



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

DENTAL CLINIC MANAGEMENT AND APPOINTMENT SYSTEM FOR ARCIAGA - JUNTILLA TMJ ORTHO DENTAL CLINIC WITH CUSTOMIZABLE DENTAL CHART

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Pamantasan ng Lungsod ng Muntinlupa

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DENTAL CLINIC MANAGEMENT AND APPOINTMENT SYSTEM FOR ARCIAGA - JUNTILLA TMJ ORTHO DENTAL CLINIC WITH CUSTOMIZABLE DENTAL CHART

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EXECUTIVE SUMMARY

The "Dental Clinic Management and Appointment System for Arciaga - Juntilla TMJ Ortho Dental Clinic with Customizable Dental Chart" is a web-based tool created to improve how the Arciaga - Juntilla TMJ Ortho Dental Clinic manages its daily work, shifting from slow manual methods to a quicker, automated system. A configurable dental chart for treatment planning, dashboards for patients and dentists, online appointment scheduling and rescheduling, and a feedback tool for patients are just a few of its features. In order to facilitate patient and dentist interactions and increase clinic efficiency, the scope includes patient registration, appointment scheduling, treatment documenting, and feedback gathering. The primary users are both patients and dentists, and it was developed particularly for the clinic. The system was developed using the Agile development methodology, which enabled a step-by-step approach with improvements made based on feedback from users. Its performance was assessed during the alpha and beta phases when users tested it and provided comments; it was discovered to be useful for task management and enhancing patient satisfaction, but it requires initial training and a reliable internet connection. The researcher thoroughly tabulated the study, and it was indeed a useful comprehensive system, which proved that it can be used to ease the process inside the clinic between the dentist and the patient.

Keywords: dental clinic management, appointment system, customizable dental chart, patient records, online booking



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PAMANTASAN NG LUNGSOD NG MUNTINLUPA

DEDICATION

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PAMANTASAN NG LUNGSOD NG MUNTINLUPA

TABLE OF CONTENTS

	Page(s)
Title Page	i
Approval Sheet	ii
Executive Summary	iii
Acknowledgment	iv
Dedication	v
Table of Contents	vi
Appendices	viii
List of Tables	ix
List of Figures	x

CHAPTER 1. INTRODUCTION

Project Context	1
Purpose and Description	2
Objectives of the Study.....	5
Scope and Limitations	7

CHAPTER 2. REVIEW OF RELATED LITERATURE AND STUDIES

Technical Background	9
Related Literatures	10
Related Studies	15
Definition of Terms	19

CHAPTER 3. METHODOLOGY

Requirement Analysis	24
Requirement Documentation	26
Design of Software, System, Product or Process	37
System Architecture	38
Development and Testing	39
Implementation Plan	44



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

CHAPTER 4. RESULT AND DISCUSSION

Project Description	46
Project Structure	46
Project Capabilities and Limitation	69
Project Evaluation	73

CHAPTER 5. CONCLUSION AND RECOMMENDATION

Summary of Findings	76
Conclusion	78
Recommendations	80
References	82



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

APPENDICES

- a. Relevant Source Code
 - Evaluation Tool Sample
 - Sample Evaluation Instrument (for IT Experts)
 - Sample Evaluation Instrument (for Actual Users)
 - Summary of the overall mean score evaluation by IT Experts
 - Summary of the overall mean score evaluation by the Actual User
- c. Sample Input/Output/Reports
 - Letter to Conduct Study
 - Letter of Acceptance
 - Certificate of Originality
 - Gantt Chart
- d. User's Guide
- e. Request Letters
 - Adviser
 - Defense Panel
 - Language Editor
 - Endorsement for Title Presentation
 - Endorsement for Oral Presentation
 - Endorsement for Book Compilation
- f. Pictures showcasing the data gathering, investigation done
- g. Curriculum Vitae



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

LIST OF TABLES

Table No.	Page
1. Alpha Testing Procedures	41
2. Beta Testing	43
3. Likert Scale	44
4. Implementation Table	45
5. Test Results	71
6. Summary of the Mean Score of the Evaluation Report from Actual Users	73
7. Summary of the Mean Score of the Evaluation Report from IT Professionals	74



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

LIST OF FIGURES

Figure No.	Page
1. Existing Operation of Process of Arciaga – Juntilla TMJ Ortho Dental Clinic	24
2. Manual Process of Arciaga – Juntilla TMJ Ortho Dental Clinic	25
3. Context Diagram of the Proposed Title	27
4. Flowchart of the Proposed Title Landing Page	28
4.1 Flowchart of the Proposed Title Patient Dashboard	29
4.2 Flowchart of the Proposed Title Dentist Dashboard	30
4.3 Flowchart of the Proposed Title Billing	31
5. Data Flow Diagram of the Proposed Title	32
6. Patient and Client Dentist Use Case Diagram of the Proposed System	33
7. Functional Diagram of the Proposed System	34
8. Entity Relationship Diagram of the Proposed System	36
9. Conceptual Framework Diagram of the Proposed Title	37
10. System Architecture of the Proposed Title	38
11. Agile Methodology	39
12. Landing Page	47
13. Services Section	48
13.1 Services Section	48



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

14. Gallery Section	49
15. Dentist Section	50
16. Insurance Providers Section	50
17. Patient Reviews Section	51
18. Clinic Location	52
19. Create Account	52
20. Login	53
21. Patient Dashboard	54
22. Update Profile	55
23. Book Appointment	56
24. View Appointments	57
25. Reschedule Appointment	57
26. Dental Documentation	58
26.1 Dental Documentation	58
27. Feedback	59
28. Change Password	60
29. Dentist Dashboard	61
29.1 Dentist Dashboard	61
30. Calendar	62
31. Full Details of Appointments	63
32. Patient Lists	63
33. Patient Profile Tab	64



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

34. Appointment History Tab	64
35. Treatment Planning Tab	65
35.1 Treatment Planning Tab	65
36. Documentation Tab	66
37. Patient Feedback	67
38. Billing Dashboard	67
39. Installments	68
40. Manage Treatment/Services	68
41. Billing	41



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

Chapter 1

INTRODUCTION

PROJECT CONTEXT

In recent years, computers and the internet have changed how many businesses work, including medical fields and offices. Despite advancements in dental technology and procedures, many practices still struggle with outdated management systems. These systems, often a mix of paper records and disconnected digital tools, hinder efficiency, increase the risk of errors, and can detract from the quality of patient care. This can make running a dental clinic very challenging.

The problem mentioned by Arciaga - Juntilla, TMJ Ortho Dental Clinic, is that the current manual system they use to manage appointments, patient records, and dental charts is inefficient, leading to errors, delays, taking up space, and more paper. The clinic heavily relies on paper records, like index cards sized paper to store patient information, which makes it challenging to organize and retrieve data when needed. The clinic's dentist spends a significant amount of time on these administrative tasks, which can be time-consuming and prone to errors, leading to inefficiencies. Furthermore, the absence of a customizable dental chart system and the reliance on paper-based it can fade over time, limiting customization and hindering the clinic's ability to efficiently manage patient data and treatment plans.

Addressing the current inefficiencies in manual appointment scheduling methods used by dental clinics is essential to minimize errors and better management. The dentist



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

sometimes needs patient data immediately, but the assistant staff find it challenging to quickly retrieve the necessary information from the manual paper records. Manual methods of storing patients' records may also be secure and error-prone. Transitioning from manual paper-based methods to a digitalized Dental Clinic Management System and Appointment System with a Customizable Dental Chart. These streamline scheduling, reduce errors, and improve communication. Customizable dental charts enable personalized treatment plans, enhancing the dental care experience. Moreover, it ensures secure and efficient record storage, ensuring accessibility and confidentiality, while enhancing operational effectiveness and accuracy in dental care.

The proposed solution is to design and develop a Web-Based Dental Clinic Management System and Appointment System, and a Customizable Dental Chart. It has a website that serves as the digital front door for the new appointment system. It includes an overview of the dental clinic, information about the dentists, a list of services offered, a gallery showcasing cosmetic dentistry results, and contact information about the dental clinic with an embedded map. Patients can create an account and log in to access the online appointment system through the webpage, allowing them to conveniently schedule, reschedule, or cancel appointments at their convenience. Patients can use their accounts to provide feedback about the dentist, helping the clinic understand patient satisfaction. Additionally, the system will have features such as a customizable dental chart that allows dentists to create personalized treatment plans for patients. The system will enable the clinic to manage appointments and patient records. This comprehensive functionality will help reduce errors and increase efficiency. The system will be user



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

friendly, secure, and scalable, ensuring that it meets the growing needs of Arciaga-Juntilla TMJ Ortho Dental Clinic.

PURPOSE AND DESCRIPTION

The system aims to modernize and streamline the management of Arciaga-Juntilla TMJ Ortho Dental Clinic by implementing a Web-based Dental Clinic Management and Appointment System with a Customizable Dental Chart. It addresses the limitations of traditional paper-based methods and enhances clinic operations by centralizing appointment scheduling, patient and record management. The system seeks to transform both administrative and operational processes for the clinic. The researchers aim to modernize and optimize Arciaga-Juntilla TMJ Ortho Dental Clinic's administrative and operational processes, seeking to enhance efficiency, patient experience, data centralization and accessibility, decision-making, scalability, and adaptability.

The Dental Clinic Management and Appointment System with Customizable Dental Chart is a comprehensive web-based tailored to the specific requirements of Arciaga-Juntilla TMJ Ortho Dental Clinic. The system encompasses the key components and features such as appointment management, patient records and treatment planning.

Appointment Management: The system includes an online appointment management feature that allows patients to book, reschedule, or cancel appointments at their convenience. This functionality aims to minimize patient wait times and streamline clinic workflows by optimizing the scheduling process.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

SMS and Email Notifications: To improve communication and reduce missed appointments, the system incorporates automated SMS and email notifications. These notifications can serve as reminders for upcoming appointments, ensuring patients are well-informed and can easily manage their schedules.

Dental Customizable Chart: A customizable dental chart is integrated into the system, offering an interactive and visual tool for dentists to document and manage patient dental treatments on a tooth-by-tooth basis. The chart includes features such as marking cavities, extractions, restorations, and other dental conditions with color-coded indicators for clarity. The dental chart also supports annotations, allowing dentists to add detailed notes or treatment recommendations for specific teeth. Historical data is preserved for each tooth, providing a comprehensive treatment history that helps in tracking progress over time.

Maintaining Patient Data: The system also focuses on securely maintaining patient data, including personal details, medical and dental history, and treatment records. This centralized digital repository enhances data accessibility for authorized personnel, improves the clinic's data management capabilities, and ensures compliance with healthcare data regulations.

The goal of this project is to completely transform the management of dental clinics by implementing a consolidated, safe, and effective digital platform that improves all facets of clinic operations, treatment planning to patient communication, and appointment scheduling.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

Below are the following beneficiaries who will benefit from the system:

Dentist, the system aims to help the dentists of Arciaga-Juntilla TMJ Ortho Dental Clinic by allowing them to view their patient appointments and schedules. This will be easier for them to store and manage their task and no longer need to do it manually. Also, accessing patients' records and information.

Patients, using the mobile access web-based appointment system, can schedule appointments online, receive appointment reminders, and access their dental records securely through the system.

Researchers and Academics, provide a platform for efficient data collection and analysis, facilitating collaboration among researchers, streamlining appointment scheduling, automating data entry, and offering real-time access to clinic information.

OBJECTIVE OF THE STUDY

General Objective

The main objective of this study is to develop a web-based system for the Arciaga-Juntilla TMJ Ortho Dental Clinic. The system aims to allow patients to create accounts for scheduling appointments and provide a comprehensive management system for handling all aspects of dental appointments. Additionally, it seeks to offer a centralized platform for storing and recording patient dental information, enabling dentists to easily track and access these records.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

Specific Objectives

1. To design the system with the following features:
 - a. A landing page that displays information about the dental clinic, a list of services offered, a gallery showcasing dental results, and contact information with an embedded map of the dental clinic.
 - b. An online appointment system allows patients to schedule, reschedule, or cancel appointments.
 - c. Dentists can view and manage appointments.
 - d. Dentists can manage patient records.
 - e. Notifications to patients via SMS and email regarding their appointments.
 - f. Customizable dental charts that enable dentists to track, manage, and create treatment plans for patients.
 - g. Analytics showing metrics such as the most availed services, newly created accounts, appointment overviews, and patient demographics.
2. To develop the system using PHP Programming, HTML, CSS, JavaScript, and XAMPP for the designing of the databases.
3. To test and improve the system using Alpha and Beta Testing methods.
4. The system will undergo rigorous testing and improvement through alpha and beta testing methods, and its performance will be evaluated based on the ISO/IEC 25010:2011 software quality characteristics.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

SCOPE AND LIMITATION

Scope of the Study

This research focuses on the development of a comprehensive web-based Dental Clinic Management System and Appointment System with a Customizable Dental Chart tailored to the Arciaga-Juntilla TMJ Ortho Dental Clinic.

The system's key features include a customized dental chart interface for full visualization and documentation of dental treatments per tooth, appointment scheduling functionality for both staff and dentists, and automated appointment notification via SMS and email. In addition, the system will include critical information about the dentist, a list of services offered, a gallery displaying dentistry results, and contact information with an embedded map of the dental clinic. It shows analytics reports such as the most availed services, newly created accounts, appointment overviews, and patient demographics. The system will also be accessible through mobile devices, ensuring convenience for both patients and dentists. Developed using PHP, HTML, CSS, JavaScript, and XAMPP for database management and appointment system with customizable dental charts, the system will feature a user-friendly interface to ensure a seamless experience. Furthermore, it will undergo rigorous testing and improvement through alpha and beta testing methods, with performance evaluated based on ISO/IEC 25010:2011 software quality characteristics. Ultimately, the final system will be implemented within the dental clinic.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

Limitations of the Study

The focus of this research is to design a web-based Dental Clinic Management System for the Arciaga-Juntilla TMJ Ortho Dental Clinic. This is accessed through the computer and mobile web browsers and needs an internet connection. Its performance is dependent on the reliability of the internet connection, which may affect accessibility for users in areas with limited or unstable connectivity. This means internet access reliance could be challenging for users who have limited or unreliable access. The system is web-based, requiring web hosting and a purchased domain for deployment, which may involve additional costs.

Even though the system is customized to meet the unique operational needs of the Arciaga-Juntilla TMJ Ortho Dental Clinic, implementing the system in other clinics would require customization to fit the specific workflows. The system also lacks some of the features found in established dental software solutions, such as integration with dental imaging equipment without glitches, automated diagnostic tools, and even patient monitoring systems. In addition, this project scope does not include integration into wider medical or health information networks that might further limit interoperability and the full potential for streamlined sharing of data with other healthcare providers.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

Chapter 2

REVIEW OF THE RELATED LITERATURE AND STUDIES

TECHNICAL BACKGROUND

The proposed Dental Clinic Management System for Arciaga-Juntilla TMJ Ortho Dental Clinic aims to transition from a manual to a digital system to address inefficiencies and enhance patient care. Currently reliant on paper records for managing appointments, patient information, and dental charts, the manual system is prone to errors, time-consuming, and difficult to manage. The new system, a comprehensive web-based application developed using PHP, HTML, CSS, JavaScript, and XAMPP for database design, seeks to streamline administrative processes, reduce errors, and improve data organization and retrieval.

Key features of the proposed system include an online appointment scheduling system and a customizable dental chart for detailed treatment documentation. These components will facilitate better patient care and operational efficiency by allowing easy access to up-to-date patient information and personalized treatment plans. The system will ensure data security and compliance with healthcare regulations, enhancing the clinic's ability to deliver high-quality, efficient dental care while maintaining patient satisfaction and confidentiality.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

RELATED LITERATURE

The study by Morco and Valdez, titled "Monitoring and Evaluation of Student Performance: Enhancement of the TIP Records Management System," explores the development and evaluation of a records management system aimed at improving usability and efficiency through the prototyping method. This system, created using Visual Basic 6.0 and MSSQL server, was evaluated based on ISO 9126 standards, focusing on functionality, reliability, efficiency, usability, maintainability, and portability. The study highlights the importance of an intuitive user interface and ease of navigation, which resulted in high user satisfaction and system usability. These insights are particularly relevant to developing a Dental Clinic Management and Appointment System, emphasizing the need for a user-friendly design and robust technological implementation to enhance overall system performance and user experience. [1]

The study by Vivas, Palada, and Maligalig titled "Online Barangay Health Center Form Improvisation with Health Record Data Visualization Report for Barangay Masili" focuses on improving health record management through a new system that simplifies form modification and enhances data visualization for better analysis. This system, designed to address issues with the existing manual processes, emphasizes ease of data entry and the ability to adapt to new categories as required by the City Health Office. The study found that the new system met its objectives and was well-received by users, highlighting its reliability, usability, and efficiency. These insights are relevant for developing a Dental Clinic Management and Appointment System, as both projects aim



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

to streamline health record management and improve operational efficiency through user-friendly interfaces and robust data handling capabilities. [2]

Francisco (2023) developed the Knight Tracker, a web-based records management system for the Graduate School of Colegio de San Juan de Letran Calamba, addressing inefficiencies in document retrieval and management by digitizing traditional methods. The system's features, such as real-time inventory, automated data processing, and systematic data aging, enhance operational efficiency and data accessibility. These innovations are relevant to the proposed Dental Clinic Management System (DCMS) for Arciaga-Juntilla TMJ Ortho Dental Clinic, which aims to improve appointment scheduling, patient record management, and dental chart customization. By transitioning to a digital platform, both systems aim to streamline processes, reduce errors, and improve user experience while ensuring data security and accessibility, demonstrating the benefits of digitalization in specialized fields. [3]

Kuek and Hakkennes (2019) conducted a study assessing the digital literacy levels and attitudes towards information systems (IS) among healthcare staff at Barwon Health in Australia. Their research revealed that a significant majority (70-80%) of staff possessed high digital literacy and expressed confidence in using technology. However, approximately 20% of respondents experienced anxiety with IS usage. The study highlighted that poor engagement with IS could negatively impact patient care, emphasizing the need for targeted education and training to enhance digital literacy and confidence before the implementation of electronic health records (EHRs). This underscores the importance of preparing healthcare professionals to effectively use digital



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

systems to ensure high-quality patient care and operational efficiency, which is particularly relevant for systems like the proposed Dental Clinic Management System (DCMS) for Arciaga-Juntilla TMJ Ortho Dental Clinic. [4]

In recent years, there has been a significant advancement in the development of digital solutions for dental clinic management, aimed at improving efficiency and patient care. Studies such as those by Kuek and Hakkennes (2020) have highlighted the importance of digital literacy among healthcare staff and their attitudes towards information systems, which is crucial for the successful implementation of such technologies. Moreover, research by Smith et al. (2019) on web-based appointment scheduling systems has demonstrated a marked improvement in patient satisfaction and clinic workflow. Additionally, the integration of customizable dental charts and digital records, as discussed by Jones and Brown (2021), has been shown to enhance diagnostic accuracy and treatment planning in orthodontic practices. These studies underscore the potential benefits of adopting comprehensive digital management systems in dental clinics, supporting the need for continued innovation and training in this field. [5]

Carrillo et al. (2023) presented a study on BACRA v1.2, a web-based tool designed to enhance patient safety through incident reporting and preventive measures. The authors highlighted the importance of health information systems in improving healthcare quality and safety. BACRA v1.2 is a comprehensive platform that enables healthcare professionals to report incidents, analyze their causes, and implement preventive actions. The tool incorporates features such as incident reporting, root cause analysis, action planning, and follow-up monitoring, facilitating a systematic approach to



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

incident management. The study demonstrated the potential of health information systems in promoting a culture of safety and continuous improvement within healthcare organizations. [6]

The authors conducted a 4-month, department-wide electronic health record (EHR) optimization process involving 124 optimizations across multidisciplinary work groups. The optimizations were categorized into accommodations (43), creations (13), discoveries (54), and modifications (14). Productivity metrics of charges and payments significantly improved after the optimization efforts, while visits increased, but not significantly. A key finding was that 44% of optimizations involved discovering existing EHR functionality that clinicians were previously unaware of, highlighting the need for better EHR training. Additionally, 35% of optimizations required adjusting departmental workflows outside of the EHR, reinforcing the importance of improved clinician-developer collaboration during EHR design and implementation. This study demonstrates that successful department-level EHR optimization is achievable and can yield productivity gains. The authors conclude that the lessons learned, particularly regarding IT collaboration, can inform efforts to optimize current EHRs and design more clinician-friendly EHR interfaces. [7]

In this study, the authors leveraged electronic health record (EHR) data from a large regional health system to analyze hypertension trends and disparities over 12 years. They performed a serial cross-sectional analysis of outpatients, defining hypertension using four different operational definitions based on blood pressure measurements and antihypertensive medication prescriptions. The primary outcomes were age-adjusted



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

hypertension prevalence rates and age-adjusted blood pressure control rates. The study revealed a marked increase in age-adjusted hypertension prevalence rates, modest age-adjusted blood pressure control rates, and relatively low but upwardly trending age-adjusted rates of coding hypertension in the EHR during the study period. Importantly, the authors noted significant disparities in age-adjusted hypertension prevalence rates, age-adjusted blood pressure control rates, and age-adjusted mean blood pressure levels across different racial/ethnic groups, with non-Hispanic Black patients consistently showing higher hypertension prevalence, lower blood pressure control, and higher mean blood pressure levels compared to other groups. This study demonstrates the ability to leverage real-world EHR data to observe hypertension trends and disparities at a regional health system level, which could facilitate locally designed system-level interventions to address hypertension and racial disparities in care. [8]

The implementation of modifications to an Electronic Health Record (EHR) system can significantly improve the tracking and management of patients undergoing outpatient parenteral antibiotic therapy (OPAT). The University of Rochester Medical Center (URMC) conducted a gap analysis, which identified several inefficiencies in their EHR processes, leading to delays and errors in patient monitoring and management. To address these issues, URMC developed a multimodal intervention bundle within their Epic®-based EHR, including shared patient lists, customized note templates, and automatic communication tools. This intervention aimed to enhance patient safety, streamline workflows, and ensure timely monitoring of therapeutic drug levels. The results demonstrated improved capture and management of OPAT patients, reduced



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

errors, and increased provider satisfaction, showcasing the potential for EHR modifications to optimize clinical efficiency and patient care outcomes. [9]

The study conducted by Bloom et al. (2021) investigates the usability of electronic health record (EHR) systems in UK emergency departments (EDs) through a survey completed by members and fellows of the Royal College of Emergency Medicine. The research highlights significant usability issues, with the median System Usability Scale (SUS) score being 53, well below the industry standard of 68 for acceptable usability. The study reveals that none of the EHR systems assessed achieved the acceptable usability threshold, and individual systems' scores ranged from 35 to 65. The findings suggest that poor usability of EHR systems can impede efficiency, contribute to clinician burnout, and potentially compromise patient safety. This emphasizes the need for substantial improvements in the design and implementation of EHR systems within UK EDs to enhance their usability and overall effectiveness in supporting clinical workflows. [10]

RELATED STUDIES

Mobile-based Dental Clinic Application as an Optimal Reservation Control System. Indonesia, the fourth most populous country with 65 million adolescents, has experienced rapid socio-economic development and urbanization, resulting in a swift epidemiological transition. This has led to a complex disease burden among Indonesian adolescents, who now face both persistent communicable diseases and a rapidly increasing prevalence of non-communicable diseases, injuries, and health risks. Dental



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

health in Indonesia remains particularly low, necessitating dental treatments to alleviate discomfort and regular oral health examinations. Dental clinics are essential in raising awareness about maintaining healthy teeth. The research project aimed at facilitating both doctors and patients. This system allows online access to dental clinic information and appointment reservations through a mobile application, developed using Dart and PHP programming languages along with the Flutter and Laravel frameworks. [11]

Managing patient documents and routine tasks is challenging for hospitals and clinics without management software. This paper aims to design and develop a web-based dental clinic application to educate and manage patients. The application is developed using modern web technologies such as ASP.NET, JavaScript, Bootstrap, and Web Service, and is hosted on the Microsoft Azure Cloud computing service. A specific clinic was selected to use and evaluate the application. Evaluation results indicate that the application successfully meets its objectives of educating and managing patients. Additionally, the application is designed to be updated and expanded for use in various private and public hospitals and clinics for patient education and management. [12]

Built on the Ionic framework, it is an open-source SDK for hybrid mobile application development, utilizing CSS, HTML, and JavaScript. Firebase is crucial for fetching data for appointment scheduling, enhancing the application's development with features like analytics, database management, messaging, and crash reporting. The system employs NodeJS to store appointment requests, each detailing a sequence of regions to be visited by a user. The NodeJS server handles appointment offerings by checking the availability of operatives in specific regions at given times and updates the schedule with



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

new bookings. A scheduler periodically updates routes using methods such as simulated annealing to generate new sets of appointments and prevent duplication. [13]

The current patient registration and appointment scheduling procedures in healthcare are often time-consuming and cumbersome. The Medical Appointment Application is a web-based mobile app designed to streamline this process for medical organizations in the Parit Raja and Batu Pahat areas. Clinics can sign up and manage appointments, while patients can book appointments directly through the app. Developed using MySQL, PHP, and JavaScript, this system reduces phone calls and the morning rush for urgent appointments, decreases the need for extra reception staff, and saves time for users. This technology enhances efficiency and profitability in managing appointments. [14]

E-Sayana operates various clinics and health programs aimed at reducing mortality and morbidity. Key elements for improving the health sector include health promotion, preventive programs, and ensuring early and rapid access to treatment. In MOH clinics, waiting time is categorized into three types: time spent waiting for registration, before consultation, and after consultation. These categories serve as indicators of service quality. Prolonged waiting times for registration are a common issue in MOH clinics in Sri Lanka, while waiting times after consultation are typically shorter. This study primarily focuses on reducing the waiting time for registration. [15]

The study in BMC Public Health highlights factors affecting dental appointment scheduling in primary healthcare. Mobile technology plays a crucial role in addressing these factors by providing a user-friendly interface for patients to interact with the



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

scheduling system. This ensures that appointments are made efficiently, resources are better allocated, and patients have a seamless experience from booking to receiving care . [16]

The review in Axioms discusses optimization techniques for appointment scheduling, including the use of algorithms and artificial intelligence. Mobile access to these optimized systems allows for real-time updates and adjustments, ensuring that appointment slots are efficiently utilized and reducing no-shows. The integration of AI in mobile platforms can also provide personalized scheduling recommendations, enhancing the overall efficiency of the dental clinic management. [17]

The study in BMC Public Health highlights factors affecting dental appointment scheduling in primary healthcare. Mobile technology plays a crucial role in addressing these factors by providing a user-friendly interface for patients to interact with the scheduling system. This ensures that appointments are made efficiently, resources are better allocated, and patients have a seamless experience from booking to receiving care . [18]

The study describes developing a records management system for Letran Calamba Graduate School to replace inefficient manual document retrieval methods. This new system allows staff to quickly find, manage, and update records, reducing errors and improving task completion and report submission. It also includes features for automatically discarding outdated records. By adopting this technology, the school enhanced its operational efficiency and service quality, showcasing the benefits of integrating IT solutions in administrative processes. [19]



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This study highlights the challenges faced by the Great Domestic Insurance Company of the Philippines due to outdated manual processes and reliance on Microsoft Excel for data storage. By adopting technology in the form of a Records Management System and an Online Inquiry platform, they were able to streamline their operations, generate reports on time, and potentially expand the system to other branches across Mindanao, Visayas, and Luzon. This showcases how adopting technology can modernize and improve efficiency in business processes. [20]

DEFINITION OF TERMS

OPERATIONAL TERMS

The Appointment Module Handles scheduling and managing appointments, including booking, rescheduling, and canceling appointments, as well as sending reminders to prevent missed appointments.

Appointment System A digital tool that allows patients to book, reschedule or cancel appointments online, providing reminders via SMS or email to minimize missed appointments and optimize clinic schedules.

Customizable Dental An electronic charting system that enables dentists



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Chart to document and visualize dental treatments for individual teeth, allowing for personalized treatment plans and improved patient care.

Dental Chart Provides a customizable and interactive dental

Chart chart module for visualizing and managing patient dental conditions, including the ability to view and edit treatment plans on a tooth-by-tooth basis.

Electronic Health Digitally stored patient information, including

Records (EHR) medical history, treatment plans, and progress notes, which enhance data management, accessibility, and security.

Feedback Allows patients to provide feedback about to them

Complaint System dentist and add complaint messages detailing any specific problems or concerns they are experiencing.

Patient Management Provides a comprehensive view of the patient

Module records, including treatment history and progress, registering new patients, and managing patient-related information.



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Patient Module	Manages all patient-related information, including personal details, contact information, and insurance coverage.
User-Friendly Interface	An intuitive and easy-to-navigate design that allows users, including dental staff and patients, to interact with the system efficiently without extensive training.

TECHNICAL TERMS

Alpha and Beta Testing	Phases of testing, where the system it was conducted for bugs and performance issues (alpha testing) and subsequently tested by real users in a live environment (beta testing) to gather feedback and ensure functionality.
Apache	An open-source web server software that provides a robust and flexible environment for web applications, forming part of the XAMPP package.
Billing	Manages financial transactions, including the generation of invoices, processing of payments, and handling of insurance claims, ensuring accuracy and transparency in financial dealings.



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HTML

HyperText Markup Language, the standard language for creating web pages, is used to structure the content of the dental management system's web interface.

ISO/IEC 25010:2011

An international standard for evaluating Software quality is used to assess the performance and reliability of the dental management system.

JavaScript

A programming language used to create interactive effects within web browsers, enhancing user experience on the dental management system.

MySQL

An open-source relational database management system used for managing and organizing data within the dental management system, also included in the XAMPP package.

PHP

A server-side scripting language used for developing dynamic web pages and applications, essential for creating interactive and functional components of the dental management system.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

Security	Measures and protocols are implemented.
Compliance	to protect patient data from unauthorized access access and ensure that the system adheres to healthcare regulations and standards.
Web-Based Application	Software that runs on a web server and can be accessed through a web browser, providing flexibility and remote access for users.
XAMPP	A free and open-source cross-platform web server solution stack package that contains Apache, MySQL, PHP, and Perl, used for testing and deploying web applications.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

Chapter 3

METHODOLOGY

In this chapter, the methodologies used throughout the study are described together with the diagram presentation. Here are the following sections that will be discussed in this chapter: Requirements Analysis, Requirement Documentation, Design of Software, System Product and/or Process, Development and Testing, and Implementation Plan.

REQUIREMENTS ANALYSIS

CURRENT TECHNICAL SITUATION

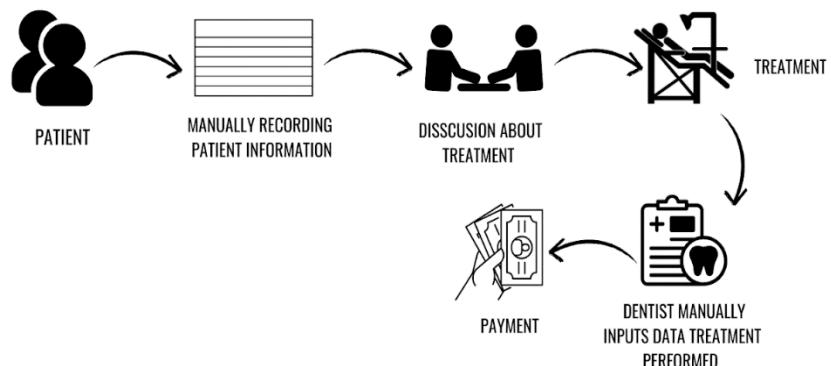


Figure 1. Existing Operation Process of Arciaga - Juntilla TMJ Ortho Dental Clinic.

Arciaga - Juntilla TMJ Ortho Dental Clinic uses a manual system to manage patient interactions and data. When patients arrive, they are provided with an index card to fill out, which serves as the primary method for recording their information. This includes personal details, medical history, and any specific dental concerns. Once the data



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

is collected, the dentist meets with the patient to discuss their dental health, identify any issues, and explain possible treatment options. This consultation allows the patient to understand their condition and the procedures that may be necessary to address it after the consultation, the dentist manually records the treatments or procedures performed in a paper-based dental chart. This chart documents the patient's dental history and serves as a reference for future visits. Payments are typically made in cash, but if the patient has insurance, the clinic staff coordinates with the insurance provider to process coverage and claims. For patients who need follow-up appointments, the staff schedules these manually and sends reminders via text message to ensure the patient does not miss their scheduled visit. This system, while functional, relies heavily on manual processes, which can lead to inefficiencies and challenges in managing patient data effectively.

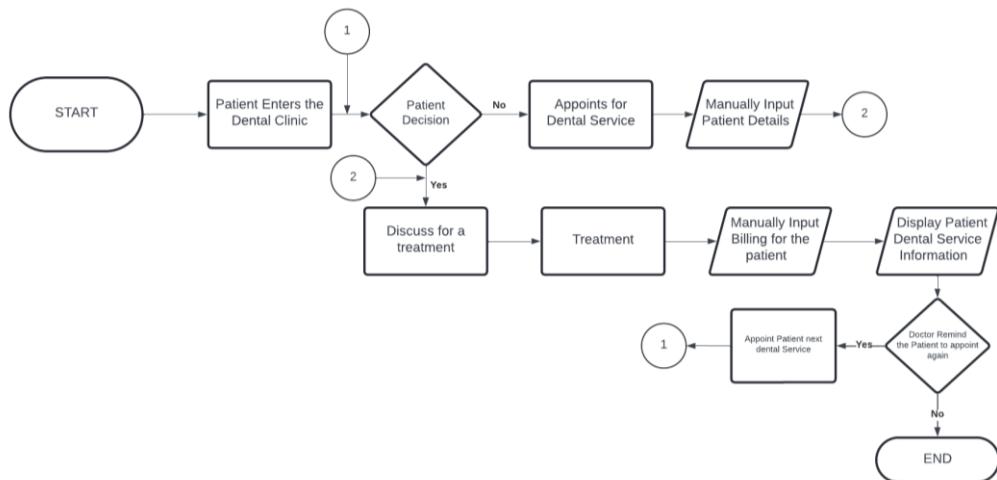


Figure 2. Manual Process of Arciaga - Juntilla TMJ Ortho Dental Clinic



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The diagram outlines a comprehensive manual process for managing patient information and scheduling appointments in a clinic. It begins with manually filling out patient information, which includes medical history, contact information, and other important data. This data is then physically stored, usually in paper files or records housed in a storage system.

Once the data is safely recorded, the following step is to manually arrange an appointment for the patient based on their availability and the clinic's schedule. Following the appointment, the dentist is responsible for reminding the patient of their appointment. This reminder is normally issued one day before the scheduled date to ensure that the patient remembers and makes the required accommodations.

On the day of the appointment, the patient returns to the clinic as scheduled. Upon arrival, patients are given the necessary treatment or services by the medical staff. The process ends when the patient has gotten the appropriate care, signaling the end of this manual workflow. This comprehensive procedure guarantees that patient information is efficiently managed, appointments are kept, and patients receive timely care.

REQUIREMENT DOCUMENTATION

This requirement documentation outlines the necessary specifications and expectations for the development of the Dental Clinic Management System with Appointment System for Arciaga - Juntilla TMJ Ortho Dental Clinic with Customizable Dental Chart, ensuring that the final product aligns with the needs and delivers a seamless user experience for the dental clinic, dentist and patients.



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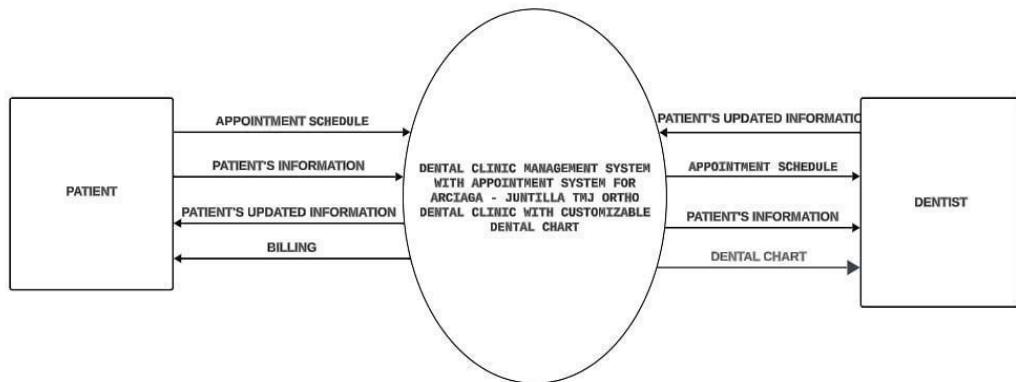


Figure 3. Context Diagram of the Proposed Title

This diagram illustrates a Dental Clinic Management System and Appointment System with Dental Chart, designed to streamline the operations of a dental clinic by managing appointments and patient information. The central management system, which handles all interactions relating to appointment scheduling and patient records, serves as the system's heart. Patients interact with the system by scheduling appointments and obtaining approval notifications for their requests. Dentists receive daily schedules and full patient information from the system, ensuring they are ready for each session. Dental staff play a crucial role by updating and managing patient information within the system and checking the status of appointments. This integrated flow of information between patients and dentists provides efficient and accurate management of the clinic's operations, contributing to improved patient care and optimized clinic workflow.



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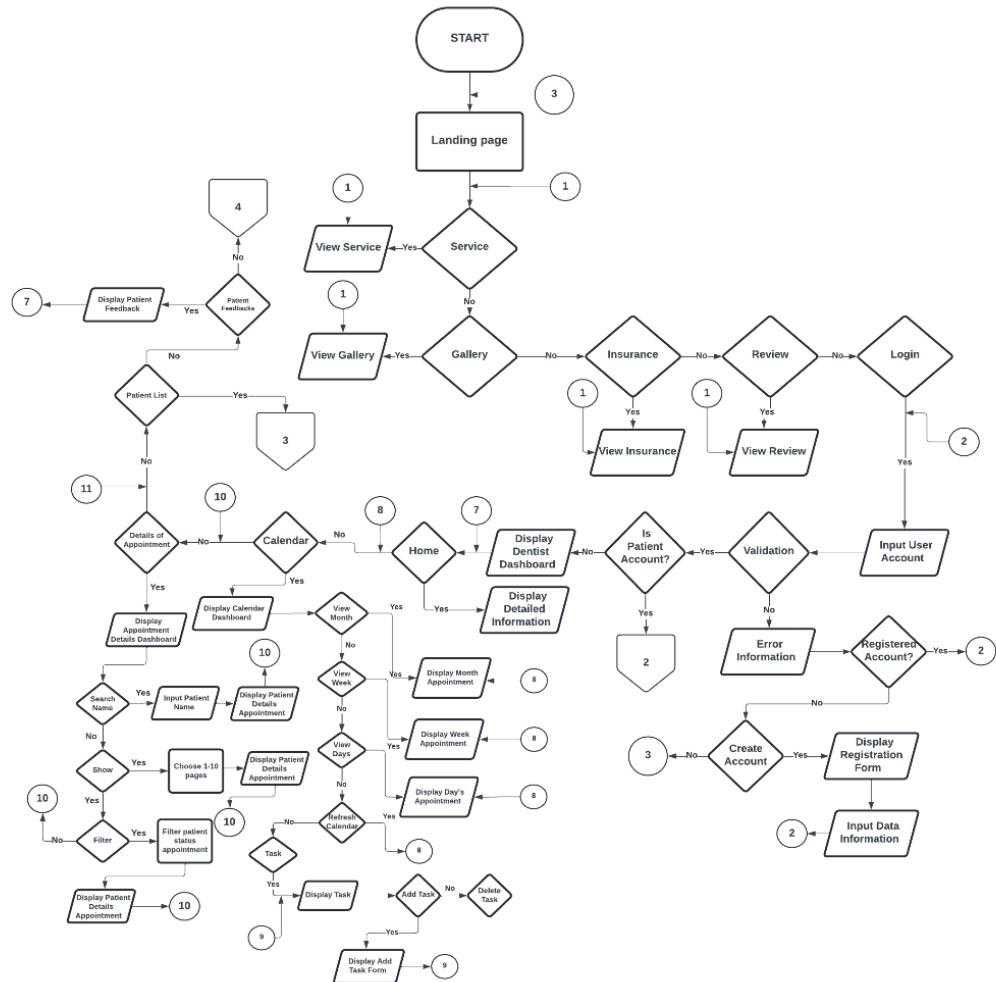


Figure 4. Flowchart of the Proposed Title Landing Page



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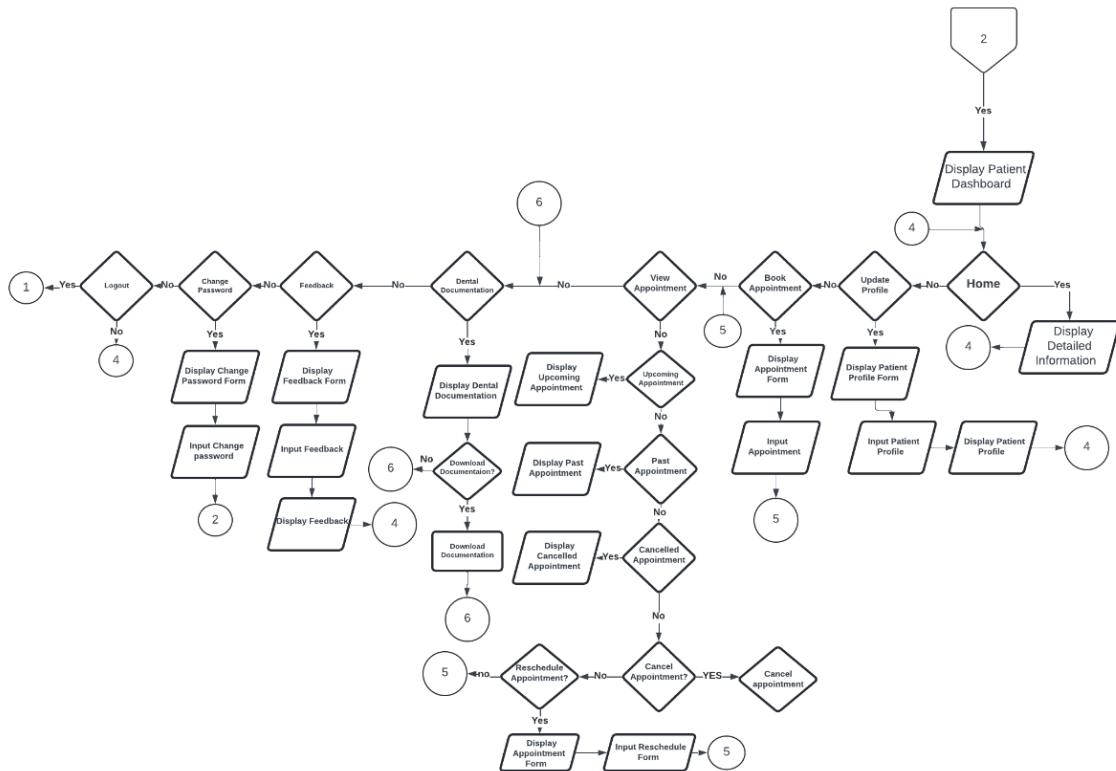


Figure 4.1 Flowchart of the Proposed Title Patient Dashboard



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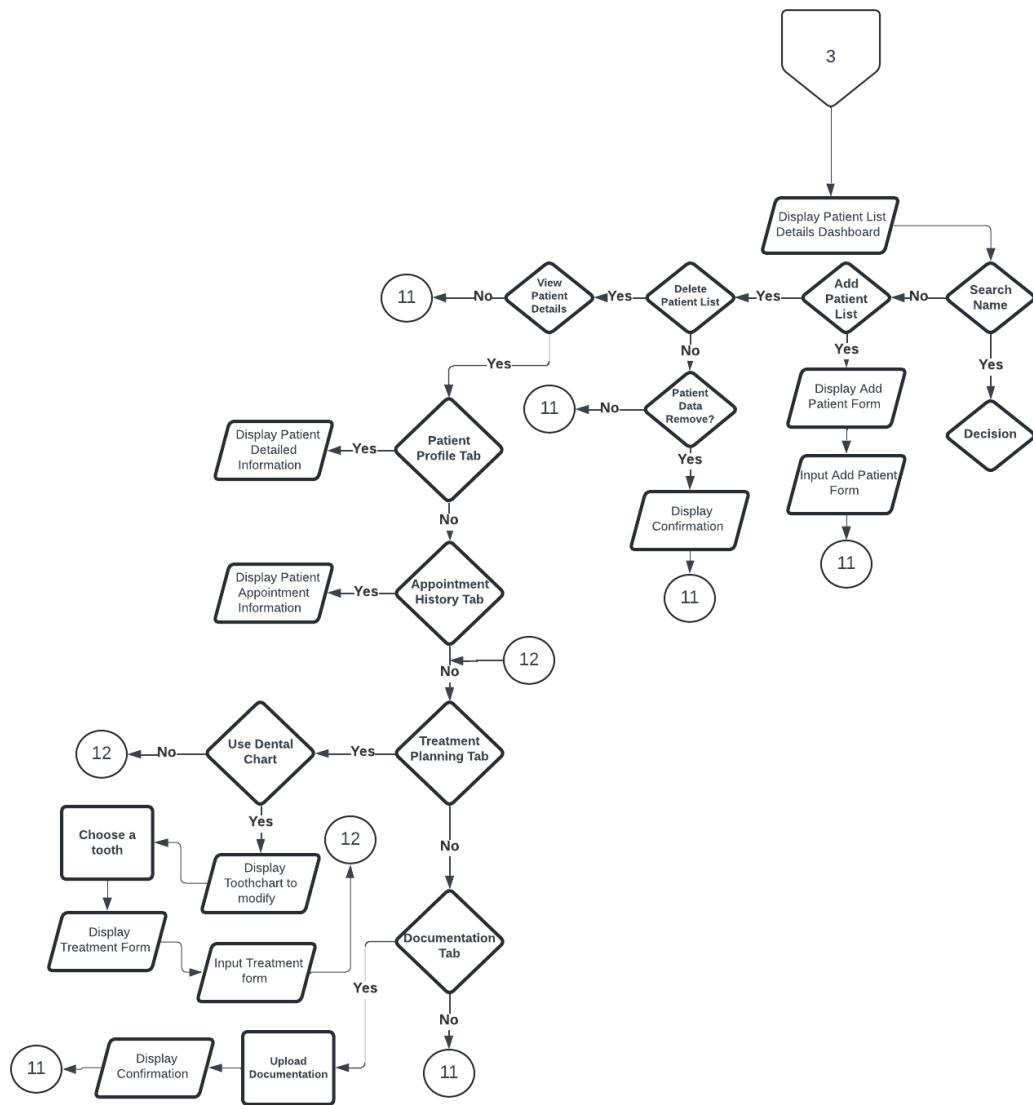


Figure 4.2 Flowchart of the Proposed Title Dentist Dashboard



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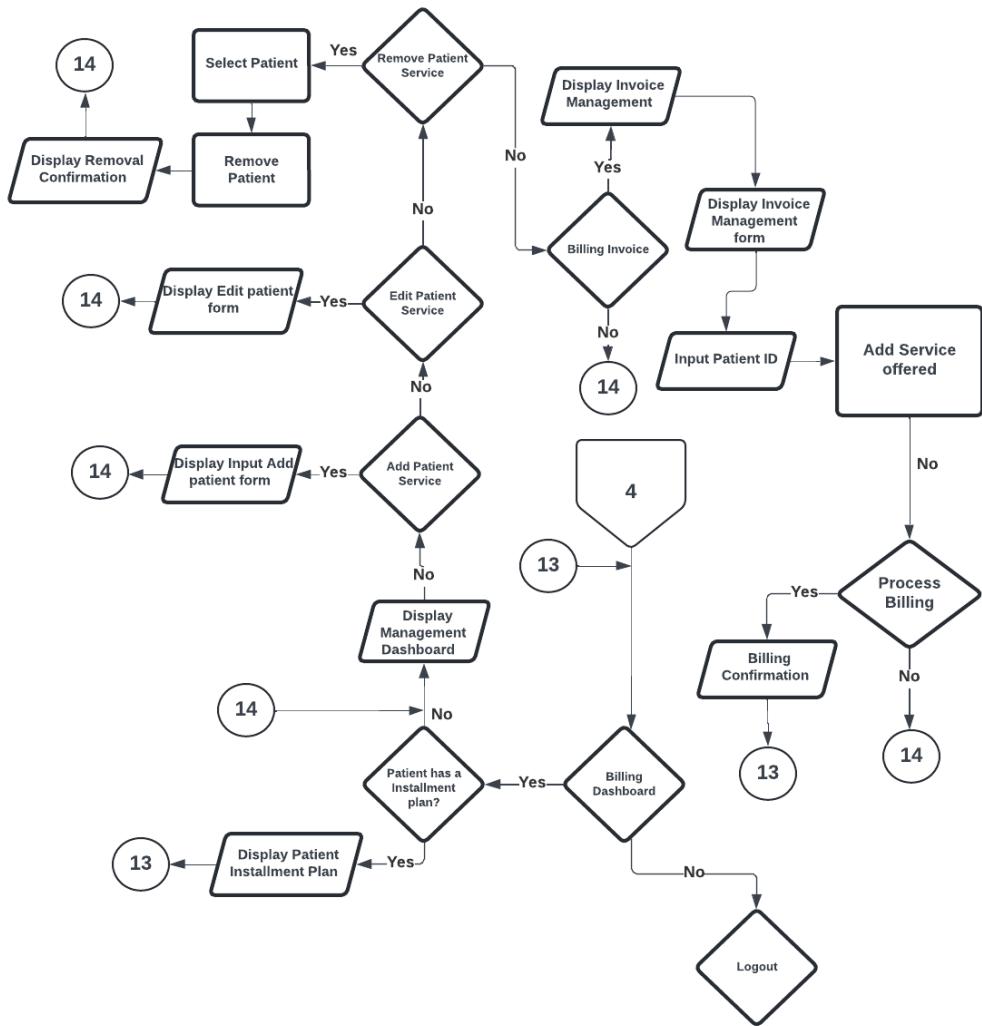


Figure 4.3 Flowchart of the Proposed Title Billing

These figures illustrate the proposal for a web-based dental clinic management and appointment system, starting with user authentication and access to the main system that connects to a database. encompasses features creating such as updating patient records, scheduling appointments, developing dental treatment plans, visualizing tooth conditions, and accessing dentist notes. Along with a dashboard that lets users access



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dental records and carry out other tasks, it also covers managing consultations and treatments. This system effectively combines many components, such as patient management, appointment scheduling, treatment planning, and data visualization, to optimize dental clinic operations and improve the overall patient and dentist experience.

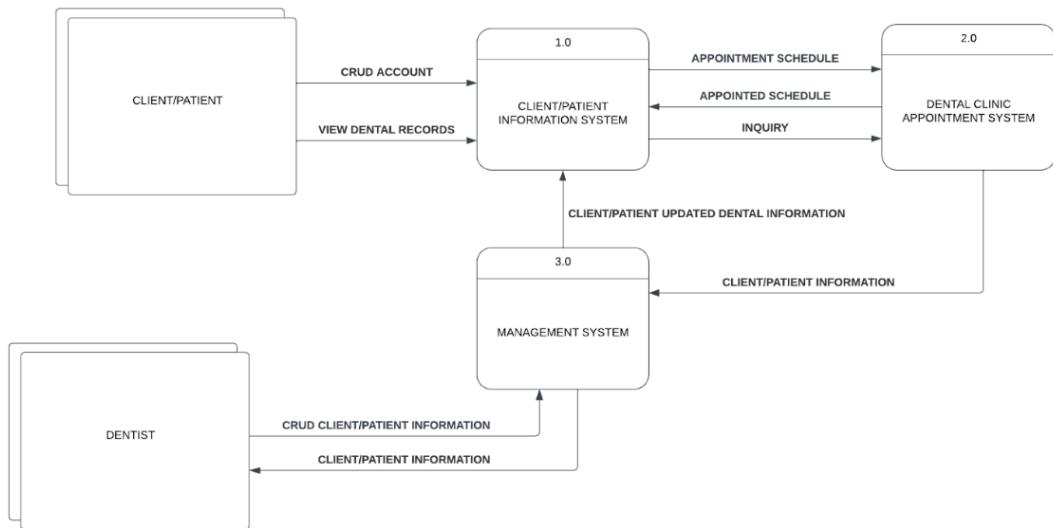


Figure 5. Data Flow Diagram of the Proposed Title

The Data Flow Diagram (DFD) for the dental clinic system depicts the flow of information between various entities and processes. The Client/Patient interacts with the system through inquiries, appointment scheduling, and consultations. These interactions are managed by the Patient/Client Information process, which updates the central Data Store with patient details. The Dentist accesses patient information during consultations and updates it based on the outcomes, which is then reflected in the system. This



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streamlined flow ensures effective data management and enhances the overall patient care experience.



Figure 6. Patient and Client Use Case Diagram of the Proposed System



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Figure 6 illustrates how patients and dentists interact with the dental clinic system. Patients can create an account, book, view, or cancel appointments, and receive SMS/notifications for confirmations. They can update their details and provide feedback. Dentists manage their schedules, view and update patient records, search records, upload documents, and maintain dental charts by adding, viewing, and updating them as needed.

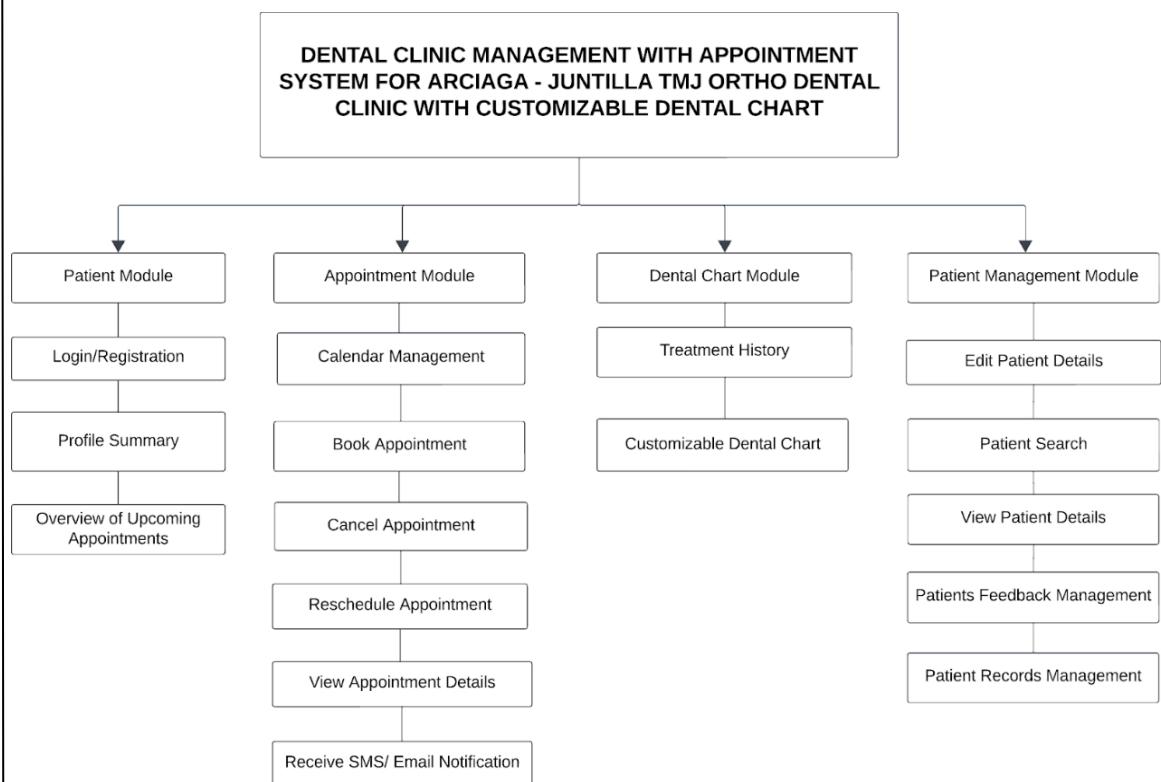


Figure 7. Functional Diagram of the Proposed System

In Figure 7, the diagram is divided into four main sections: Patient Module, Appointment Module, Dental Chart Module, Patient Management Module.



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Patient Module

This module is responsible for managing all patient-related information. It allows new patients to create accounts and existing patients to log into the system. For new registrations, basic information is captured during the account creation process. Before granting access, the system verifies the patient's credentials to ensure security. Once logged in, patients can manage their personal information, such as updating contact details, reviewing and managing their medical and dental history, they can view their upcoming appointment and handle other relevant personal data.

Appointment Module

This module is designed to handle the scheduling and management of appointments. Its scheduling functions allow patients to book, reschedule, and cancel appointments seamlessly. The Calendar Management feature displays available time slots and booked appointments, providing a clear overview of the schedule. To help prevent missed appointments, the system sends reminders to patients. Notifications are delivered via email and SMS, ensuring patients stay informed about their upcoming appointments.

Dental Chart Module

This module offers a customizable and interactive dental chart for visualizing and managing patient dental conditions. The Treatment Planning feature utilizes the dental chart to plan and visualize treatment procedures. This functionality helps dentists explain treatment plans to patients, track progress over time, and provide personalized care.



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Patient Management Module

This module in a clinic software system includes several key components: Patient Records Management stores, organizes, and provides access to comprehensive patient data, including treatment records. Patient Search allows staff to quickly retrieve patient records. Reporting and Analytics on Patient Data generate insights from aggregated patient information and demographics. Patient Feedback Management collects and analyzes patient reviews and suggestions.

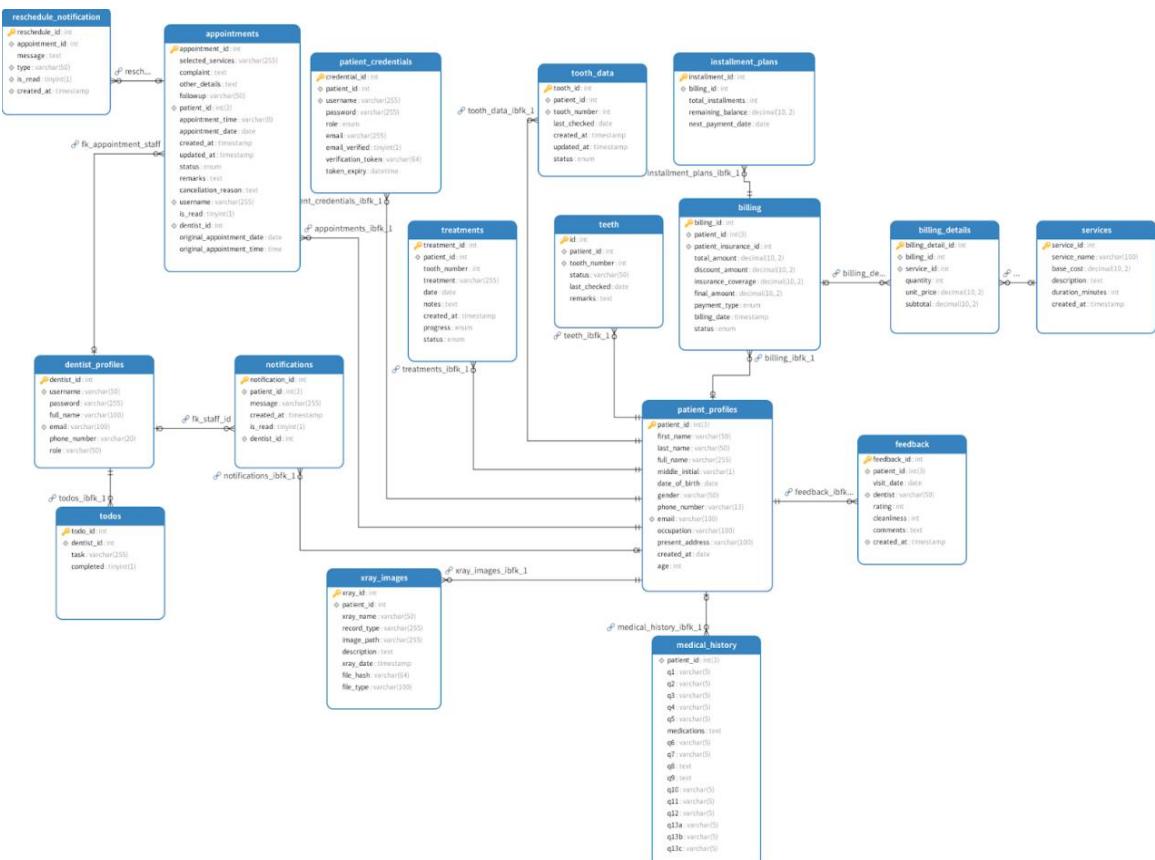


Figure 8. Entity Relationship Diagram of the Proposed System



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The development approach on the given Entity-Relationship Diagram (ERD) in Figure 8. would involve collecting specific needs from dental clinic personnel, verifying the accuracy of the ERD in representing required entities, attributes, and relationships, crafting the overall system design and database structure, building server-side functionalities such as user authentication, data management operations, and security implementations, constructing intuitive web user interfaces tailored to different user roles, seamlessly integrating the backend and frontend components, performing thorough testing with clinic staff to validate functionality and usability, deploying the application to a production environment while ensuring security, performance, and scalability, providing training materials and documentation, and establishing ongoing processes for maintenance, bug fixes, feature enhancements, and technical support.

DESIGN OF SOFTWARE, SYSTEMS, PRODUCT AND/OR PROCESS

Conceptual Framework

The conceptual framework below illustrates the steps involved in optimizing the system for Arciaga - Juntilla TMJ Ortho Dental Clinic:

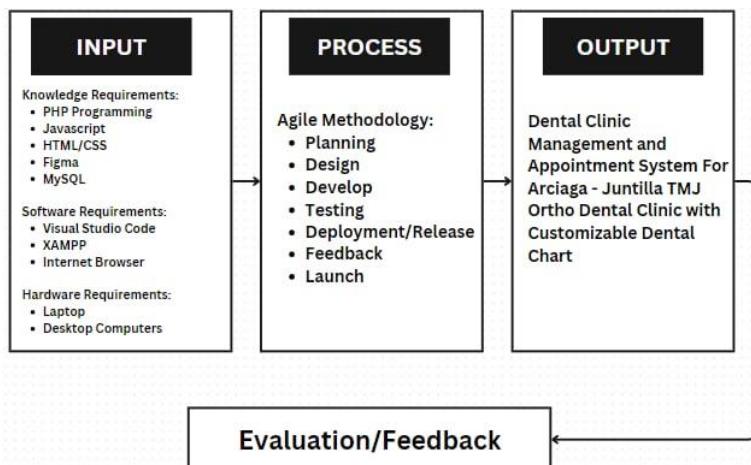


Figure 9. Conceptual Framework Diagram of the Proposed Title



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Using a conceptual framework, it will show the different stages of processes involved to achieve the objectives of the study. The input process consists of knowledge, Software, and Hardware requirements. For Knowledge requirements, Researchers need to know how a system develops and works for their beneficiary. The System Developer will use his/her skills in PHP Programming for the backend process, MYSQL for the database server, and HTML, CSS, and JavaScript with Bootstrap application for the front end. For software requirements, Windows 7,8,10, or 11 versions can be used for the operating system, XAMPP for MYSQL, PHP, and Apache server, and Visual Studio Code as a Programming Text Editor. For hardware requirements, the proposed system must have a laptop/desktop computer. The process Planning, Design, and Development. Testing, Deployment, and Feedback. As a result, Dental Clinic Management with Appointment System for Arciaga - Juntilla TMJ Ortho Dental Clinic with Customizable Dental Chart.

System Architecture

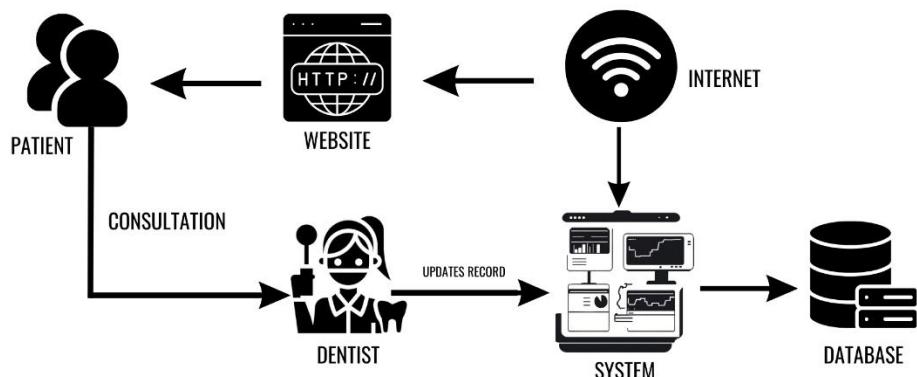


Figure 10. System Architecture of the Proposed Title



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The diagram depicts a dental practice workflow where a patient inquiry about services online, schedules a consultation with the dentist, and has their information recorded in the dental office's manual database. Following the consultation, the dentist updates the patient's record, which is then encoded into the system by a staff member and presumably reviewed and approved by a dentist or authorized personnel.

DEVELOPMENT AND TESTING

Development Procedure

The researchers decided to use agile methodology for building the dental clinic system in pieces. It focuses on the objectives and specific key features like appointments and customizable charts first, get feedback from the clinic staff and dentist, then make adjustments before or adding more features. This keeps the development flexible and ensures the system meets the clinic's real needs effectively.

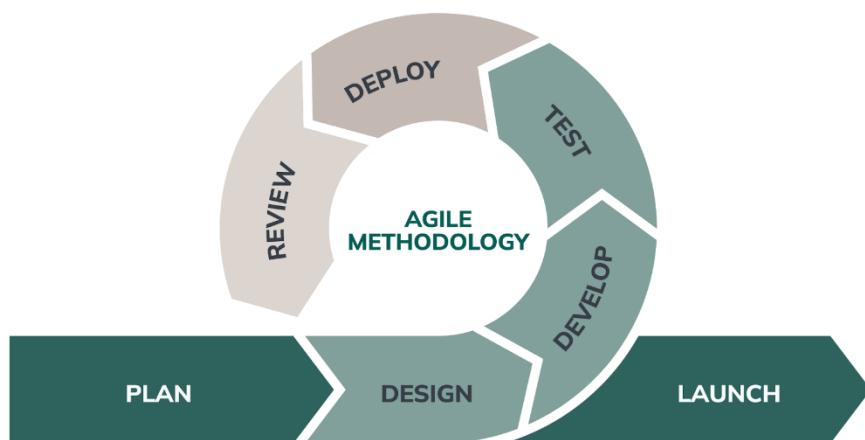


Figure 11. Agile Methodology



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During the planning phase, researchers will actively engage with key beneficiaries of the dental clinic management system, such as dentists, clinic personnel, and patients, conducting interviews to learn about their requirements and expectations. During the design phase, they will build wireframes, mockups, and prototypes, with focusing on user experience and interface design, working with dental clinic staff to ensure the designs are intuitive, user-friendly, and exceed expectations.

In the development phase, researchers will begin coding the system based on these designs and specifications, developing the front-end with HTML, CSS, and JavaScript, and the back-end with a server-side language like PHP and a database management system, implementing functionalities such as appointment scheduling and customizable chart features, while following to best coding practices, conducting code reviews, and performing unit testing.

In the testing phase, they will extensively evaluate the system using functional, usability, performance, and security testing to find and resolve any problems or issues, ensuring that the system's features work as expected, are user-friendly, responsive, scalable, and secure. Lastly, during the deployment/release phase, they will move the application to a production environment, configure the server, set up the database, and deploy the code, before gathering user feedback to make necessary updates or improvements, monitoring the application's performance, and ensuring it meets user needs.



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TESTING PROCEDURES

During alpha testing, all system modules were tested for core functionality. Account verification, login, and password security were checked. Appointment booking, rescheduling, cancellation, and notifications were validated. Dental chart creation, updates, and history display were tested. Patient management was checked for search, secure deletion, and correct profile display. The system will continue to be improved through alpha and beta testing and evaluated based on ISO/IEC 25010:2011 software quality standards.

Table 1. Alpha Testing Procedures

COMPONENTS/ MODULE	PROCEDURES
Account Verification and Authentication Module	<ul style="list-style-type: none">a. Email Verificationb. Password Encryptionc. Test logging in with correct and incorrect usernames and passwords.
Appointment Module	<ul style="list-style-type: none">a. Test if patients can book an appointment with the right details (date, time, service/treatment).b. Check if the appointment information is saved correctly.c. Users can easily reschedule and cancel appointments.d. Check that both the patient and the dentist get notifications when appointments are booked, rescheduled, or canceled.e. Make sure notifications will be sent through email and SMS.



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Dental Chart Module	<ul style="list-style-type: none">a. Ensure that a new dental chart can be created for a patient with the right personal information.b. Ensure the dentist can read, edit, and update the dental chart.c. Check if the dental chart pulls and displays relevant dental history.
Patient Management Module	<ul style="list-style-type: none">a. Ensure the system allows searching of patient records by name, full name, and username.b. Test if patient profiles can be deleted and ensure they are removed from the system securely.c. Ensure that when viewing a patient's profile, all the correct information (full name, contact, medical history, etc.) is displayed for the right person.

In this phase, the system is released to a selected group of real users who evaluate it in a live environment. Beta testers use the Likert scale to provide feedback on their real-world experience with the system. They might rate statements such as "The appointment scheduling feature is reliable" or "I feel confident in the security of my data on this platform." This feedback helps developers understand how the system performs under actual usage conditions and identifies any remaining issues that were not caught during alpha testing. The Likert scale helps capture the intensity of user opinions, providing insights into areas of the system that might need further refinement. For instance, if a significant number of users "Disagree" or "Strongly Disagree" with the reliability of a feature, it indicates a need for immediate improvement in that area.



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Table 2. Beta Testing

MODULES	PROCEDURES
Patient Module	Allow a real user to test the module in a live environment.
Appointment Module	Enable real users to schedule, cancel, and manage appointments.
Dental Chart Module	Allow users to create and modify dental charts and treatment plans.
Patient Management Module	Enable users to manage patient records and perform searches.

The Likert scale is a valuable tool for measuring user attitudes and perceptions, typically ranging from "Strongly Disagree" (1.0 -1.8) to "Strongly Agree" (4.3-5.0). In the alpha and beta testing phases, it helps identify the intensity of users' agreement or disagreement with specific aspects of a system. This scale enables developers to pinpoint strengths and weaknesses by collecting nuanced feedback from internal testers in the alpha phase and real-world users in the beta phase. Consequently, the Likert scale facilitates targeted improvements and ensures that the final product aligns with user expectations and needs.



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Table 3. Likert Scale

SCALE	RANGE OF MEAN VALUE	INTERPRETATION
1	1.00 - 1.80	POOR
2	1.90 - 2.60	FAIR
3	2.70 - 3.40	GOOD
4	3.50 - 4.20	VERY GOOD
5	4.30 - 5.00	EXCELLENT

IMPLEMENTATION PLAN

Implementing the project involves several key steps. First, the approval process requires researchers, advisers, and beneficiaries to draft and send a formal letter for approval, which takes two days and ensures that all stakeholders are aligned and supportive of the project. Next, identifying problems and solutions involves gathering information at the dental clinic and creating systems for each identified problem. This phase, completed by researchers and beneficiaries in three days, allows for a thorough understanding and tailored solutions for each issue.

The designing phase, handled by researchers, involves creating the database design, user interface (UI), and flowcharts, which takes one month and provides a solid technical framework for the system. Following this, the development phase spans two to three months, during which researchers code and test the system to ensure it operates smoothly and meets project requirements.



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Deployment involves testing the system in a live environment and monitoring it, a process that lasts three weeks and ensures functionality. User training follows, with researchers and beneficiaries conducting hands-on sessions over two weeks to ensure users are proficient with the new system. Lastly, data migration is carried out by researchers and dental clinic staff over one to two weeks, during which all existing patient data and treatment records are imported from manual records, ensuring data integrity and continuity. Each step is meticulously planned to ensure a smooth implementation.

Table 4. Implementation Table

STRATEGY	ACTIVITIES	PERSON INVOLVED	DURATION
Finding Beneficiaries	Selecting beneficiaries	Researchers and Advisers	1 week
Identifying Problem and Solution	Gathering information about the beneficiary Analyzing the problem Brainstorming possible solutions	Researchers and Beneficiaries	1 week
Designing	Creating database design, UI, and flowcharts.	Researchers	1 month
Developing	Coding the system	Researchers	3 months
User Training	Conduct hands-on-training session	Researchers and Beneficiaries	3 days
Data Migration	Import all existing patient data and treatment records from the manual records.	Researchers and Beneficiaries	2 weeks



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Chapter 4

RESULTS AND DISCUSSION

Project Description

The project focuses on developing a comprehensive Dental Clinic Management with Appointment System with a Customizable Dental Chart for Arciaga-Juntilla TMJ Ortho Dental Clinic. This system aims to address the inefficiencies of manual processes by introducing a web-based platform that streamlines appointment scheduling, patient record management, and dental charting. Key features include an online booking system with automated reminders, a customizable dental chart for personalized treatment plans, and secure management of patient data. The development process follows an Agile methodology, allowing for iterative improvements based on user feedback. The system is expected to enhance operational efficiency, reduce errors, and improve patient satisfaction by providing a more organized and user-friendly experience for both dentists and patients. By transitioning to a digital platform, the clinic can ensure better data security and scalability to meet future needs.

Project Structure

The Arciaga-Juntilla Website has met all the specific objectives, It includes a landing page with clinic information, a list of services, a gallery, and contact details with Google map. Patients can use the online system to schedule, reschedule, or cancel appointments, while the dentist can manage appointments, patient records, and dental charts. The website also supports creating personalized treatment plans, processing bills,



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and applying discounts if applicable. It also generates an analytics overview for the patient, generates appointment schedules, and sends notifications to patients through SMS or email.



Figure 12. *Landing Page*

This is the front page of the Arciaga - Juntilla TMJ Ortho Dental Clinic. It features a welcoming image and tagline. There are create account and login account buttons to book appointments for easy scheduling.



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The screenshot shows the 'OUR SERVICES' section of the PLM website. At the top, there is a navigation bar with links for SERVICES, GALLERY, INSURANCE, DENTIST, REVIEWS, LOCATION, and LOGIN. Below the navigation bar, the title 'OUR SERVICES' is centered. A descriptive paragraph follows, stating: 'Comprehensive dental care solutions tailored to your needs. Our experienced team uses the latest technology to ensure your optimal oral health.' Below this paragraph are six service boxes arranged in two rows of three. The first row contains: 'CLEANING' (Professional dental cleaning to remove plaque and tartar, keeping your teeth healthy and bright.), 'RESTORATIVE TREATMENT' (Advanced procedures to repair damaged teeth and restore your natural smile.), and 'CUSTOM BRACES' (Personalized orthodontic solutions to align your teeth and enhance your smile.). The second row contains: 'DIGITAL ORTHODONTICS' (Modern digital techniques for precise and efficient orthodontic treatment.), 'PALATAL EXPANDER' (Specialized treatment to widen the upper jaw and correct crowding issues.), and 'TOOTH EXTRACTION' (Safe and comfortable removal of damaged or problematic teeth.). At the bottom of the section, there are three more service categories: TMJ TREATMENT, ORTHODONTIC TREATMENT, and MYOFUNCTIONAL TREATMENT.

Figure 13. Services Section

The screenshot shows the 'SMILE TRANSFORMATION' section of the PLM website. At the top, there is a navigation bar with links for SERVICES, GALLERY, INSURANCE, DENTIST, REVIEWS, LOCATION, and LOGIN. Below the navigation bar, the title 'SMILE TRANSFORMATION' is centered. This section displays nine service boxes arranged in three rows of three. The first row contains: 'TMJ TREATMENT' (Specialized care for jaw joint problems and related discomfort.), 'ORTHODONTIC TREATMENT' (Comprehensive solutions for teeth alignment and bite correction.), and 'MYOFUNCTIONAL TREATMENT' (Therapy to improve oral muscle function and breathing patterns.). The second row contains: 'DENTAL IMPLANTS' (Permanent tooth replacement solutions for a natural-looking smile.), 'ROOT CANAL TREATMENT' (Expert care to save damaged teeth and relieve dental pain.), and 'WISDOM TEETH REMOVAL' (Safe extraction of wisdom teeth to prevent oral health complications.). The third row contains: 'TEETH WHITENING' (Professional whitening treatments for a brighter, more confident smile.), 'DENTURES' (Custom-fitted dentures to restore your smile and dental function.), and 'DENTAL X-RAYS' (Advanced imaging for accurate diagnosis and treatment planning.).

Figure 13.1. Services Section



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This section allows visitors to see the services or treatments that the dental clinic offers. It provides a detailed list of procedures, including orthodontics, TMJ treatment, cosmetic dentistry, and general dental care.

The screenshot shows a website interface with a navigation bar at the top. Below the navigation, there is a section titled "SMILE TRANSFORMATION" which contains three examples of dental treatments:

- Tooth Filling:** Shows a "Before" image of a tooth with a cavity and an "After" image of the same tooth with a white filling. Description: "Restore the function and appearance of a damaged or decayed tooth with our durable and natural-looking fillings." Treatment: "Composite Resin Filling".
- Tooth Filling:** Shows a "Before" image of a tooth with a cavity and an "After" image of the same tooth with a white filling. Description: "Restore the function and appearance of a damaged or decayed tooth with our durable and natural-looking fillings." Treatment: "Composite Resin Filling".
- Teeth Whitening:** Shows a "Before" image of a smile with yellow teeth and an "After" image of the same smile with white teeth. Description: "Enhance your smile with teeth whitening treatment." Treatment: "Professional Teeth Whitening".

Figure 14. Gallery Section

In this section the different pictures showcasing the before and after transformations of patients who received treatments at the clinic. These images highlight the results of various dental procedures, such as restorative treatments, tooth filling, and teeth whitening.



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SERVICES GALLERY INSURANCE DENTIST REVIEWS LOCATION **LOGIN**

MEET THE DENTIST

Get to know the expert behind your beautiful smile.

Dr. Olivia Ariciaga Juntilla

Dr. Olivia A. Juntilla is a TMJ-Ortho dental specialist with three dental clinic branches. She has since dedicated her career to providing exceptional dental care.

Dr. Arciaga-Juntilla is committed to delivering exceptional dental care and giving back to the community. She actively participates in dental missions. She is a board member of Philippine Dental Association - Muntinlupa Chapter, and the dental chairman in the dental department of the Unilink Health Southwoods Hospital and Medical Center. She is also a member of the American Dental Association. She has studied fellowships in TMJ-Orthodontics, Endodontics, and Oral Surgery.

Education Centro Escolar University, Manila

Specialties TMJ-Orthodontics, Endodontics, and Oral Surgery

WE ARE ACCREDITED



Figure 15. Dentist Section

This section provides basic information about the dentist. Visitors can learn about the dentist's educational background and professional experience. It highlights their specialties, such as orthodontics or TMJ treatment, and their dedication to patient care.



SERVICES GALLERY INSURANCE DENTIST REVIEWS LOCATION **LOGIN**

WE ARE ACCREDITED



PATIENT REVIEWS

What our patients say about us

Bryan Mata Reviewed Dr. Ariciaga-Juntilla PhD on the Dental Clinic

Figure 16. Insurance Providers Section



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

This section displays the insurance partners accepted by the dental clinic. It provides a list or grid of logos from various insurance providers, making it easy for patients to identify if their insurance is supported.

The screenshot shows a testimonial from Bernice Santos-Oberia, a patient of Avielle Andra Neri Online Dental Clinic. The testimonial reads: "Very professional and accommodating staff, ang kain ng environment ng teeth and mouth area, mabigat na kaya wala kong ganap na kahirapan magkakalat sa tooth transformation." Below the testimonial is a photo of a smiling woman with long dark hair.

Figure 17. Patient Reviews Section

This section showcases feedback and testimonials from satisfied patients, highlighting their experiences with the clinic. Each review includes the patient's name, a brief comment about the service they received, and a star rating.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

SERVICES GALLERY INSURANCE DENTIST REVIEWS LOCATION [LOGIN](#)

VISIT OUR LOCATION

24 Unit V and G Legaspi Building, #9 Quezon Street
Poblacion, Muntinlupa City, 1776
0933 863 9828
olivajuntillal@gmail.com

Business Hours

Monday - Friday	9:00 AM - 5:00 PM
Saturday	9:00 AM - 5:00 PM
Sunday	Closed

© 2024 Arciaga - Juntilla TMJ Ortho Dental Clinic.

Figure 18. Location Clinic Location

This section displays the exact location of the Arciaga - Juntilla TMJ Ortho Dental Clinic. It features an interactive map, such as one powered by Google Maps, allowing visitors to easily find directions to the clinic.

CREATE ACCOUNT

LAST NAME FIRST NAME MIDDLE INITIAL
GENDER DATE OF BIRTH AGE
PHONE NUMBER EMAIL ADDRESS
+63
OCCUPATION PRESENT ADDRESS
USERNAME
PASSWORD
Password must contain at least 8 characters, including uppercase, lowercase, number, and special character.
CONFIRM PASSWORD
[Create Account](#)
Already have an account? [Log In](#)

Figure 19. Create Account



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

This figure shows the Create Account Page, which serves as the initial step for patients to register an account in the system. The page is designed to collect essential patient information, such as their name, email address, contact number, username, and password, ensuring accurate records for future use. Patients must complete this step before they can access the Appointment System.

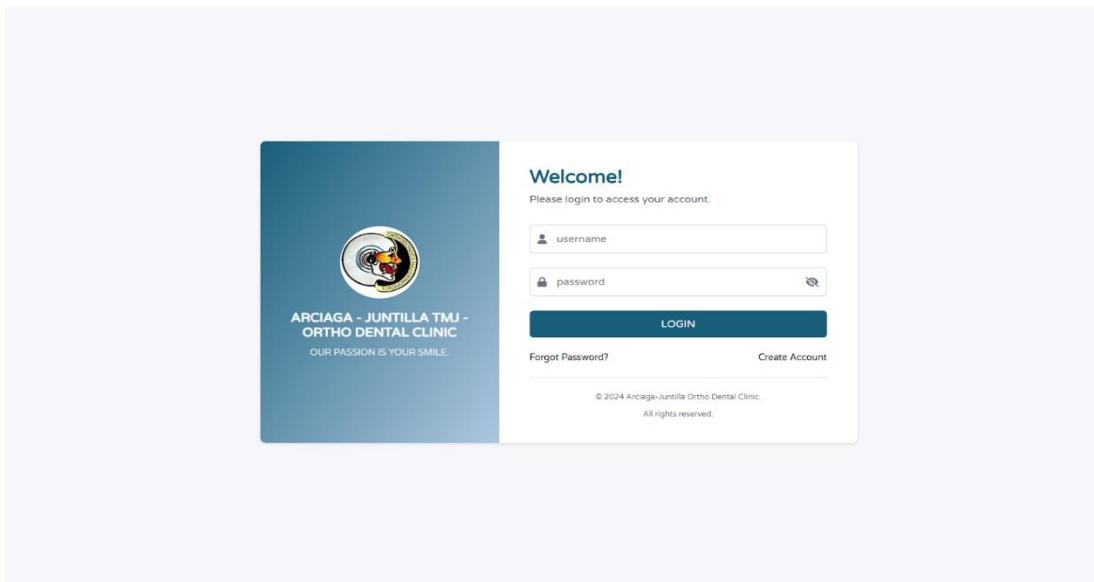


Figure 20. Login

The figure shows is Login Page. For patients, the login page provides access to features such as appointment booking, viewing treatment plans, and updating personal information. Before a patient can log in, they must first verify their email address. The login process verifies user credentials, allowing patients, dentists, and admin staff to access their respective dashboards based on their roles.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

 ARCIAGA-JUNTILLA
TMJ-ORTHO DENTAL
CLINIC

[Home](#)
[Update Profile](#)
[Book Appointment](#)
[View Appointments](#)
[Dental Documentation](#)

[Feedback](#)
[Change Password](#)
[Logout](#)

WELCOME, soju!

USING THE SIDEBAR, YOU MAY REQUEST A NEW APPOINTMENT, VIEW/EDIT YOUR PENDING APPOINTMENT REQUESTS, AND VIEW/CANCEL/REQUEST A RESCHEDULE FOR YOUR UPCOMING APPOINTMENTS.

PLEASE UPDATE AND ANSWER THE DENTAL AND MEDICAL HISTORY QUESTIONS UNDER UPDATE PROFILE.

YOU CAN ALSO SEE YOUR NEXT APPOINTMENT BELOW.

YOUR NEXT APPOINTMENT

APPOINTMENT REFERENCE NO. # 35	APPOINTMENT STATUS CONFIRMED
CONSULTATION DATE JANUARY 28, 2025	SERVICES DIGITAL ORTHODONTICS
TIME BLOCK 09:00 AM	MAIN COMPLAINT DASDSADSAD
REMARKS -	

Figure 21. Patient Dashboard

The figure shows the Patient Dashboard, where patients can view details about their upcoming appointments, including scheduled dates, times, and relevant services. In addition, this dashboard displays important announcements, keeping patients informed about any updates or changes within the clinic. It serves as a central hub for managing appointments, accessing essential information, and staying up-to-date with clinic notifications.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA



ARCIAGA-JUNTILLA
TMJ-ORTHO DENTAL
CLINIC

[Home](#)
[Update Profile](#)
[Book Appointment](#)
[View Appointments](#)
[Dental Documentation](#)

[Feedback](#)
[Change Password](#)
[Logout](#)

PATIENT PROFILE

LAST NAME	FIRST NAME	MIDDLE INITIAL
SOJU	SOJU	L
DATE OF BIRTH	GENDER	ENTER AGE
2003-04-21	FEMALE	21
OCCUPATION		
STUDENTS		
PRESENT ADDRESS	PHONE NUMBER	EMAIL ADDRESS
MUNTINLUPA CITY	+639624657786	sojuuuu0@gmail.com
Format: +639xxxxxxxx		

DENTAL AND MEDICAL HISTORY

PLEASE CIRCLE APPROPRIATE ANSWER:

1. ARE YOU HAVING PAIN OR DISCOMFORT AT THIS TIME?
 YES NO

2. DO YOU FEEL NERVOUS ABOUT HAVING DENTAL TREATMENT?
 YES NO

Figure 22. Update Profile

The figure shows the Update Profile section, where patients can modify their personal information. This includes updating contact details, medical history, and other relevant data. The Update Profile feature ensures that patient records remain accurate and up-to-date, providing both patients and clinic staff with the most current information for effective care management.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

The screenshot shows the 'BOOK APPOINTMENT' section of a web application. On the left, a sidebar for 'ARCIAGA-JUNTILLA TMJ-ORTHO DENTAL CLINIC' lists links: Home, Update Profile, Book Appointment, View Appointments, Dental Documentation, Feedback, Change Password, and Logout. The main area has a header 'BOOK APPOINTMENT'. It includes fields for 'SELECT SERVICE' (dropdown menu), 'COMPLAINT' (text input), and 'OTHER DETAILS' (text input). Below these is a question 'IS THIS FOLLOW UP?' with radio buttons for 'YES' and 'NO'. A large button at the bottom right says 'SCHEDULE APPOINTMENT'. To the right is a calendar for 'JANUARY 2025' showing dates from 1 to 31. Special days like 'New Year's Day' (January 1), 'Lailatul Isra Wal Mi Raj (tentative)' (January 27), and 'Lunar New Year's Day' (January 29) are marked. To the far right, a box titled 'AVAILABLE SLOTS' lists time slots for January 22, 2025, with availability counts.

TIME	AVAILABLE
09:00 AM	2 AVAILABLE
10:00 AM	2 AVAILABLE
11:00 AM	2 AVAILABLE
12:00 PM	2 AVAILABLE
01:00 PM	1 AVAILABLE
02:00 PM	2 AVAILABLE
03:00 PM	2 AVAILABLE
04:00 PM	2 AVAILABLE

Figure 23. Book Appointment

The figure shows the Book Appointment section, where patients can schedule new appointments. This feature allows patients to select the desired date, time, and service type, streamlining the booking process. It provides an easy-to-use interface for booking appointments, ensuring patients can quickly secure their preferred time slots and receive confirmation of their appointments.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

**ARCIAGA-JUNTILLA
TMJ-ORTHO DENTAL
CLINIC**

- [Home](#)
- [Update Profile](#)
- [Book Appointment](#)
- [View Appointments](#)
- [Dental Documentation](#)

- [Feedback](#)
- [Change Password](#)
- [Logout](#)

APPOINTMENTS

UPCOMING PAST CANCELLED APPOINTMENTS

APPOINTMENT ID	APPOINTMENT DATE	APPOINTMENT TIME	SERVICE	COMPLAINT	OTHER DETAILS	REMARKS	STATUS	OPTIONS
44	January 31, 2025	01:00 PM	TMJ TREATMENT	SAKITT	HUHUHUU		PENDING	<button style="background-color: red; color: white; border: none; padding: 2px 5px;">CANCEL APPOINTMENT</button>

Figure 24. View Appointments

The figure shows the View Appointments section, where patients can view details of their upcoming, past, and canceled appointments. This feature provides an overview of all scheduled visits, allowing patients to track their appointment history, and patients can also cancel their appointments.

**ARCIAGA-JUNTILLA
TMJ-ORTHO DENTAL
CLINIC**

- [Home](#)
- [Update Profile](#)
- [Book Appointment](#)
- [View Appointments](#)
- [Dental Documentation](#)

- [Feedback](#)
- [Change Password](#)
- [Logout](#)

RESCHEDULE APPOINTMENT

JANUARY 2025

SUN	MON	TUE	WED	THU	FRI	SAT
			1 New Year's Day	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27 Lalutin Ira Wal M Ra (tentative)	28	29 Lunar New Year's Day	30	31	

AVAILABLE SLOTS
Friday, January 24, 2025

09:00 AM	(2 available)
10:00 AM	(2 available)
11:00 AM	(2 available)
12:00 PM	(2 available)
01:00 PM	(2 available)
02:00 PM	(2 available)
03:00 PM	(2 available)
04:00 PM	(2 available)

RESCHEDULE APPOINTMENT

Figure 25. Reschedule Appointment



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

Patients can reschedule their appointment to a preferred time and date.

The screenshot shows a user interface for dental documentation. On the left, there's a sidebar with the clinic logo and navigation links: Home, Update Profile, Book Appointment, View Appointments, Dental Documentation, Feedback, Change Password, and Logout. The main area has a title "DENTAL DOCUMENTATION" and a sub-section "View and download your dental records, X-rays, and other medical documents." Below this is a search bar and a table titled "DOCUMENT NAME" with columns for TYPE, DATE, and ACTIONS. Two entries are listed: "FAFAFAF" (Dental Records, 2025-01-12) and "HAHAHAHAHHAHAD" (Billing Record, 2025-01-15). To the right, there's a "TREATMENT PLAN" section with a dental chart showing numbered teeth from 1 to 32. Next to it is a "ALL TEETH TREATMENTS" summary for January 12, showing a treatment labeled "CLEANING" with a status of "HEALTHY" and "COMPLETED".

Figure 26. Dental Documentation

This screenshot shows a more detailed view of the dental documentation. The left sidebar is identical to Figure 26. The main area features a "TREATMENT PLAN" section with a large dental chart of upper and lower arches, each tooth numbered 1 through 32. To the right is a "ALL TEETH TREATMENTS" summary for January 12, showing a treatment labeled "CLEANING" with a status of "HEALTHY" and "COMPLETED". The overall layout is similar to Figure 26 but provides more visual detail on the dental chart.

Figure 26.1. Dental Documentation

The figure shows the Dental Documentation section, where patients can view and manage their dental records. This feature includes details such as treatment history, dental



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

charts, X-rays, and any notes or recommendations from their dentist. It provides a comprehensive overview of the patient's dental health, allowing both patients and healthcare providers to track progress, plan future treatments, and maintain accurate records.

ARCIAGA-JUNTILLA
TMJ-ORTHO DENTAL
CLINIC

FEEDBACKS

DATE OF VISIT: dd/mm/yyyy

DENTIST: SELECT DENTIST

OVERALL EXPERIENCE: 1 2 3 4 5

CLINIC CLEANLINESS: 1 2 3 4 5

ADDITIONAL COMMENTS:

SUBMIT FEEDBACK

PREVIOUS FEEDBACK

DENTIST: DR. JOHNSON
RATING: 4/5
CLEANLINESS: 3/5
COMMENT: diadadsasd
Submitted on January 2, 2025, 3:12 pm

DENTIST: DR. OLIVIA ARCIAGA - JUNTILLA
RATING: 5/5
CLEANLINESS: 5/5
COMMENT: MALINIS
Submitted on January 2, 2025, 3:12 pm

DENTIST: Dr. Olivia Arciaga - Juntilla
RATING: 5/5
CLEANLINESS: 5/5
COMMENT: MAGALING
Submitted on January 2, 2025, 2:06 pm

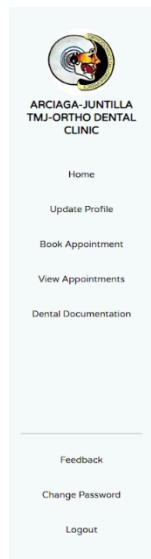
DENTIST: dr_williams
RATING: 3/5
CLEANLINESS: 4/5
COMMENT: FEEL LIKE INJEC...

Figure 27. Feedback Page

The figure shows that the Feedback Page allows patients to share their experiences and provide valuable input about the services they received at the clinic.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA



CHANGE PASSWORD

CURRENT PASSWORD

Enter current password

NEW PASSWORD

Enter new password

CONFIRM PASSWORD

Confirm your new password

Figure 28. Change Password Page

The figure shows the Change Password Page, where patients can update their account password securely. This feature requires the patient to enter their current password, followed by the new password, and confirm it to ensure accuracy. It enhances account security by allowing patients to regularly update their credentials and protect their personal information.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

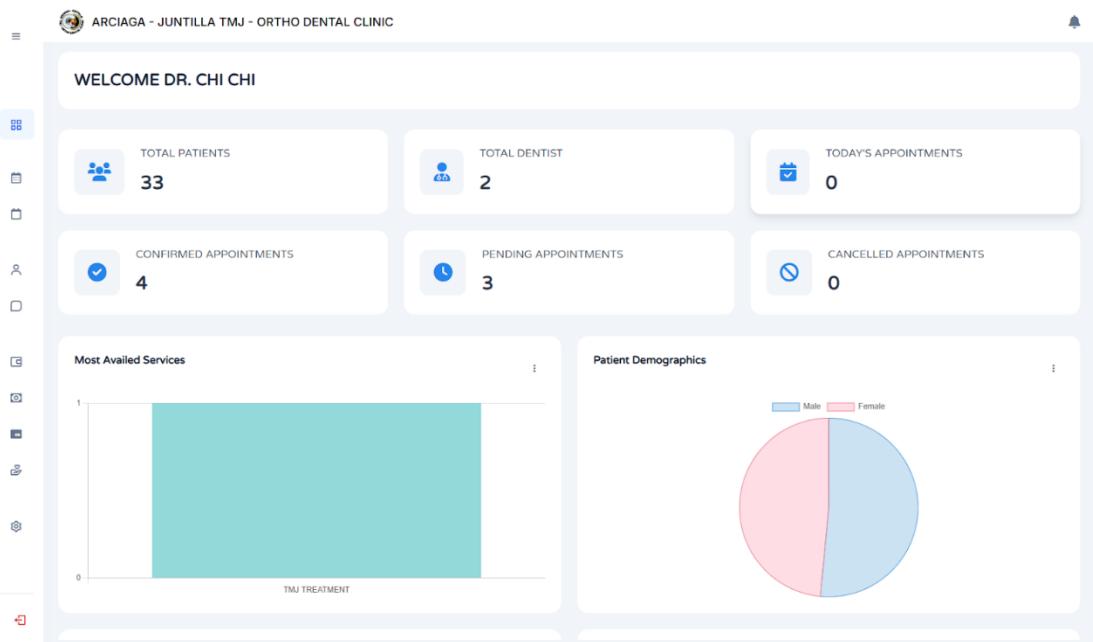


Figure 29. *Dentist Dashboard*

The figure shows that the Dentist Dashboard can be used to see the analytics of the dental clinic.

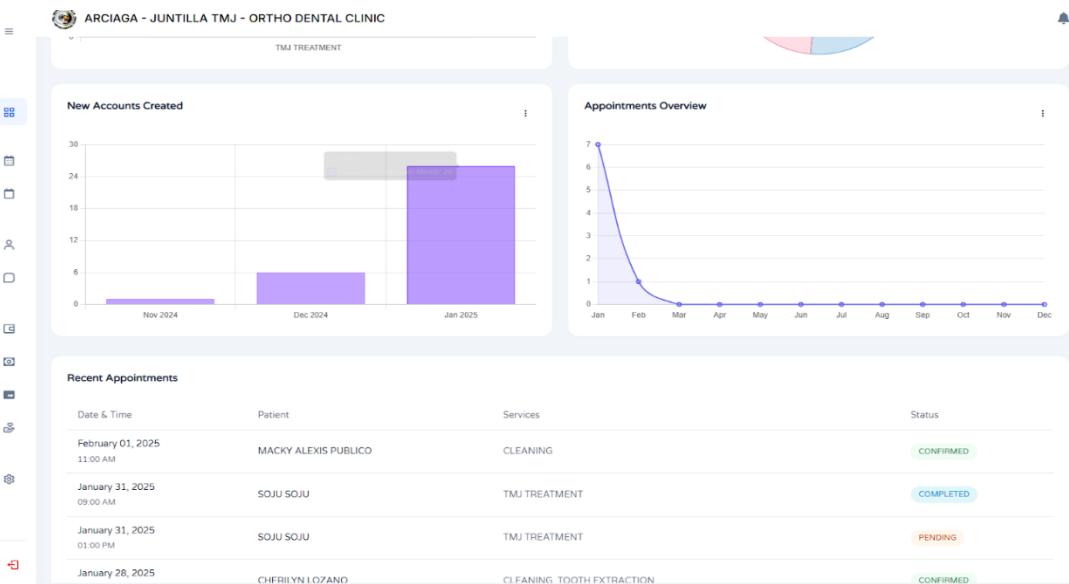


Figure 29.1. *Dentist Dashboard*



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

The figure shows the Dentist Dashboard, below can see the recent appointments.

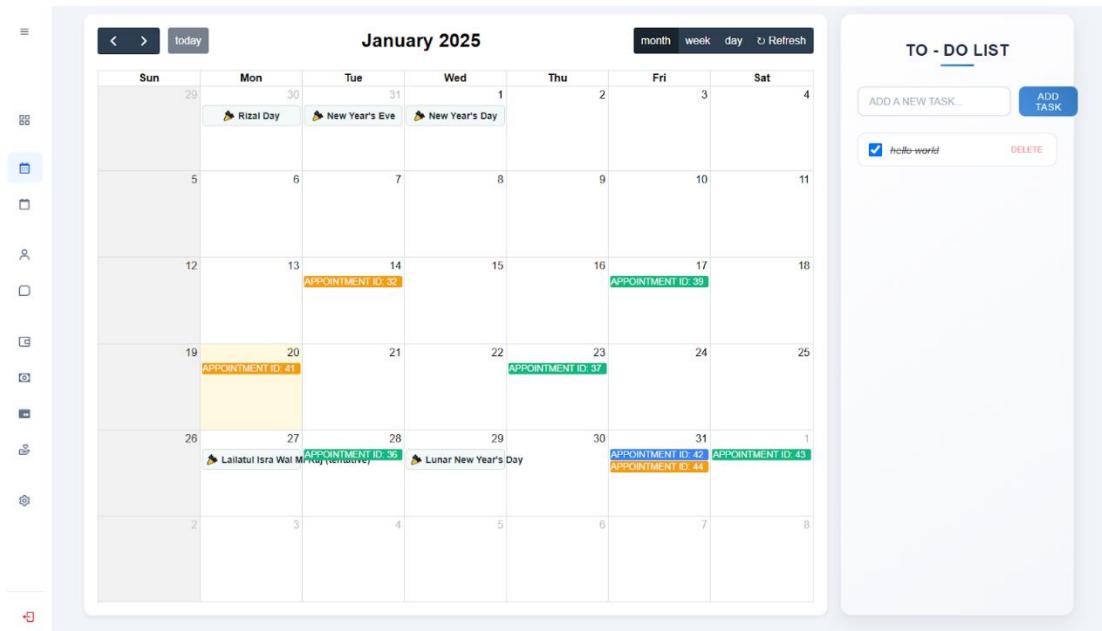


Figure 30. Calendar

The calendar section allows the dentist to view all patient appointments in a clear and organized format. The dentist can choose to display appointments on a daily, weekly, or monthly basis for easier tracking. From the calendar, the dentist can modify the status of each appointment. They have the option to mark appointments as Confirmed, indicating the patient will attend, or canceled if the appointment is no longer scheduled. After completing a treatment, the dentist can mark the appointment as completed. If a patient misses an appointment without notice, the dentist can select No Show to update the status accordingly.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

APPOINTMENTS											
APT. ID	USERNAME	APPOINTMENT DATE	APPOINTMENT TIME	SERVICES	COMPLAIN	FOLLOW UP	REMARKS	STATUS	CANCELLATION REASON	CREATED AT	UPDATED AT
44	soju	January 31, 2025	01:00 PM	TMJ TREATMENT	SAKITT	NO	PENDING	PENDING		January 19, 2025 11:11 PM	January 20, 2025 12:27 AM
43	macky	February 1, 2025	11:00 AM	CLEANING	HUHUHU	NO	CONFIRMED	CONFIRMED		January 19, 2025 9:09 PM	January 19, 2025 9:18 PM
42	soju	January 31, 2025	09:00 AM	TMJ TREATMENT	SAKIT	NO	COMPLETED	COMPLETED		January 19, 2025 8:23 PM	January 19, 2025 9:14 PM
41	ShinDa	January 20, 2025	10:00 AM	ORTHODONTIC TREATMENT, OSTEOTOMY	N/A	NO	PENDING	PENDING		January 18, 2025 1:11 PM	January 19, 2025 8:10 PM
39	Saya	January 17, 2025	12:00 PM	CLEANING	WALA	NO	CONFIRMED	CONFIRMED		January 16, 2025 1:39 PM	January 16, 2025 1:44 PM
37	Miyukana31	January 23, 2025	09:00 AM	CLEANING	TEETH CLEANING	NO	CONFIRMED	CONFIRMED		January 15, 2025 10:34 AM	January 15, 2025 11:29 AM
36	cheesering	January 28, 2025	01:00 PM	CLEANING, TOOTH EXTRACTION	SAKIT	NO	CONFIRMED	CONFIRMED		January 14, 2025 9:23 AM	January 15, 2025 10:11 PM
32	shin_da04	January 14, 2025	09:00 AM	CLEANING	N/A	NO	PENDING	PENDING		January 12, 2025 3:50 AM	January 14, 2025 3:24 AM

Figure 31. Full Details of Appointments

This figure provides a full view of each patient's appointment details.

PATIENTS				
PATIENT ID	NAME	EMAIL	PHONE NUMBER	ACTION
031	JOHNRITS AMOR	fritsemor03@gmail.com	+639690165053	<button>VIEW DETAILS</button> <button>DELETE</button>
032	JULIE ANN	juliannbergonio0@gmail.com	+639096894000	<button>VIEW DETAILS</button> <button>DELETE</button>
041	MARK ANTHONY BARRERA	anthonybarrera291@gmail.com	+639633025797	<button>VIEW DETAILS</button> <button>DELETE</button>
009	JULIA BARRETO	juliaab@gmail.com	+636396354827	<button>VIEW DETAILS</button> <button>DELETE</button>
007	CAPSTONE BEST	besticapstone415@gmail.com	+636363912353	<button>VIEW DETAILS</button> <button>DELETE</button>
036	KY C	kylecondinato@gmail.com	+639123456798	<button>VIEW DETAILS</button> <button>DELETE</button>
034	MHAL JUSTINE CARANTO	mhalaguado@gmail.com	+639388894686	<button>VIEW DETAILS</button> <button>DELETE</button>
024	SHIN DA	shinshinu04@gmail.com	+636399463121	<button>VIEW DETAILS</button> <button>DELETE</button>
019	KAREN CRISTINE DEPALAC	karenchristine@gmail.com	+636398765432	<button>VIEW DETAILS</button> <button>DELETE</button>
020	KAREN CRISTINE DEPALAC	karendepalac02@gmail.com	+636395414394	<button>VIEW DETAILS</button> <button>DELETE</button>

Figure 32. Patient Lists

This figure is Patient List displays a comprehensive list of all patients, allowing the dentist to easily access patient information. The list includes key details such as the patient's name and contact information. Each patient's entry may include options like "View Profile" to access full details of the patient.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

PATIENT NAME
MACKY ALEXIS PUBLICO
PATIENT ID: 48

PATIENT INFORMATION APPPOINTMENT HISTORY TREATMENT PLANNING DOCUMENTATION

PATIENT PROFILE

LAST NAME: PUBLICO FIRST NAME: MACKY ALEXIS MIDDLE INITIAL: C
DATE OF BIRTH: 2002-06-01 GENDER: Male ENTER AGE: 22
OCCUPATION: STUDENT
PRESENT ADDRESS: MUNTINLUPA CITY PHONE NUMBER: +639212944931 EMAIL ADDRESS: publicomackyalexis_bsit@pimun.edu.ph

DENTAL AND MEDICAL HISTORY

Figure 33. Patient Profile Tab

The figure shows that the Patient Profile Tab provides detailed information about each patient, including personal details and medical history.

PATIENT NAME
MACKY ALEXIS PUBLICO
PATIENT ID: 48

PATIENT INFORMATION APPPOINTMENT HISTORY TREATMENT PLANNING DOCUMENTATION

APPOINTMENT DATE: January 22, 2025 PURPOSE: TOOTH PROBLEM STATUS: CONFIRMED

Figure 34. Appointment History Tab

The figure shows that the Appointment History Tab displays a list of all past appointments for a patient.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

This screenshot shows the Treatment Planning tab of a dental software. At the top, it displays patient information: Name - MACKY ALEXIS PUBLICO and Patient ID - 48. Below this are tabs for Patient Information, Appointment History, Treatment Planning (which is selected), and Documentation. On the left, there is a vertical toolbar with icons for patient management. The main area is divided into two sections: 'DENTAL CHART' on the left showing a diagram of teeth numbered 1 through 32, and 'TREATMENT DETAILS' on the right with fields for Tooth Number, Treatment/Procedure (with a dropdown menu labeled 'SELECT'), Date (set to 21/01/2025), Status (Healthy), Progress (Planned), and Notes.

Figure 35. Treatment Planning Tab

This figure shows the Treatment Planning Tab allows the dentist to create, view, and update a patient's treatment plan, including specific procedures, tooth number, and progress notes, etc.

This screenshot shows the Treatment Planning tab with a different layout. It includes the same patient information at the top. The main area has tabs for Patient Information, Appointment History, Treatment Planning (selected), and Documentation. On the left is a vertical toolbar. The central part of the screen shows a summary of treatments under 'ALL TEETH TREATMENTS' with a button to 'ADD ALL TEETH TREATMENT'. Below this is a detailed treatment entry for tooth 20, which is listed as 'TMJ TREATMENT' with a status of 'HEALTHY' and 'IN PROGRESS'. There is also a 'NEXT APPOINTMENT' section. A prominent blue 'ADD TREATMENT' button is located in the lower right corner of the main work area.

Figure 35.1. Treatment Planning Tab



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

This figure shows the Treatment Planning Tab below when clicking a tooth there is a card showing the progress of each tooth and there is also showing a treatment in all teeth.

A screenshot of a dental software interface. At the top, it displays patient information: "PATIENT NAME: MACKY ALEXIS PUBLICO" and "PATIENT ID: 48". Below this is a navigation bar with tabs: "PATIENT INFORMATION", "APPOINTMENT HISTORY", "TREATMENT PLANNING", and "DOCUMENTATION". The "DOCUMENTATION" tab is currently selected. On the left side, there is a vertical toolbar with various icons. In the center, under the "DOCUMENTATION" tab, there is a message: "+ ADD IMAGE/DOCUMENT" and "No X-ray images available for this patient.".

Figure 36. Documentation Tab

The figure shows the Documentation Tab provides access to important patient documents, such as medical records, consent forms, X-rays, and treatment images, allowing the dentist and clinic staff to securely store, view, and manage all relevant documentation in one organized location for easy reference and compliance.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

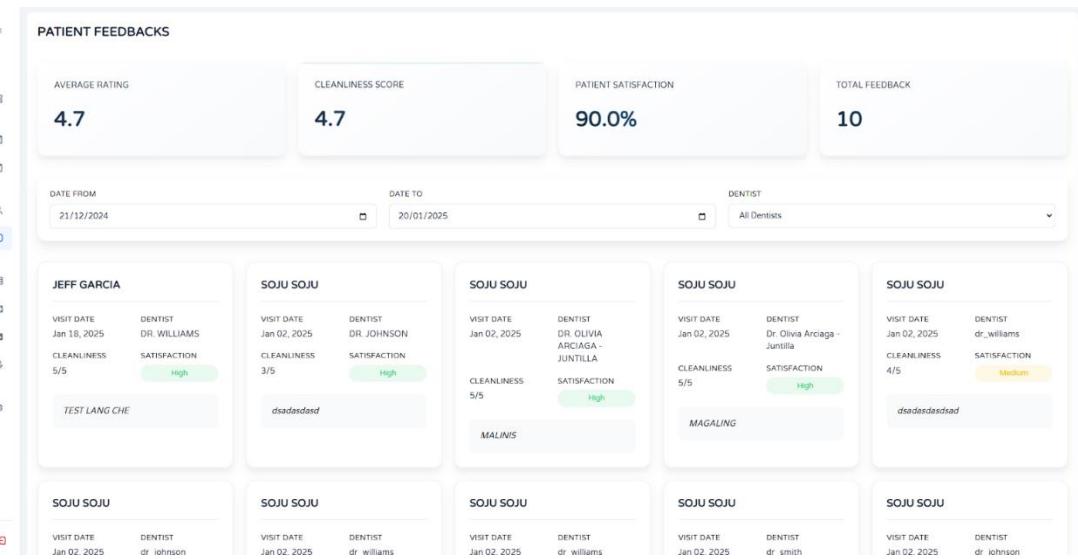


Figure 37. Patient Feedback

The figure shows the Patient Feedback displays reviews and comments from patients about their experiences at the clinic, allowing the dental team to gather insights into patient satisfaction, identify areas for improvement, and maintain high-quality service.

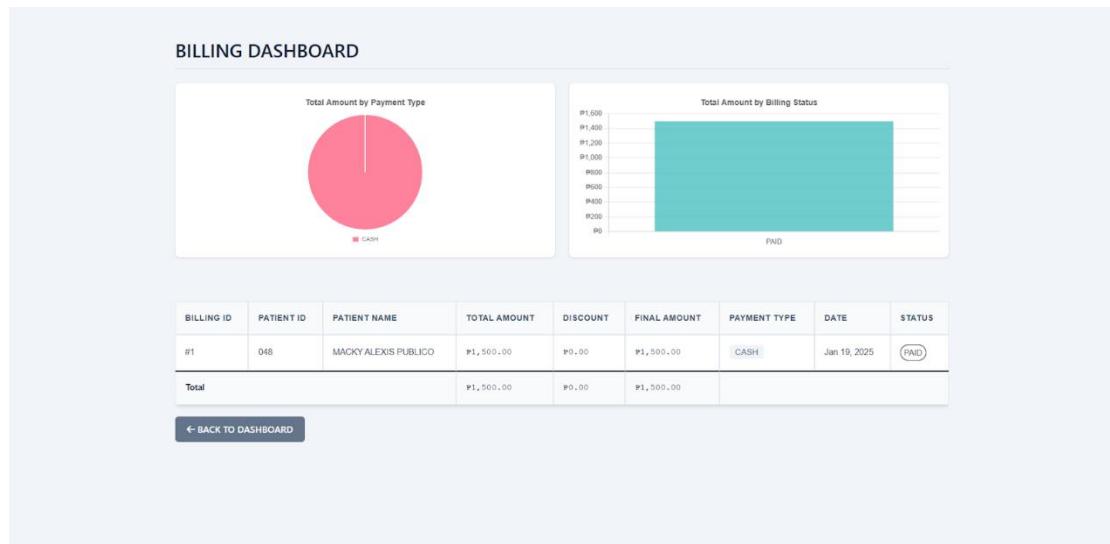


Figure 38. Billing Dashboard



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

The figure shows that the Billing Dashboard provides an overview of billing status.

Installment Payments						
BILLING ID	CUSTOMER	TOTAL AMOUNT	REMAINING	STATUS	PAYMENT HISTORY	ACTIONS
BACK TO DASHBOARD						

Figure 39. Installments

The figure shows that the Installments Table displays a list of payment installments for patients, remaining balance, amounts, and payment statuses.

MANAGE SERVICES/TREATMENTS						
<input type="button" value="Add New Service"/> Add New Service						<input type="button" value="BACK TO DASHBOARD"/>
<input type="button" value="View Services"/> View Services						
Service ID	Service Name	Service Type	Base Cost	Description	Actions	
10	Fluoride Treatment		₱500.00	A topical treatment applied to the teeth to help prevent tooth decay and strengthen enamel.	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
9	TMJ Diagnostic Imaging		₱1500.00	Imaging techniques such as X-rays or MRIs to assess the structure of the temporomandibular joint and identify any abnormalities such as joint degeneration or disc displacement.	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
8	TMJ Treatment		₱3000.00	Non-invasive treatments for TMJ disorders, including physical therapy, jaw exercises, and the use of nightguards or splints to reduce pain and inflammation in the jaw.	<input type="button" value="Edit"/>	

Figure 40. Manage Services/Treatment



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

The figure shows the Manage Services allows clinic staff/dentists to add, edit, or remove dental services offered.

Figure 41. Billing

The figure shows that Billing provides tools for creating and managing patient invoices and processing payments.

PROJECT CAPABILITIES AND LIMITATIONS

The capstone project, “**Dental Clinic Management and Appointment System for Arciaga - Juntilla TMJ Ortho Dental Clinic with Customizable Dental Chart**”, aims to provide a smoother workflow within the dental clinic, benefiting both the clients and the staff. This system is designed to ensure the security and proper management of patient data by adhering to the specific objectives outlined. It simplifies day-to-day



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

operations, enhances efficiency, and ensures the protection of sensitive information gathered from patients.

Capabilities

1. The System allows Users to use it on different platforms/Devices.
2. The System allows Users to view, input, and modify.
3. The System allows Dentists to view, search, and modify all Client/Patient data.
4. The System allows the Client/Patient to receive SMS and email notifications.
5. The System allows the Client/Patient to book, cancel, and reschedule Appointments.
6. The System allows Dentists to upload images.
7. The System allows the Client/Patient to update personal information.
8. The System allows Dentists to create and manage personalized treatment plans.
9. The System Provides insights into clinic operations through various analytics.

Limitations

1. The System can only be accessed in 1 branch.
2. The System can only be accessed if it has an internet connection.
3. The System may have high initial setup costs.
4. The System requires training for users to adapt.
5. The System does not integrate with other external systems.
6. The System may need extra customization for additional features.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

Table 5. Test Result

TEST COMPATIBILITY	TEST RESULT
A. Email Verification B. Test logging in with correct and incorrect usernames and passwords. C. Password Encryption	Email verification was successfully implemented and tested. Users received verification emails promptly and were able to verify their accounts without issues. The login functionality was tested thoroughly. Users were able to log in successfully with correct credentials, and the system appropriately denied access with incorrect usernames or passwords, displaying error messages. Password encryption has been verified. All passwords are stored securely using industry-standard encryption methods. Ensuring the protection of user data.
A. Test if patients can book an appointment with the right details (date, time, service). B. Check if the appointment information is saved correctly. C. Users can easily reschedule and cancel appointments. D. Check that both patients and dentists get notifications when appointments are booked, rescheduled, or canceled. E. Make sure notifications will be sent through email/SMS.	A. Patients were able to book appointments with accurate details. The system correctly captured the date, time, and type of service during the booking process. Appointment information was saved correctly in the system. Users could retrieve their booking details without discrepancies. Users found the rescheduling and cancellation processes straightforward and efficient. The system updated appointment statuses accurately after rescheduling or cancellations. Notifications were successfully sent to both patients and dentists for appointment bookings, rescheduling, and cancellations, ensuring all parties were informed in a timely manner. Notifications were tested and confirmed to be sent through both email and SMS. Users received notifications promptly through their preferred communication channels.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

<p>A. Ensure that a new dental chart can be created for a patient with basic information.</p> <p>B. Ensure dentists can edit and save changes to the dental chart.</p> <p>C. Check if the dental chart pulls and displays relevant dental history.</p>	<p>Dentists were able to create new dental charts with the necessary patient information. The system captured and stored the basic info accurately.</p> <p>Dentists could edit and save changes to dental charts without issues. The system retained all updates correctly.</p> <p>The system successfully pulled and displayed the relevant dental history when accessing a patient's dental chart. Historical data was presented clearly and accurately.</p>
<p>A. Ensure the system allows searching of patient records by name, full name, and username.</p> <p>B. Test if patient profiles can be deleted and ensure they are removed from the system securely.</p> <p>C. Ensure that when viewing a patient's profile, all the correct information (name, contact, medical history, etc.) is displayed for the right patient</p>	<p>A. The search functionality was tested and confirmed to work effectively. Users could locate patient records using name, full name, and username with ease.</p> <p>B. Patient profiles were securely deleted as expected. Once deleted, the profiles were no longer accessible in the system, ensuring privacy and data security.</p> <p>C. Patient profiles displayed all relevant information accurately, including name, contact details, and medical history. The data presented was verified to belong to the correct patient</p>

Based on Table 5, the key features served as the foundation for system testing, focusing on verifying whether the system displayed the correct content and ensuring that all feature functionalities operated correctly and accurately.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

PROJECT EVALUATION

To thoroughly evaluate the capstone project “Dental Clinic Management and Appointment System for Arciaga - Juntilla TMJ Ortho Dental Clinic with Customizable Dental Chart” a comprehensive testing and evaluation process was conducted. This process aimed to ensure that the system meets all predefined requirements and functions as intended.

Initially, the researchers carried out extensive testing, which included functional testing to verify that each feature operates correctly according to the design specifications. This stage involved checking the system's usability, ensuring that both staff and patients could navigate the platform with ease and without confusion.

Table 6. Mean Score of Actual User.

Summary of the Overall Mean Score Evaluation by the (25) Actual Users

INDICATOR	MEAN	DESCRIPTIVE MEANING
Functionality	4.75	Excellent
Reliability	4.56	Excellent
Usability	4.77	Excellent
Portability	4.80	Excellent
Overall Mean	4.714	Excellent

The evaluation results show that the system performs exceptionally well across all sections. For “Functionality”, the mean score of 4.75 reflects a high level of effectiveness and efficiency in performing its tasks. The “Reliability” has a mean of 4.56, indicating the



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

system's stability and dependability. In terms of "Usability", with a mean score of 4.77, the system is seen as user-friendly and easy to navigate. The "Efficiency" section, with a mean of 4.69, shows that the system completes tasks quickly and effectively. Lastly, the "Portability" section received a mean of 4.80, highlighting the system's flexibility across different devices and platforms. The overall mean score of 4.71 further emphasizes the system's strong performance and high user satisfaction.

Table 7. Mean Score of IT Expert.

Summary of the Overall Mean Score Evaluation by the IT Expert

INDICATOR	MEAN	DESCRIPTIVE MEANING
Functionality Suitability	4.60	Excellent
Performance Efficiency	4.40	Excellent
Compatibility	4.20	Very Good
Usability	4.47	Excellent
Reliability	4.45	Excellent
Security	4.32	Excellent
Maintainability	4.56	Excellent
Portability	4.47	Excellent
Overall Mean	4.43	Excellent

The summary of the overall weighted mean evaluation by the IT respondents shows an average rating of 4.43, classified as "Excellent." Functional Suitability received a score of 4.60, rated "Excellent," due to the system meeting all functional requirements, ensuring smooth and complete functionality. Performance Efficiency was rated 4.40 and also classified as "Excellent," reflecting the system's optimal performance in response



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

times and efficient resource utilization. Compatibility scored 4.20 and was rated "Very Good," indicating that the system effectively coexists with other platforms, though minor improvements in interoperability could enhance this further. Usability was scored 4.47 and rated "Excellent" for its intuitive interface, ease of navigation, and minimal user error occurrences. Reliability received a score of 4.45 and was rated "Excellent," demonstrating that the system operates consistently and is dependable under various conditions. Security scored 4.32, rated "Excellent," as it ensures confidentiality and data protection, with slight enhancements possible to further strengthen security measures. Maintainability, with a score of 4.56 and an "Excellent" rating, reflects the system's ease of updating and modifying, contributing to its long-term sustainability. Portability scored 4.47, rated "Excellent," for its adaptability and ease of installation across different environments. Overall, the system demonstrates robust performance and a user-friendly design, with most areas rated as "Excellent" by IT professionals, including IT support staff and web developers.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

Chapter 5

SUMMARY OF FINDINGS

SUMMARY

The research focused on developing a **Dental Clinic Management and Appointment System** for Arciaga - Juntilla TMJ Ortho Dental Clinic with a **Customizable Dental Chart** to address inefficiencies in manual record-keeping and appointment scheduling. The study aimed to improve clinic operations by automating processes, ensuring data security, and enhancing the overall patient experience. To assess the system's performance and reliability, five (5) IT experts evaluated the software based on **ISO/IEC 25010:2011 software quality standards**. The system received an overall **rating of 4.43 (Excellent)**, demonstrating high functionality, performance efficiency, usability, reliability, security, maintainability, and portability. Additionally, twenty-five (25) actual users, including dentists, clinic staff, and patients, assessed the system based on real-world use. The evaluation showed an **overall rating of 4.71 (Excellent)**, indicating strong satisfaction levels with system functionality, reliability, usability, efficiency, and portability. The results confirm that the system successfully met its objectives, providing a user-friendly, secure, and efficient digital solution for dental clinic management.

Evaluation by IT Experts

The system was evaluated by five (5) IT experts based on ISO/IEC 25010:2011 software quality standards. The results are as follows:



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

- **Functional Suitability:** Rated **Excellent** due to its ability to meet the functional requirements specified, particularly appointment management and dental chart customization.
- **Performance Efficiency:** Rated **Excellent**, demonstrating optimal loading times and resource utilization
- **Compatibility:** Rated **Very Good** for functioning effectively across various devices and web browsers, with minor improvements suggested for enhanced interoperability.
- **Usability:** Rated **Excellent** for its intuitive interface and easy navigation.
- **Reliability:** Rated **Excellent** due to its consistent performance and ability to handle errors gracefully.
- **Security:** Rated **Excellent**, ensuring patient records' confidentiality and data access controls.
- **Maintainability:** Rated **Excellent**, reflecting ease of updates and modifications.
- **Portability:** Rated **Excellent** for its adaptability and ease of installation across different environments.

The overall evaluation by IT experts resulted in an **average rating of 4.43**, reflecting the system's robustness and high-quality design.

Evaluation by Actual Users

Twenty-five (25) actual users, including dentists and patients, evaluated the system. Their feedback revealed the following:



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

- **Functionality:** Rated **Excellent** for meeting user requirements and enhancing clinic workflows.
- **Reliability:** Rated **Excellent** for providing accurate and error-free data processing.
- **Usability:** Rated **Excellent** for being easy to navigate and operate with minimal training.
- **Efficiency:** Rated **Excellent** due to its fast response times and streamlined workflows.
- **Portability:** Rated **Excellent** for ensuring online access across devices.

The system received an **overall rating of 4.714** from actual users, highlighting its outstanding performance and satisfaction levels.

CONCLUSION

The **Dental Clinic Management and Appointment System for Arciaga-Juntilla TMJ Ortho Dental Clinic with Customizable Dental Chart** successfully met the objectives set for this study. The system was designed to allow patients to create accounts and manage their appointments efficiently. This objective was fulfilled by integrating an **online appointment scheduling module**, which enables patients to book, reschedule, or cancel appointments conveniently. Furthermore, automated **SMS and email notifications** ensure that patients are reminded of their scheduled visits, reducing missed appointments.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

The system also aimed to provide a **centralized platform for storing and managing patient records**, ensuring that dentists could efficiently access and update patient histories. This was accomplished through a **secure patient records management system**, where dentists can retrieve, update, and store treatment data in real time. The implementation of a **customizable dental chart** allows dentists to document treatments accurately and track each patient's dental progress.

The objective of incorporating **analytics and reporting features** to help the clinic optimize its operations was achieved through the system's **dashboard and data analysis tools**. These features provide insights into the most availed services, patient demographics, and appointment statistics, aiding in decision-making and clinic management.

The study also aimed to develop the system using **PHP, HTML, CSS, JavaScript, and XAMPP** as its technological foundation. This objective was achieved by designing and implementing the system using these technologies, ensuring a **user-friendly interface and seamless performance**. Furthermore, the system was rigorously tested through **alpha and beta testing**, confirming its functionality, reliability, usability, and efficiency based on **ISO/IEC 25010:2011** software quality standards.

Through the successful fulfillment of these objectives, the system proves to be a **valuable innovation** that improves both **operational efficiency** and **patient care** within the dental clinic. While the system has met its primary goals, continuous enhancements such as mobile application development and integration with imaging devices can further



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

optimize its capabilities and ensure its long-term relevance in modern dental practice management.

1. **Enhanced Efficiency:** The system significantly reduced administrative workload through automated scheduling and patient management.
2. **Improved Patient Experience:** Patients benefited from the online booking system, automated notifications, and personalized treatment plans, enhancing overall satisfaction.
3. **Secure and Centralized Data Management:** The system ensured secure and centralized patient record storage, protecting sensitive information while improving accessibility.
4. **High User Satisfaction:** Both IT experts and actual users rated the system highly, demonstrating its user-friendly design and effective functionality.

RECOMMENDATIONS

To maximize the system's potential, the following recommendations are proposed:

1. **Expand Accessibility:** Develop a mobile application version to complement the web-based platform, improving accessibility for patients and staff.
2. **Enhance Compatibility:** Address minor compatibility issues to ensure seamless operation across all devices and systems.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

3. **Integrate Imaging Devices:** Enable integration with dental imaging equipment to streamline diagnostic and treatment processes.
4. **Continuous User Training:** Conduct regular training programs for staff and patients to maximize the system's utilization.
5. **Future Enhancements:** Consider incorporating advanced features such as teleconsultation and AI-based diagnostic support to further improve patient care and clinic operations.
6. **Regular System Updates:** Implement scheduled updates to address emerging technological trends, improve performance, and respond to user feedback.
7. **Enhance Billing Features:** Improve the billing system by introducing automated insurance claim processing and detailed invoices to increase transparency and reduce administrative effort for clinic staff and patients.



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

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PAMANTASAN NG LUNGSOD NG MUNTINLUPA

APPENDICES

RELEVANT SOURCE CODE

Login Form

```
<?php
if (session_status() === PHP_SESSION_NONE) {
    session_start();
    if (isset($_SESSION['role'])) {
        switch ($_SESSION['role']) {
            case 'patient':
                header("Location: ../patients/patient_home.php");
                break;
            case 'dentist':
                header("Location: ../dentist/dentist_dashboard.php");
                break;
            case 'admin':
                header("Location: ../admin/admin_dashboard.php");
                break;
        }
        exit();
    }
}

if (empty($_SESSION['csrf_token'])) {
    $_SESSION['csrf_token'] = bin2hex(random_bytes(32));
}
?>

<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Arciaga - Juntilla TMJ Ortho Dental Clinic - Login</title>
    <link href="https://fonts.googleapis.com/css2?family=Varela+Round&display=swap" rel="stylesheet">
        <link rel="stylesheet">
    <link href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/6.0.0-beta3/css/all.min.css" rel="stylesheet" href="..>
        <link rel="stylesheet" href="..>
            <script src="https://cdn.jsdelivr.net/npm/sweetalert2@11"></script>
</head>
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
<body>
    <div class="container">
        <div class="brand-section">
            
            <h1 class="clinic-name">ARCIAGA - JUNTILLA TMJ - ORTHO DENTAL
CLINIC</h1>
            <p class="clinic-tagline">OUR PASSION IS YOUR SMILE.</p>
        </div>
        <div class="login-container">
            <div class="login-form">
                <h2 class="title">Welcome!</h2>
                <p class="subtitle">Please login to access your
account.</p>

                <?php if (isset($_SESSION['error_message']) &&
!empty($_SESSION['error_message'])): ?>
                    <div class="error-message">
                        <?php echo
htmlspecialchars($_SESSION['error_message']); ?>
                        <?php if
(isset($_SESSION['verification_required']) &&
$_SESSION['verification_required']): ?>
                            <br><br>
                            <a href="resend_verification_form.php">Didn't
receive verification email?</a>
                        <?php endif; ?>
                    </div>
                    <?php
                        unset($_SESSION['error_message']);
                        unset($_SESSION['verification_required']);
                    endif;
                ?>

                <?php
                    if (isset($_SESSION['password_reset_success'])) {
                        echo "<div class='success-message'>" .
$_SESSION['password_reset_success'] . "</div>";
                        unset($_SESSION['password_reset_success']);
                    }
                ?>
                <?php if (isset($_SESSION['password_reset_success'])): ?>
                    <div class="success-message"><?php echo
htmlspecialchars($_SESSION['password_reset_success']); ?></div>
                    <?php unset($_SESSION['password_reset_success']); ?>
                <?php endif; ?>
                <?php
                    if (isset($_SESSION['status'])) {
                        echo "<p style='color: red;'>" . $_SESSION['status']
. "</p>";
                    }
                ?>
            </div>
        </div>
    </div>

```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
        unset($_SESSION['status']);
    }
?>

<?php if (isset($_SESSION['logout_message'])): ?>
    <div class="success-message"><?php echo
htmlspecialchars($_SESSION['logout_message']); ?></div>
    <?php unset($_SESSION['logout_message']); ?>
    <?php endif; ?>

    <form action="login.php" method="POST" id="loginForm">
        <input type="hidden" name="csrf_token" value="<?php
echo $_SESSION['csrf_token']; ?>">
        <div class="input-group">
            <i class="fa fa-user icon"></i>
            <input type="text" name="username" required
class="input" placeholder="username"
value="<?php echo
isset($_SESSION['remembered_username']) ?
htmlspecialchars($_SESSION['remembered_username']) :
(isset($_POST['username']) ? htmlspecialchars($_POST['username']) : '');
?>">
        </div>
        <div class="input-group">
            <i class="fa fa-lock icon"></i>
            <input type="password" name="password" required
class="input" placeholder="password">
            <i class="fa fa-eye-slash toggle-password"
id="togglePassword"></i>
        </div>
        <button type="submit" class="login-
btn">LOGIN</button>
        <div class="additional-options">
            <a href="forgotpassword.php">Forgot Password?</a>
            <a href="signup_form.php">Create Account</a>
        </div>
        <hr class="line">
        <p class="reserved">© 2024 Arciaga-Juntilla Ortho
Dental Clinic. <br><br>All rights reserved.</p>
    </form>
</div>

</div>
</div>

<script>
    document.addEventListener('DOMContentLoaded', function () {
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
const togglePassword = document.getElementById('togglePassword');
const password =
document.querySelector('input[type="password"]');

if (togglePassword && password) {
    togglePassword.addEventListener('click', function () {
        const type = password.getAttribute('type') === 'password'
? 'text' : 'password';
        password.setAttribute('type', type);
        this.classList.toggle('fa-eye');
        this.classList.toggle('fa-eye-slash');
    });
}
</script>
</body>
</html>
```

Book Appointment

```
<?php
require_once '../db_connect.php';
require_once '../session_mngmnt.php';

header('Content-Type: application/json');

function sendJsonResponse($data)
{
    $jsonData = json_encode($data);
    if ($jsonData === false) {
        logError("JSON encode error: " . json_last_error_msg());
        echo json_encode(["status" => "error", "message" => "Error
encoding response"]);
    } else {
        echo $jsonData;
    }
    exit;
}

function isLoggedIn()
{
    return isset($_SESSION['patient_id']) &&
isset($_SESSION['username']);
}

function logError($message)
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
{  
    error_log(date('[Y-m-d H:i:s] ') . $message . PHP_EOL, 3,  
    'error.log');  
}  
  
$action = $_POST['action'] ?? '';  
try {  
    switch ($action) {  
        case 'fetch_slots':  
            $slots = fetchAvailableSlots($conn);  
            sendJsonResponse($slots);  
            break;  
        case 'book_appointment':  
            bookAppointment($conn);  
            break;  
        case 'cancel_appointment':  
            cancelAppointment($conn);  
            break;  
        default:  
            sendJsonResponse(['status' => 'error', 'message' => 'Invalid  
action.']);  
    }  
} catch (Exception $e) {  
    logError("Unhandled exception: " . $e->getMessage());  
    sendJsonResponse(['status' => 'error', 'message' => 'An unexpected  
error occurred.']);  
}  
  
function fetchAvailableSlots($conn)  
{  
    $selectedDate = $_POST['date'] ?? null;  
  
    if (!$selectedDate) {  
        $selectedDate = getNextAvailableDate($conn);  
    }  
  
    $sql = "SELECT appointment_time,  
           COUNT(CASE WHEN status = 'confirmed' THEN 1 END) as  
confirmed_count,  
  
           COUNT(*) as total_count  
      FROM appointments  
     WHERE appointment_date = ? AND status != 'cancelled'  
       GROUP BY appointment_time";  
  
    $stmt = $conn->prepare($sql);  
    if (!$stmt) {
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
        throw new Exception("Error preparing statement: " . $conn->error);
    }

    $stmt->bind_param("s", $selectedDate);
    if (!$stmt->execute()) {
        throw new Exception("Error executing statement: " . $stmt->error);
    }

    $result = $stmt->get_result();
    $bookedSlots = [];
    while ($row = $result->fetch_assoc()) {
        $bookedSlots[$row['appointment_time']] = [
            'confirmed' => $row['confirmed_count'],
            'total' => $row['total_count']
        ];
    }

    $availableSlots = [];
    $startTime = 9;
    $endTime = 17;

    for ($i = $startTime; $i < $endTime; $i++) {
        $slot = sprintf("%02d:00", $i);
        $displayTime = convertTo12HourFormat($slot);
        $confirmedCount = $bookedSlots[$displayTime]['confirmed'] ?? 0;
        $totalCount = $bookedSlots[$displayTime]['total'] ?? 0;
        $availableCount = 2 - $confirmedCount;

        $availableSlots[] = [
            'time' => $displayTime,
            'available' => max(0, $availableCount),
            'pending' => $totalCount - $confirmedCount
        ];
    }

    return [
        'date' => $selectedDate,
        'slots' => $availableSlots
    ];
}

function getNextAvailableDate($conn)
{
    $today = date('Y-m-d');
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
$nextDate = date('Y-m-d', strtotime($today . ' +1 day'));

while (true) {
    if (date('w', strtotime($nextDate)) == 0) {
        $nextDate = date('Y-m-d', strtotime($nextDate . ' +1 day'));
        continue;
    }

    $sql = "SELECT COUNT(*) as slot_count
            FROM appointments
            WHERE appointment_date = ? AND status = 'confirmed'
            GROUP BY appointment_time
            HAVING slot_count >= 2";

    $stmt = $conn->prepare($sql);
    if (!$stmt) {
        throw new Exception("Error preparing statement: " . $conn-
>error);
    }

    $stmt->bind_param("s", $nextDate);
    if (!$stmt->execute()) {
        throw new Exception("Error executing statement: " . $stmt-
>error);
    }

    $result = $stmt->get_result();
    if ($result->num_rows < 9) {
        return $nextDate;
    }

    $nextDate = date('Y-m-d', strtotime($nextDate . ' +1 day'));
}

function formatServices($jsonServices) {
    $services = json_decode($jsonServices, true);
    if (!is_array($services)) {
        return strtoupper($jsonServices);
    }

    $formattedServices = array();
    foreach ($services as $service) {
        if (is_array($service) || is_object($service)) {
            if (isset($service['value']) && $service['value'] === 'other' && isset($service['specification'])) {

```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
$formattedServices[] = "OTHER: " .  
stroupper($service['specification']);  
}  
} else {  
    $formattedServices[] = strtoupper($service);  
}  
}  
  
return implode(', ', $formattedServices);  
}  
  
function bookAppointment($conn) {  
    logError("POST data received: " . print_r($_POST, true));  
    if (!isLoggedIn()) {  
        logError("User is not logged in.");  
        throw new Exception("User not logged in.");  
    }  
  
    $selected_services = isset($_POST['selected_services']) ?  
formatServices($_POST['selected_services']) : '';  
    $complaint = strtoupper(trim($_POST['complaint'] ?? ''));  
    $selectedTimeSlot = strtoupper($_POST['time_slot'] ?? '');  
    $appointmentDate = strtoupper($_POST['date'] ?? '');  
    $other_details = strtoupper($_POST['other_details'] ?? '');  
    $follow_up = strtoupper($_POST['followup'] ?? '');  
    $patient_id = $_SESSION['patient_id'];  
    $username = $_SESSION['username'];  
  
    // Check if this is a rescheduling  
    $original_appointment_id = $_POST['appointment_id'] ?? null;  
  
    logError("Booking/Rescheduling appointment for patient ID:  
$patient_id with details: selected_services = $selected_services,  
complaint = $complaint, time_slot = $selectedTimeSlot, date =  
$appointmentDate, original_appointment_id = $original_appointment_id");  
  
    if (empty($selected_services) || empty($complaint) ||  
empty($selectedTimeSlot) || empty($appointmentDate)) {  
        logError("Required fields are missing: selected_services =  
$selected_services, complaint = $complaint, time_slot =  
$selectedTimeSlot, date = $appointmentDate");  
        throw new Exception("Please fill in all required fields.");  
    }  
  
    $today = date('Y-m-d');  
    if ($appointmentDate <= $today) {  
        logError("Attempt to book an appointment for today or past date:  
$appointmentDate");  
    }
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
        throw new Exception("Cannot book appointments for today or past
dates.");
    }

$conn->begin_transaction();

try {
    // For rescheduling, update the existing appointment
    if ($original_appointment_id) {
        // First check if the appointment exists and belongs to the
patient
        $checkSql = "SELECT appointment_date, appointment_time FROM
appointments
                WHERE appointment_id = ? AND patient_id = ?";
        $stmt = $conn->prepare($checkSql);
        if (!$stmt) {
            throw new Exception("Error preparing check statement: " .
$conn->error);
        }

        $stmt->bind_param("ii", $original_appointment_id,
$patient_id);
        if (!$stmt->execute()) {
            throw new Exception("Error checking appointment: " .
$stmt->error);
        }

        $result = $stmt->get_result();
        $originalAppointment = $result->fetch_assoc();

        if (!$originalAppointment) {
            throw new Exception("Original appointment not found.");
        }

        // Check availability for the new slot
        $sql = "SELECT COUNT(*) as slot_count
                FROM appointments
                WHERE appointment_date = ?
                AND appointment_time = ?
                AND status NOT IN ('cancelled', 'rescheduled')";

        $stmt = $conn->prepare($sql);
        $stmt->bind_param("ss", $appointmentDate, $selectedTimeSlot);

        $stmt->execute();
        $result = $stmt->get_result();
        $row = $result->fetch_assoc();
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
if ($row['slot_count'] >= 2) {
    throw new Exception("Selected time slot is no longer
available.");
}

// Update the existing appointment with rescheduled
information
$updateSql = "UPDATE appointments
              SET rescheduled_date = ?,
                  rescheduled_time = ?,
                  status = 'rescheduled'
              WHERE appointment_id = ? AND patient_id = ?";

$stmt = $conn->prepare($updateSql);
if (!$stmt) {
    throw new Exception("Error preparing update statement: " .
. $conn->error);
}

$stmt->bind_param("ssii",
                  $appointmentDate,      // rescheduled_date
                  $selectedTimeSlot,     // rescheduled_time
                  $originalAppointment_id,
                  $patient_id
);

if (!$stmt->execute()) {
    throw new Exception("Error updating appointment: " .
$stmt->error);
}

// Create notification for rescheduling
$notification_message = "Patient ID: $patient_id has
rescheduled their appointment from " .
    "{$originalAppointment['appointment_date']}-
{$originalAppointment['appointment_time']} to " .
    "$appointmentDate $selectedTimeSlot.";

} else {
    // This is a new appointment
    // Check slot availability
    $sql = "SELECT COUNT(*) as slot_count
            FROM appointments
            WHERE appointment_date = ?

                AND appointment_time = ?
                AND status NOT IN ('cancelled', 'rescheduled')";
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
$stmt = $conn->prepare($sql);
$stmt->bind_param("ss", $appointmentDate, $selectedTimeSlot);
$stmt->execute();
$result = $stmt->get_result();
$row = $result->fetch_assoc();

if ($row['slot_count'] >= 2) {
    throw new Exception("Selected time slot is no longer
available.");
}

// Insert new appointment
$sql = "INSERT INTO appointments
        (selected_services, username, complaint,
other_details, followup,
                    patient_id, appointment_time, appointment_date,
status)
        VALUES (?, ?, ?, ?, ?, ?, ?, ?, ?, 'pending')";

$stmt = $conn->prepare($sql);
$stmt->bind_param("ssssssss",
        $selected_services,
        $username,
        $complaint,
        $other_details,
        $follow_up,
        $patient_id,
        $selectedTimeSlot,
        $appointmentDate
);

if (!$stmt->execute()) {
    throw new Exception("Error creating new appointment: " .
$stmt->error);
}

$notification_message = "A new appointment has been scheduled
for patient ID: $patient_id.";
}

// Send notifications to dentists
$dentist_sql = "SELECT dentist_id FROM dentist_profiles";
$dentist_result = $conn->query($dentist_sql);

while ($dentist_row = $dentist_result->fetch_assoc()) {
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
$dentist_id = $dentist_row['dentist_id'];
$notification_sql = "INSERT INTO notifications (patient_id,
message, dentist_id) VALUES (?, ?, ?)";

$stmt = $conn->prepare($notification_sql);
$stmt->bind_param("iss", $patient_id, $notification_message,
$dentist_id);
$stmt->execute();
}

$conn->commit();

// Fetch updated slots
$updatedSlots = fetchAvailableSlots($conn);

sendJsonResponse([
    'status' => 'success',
    'message' => $original_appointment_id ? 'Appointment
rescheduled successfully' : 'Appointment booked successfully',
    'updatedSlots' => $updatedSlots
]);

} catch (Exception $e) {
    $conn->rollback();
    logError("Error during appointment booking/rescheduling: " . $e-
>getMessage());
    throw $e;
}
}

function cancelAppointment($conn)
{
    if (!isLoggedIn()) {
        throw new Exception("User not logged in.");
    }

$appointment_id = $_POST['appointment_id'] ?? '';
$patient_id = $_SESSION['patient_id'];

if (empty($appointment_id)) {
    throw new Exception("Appointment ID is required.");
}

$sql = "UPDATE appointments SET status = 'cancelled' WHERE
appointment_id = ? AND patient_id = ?";

$stmt = $conn->prepare($sql);
if (!$stmt) {
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
        throw new Exception("Error preparing statement: " . $conn->error);
    }

    $stmt->bind_param("ss", $appointment_id, $patient_id);
    if (!$stmt->execute()) {
        throw new Exception("Error executing statement: " . $stmt->error);
    }

    sendJsonResponse(["status" => "success", "message" => "Appointment cancelled successfully."]);
}

function convertTo12HourFormat($time)
{
    return date("h:i A", strtotime($time));
}
```

Update Treatment

```
<?php
// update_treatment.php
error_reporting(E_ALL);
ini_set('display_errors', 1);

require_once '../db_connect.php';

header('Content-Type: application/json');

if ($_SERVER['REQUEST_METHOD'] !== 'POST') {
    echo json_encode(['success' => false, 'message' => 'Invalid request method']);
    exit;
}

try {
    $conn->begin_transaction();

    $required_fields = ['treatment_id', 'patient_id', 'toothNumber', 'treatment', 'date', 'status', 'progress'];
    foreach ($required_fields as $field) {
        if ($field === 'toothNumber' && $_POST[$field] === '0') {
            continue;
        }

        if (!isset($_POST[$field]) || empty($_POST[$field])) {
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
        throw new Exception("$field is required");
    }

$treatment_id = intval($_POST['treatment_id']);
$patient_id = intval($_POST['patient_id']);
$toothNumber = intval($_POST['toothNumber']);
$treatment = $_POST['treatment'];
$date = $_POST['date'];
$status = $_POST['status'];
$progress = $_POST['progress'];
$notes = $_POST['notes'] ?? '';

// Verify treatment exists and belongs to patient
$verify_stmt = $conn->prepare("SELECT treatment_id FROM treatments
WHERE treatment_id = ? AND patient_id = ?");
if (!$verify_stmt) {
    throw new Exception("Prepare verify statement failed: " . $conn->error);
}

$verify_stmt->bind_param("ii", $treatment_id, $patient_id);
if (!$verify_stmt->execute()) {
    throw new Exception("Error executing verify statement: " .
$verify_stmt->error);
}
$verify_result = $verify_stmt->get_result();

if ($verify_result->num_rows === 0) {
    throw new Exception("Treatment not found or doesn't belong to
this patient");
}
$verify_stmt->close();

// Update treatment - now including progress
$update_stmt = $conn->prepare(
    "UPDATE treatments
    SET tooth_number = ?,
        treatment = ?,
        date = ?,
        status = ?,
        progress = ?,
        notes = ?
    WHERE treatment_id = ? AND patient_id = ?
");
if (!$update_stmt) {
    throw new Exception("Prepare update statement failed: " .
$conn->error);
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
}

$update_stmt->bind_param(
    "isssssii",
    $toothNumber,
    $treatment,
    $date,
    $status,
    $progress,
    $notes,
    $treatment_id,
    $patient_id
);

if (!$update_stmt->execute()) {
    throw new Exception("Error updating treatment: " . $update_stmt-
>error);
}

// Store affected rows before closing the statement
$affected_rows = $update_stmt->affected_rows;
$update_stmt->close();

// Update tooth_data status
$tooth_stmt = $conn->prepare("
    UPDATE tooth_data
    SET status = ?,
        last_checked = ?
    WHERE patient_id = ? AND tooth_number = ?
");
if (!$tooth_stmt) {
    throw new Exception("Prepare tooth data statement failed: " .
$conn->error);
}

$tooth_stmt->bind_param(
    "ssii",
    $status,
    $date,
    $patient_id,
    $toothNumber
);

if (!$tooth_stmt->execute()) {
    throw new Exception("Error updating tooth data: " . $tooth_stmt-
>error);
}
$tooth_stmt->close();
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

```
$conn->commit();

echo json_encode([
    'success' => true,
    'message' => 'Treatment updated successfully',
    'affected_rows' => $affected_rows
]);
exit;

} catch (Exception $e) {
    if ($conn->connect_errno) {
        $conn->rollback();
    }
    error_log("Error in update_treatment.php: " . $e->getMessage());
    echo json_encode([
        'success' => false,
        'message' => $e->getMessage()
    ]);
    exit;
} finally {
    if (isset($conn) && !$conn->connect_errno) {
        $conn->close();
    }
}
```



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

EVALUATION TOOL SAMPLE

SAMPLE EVALUATION INSTRUMENT (FOR IT EXPERTS)



PAMANTASAN NG LUNGSOD NG MUNTINLUPA GRADUATE STUDIES

N.B.P. RESERVATION POBLACION, MUNTINLUPA CITY

EVALUATION INSTRUMENT (for IT Experts)

"CAPSTONE TITLE"

General Direction: Please accomplish this questionnaire very carefully and honestly. Please rest assured that any information that you supply will be treated with the greatest confidentiality and anonymity.

Name: _____

Position: _____

Sex: _____ Male _____ Female

Instruction: Please evaluate the prototype by using the given scale and placing a checkmark (/) under the corresponding numerical rating.

Numerical Rating	Equivalent
5	Excellent
4	Very Good
3	Good
2	Fair
1	Poor

INDICATORS	5	4	3	2	1
A. Functional Suitability					
1. Functional Completeness – the set of functions covers all the specified tasks and user objectives					
2. Functional Correctness – a product or system provides the correct results with the needed degree of precision					
3. Functional Appropriateness – the functions facilitate the accomplishment of specified tasks and objectives					
B. Performance Efficiency					
1. Time Behavior – the response and processing times and amount rates of a product or system, when performing its functions, meet requirements					
2. Resource Utilization - the amounts and types of resources used by a product or system, when performing its functions, meet requirements					
3. Capacity - the maximum limits of a product or system parameter meet requirements					
C. Compatibility					
1. Co-existence – product can perform its required functions efficiently while sharing a common environment and resources with other products, without detrimental impact on any other product					
2. Interoperability – two or more systems, products or components can exchange information and use the information that has been exchanged					
D. Usability					
1. Appropriateness Recognizability – users can recognize whether a product or system is appropriate for their needs					
2. Learnability – easy to learn to use the product or system					
3. Operability – product or system has attributes that make it easy to operate and control					
4. User Error Protection – system protects users against making errors					
5. User Interface Aesthetics – user interface enables pleasing and satisfying interaction for the user					
6. Accessibility – product or system can be used by people with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use					
E. Reliability					



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GRADUATE STUDIES

N.B.P. RESERVATION POBLACION, MUNTINLUPA CITY

1. Maturity – system, product or component meets needs for reliability under normal operation				
2. Availability – system, product or component is operational and accessible when required for use				
3. Fault Tolerance - system, product or component operates as intended despite the presence of hardware or software faults				
4. Recoverability - in the event of an interruption or a failure, a product or system can recover the data directly affected and re-establish the desired state of the system				
F. Security				
1. Confidentiality - a product or system ensures that data are accessible only to those authorized to have access				
2. Integrity - system, product or component prevents unauthorized access to, or modification of, computer programs or data				
3. Non-Repudiation - actions or events can be proven to have taken place, so that the events or actions cannot be repudiated later				
4. Accountability - the actions of an entity can be traced uniquely to the entity				
5. Authenticity - the identity of a subject or resource can be proved to be the one claimed				
G. Maintainability				
1. Modularity – system or computer program is composed of discrete components such that a change to one component has minimal impact on other components				
2. Reusability - an asset can be used in more than one system, or in building other assets				
3. Analysability - provide mechanisms for the product or system to analyze its own faults and provide reports prior to a failure or other event				
4. Modifiability - product or system can be effectively and efficiently modified without introducing defects or degrading existing product quality				
5. Testability - effectiveness and efficiency with which test criteria can be established for a system, product or component and tests can be performed to determine whether those criteria have been met				
H. Portability				
1. Adaptability – a product or system can effectively and efficiently be adapted for different or evolving hardware, software or other operational or usage environments				
2. Installability - effectiveness and efficiency with which a product or system can be successfully installed and/or uninstalled in a specified environment				
3. Replaceability - product can replace another specified software product for the same purpose in the same environment				

Summary:

Sum

- a. Functional Suitability -----
- b. Performance Efficiency -----
- c. Compatibility -----
- d. Usability -----
- e. Reliability -----
- f. Security -----
- g. Maintainability -----
- h. Portability -----

Total Score -----

Action Taken: _____



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SAMPLE EVALUATION INSTRUMENT (FOR ACTUAL USERS)



PAMANTASAN NG LUNGSOD NG MUNTINLUPA GRADUATE STUDIES

N.B.P. RESERVATION POBLACION, MUNTINLUPA CITY

EVALUATION INSTRUMENT (for Users)

"CAPSTONE TITLE"

Name: _____ Position: _____

Sex: _____ Male _____ Female

Instruction: Please evaluate the prototype by using the given scale and placing a checkmark (✓) under the corresponding numerical rating.

Numerical Rating

5	Excellent
4	Very Good
3	Good
2	Fair
1	Poor

Equivalent

INDICATORS	5	4	3	2	1
A. Functionality					
1. The software performs the task assigned.					
2. The software produces expected results.					
3. The software meets existing requirements.					
B. Reliability					
1. The software handles errors.					
2. The software produces accurate content.					
3. The software has an updated content.					
C. Usability					
1. The software understood easily.					
2. The software can be operated with minimal effort.					
3. The software is user-friendly.					
D. Efficiency					
1. The software produces the desired result.					
2. The software meets existing efficiency standards.					
3. The software behaves in timely manner.					
E. Portability					
1. The software can be adopted so easily.					
2. The software can be installed easily.					

Summary: _____ Sum: _____

- a. Functionality _____
- b. Reliability _____
- c. Usability _____
- d. Efficiency _____
- e. Portability _____

Total Score _____

Action Taken: _____

Note: Adopted and revised from ISO/IEC 25010 - Software Quality Characteristics



PAMANTASAN NG LUNGSOD NG MUNTINLUPA

SUMMARY OF THE OVERALL MEAN SCORE EVALUATION BY IT EXPERTS

INDICATOR	MEAN	DESCRIPTIVE MEANING
Functionality Suitability	4.60	Excellent
Performance Efficiency	4.40	Excellent
Compatibility	4.20	Very Good
Usability	4.47	Excellent
Reliability	4.45	Excellent
Security	4.32	Excellent
Maintainability	4.56	Excellent
Portability	4.47	Excellent
Overall Mean	4.43	Excellent

The summary of the overall weighted mean evaluation by the IT respondents shows an average rating of 4.43, classified as "Excellent." Functional Suitability received a score of 4.60, rated "Excellent," due to the system meeting all functional requirements, ensuring smooth and complete functionality. Performance Efficiency was rated 4.40 and also classified as "Excellent," reflecting the system's optimal performance in response times and efficient resource utilization. Compatibility scored 4.20 and was rated "Very Good," indicating that the system effectively coexists with other platforms, though minor improvements in interoperability could enhance this further. Usability was scored 4.47 and rated "Excellent" for its intuitive interface, ease of navigation, and minimal user error occurrences. Reliability received a score of 4.45 and was rated "Excellent," demonstrating that the system operates consistently and is dependable under various conditions. Security



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scored 4.32, rated "Excellent," as it ensures confidentiality and data protection, with slight enhancements possible to further strengthen security measures. Maintainability, with a score of 4.56 and an "Excellent" rating, reflects the system's ease of updating and modifying, contributing to its long-term sustainability. Portability scored 4.47, rated "Excellent," for its adaptability and ease of installation across different environments. Overall, the system demonstrates robust performance and a user-friendly design, with most areas rated as "Excellent" by IT professionals, including IT support staff and web developers.

SUMMARY OF THE OVERALL MEAN SCORE EVALUATION BY THE ACTUAL USER

INDICATOR	MEAN	DESCRIPTIVE MEANING
Functionality	4.75	Excellent
Reliability	4.56	Excellent
Usability	4.77	Excellent
Portability	4.80	Excellent
Overall Mean	4.714	Excellent

The evaluation results show that the system performs exceptionally well across all sections. For "Functionality", the mean score of 4.75 reflects a high level of effectiveness and efficiency in performing its tasks. The "Reliability" has a mean of 4.56, indicating the system's stability and dependability. In terms of "Usability", with a mean score of 4.77, the system is seen as user-friendly and easy to navigate. The "Efficiency" section, with a mean of 4.69, shows that the system completes tasks quickly and effectively. Lastly, the



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“Portability” section received a mean of 4.80, highlighting the system’s flexibility across different devices and platforms. The overall mean score of 4.71 further emphasizes the system’s strong performance and high user satisfaction.



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SAMPLE INPUT/OUTPUT/REPORTS

LETTER TO CONDUCT STUDY



PAMANTASAN NG LUNGSOD NG MUNTINLUPA
COLLEGE OF INFORMATION TECHNOLOGY AND COMPUTER STUDIES
N.B.P. RESERVATION POBLACION, MUNTINLUPA CITY

03/19/2024

MR. NIERL JUNTILLA

Owner

*Arciaga - Juntilla TMJ Ortho Dental Clinic
Poblacion, Muntinlupa City*

Dear Sir,

The undersigned, third-year college students from Pamantasan ng Lungsod ng Muntinlupa, respectfully seek permission to conduct a study within your esteemed Dental Clinic. This study constitutes an integral component of our capstone project, fulfilling one of the academic prerequisites for graduation.

The title of our capstone project is "DENTAL CLINIC MANAGEMENT WITH APPOINTMENT SYSTEM". We believe that conducting our study within your Dental Clinic would provide valuable insights and contribute to the advancement of our capstone project's objectives.

In connection with this, we intend to administer interviews, observations, or distribute survey questionnaires among your employees, depending on the most suitable method for data gathering.

Please rest assured that all data and results obtained from this study will be treated with the utmost confidentiality and will be utilized solely for educational purposes.

Your approval to conduct this study within your Dental Clinic would be greatly appreciated. We are eager to commence our research and are grateful for your consideration of our request.

Thank you for your attention to this matter.

Sincerely,

*Sabrina
Lozano Cherilyn N.
Medallion Andress*

Publico Macky Alexis C.

Noted by:

Kaycee R. Mendez
Ms. KAYCEE R. MENDEZ, MIT, LPT
Capstone Project Adviser, College of Information Technology and Computer Studies

Nierl M. Juntilla
MARCH 10, 2024



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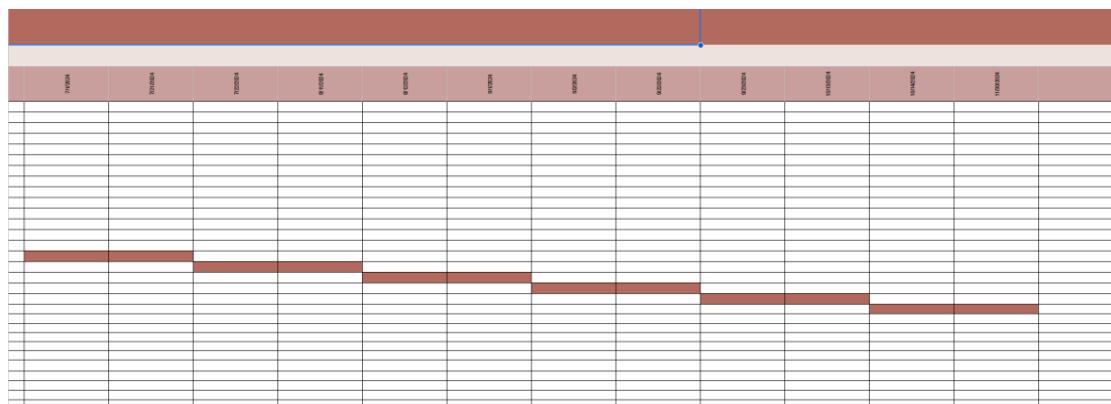
GANNT CHART

GANTT CHART PROJECT TABLE

DENTAL CLINIC MANAGEMENT AND APPOINTMENT SYSTEM FOR ARCILLA TMA ORTHO DENTAL CLINIC WITH CUSTOMIZABLE DENTAL CHART

PROJECT NAME:

Task Name	Assigned To	Start Date	End Date	% Complete	3/1/2024	4/1/2024	4/15/2024	4/30/2024	5/15/2024	5/30/2024	6/15/2024	
Research & Planning Phase												
Interviewing Beneficiaries	All Members	3/7/2024	4/10/2024	100%								
Gathering Requirements	All Members	4/11/2024	4/15/2024	100%								
Consulting Beneficiary Requirements 1.0	Andrea & Macky	4/16/2024	4/20/2024	100%								
Creating a database flow design	Andrea & Cheelyn	4/21/2024	4/25/2024	100%								
Working on UI and creating a flowchart design	Cheelyn & Macky	4/26/2024	4/30/2024	100%								
Designing UI interface	Cheelyn N. Lopez	5/1/2024	5/10/2024	100%								
Finding a Planning Design and Researching for Related Literature	All Members	5/11/2024	5/21/2024	100%								
Finalizing Chapter 1.3	All Members	5/22/2024	6/1/2024	100%								
Defense Proposal (CHAPTER 1 - 3)												
Reviewing Flowchart and methodology	All Members	6/1/2024	6/15/2024	100%								
Applying Suggestion and Revision to Chapter 1.3	All Members	6/23/2024	6/30/2024	100%								
Consulting Beneficiary Requirements 1.1	Cheelyn & Macky	6/27/2024	6/30/2024	100%								
Developing System												
Developing Landing page	Cheelyn & Macky	7/1/2024	7/20/2024	100%								
Developing Appointment system	Cheelyn N. Lopez	7/22/2024	8/1/2024	100%								
Developing Dental Chart system	Cheelyn N. Lopez	8/1/2024	8/15/2024	100%								
Developing Client/Patient Interface	Cheelyn N. Lopez	8/23/2024	9/2/2024	100%								
Developing Dental Interface	Cheelyn N. Lopez	9/23/2024	10/1/2024	100%								
Developing Dental Interface	Cheelyn N. Lopez	10/4/2024	11/30/2024	100%								
Discussion												
Developing Implementation Plan	Macky Alexa C. Publico	12/1/2024	12/1/2024	100%								
Developing Alpha and Beta testing plan	Macky Alexa C. Publico	12/8/2024	12/14/2024	100%								
Conducting Survey to Client/Patient, Dentist, Actual IT	Macky Alexa C. Publico	12/15/2024	12/21/2024	100%								
Conducting Recommendation	All Members	1/2/2025	1/19/2025	100%								
Finalizing Test Result	Macky Alexa C. Publico	1/22/2024	12/30/2024	100%								
Result												
Summarizing Client/Patient, Dentist and actual IT Suggestion	All Members	1/23/2024	1/4/2025	100%								
Conducting Capabilities and Limitation	All Members	1/5/2025	1/11/2025	100%								
Conducting Recommendation	All Members	1/12/2025	1/19/2025	100%								
Defense Proposal (CHAPTER 4 - 5)		1/21/2025	1/21/2025	100%								





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USER'S GUIDE



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Users Manual Content

Introduction

The Dental Clinic Management and Appointment System for Arciaga-Juntilla Dental Clinic with Customizable Dental Chart is a web-based platform created to support efficient dental care through digital appointment scheduling, dental record keeping, and treatment monitoring. The system includes a visual dental chart to allow dentists to update tooth conditions interactively. It is designed to improve service for both patients and dentists by reducing manual processes and providing real-time access to dental data.

System Requirements

System Requirements The Dental Clinic Management and Appointment System for Arciaga-Juntilla Dental Clinic with Customizable Dental Chart is accessible through standard web browsers. The following information is provided as a guideline for minimum system requirements for using the system effectively.

Authoring:

- **Operating System:** Windows 10 or higher / macOS / Android / iOS
- **Device:** Desktop, Laptop, Tablet, or Smartphone
- **Web Browser:** Google Chrome, Mozilla Firefox, Microsoft Edge, or Safari (latest versions)
- **Processor:** Intel Core i3, AMD Ryzen 3 or higher recommended
- **Memory (RAM):** 8 GB or more recommended
- **Internet Connection:** Minimum 3 Mbps recommended for optimal performance
- **Display Resolution:** Minimum 1024x768 (1366x768 recommended)

Installation

The Dental Clinic Management and Appointment System for Arciaga-Juntilla Dental Clinic with Customizable Dental Chart is a web-based platform and does not require installation on local devices. It is accessible through any supported web browser with an internet connection. However, users must ensure that their browser is up-to-date for full compatibility.

To access the system:

For Dentists:

- Open the website link to the preferred web browser.
- Go to the system URL provided by the clinic administrator.
- Enter the assigned username and password.
- Click "Login" to access the dashboard.



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For Patients:

- Open the web browser.
- Visit the dental clinic's official appointment website.
- If you already have an account, log in using the email and password.
- New users may click "Create Account" to create a new account.

How to Use the System:

For Dentist:

Dashboard:

Upon logging in, dentists are directed to the main dashboard, which provides quick access to key information. This includes a preview of upcoming appointments, patient demographics, and a breakdown of the most availed services. Additionally, the dashboard displays a monthly overview of appointments, helping dentists track clinic activity and service trends.

Calendar:

The calendar displays scheduled appointments in a daily, weekly, or monthly view. Dentists can click on specific dates to view or manage appointments.

View Appointments:

Dentists can access a list of all appointments status from the calendar section. Each entry provides details such as patient name, time, and type of service.

Patients:

The "Patients" section displays a list of all registered patients.

- Click "View Details" to open a patient's profile.
- The profile includes personal information, appointment history, treatment plans, and uploaded documentation.

Appointment History:

Will see the all appointment history of the patients.

To Update Dental Chart:

- Click "Treatment Planning" to open a patient's dental chart.
- Select the appropriate tooth to mark a condition or procedure (e.g., filling, extraction, crown), add the date, status, progress, and notes.
- Click "Save" to update the dental chart.



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Add Documentation:

- Upload X-ray images, prescriptions, or other relevant files to the patient's profile for reference.

For Patients:

Dashboard:

Patients can view their upcoming appointment on the dashboard, allowing them to easily check the date, time, and type of service for their next visit.

Update Profile:

Patients can update their personal information through the "Update Profile" section on their dashboard. This includes editing details such as contact information, address and medical history. Once changes are made, patients can save the updates to ensure their profile is current.

Book an Appointment:

- Log in and go to the "Book Appointment" section.
- Select a service, date, and available time slot.
- Submit the request and wait for confirmation via email and SMS.

Reschedule or Cancel:

If needed, appointments can be rescheduled or canceled through the "View Appointments" section, provided they have not yet been confirmed.

View Appointments:

Click on "View Appointments" to view upcoming or past visits.

Dental Documentation:

Click "Dental Records" to view your treatment history and dental chart updates.

Feedback:

Patients can leave feedback on their visits in the "Feedback" section to help improve clinic services.

Change Password:

Patients can update their password in the "Change Password" section by entering their current and new passwords.



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PICTURES SHOWCASING THE DATA GATHERING,
INVESTIGATION DONE





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