier and more convenient. To sum up, both patient and the dental clinic will take advantage of the system in a way that they can lessen the uncertain problem of booking an appointment and finding the records of the patient.

Dr. Joseph Tesoro the owner of the Dental Expert Dental Clinic agreed with the proponents to conduct a study on their company.

Proponents conducted a zoom and physical interview to discuss the proposed system and to gather information on their company and they are willing to give the information that is needed to become the study successfully.

#### 4.4 Compliance Requirements



#### INDEX K

In an old way process in dental clinic, marketing will remind the patients regard to their schedule through text message. Patients need to provide their information by using the log book when they visit the clinic. During the dental procedure secretary will find the records of the patient in the storage cabinet, after he found the patient record, she will give the records to the dentist to list down all the assessment and lastly if the dental procedure is done secretary will bring back the patients on the storage cabinet.

In our new way, Patients need to create their own account to access the web application by providing their personal information and email verification is required. If the user log in their account OTP password is required for better security. All of the information will store in Firebase Realtime Database for security.

**OTP** - A one-time password (OTP) is an automatically generated numeric or alphanumeric string of characters that authenticates a user for a single transaction or login session. An OTP is more secure than a static password, especially a user-created password, which can be weak and/or reused across multiple accounts. In our system OTP will use when the user forgets the password.

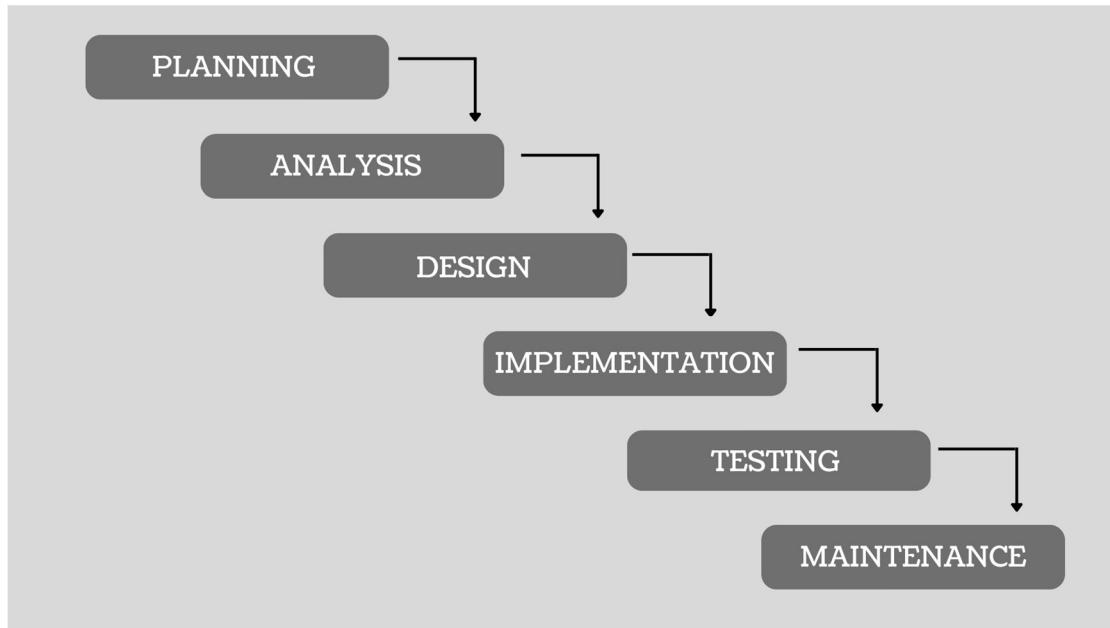
**Captcha Code** - CAPTCHA helps protect you from spam and password decryption by asking you to complete a simple test that proves you are human and not a computer trying to break into a password protected account. In our system captcha will appear when user is trying to log in.

**Email Verification** - Email Verification is the process of verifying an email address is valid and improving the odds that it belongs to a real person. The whole purpose of email

verification is to ensure that a real person with a valid email address will receive and interact with the sent email. In our system email authentication will use when there is a new user or patient that is creating account.

**Firebase Realtime Database** - The Firebase Realtime Database is a cloud-hosted NoSQL database that lets you store and sync data between your users in real-time. In the system, information will store in Realtime database and SSL is involved in the system for extra security.

#### 4.5 Analysis of Data



##### **Planning Stage**

In this stage, the proponents come up with the idea of brainstorming where they can share their thoughts on how they start to build the title and who their target beneficiary and what kind of system they want to develop. The planning stage continues when they already have a beneficiary. Then they set a zoom interview with the CEO of the company to identify the problem and to know the scope and the limit of the system. After the zoom interview, the specific goals were identified.

##### **Analysis Stage**

In this stage, all the gathered information from the CEO was analyzed and the stated problem was fully understood from their existing process or manual system.

### **Design Stage**

In this stage, all of the designs such as Flow charts, Context diagrams, Data flow, and the user interface or mockup design were being done to fully understand the flow of the system.

### **Implementation Stage**

In this stage, from mockup design, it will turn into a working system because in this specific phase of development the system will start to build.

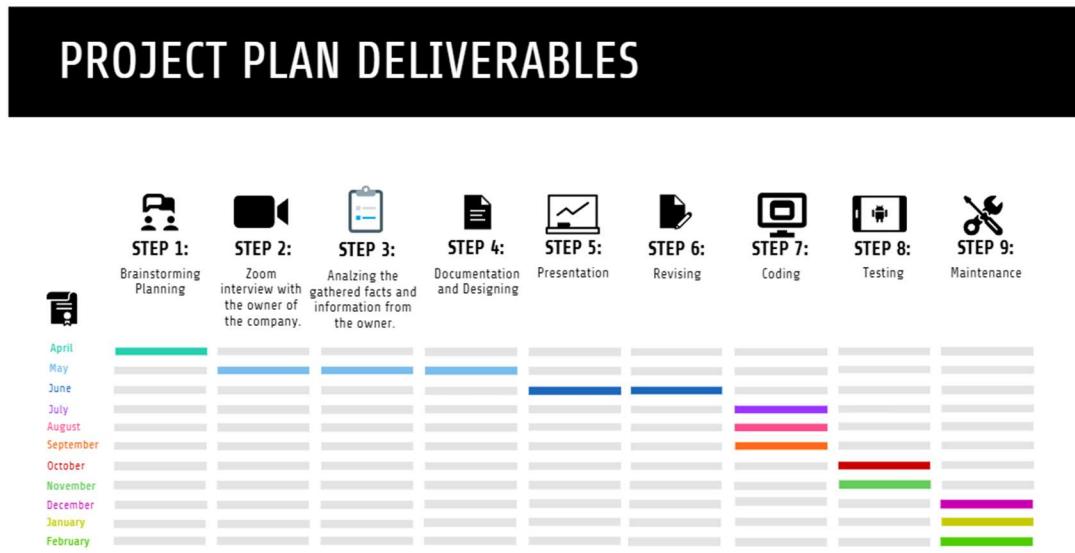
### **Testing Stage**

In this stage, the system is already built but it needs to be tested to identify what are the possible errors and bugs in the system to fix it. Also in this stage, it will be determined if they meet the requirements of the system.

**Maintenance Stage**

In this stage, if the testing stage is already successful, all the bugs and errors have already been fixed, and they already meet the system requirements. System maintenance will start

#### 4.6 Project Plan Deliverables



#### Step 1: Planning and Brainstorming Stage

In this stage, Proponents start to identify their target beneficiaries and started to find companies that they are going to work with. After they had already identified who is their target beneficiaries, proponents started to share their thoughts on what kind of system they are going to propose. The planning stage continues when they already have beneficiaries.

**Step 2: Data Gathering**

Proponents started to gather data by using zoom. Upon interviewing the CEO of the dental clinic, the problem of the company was already identified. Dr. Tesoro who is the CEO and Chief Dentist of the dental clinic stated all the problems that they are experiencing with the manual process and he also provided all the information that proponents need in conducting the study.

**Step 3: Analyzing**

After the data gathering, proponents started to analyze all the information that they got from the owner of the dental clinic.

**Step 4: Documentation and Designing**

In this stage, Proponents started to work with their documents and system design. In this phase, proponents include all the information that they got from the CEO of the dental clinic also in this stage all the existing processes and propose systems started to build including all the alternative courses of action as well as the mock-up design of the system.

**Step 5: Presentation**

After the four stages, finally in this part proponents will present their initial study on their panelists.

**Step 6: Revising**

In this stage, proponents started to revise their documents to comply with all the recommendations of their panelists such as redesigning the mock-up design, identifying the backup plan, and other minimal corrections to the documents.

**Step 7: Coding**

In this stage, the proponent will use their vacation to develop their system. The proponent will allot their vacation to start watching some tutorial that is related to their system.

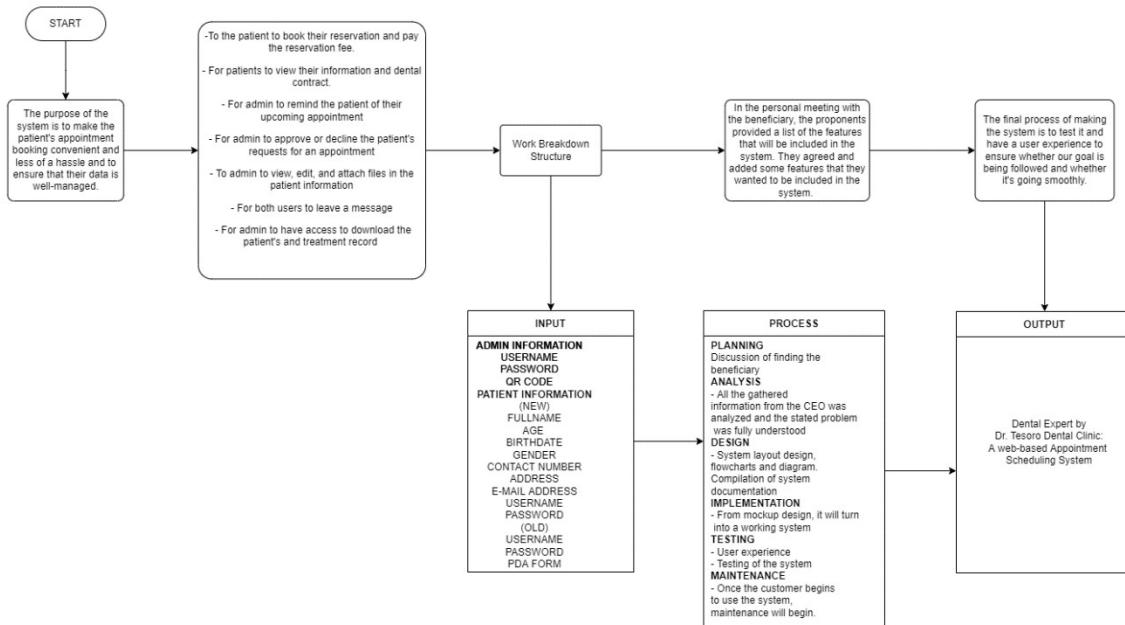
**Step 8: Testing**

The system is already developed at this point, but it must be tested to determine possible errors and bugs to be addressed. At this point, it will also be analyzed whether they fulfill the system's criteria.

**Step 9: Maintenance**

If the testing step has already been successful, all problems and errors have been resolved, and they meet the system requirements. The system maintenance will begin.

#### 4.7 Work Breakdown Structure



#### **4.8 Risk Analysis**

**Identification of Risk** - Based on the zoom interview of the proponents with the CEO of the Dental clinic they found out that the clinic experiencing misplaced patient records that contain their personal information and other confidential data. Therefore, the risk of misplacing the patient's record is there is a possibility that the personal information will be leaked. They also found out that there is a conflict in booking an appointment. The involved risk is the personal contact details of the patient because the clinic is using the manual way of booking an appointment through text messages.

**Analyzing the Risk** - After the proponents already identified the risk to the company in security, they come up proposing a web-based appointment scheduling system with additional features in patients' records to become safer in recording the assessment of the dentist.

**Evaluating the Risk** - Personal Information of the patients will leak as well as the confidential records.

**Treat the Risk -** The system will eliminate the problems of the company in manual process and the work of the admin will be easier and the information of the patients and confidential data of the said beneficiary will become secured.

**Review the Risk -** In this part, reviewing the risk is needed to maintain the security of all information.

#### **4.9 Duration**

**April** - For this month all the members of the proponents are involved because in this stage proponents start to share their idea about their target beneficiaries and what kind of a system they are going to propose with the company.

**May** - May 5, Proponents conducted a zoom interview with the CEO and Chief Dentist of the Dental Clinic. All of the proponents participated in the interview.

On week 2 of May, proponents started to work with their Chapter 1. They divided the sub-topic for chapter 1 to make the documentation easier and faster.

On week 3 of May, Documentation for chapter 2 started wherein each individual have an assigned task to have fast progress. For Tulalian and Panotes, they did the proposed flowchart, context diagram, and data flow diagram. For Del Pilar, he did the Gantt chart. For Alimoot, he did the data dictionary and user requirement personnel. For Puno, he did all the narrative explanations in chapter 2.

On week 4 of May, Documentation for chapter 3 started where we divided all of the sub-topic in the said chapter.

For Tulalian and Alimoot, they did the User interface of each Alternative Course of Action and mockup design of the system. The rest of chapter 3 was assigned to Puno, Del Pilar, and Panotes. This week, Proponents also did their PowerPoint presentation for their title defense.

**June** - During this duration, the proponent started to revise their documents based on the panel recommendations and insert chapter 4 which is the methodology.

**July, August, and, September** - During this duration, Proponents will start to develop the system. Also watching some tutorials to help the programmer to build the system.

**October and November** - During this duration, the system is already built but it should be tested to identify the errors and bugs. It also needs to review if all the features are working and if the system meets the requirements.

**December, January, and February** - in this duration, if the testing phase is already successful and if all the problems that are addressed are resolved, system maintenance will begin.

**Panel Recommendation****Suggestion 1: Security in User Login.**

Solution: We added a Captcha Code in the login form to add security and to prevent hackers from spamming.

**Suggestion 2: Familiarize with the Firebase Platform Plan.**

Solution: We Investigate further the Blaze Plan in the Firebase Platform and added to the Future costing in Chapter 3.

**Suggestion 3: Include all changes to the documents such as the backup process in the system prototype.**

Solution: All suggestions above and some changes/additions were comprised in the documents and mock-up design.