DENTAL CLINIC MANAGEMENT SYSTEM

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DENTAL CLINIC MANAGEMENT SYSTEM

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Thesis submitted in fulfillment of the requirements
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ABSTRAK

DCMS adalah sistem berasaskan web yang akan membantu organisasi klinik pergigian untuk menguruskan operasi mereka secara sistematik. Daripada menggunakan cara manual atau tradisional untuk mendaftarkan pesakit baru. Kebarangkalian kehilangan rekod kesihatan pesakit lebih tinggi daripada menggunakan sistem. Sistem ini akan menyimpan rekod kesihatan pesakit dalam pangkalan data. Pesakit dengan mudah boleh membuat tempahan untuk temujanji.

ABSTRACT

DCMS is a web-based system that will help an organization of dental clinic to manage their operation systematically. Instead of using manual or traditional way to register new patient. Probability to lost the record of patients' health is higher rather than using a system. The system will save the patients' health record in database. Patient easily can book for an appointment.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Nowadays, the rapid growth of dental clinic leads them to compete each other aggressively. The most important about a dental clinic business is their management level. If they are good enough in manage their clinic, it will be good in their business profit too. Some dental clinic still having an outdated management system that can risk their business. They register the patient information on a piece of paper, stored them in a file, arrange the files manually on the racks, and retrieve them when needs. These are the normal process related to patients' information of the old management system. So, to complete the limitation of the old management system which are using a lot of paper to record, manually store and retrieve the file which consume much effort and time, and no backup if the record being destroyed physically.

With the technology that we learned till this moment, there is a solution to overcome the problems of the old management system. The solution is a web-based system that can assist its user in managing their clinic in a better and efficient way. To support the statement, I propose a system named Dental Clinic Management System (DCMS). The DCMS will be used by 3 user categories which are admin, dentist, and patient. The main objective of the DCMS is to overcome the problem faced by most dental clinic out there and help them to gain more profit on their business.

As a conclusion, DCMS will be develop to upgrade the current management system of a dental clinic to the next higher level.

1.2 Problem Statement

As to the existing management system in the dental clinic, they lacked in several aspects such as;

i. Using a lot of paper to register new patients' information that can harm our earth.

ii. Manually keep and retrieve the file of patients' health record that are not efficient in both time and effort.

iii. The file of patients' health record is not safe since it can be easily altered and destroyed physically by irresponsible person.

1.3 Objective

There are 3 objectives of this management system which are;

i. To study the Dental Clinic Management System.

ii. To develop a Dental Clinic Management System.

iii. To evaluate the functionality of Dental Clinic Management System that has been developed.

1.4 Scope

The Dental Clinic Management System will scope to these users;

User	Functionality	Software	Hardware
Admin	Login Register Manage Dentist Manage Patients Manage Appointments Manage Treatments Manage Payments Manage Reports	Browser (Google Chrome, Firefox, Microsoft Edge	Desktop/PC
Dentists	Login Manage Appointments Manage Treatments Manage Payments	Browser (Google Chrome, Firefox, Microsoft Edge	Desktop/PC
Patients	Login Register Manage Appointments Manage Treatments Manage Payments	Browser (Google Chrome, Firefox, Microsoft Edge	Desktop/PC

1.5 Thesis Organization

This section is about chapter that going to be documented in the thesis. Chapter 1 discussing on the introduction of the system that we going to developed. Chapter 2 is some sort of researching on existing system that can help a lot in upgraded the current system which have similarity to our system. Chapter 3 will discuss on methodology that going to be used in this project. Chapter 4, result and discussion is being documented. Lastly is Chapter 5 where the conclusion being conclude and every detail being documented.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter is about comparing the existing or similar system to the proposed system. The main objective of this chapter is to gain knowledge of proposed system's problems and solutions done by other parties. So that, any advantages and disadvantages from the existing system can be discovered during this review. There are three system that will be selected as reference which are Sunway Medical Centre, Premier Dental Group Hi and Dental Clinic Management Software. From these three systems, any suitable features and functions will be adapted to the DCMS while any weaknesses will be avoided. Therefore, we can develop the proposed system with much better features and functions than the reviewed system.

2.2 Dental Clinic Management System

The DCMS will overcome most of problems faced by old management system in a dental clinic. These include the space used to store data, effort to keep and retrieve big data manually, upgrade to digitally database backup, safety and security of patients' health record and many more. In addition, DCMS also will enhance its functionality from its reviewed systems. Any weaknesses will be cover up while maintaining the good function without ignoring its main objectives. For the information, DCMS also will add a function where it can connect the patients and clinic through online appointment reservation. This is one of the most important features that a dental clinic business should have. It is not only efficient in managing time for both patients and clinic, but it is also flexible or patient-friendly for the patients to do treatment since most of the patients prefer to make an appointment reservation first rather than walk in to the dental clinic. To conclude, DCMS will have a balance functionality between managing clinic (records, dentists, patients, bill, treatments and many more) and patients (appointments, history, and bill). So, the DCMS will be a great management system of a dental clinic once it is complete developed.

2.3 Review on Existing System

This section is reviewing on the 3 existing system to get the idea, improve it and apply in DCMS to ensure the DCMS will overcome each issues and problems. Any great functions will be kept in DCMS while covered up the weakness they have.

2.4 Sunway Medical Centre

The Sunway Medical Centre is a web system that functioning more to the client side. All the function that patients have are great and interesting. So, we could implement DCMS with all the functions that they have. As weakness, there is no management in the dental clinic like patient treatment, manage dentists, and many more. DCMS will covered up this weakness to be more flexible in both clinic and patient's management. Figure 2-1 is an example of GUI from Sunway Medical Centre.

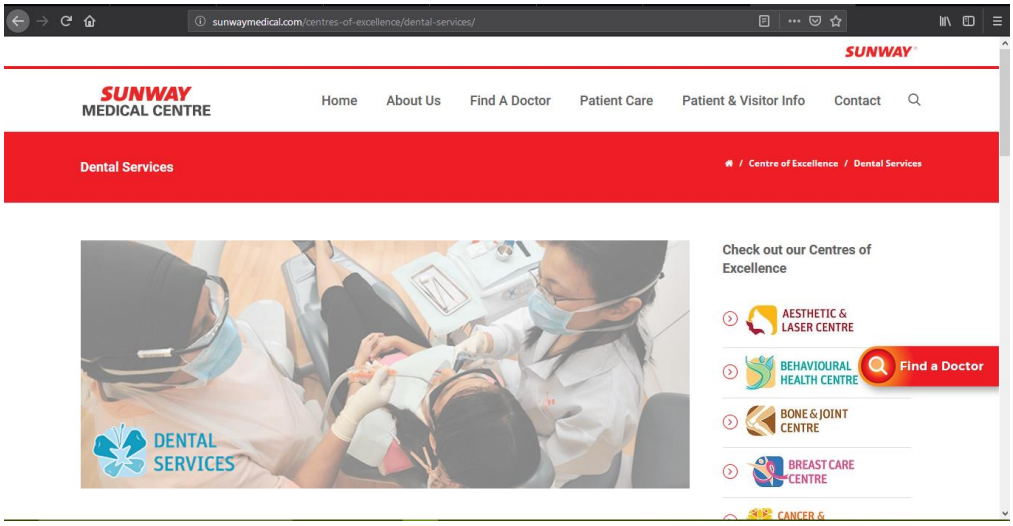


Figure 2-1 GUI of Sunway Medical Centre

2.5 Premier Dental Group Hi

This is the second system that going to be reviewed as DCMS reference. The Premier Dental Group Hi also focusing more on its patients/customer side only. It has no management of dental clinic which I can consider as not balance between clinic and patient's management. To enhance the DCMS, we will implement another function that can be used to manage dental clinic so it could be more balance in managing the clinic, patients, and health record. Figure 2-2 is an example of GUI from Premier Dental Group Hi.

Figure 2-2 GUI of Premier Dental Group Hi

2.6 Dental Clinic Management Software

This is currently the best management system of dental clinic founded to be reviewed. Unfortunately, the system is only offline system that operating digitally but cannot go online. Second issue is the Dental Clinic Management Software is a desktop system which mean the record is only kept in the current running desktop. It will be complicated if we need to transfer the record into another desktop. As usual, DCMS will enhance its capabilities and upgrade from reviewed system to ensure its user can operate/run anywhere by developing a web-based system. Figure 2-3 is an example of GUI from Dental Clinic Management System.

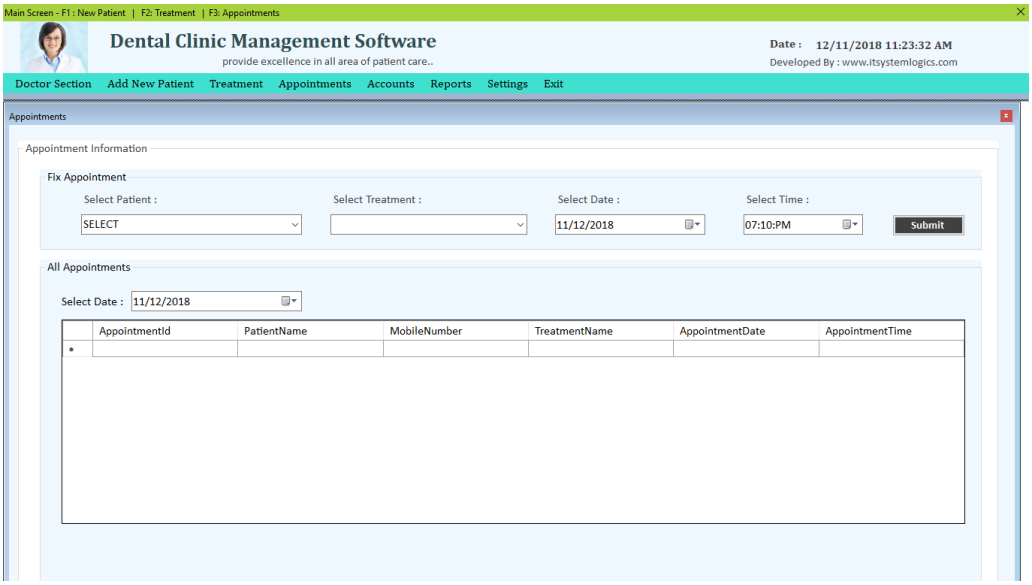
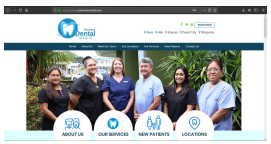
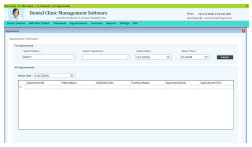


Figure 2-3 GUI of Dental Clinic Management System

2.7 Comparison between Existing System

Table 2.1 below shows the comparison of three existing system.

Table 2-1 Comparison of Three Existing System

Name / Features	Sunway Medical Centre	Premier Dental Group Hi	Dental Clinic Management Software
GUI			
Main Functions	Manage Patient's -Information -Appointments	Manage Patient's -Information -Appointments	Manage Clinic's -Patients' Info -Dentists' Info -Appointments -Treatments -Reports
Supported Platform	Web System (browser)	Web System (browser)	Application System (desktop)
System Stability	Best – Very Stable	Medium – Sometime Late Respond	Best – Very Stable
System GUI	Best – User Friendly	Medium – Not User Friendly	Medium – Not User Friendly

2.8 Limitation of The Existing System

Here is the conclusion of the limitations from reviewed systems that can be overcome in DCMS. Firstly, all of the systems are not capable in managing both clinic and patients equally. For the Sunway Medical Centre and Premier Dental Group Hi, the systems not support the clinic management, while Dental Clinic Management Software is vice versa. This is the main limitation of the reviewed systems. The Sunway Medical Centre and Premier Dental Group Hi are limit to basic patients' functions. These functions are provided by all the other dental clinic management system. So, they have no strength to be chosen as management system of a dental clinic. For Dental Clinic Management Software, it has really good functions as to manage clinic but not to manage patients (apply appointments online). It is also a desktop application which saved all dental clinic records by its hard drive. This is limiting the transfer and movement of the records between a desktop to another desktop. Therefore, DCMS must be develop as balance in both clinic and patients' management.

2.9 Summary

To conclude this chapter, there are 3 systems reviewed to learn and get knowledge on how DCMS should be developed. All the strength and weaknesses of reviewed systems being discovered. The suggested functions of DCMS also been stated to upgrade from existing system. There is also a comparison table where we can compare side by side of these 3 systems. Lastly, the limitation of these systems is being discussed and concluded.

CHAPTER 3

METHODOLOGY

3.1 Introduction

Methodology is a chapter where the methods used will be documented for later on revision and as a guideline purpose. A software development methodology is a framework of structuring, planning and controlling the development process. There are several methodologies exist in software development field such as Waterfall (Traditional), Agile, Rapid Application Development (RAD), and Spiral. For the system that going to be develop, Agile method is chosen to be applied through the development process.

Agile methodology is the best approach to develop the DCMS because we can get faster feedback from the client alongside in the development process. An Agile Software Development Life Cycle (SDLC) differ to traditional SDLC like Waterfall because they focus more on quick development and fast feedback rather than spending more time during the initial project planning and analysing the actual requirements. The client also can easily monitor our current progress on the DCMS. Therefore, this methodology approach is the best suited in developing the DCMS.

3.2 Methodology

By using Agile methodology, structuring, planning and controlling development process of the system will become more systematic and easier to handle. This is because the method chosen act as a guideline to be followed. Since we use Agile Methodology, involvement of the client is a must throughout the development process from prioritizing features to iteration planning and review session. Figure 3-1 is an illustrator of Agile Development Process.

3.2.1 Planning

In the first phase of development process which is planning, all the problems stated out, objective decided, scope user being suggested, and planned on what are the functions that DCMS should provide.

3.2.2 Requirements

In the requirements phase, all user requirements being discussed and be determined. The discussion is between the developer and the client. After all the requirements confirmed, a few documents are being documented to be reviewed later on.

3.2.3 Analysis and Design

Here, the developer analysed the user requirements from the previous phase and prepared some documents which consists of a few diagrams to illustrate the flow of the system. Developer also determine on how the function is going to be fulfilled. Another one is designing of the system such as Graphical User Interface (GUI), and overall system design.

3.2.4 Implementation

This is the phase where developer write and implement the source code based on documents that had been prepared in previous phase.

3.2.5 Testing

This is the last phase, finalize system being tested to ensure the system free from error for at least the major and critical error.

3.3 Hardware and Software Requirement

This section is to record the hardware and software used alongside the development of DCMS.

3.4 Hardware Requirement

Table 3.1 shows the hardware requirements.

Table 3-1 Hardware Requirements

Hardware	**Purpose**
Laptop (Lenovo G400s)	Develop the DCMS Prepare documentation of DCMS Designing the DCMS
Thumb Drive & External Hard Disk	Backup the DCMS Transfer related data of DCMS
Printers	Printing document

3.4.1 Software Requirement

Table 3.2 shows the hardware requirements.

Table 3-2 Software Requirement

Software	**Purpose**
MS Office	Documentation of DCMS
Notepadd++	Implementation of coding
Xampp	System server and database (localhost and phpMyAdmin)

3.5 Gantt Chart

Figure 3-1 is a Gantt Chart (PSM1) of Dental Clinic Management System.

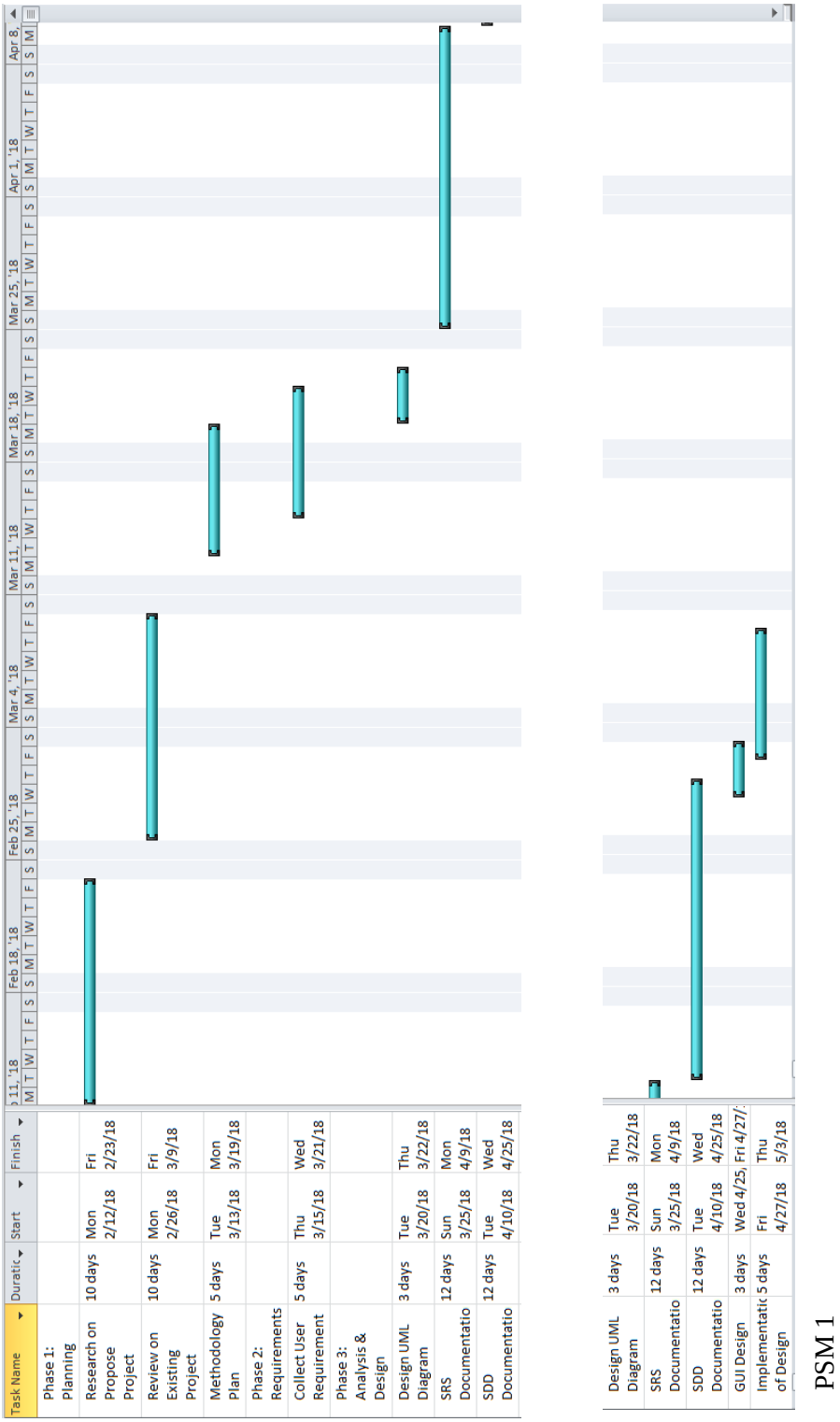


Figure 3-1 Gantt Chart (PSM1) of Dental Clinic Management System

Figure 3-2 is a Gantt Chart (PSM2) of Dental Clinic Management System.

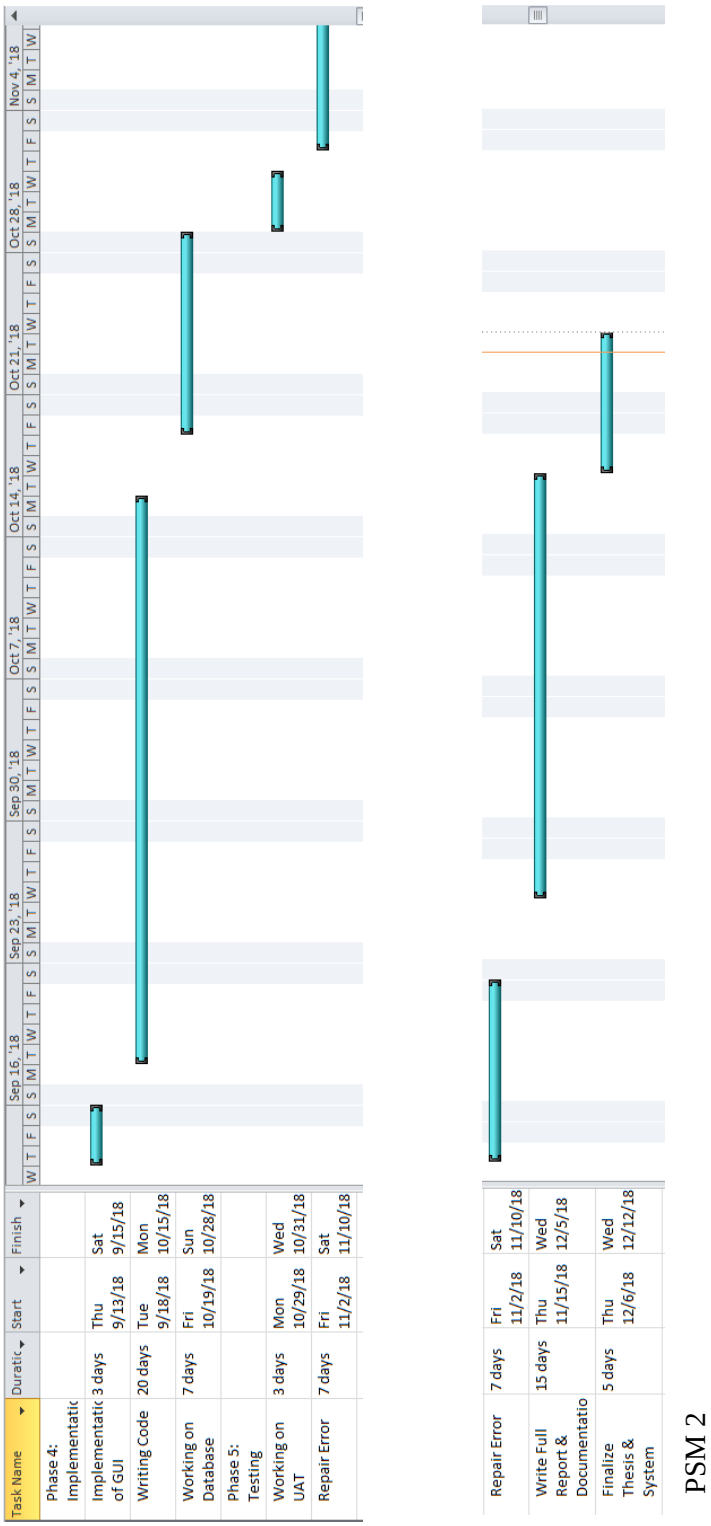


Figure 3-2 Gantt Chart (PSM2) of Dental Clinic Management System

3.6 Implementation

Figure 3-3 is a Use Case Diagram of Dental Clinic Management System.

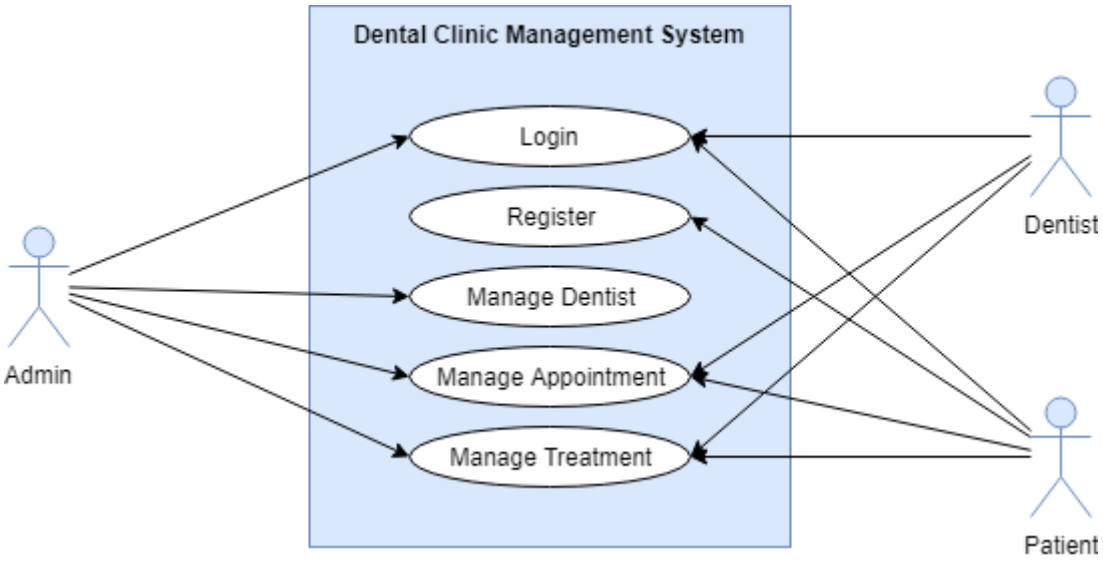


Figure 3-3 Use Case Diagram of DCMS

3.7 Summary

In a nutshell, methodology that will be implemented alongside the development of DCMS is Agile. The methodology choose is really give a lot of benefits to developer side. All the phase is clearly discussed on how DCMS being developed. Moreover, hardware, software requirements also been identified and decided. The Gantt chart of the system development process also provided. Last but not least is the use case of the system and dialog diagram is used as an illustrator to help increasing the understanding of both clients and developers.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

The testing phase must be proceeding once the development phase is completely done. The reason we do test DCMS is to find if there are any errors that need to be corrected. Not only for the source code, the DCMS also must undergo a test phase related to the support browser and technologies. Other than that, User Acceptance Test (UAT) also conducted to ensure DCMS is free error or at least no major and critical error.

This chapter will be discussing on the finding of the DCMS once the result of the testing is out. The discussion is on either user requirement, objectives, and others are fulfilled.

4.2 Testing

The User Acceptance Test (UAT) will be conduct in this chapter. The functionality of DCMS will be test with the presence of both developer and client. The testing process of UAT will be documented in UAT report (refer appendix c).

4.3 Result & Discussion

Figure 4-1 is an example of Home GUI

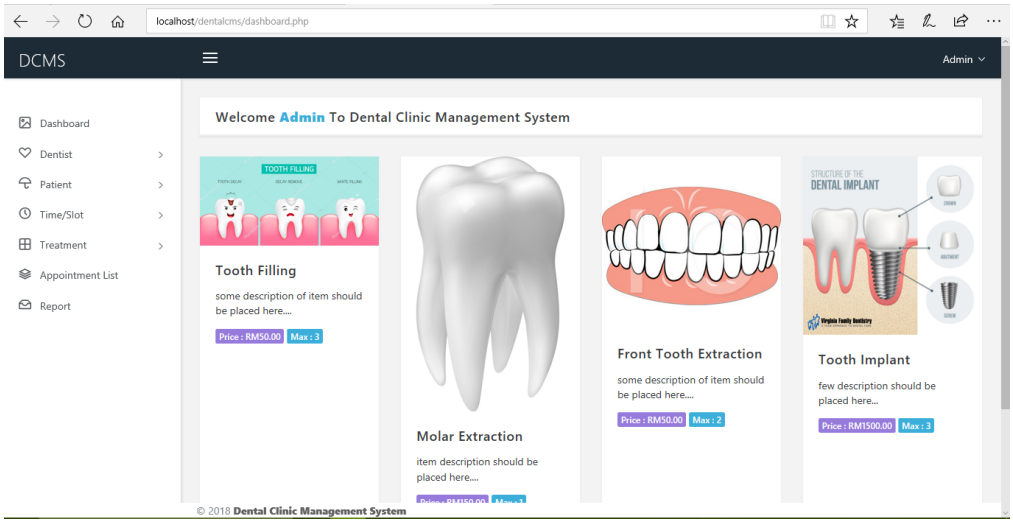


Figure 4-1 Home GUI

Approved and functioning as requested.

Figure 4-2 is an example of Login GUI

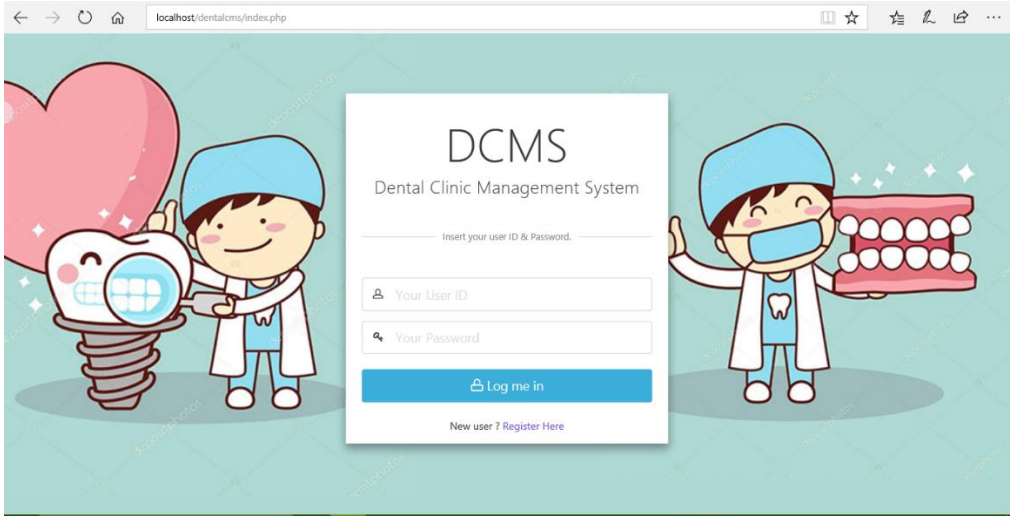


Figure 4-2 Login GUI

Approved and functioning as requested.

Figure 4-3 is an example of Register GUI

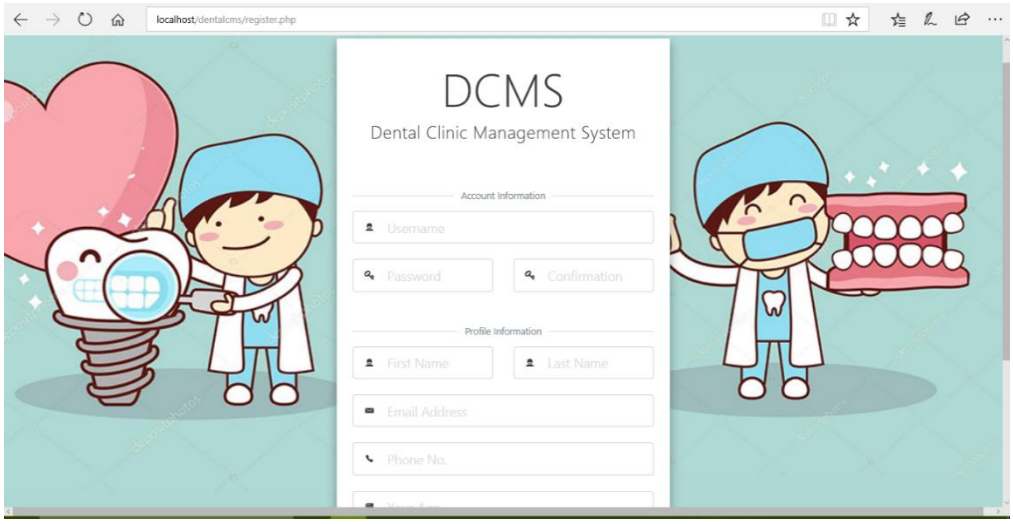


Figure 4-3 Register GUI

Approved and functioning as requested.

Figure 4-4 is an example of Manage Dentist GUI

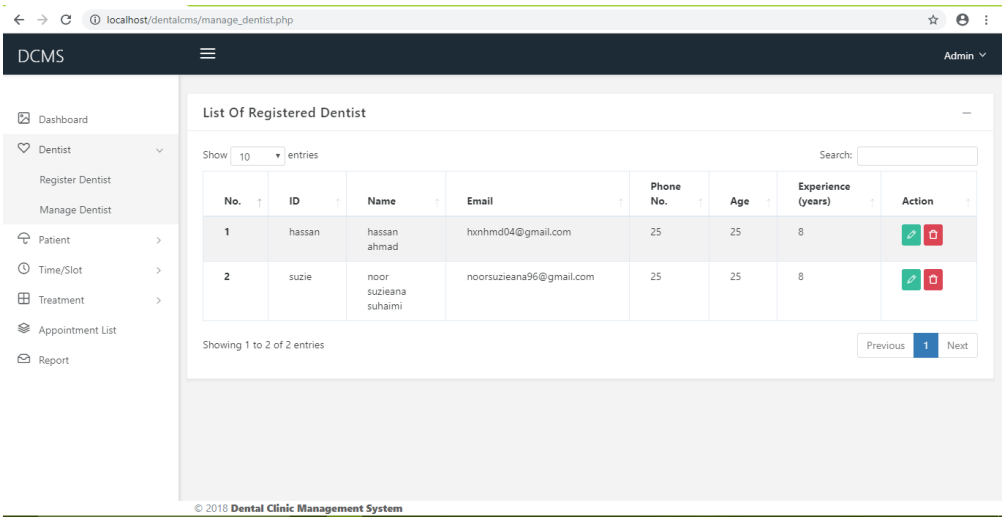


Figure 4-4 Manage Dentist GUI

Approved and functioning as requested.

Figure 4-5 is an example of Manage Patient GUI

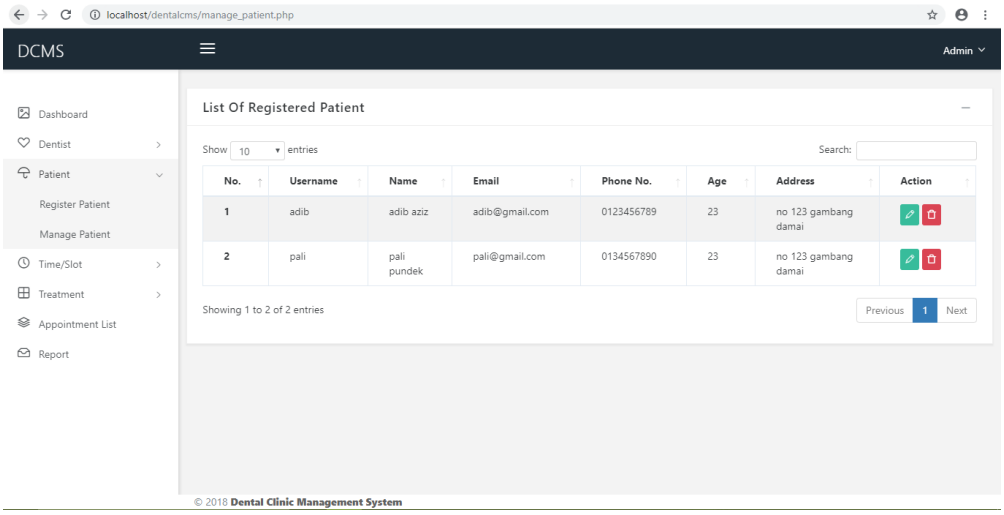


Figure 4-5 Manage Patient GUI

Approved and functioning as requested.

Figure 4-6 is an example of Manage Time/Slot GUI

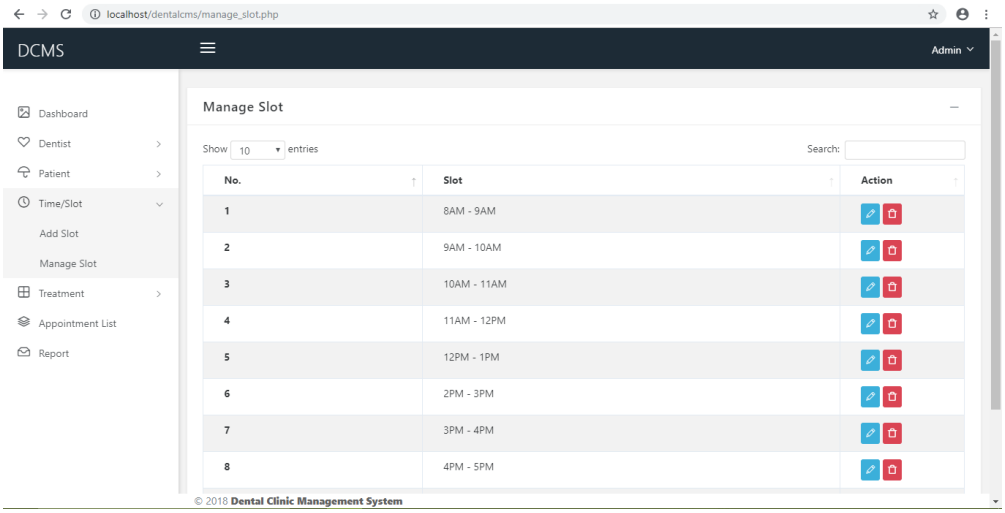


Figure 4-6 Manage Time/Slot GUI

Approved and functioning as requested.

Figure 4-7 is an example of Manage Treatment GUI

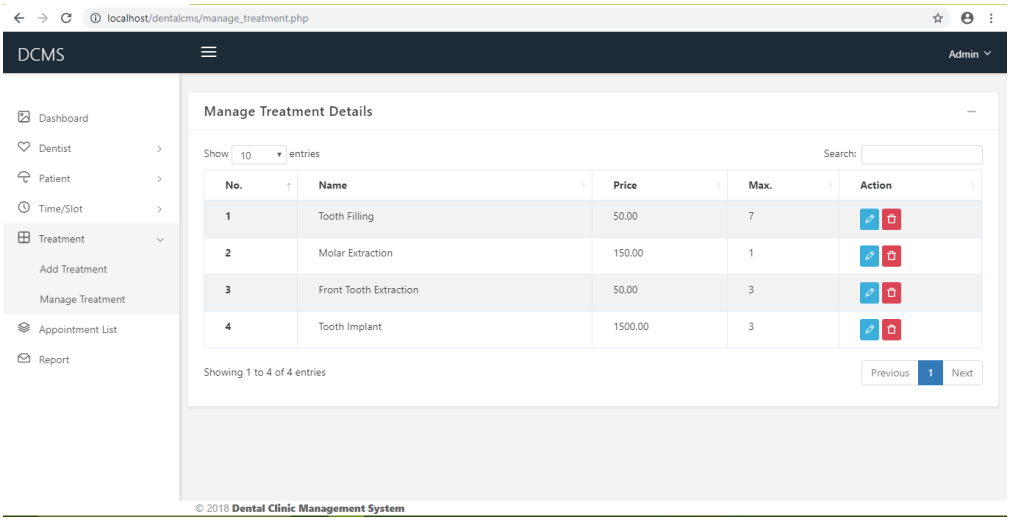


Figure 4-7 Manage Treatment GUI

Approved and functioning as requested.

Figure 4-8 is an example of Manage Appointment GUI

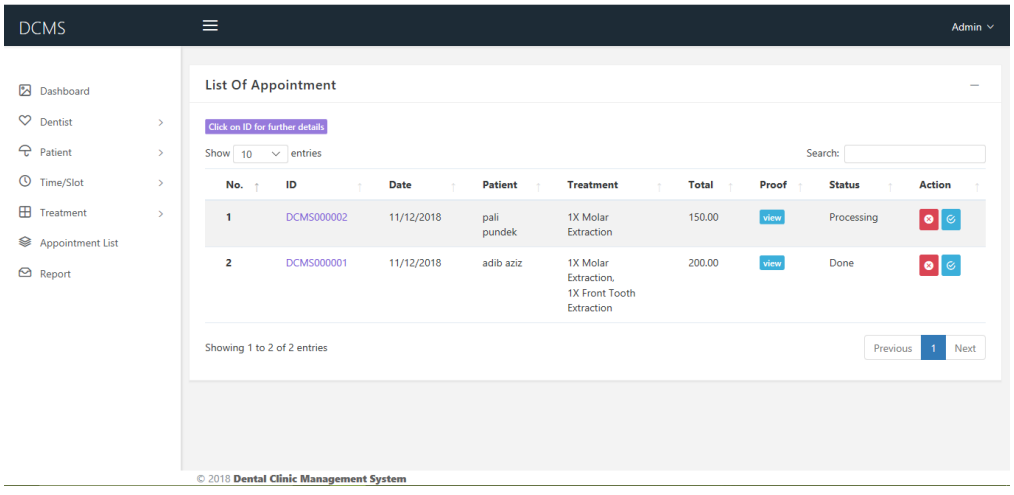


Figure 4-8 Manage Appointment GUI

Approved and functioning as requested.

Figure 4-9 is an example of Manage Report GUI

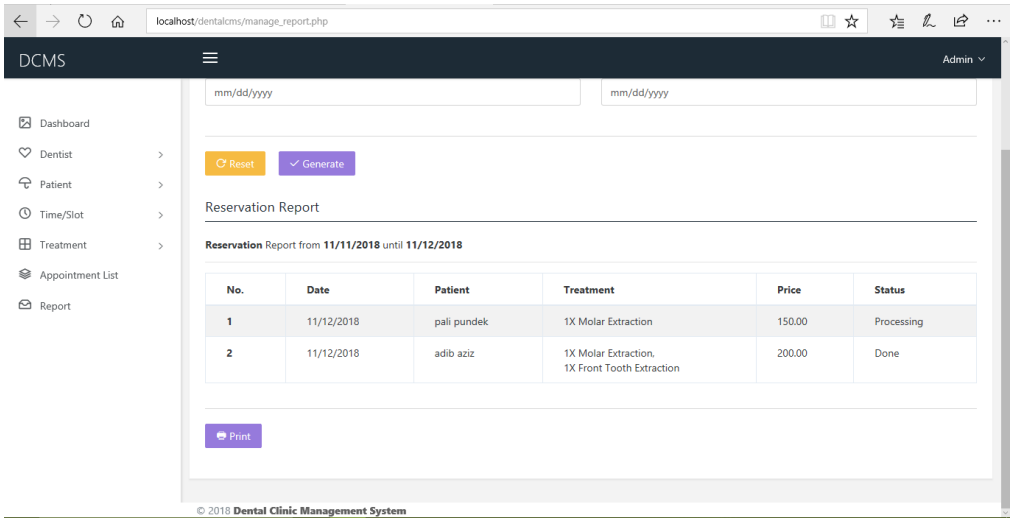


Figure 4-9 Manage Report GUI

Approved and functioning as requested.

4.4 Conclusion

The test result of DCMS is all acceptable and meet each objective aim in this system which are;

i. To study the Dental Clinic Management System.

ii. To develop a prototype of the Dental Clinic Management System.

iii. To evaluate the functionality of Dental Clinic Management System that has been developed.

CHAPTER 5

CONCLUSION

5.1 Introduction

The DCMS is successfully completed the development process and ready to be deployed. As the methodology chosen for the DCMS is Agile, we follow all the phase that suggested by this methodology. The first phase planning is long ago completed, followed by requirement gathering where all user requirements confirmed and documented. Everything related to the DCMS is defined in planning such as problem statement, objective and scope user. Hence, gathering the requirements from the client on what the functions will be developed in DCMS.

After that, the analysis and design phase are performed as per user requested in user requirements documented. The GUI been design here, and being confirmed by the client. The next phase is implementation that is very important because this is the asset of the project. DCMS start developed in this phase where all source code, all the programming things being done here. Lastly is the previous chapter, all the test result is accepted and confirmed its functionality as the user requested.

For now, these are what DCMS capable of doing, but it still has its own room to be improved. As an example, DCMS can support mobile view which is more relevant to current technology.

5.2 Development Constraint

Development constraint is a must have in any project development. But it is not a good thing that we must happy about it. Conversely, we must endure and for sure to overcome the constraint that we faced along the development process. One of the constraints faced in DCMS development phase is a limited time. Because of the limited time, everything needs to be done quickly to ensure DCMS finish by time as user requested.

Other than that, budget also is a constraint because DCMS provide function where certain cases need a notification from email that is supported by official domain only. Since DCMS use localhost, a few settings need to be done first before the function can successfully working. This take a lot of time to discover on how to do that.

Lastly, DCMS already finish its development phase. It is all complete for now and ready to be used in a dental clinic. This is because all the constraints successfully overcome.

5.3 Future Work

There is one thing that can be upgrade for the future of DCMS which is support of mobile devices user. Once it has been upgraded, it will be more relevant to the current trend where everything is from your smartphone.

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APPENDIX A

Software Requirement Specification (SRS)

2018

SOFTWARE REQUIREMENT SPECIFICATION (SRS)

DENTAL CLINIC MANAGEMENT SYSTEM

HASSAN BIN AHMAD (CB14068)
To be submitted to the Final Year Project
Bachelor of Computer Science (Software Engineering)

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1.0 INTRODUCTION

1.1 PURPOSE

Software Requirements Specification (SRS) purposely describing the requirements of the system going to be develop. The main objective of SRS is achieving the agreement and understanding between requirement team and client. Here, all functional and non-functional requirements are identified and documented. The details of system and user also will be described in the SRS. To conclude, SRS use is to document the details of requirement specification on how Dental Clinic Management System (DCMS) is going to be developed with its user and as the reference if any problem related to the requirements arise later on.

1.2 SYSTEM IDENTIFICATION

This section is going to describe on how the unique identification (ID) is created to differentiate the document and requirement from each other. Figure 1.1 shows the document identification format.

<COMPANY NAME>_<PRODUCT NAME>_<DOCUMENT TYPE>_<VERSION NUMBER>

Figure 1-1 Document Identification Format

The ID begin with the client's company/organization name, then the system name that we going to build, next the type of software document we create either Software Requirement Specification (SRS) or Software Detail Design (SDD), followed by the version of current software document. All the name must be understandable and not too long if can. Table 1.1 below shows the document identification of DCMS.

Table 1-1 Document Identification of DCMS

Company Name	Product Name	Document Type	Version Number
KPDF	DCMS	SRS	V1.0

Organization Name: Klinik Pergigian Doktor Fatain

Organization Abbreviation: KPDF

System Name: Dental Clinic Management System

System Abbreviation: DCMS

Document Type: Software Requirement Specification

Document Abbreviation: SRS

Current Version: Version 1.0

Version Abbreviation: V1.0

System ID: KPDNF_DCMS_SRS_V1.0

Figure 1.2 below shows the requirement identification format.

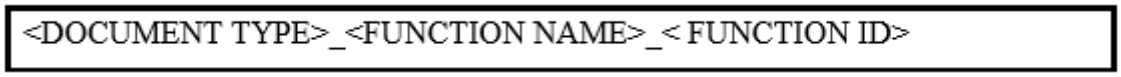

Figure 1-1 Requirement Identification Format

Document type is definitely same as previous defined identification while function name is the main functional or non-functional requirements name in the system such as register and login. Lastly, function ID is the unique number given to that function either there is sub-function for the main function or not. Table 1.2 shows the requirement identification of DCMS.

Table 1-2 Requirement Identification of DCMS

Document type	Function name	Function ID
SRS	LGN	001

Document Type: Software Requirement Specification

Document Abbreviation: SRS

Function Name: Login

Function Abbreviation: LGN

Function ID: 001

Requirement ID: SRS_LGN_001

1.3 SYSTEM OVERVIEW

Dental Clinic Management System will be developed to assist any dental clinic whom desired to use this application as one of the solutions in managing their

clinic. It will be fully depending on that current dental clinic management either to use DCMS or not. For the information, DCMS consist of 5 main functions which are Login, Register, Manage Dentist, Manage Appointments and Manage Treatments. All these main functions ensure the user can operate/run DCMS smoothly while helping them a lot in managing their basic tasks. To conclude, the DCMS is a helpful application that can assist in managing a dental clinic.

1.4 REFERENCES

1. Donn Le Vie, Jr. (2010, August 29). Writing Software Requirements Specifications (SRS). Retrieved from https://techwhirl.com/writing-software-requirements-specifications/
2. Cherry, K. (2018, March 11). Electronic Sources in APA Format. Retrieved from https://www.verywellmind.com/electronic-sources-in-apa-format-2794851

3. Belitsoft. (2016, Aug 08). Custom Software Requirements Specification Document Example (International Standard) Retrieved from https://belitsoft.com/php-development-services/software-requirements-specification-document-example-international-standard

1.5 DOCUMENT OVERVIEW

Chapter 1 Introduction

This chapter give a brief explanation on this document from the purpose until the references.

Chapter 2 Product Description

This chapter explain the system that going to be developed (DCMS) and its user. System interface and constraints of the system also included in this chapter

Chapter 3 Software Product Features

This chapter all about use case that going to be create in the system. The figure provided as an illustration while the table shows the description on that use case.

Chapter 4 Requirements Traceability

This chapter is a reference to trace all the requirements in the DCMS. It consists of requirements and the descriptions of that requirement.

2.0 PRODUCT DESCRIPTION

2.1 SYSTEM CHARACTERISTICS

The system intended to be developed is a web-based system. It means that the system only run/operate through browsers such as Google Chrome, Firefox and Microsoft Edge. The DCMS consisted of several functions such as Login, Register, Manage Dentist, Manage Appointments and Manage Treatments. The functions provided ensuring that the dental clinic can be manage efficiently with lesser effort, resources and even time spent for each task. To conclude, the DCMS assist its user with managing their dental clinic in a better way.

2.2 SYSTEM INTERFACE

There is suggestion to the system interfaces. All of suggested interfaces has been design earlier and will be documented in this SRS. Figure 2.1 shows the example system interface (1) of DCMS.

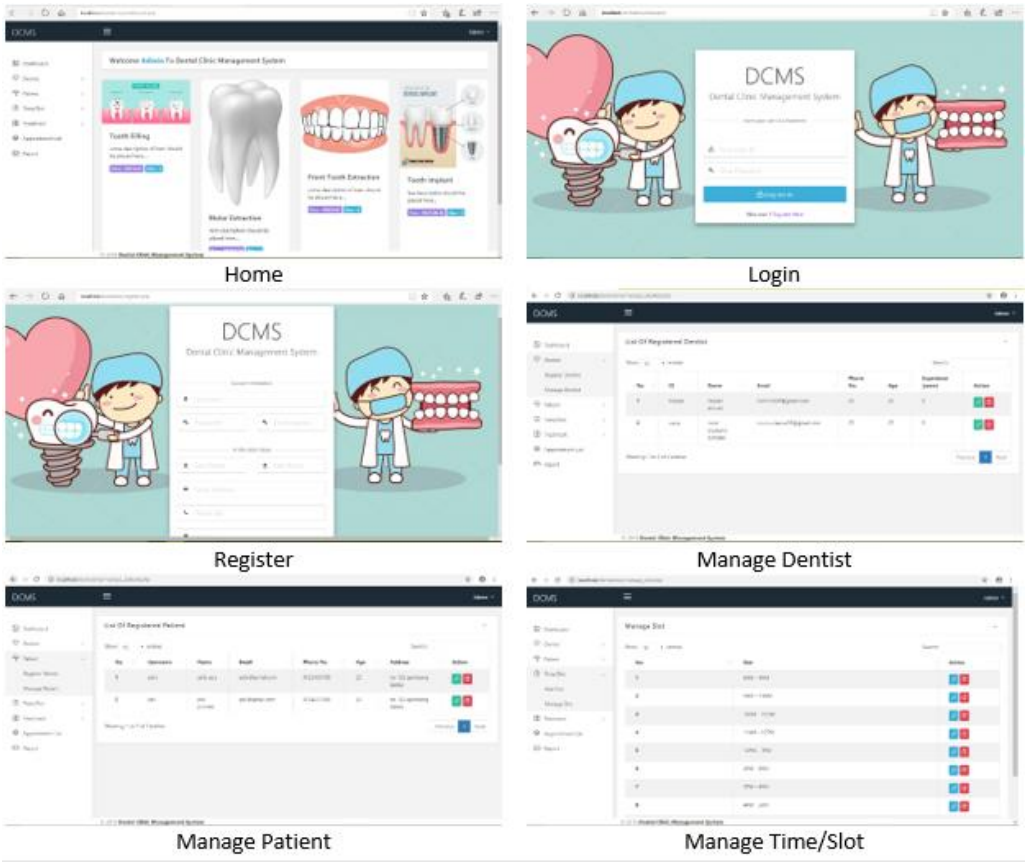

Figure 2-1 Example System Interface (1) of DCMS

Figure 2.2 shows the example system interface (2) of DCMS.

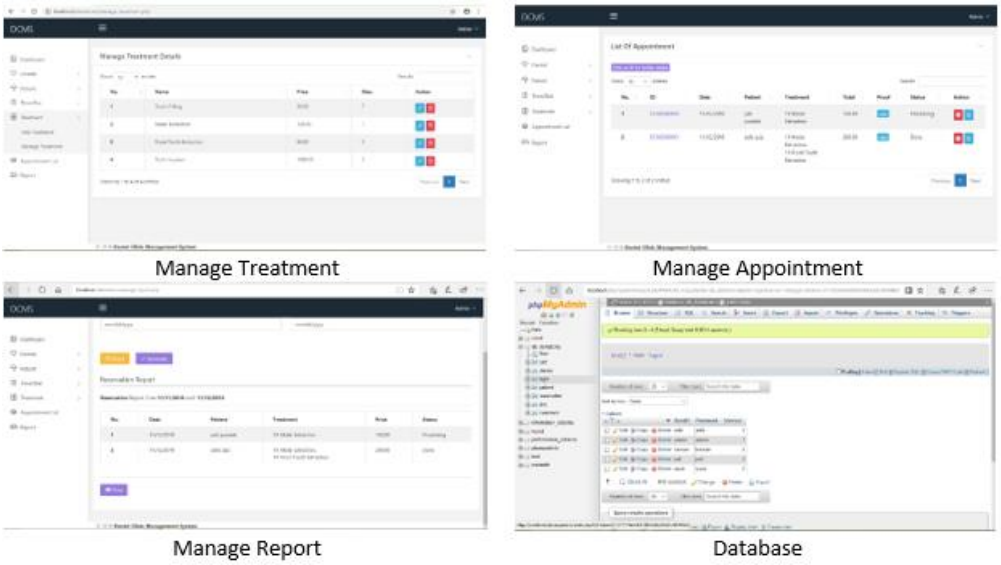

Figure 2-2 Example System Interface (2) of DCMS

2.3 SYSTEM FUNCTIONS

Figure 2.3 shows the use case diagram of DCMS.

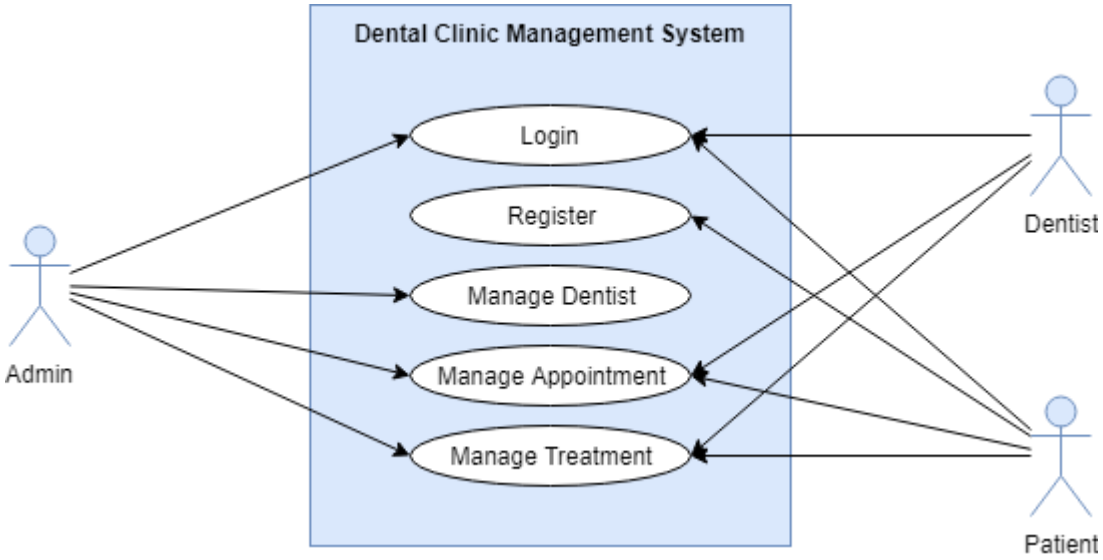

Figure 2-3 Use Case Diagram of DCMS

The following are details on each use case illustrated on figure 2-3.

1. **Login**

   Allow user (admin, dentist, patient) to login the DCM by input login detail. Login information must be valid/registered first. The detail that must be input are username and password.

2. **Register**

   First register is for admin where he/she can register a new dentist and a new patient. Second register is for patient who can register themselves through online system in registration form. The details in the registration form must be filled up as per requested.

3. **Manage dentist**

   Manage dentist function is where admin can register his/her new dentist and manage detail of the existing dentist.

4. **Manage appointment**

   All 3 users have their own role to the appointment;

   Patient book appointment > admin and dentist get notified > admin and dentist can manage the appointment

5. **Manage treatment**

   Admin can add a new treatment provided by the clinic through this function. Hence, the web content view will be updated with added treatment. Admin also can edit the existing treatment using this function.

2.4 USER CHARACTERISTICS

For current system, we have 3 actors which are admin, dentist and patient. Table 2.1 shows the user description of DCMS.

Table 2-1 User Description of DCMS

Actor	Education Level/Background Experience	Description
Admin	Have skill to manage the clinic.	Admin is the manager of the clinic whom can manage and use every function provided by DCMS.
Dentist	Have skill in dentistry. Studied in related field.	Dentist must be registered by admin only. He must have a certificate of dentistry.

Patient	Have knowledge on how to use browsers.	Patient is anybody whom need to reserve for an appointment online.

2.5 CONSTRAINTS

There are several constraints to the system that has been estimated. Below is the list of the constraints.

a) English language only for the GUI.

b) Response time differ by speed connectivity and devices performance.

c) Support on web browser only.

2.6 ASSUMPTION AND DEPENDENCIES

Assumptions

a) The data is secured and only accessible by the one who has privilege only.

b) Database is automatically updated with the access of internet connection.

c) Same account can be login by many devices in one time.

Dependencies

a) System performance depend on the internet connection speed.

b) Devices performance affected the system performance

3.0 SOFTWARE PRODUCT FEATURES

3.1 LOGIN USE CASE

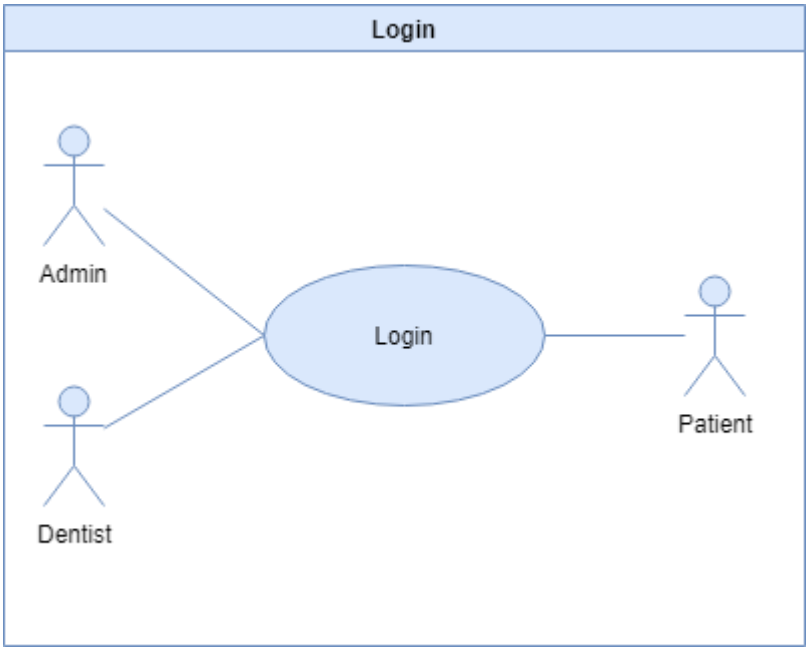

Figure 3-1 Login UC

Table 3-1 Login UCD

Use Case ID	SRS_LGN_001
Brief Description	This use case describes the steps on how user can login to the system.
Actor	Admin, Dentist, Patient.
Pre-Conditions	User run the system.
Basic Flow	1. User input login details. **[E-1]** 2. User click on Login button. 3. System checked login detail. 4. System display Home GUI. **[A-1]**
Alternative Flow	**A-1 Invalid Login Detail** 1. System prompt user to re-input the login detail. 2. Continue step 1.

Exception Flow	**E-1 Sign Up** 1. User click on Register button. 2. User input Register details. 3. User click on Register button. 4. System display Home GUI
Post-Conditions	Home GUI displayed.
Rules	Not applicable.
Constraints	Not applicable.
Sequence Diagram	Refer Appendix A-1.1: Login

3.2 REGISTER USE CASE

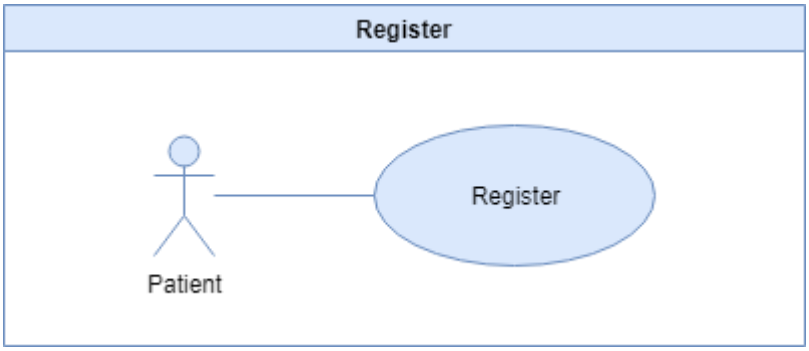

Figure 3-2 Register UC

Table 3-2 Register UCD

Use Case ID	SRS_REG_001
Brief Description	This use case describes how user can use register to DCMS.
Actor	Patient.
Pre-Conditions	User click on Register button.
Basic Flow	**Add Patient.** 1. User add patient detail. **[A-1, A-2, A-3]** 2. System save patient detail.

	3. System display back the patient detail. **[E-1]**
Alternative Flow	**A-1 Edit Patient.** 1. User edit patient detail. **[A-1, A-2, A-3]** 2. System save patient detail. 3. System display back the patient detail. **[E-1]** **A-2 Delete Patient.** 1. User delete patient detail. **[A-1, A-2, A-3]** 2. System save patient detail. 3. System display back the patient detail. **[E-1]** **A-3 View Patient.** 1. User view patient detail. **[A-1, A-2, A-3]** 2. System save patient detail. 3. System display back the patient detail. **[E-1]**
Exception Flow	**E-1 Invalid Detail** 1. System display error message. 2. Continue step 1.
Post-Conditions	Patient details displayed.
Rules	Not applicable.
Constraints	Not applicable.
Sequence Diagram	Refer Appendix A-1.2: Register

3.3 MANAGE DENTIST

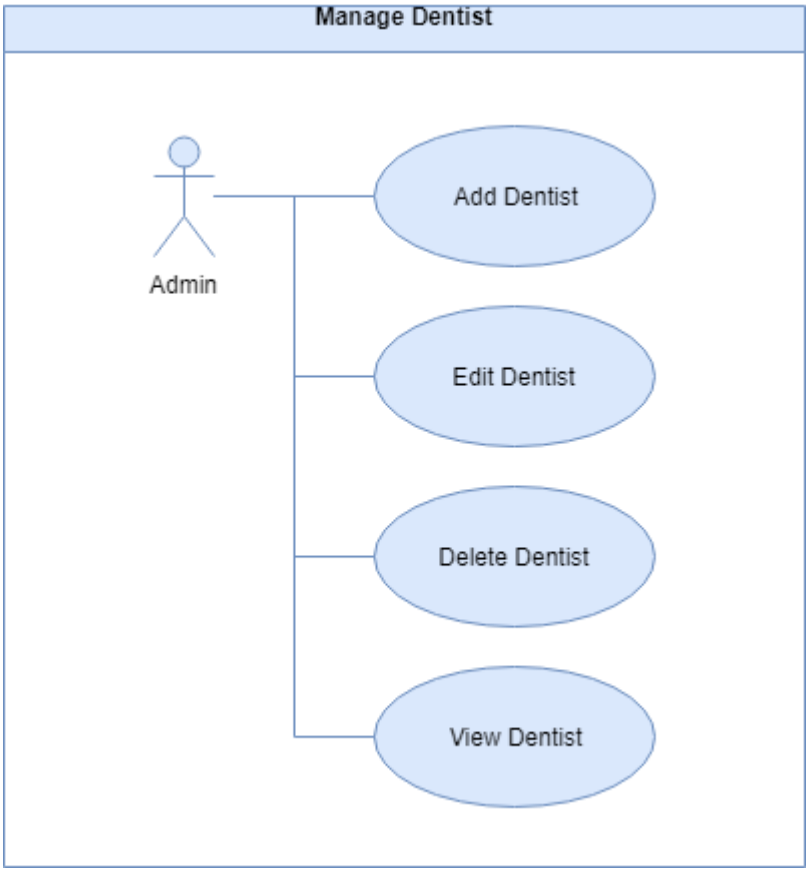

Figure 3-3 Manage Dentist UC

Table 3-3 Manage Dentist UCD

Use Case ID	SRS_MDEN_001
Brief Description	This use case describes how user can use manage dentist function.
Actor	Admin.
Pre-Conditions	User click on Manage Dentist button.
Basic Flow	**Add Dentist.** 1. User add dentist detail. **[A-1, A-2, A-3]** 2. System save dentist detail. 3. System display back the dentist detail. **[E-1]**

Alternative Flow	**A-1 Edit Dentist.** 1. User edit dentist detail. **[A-1, A-2, A-3]** 2. System save dentist detail. 3. System display back the dentist detail. **[E-1]** **A-2 Delete Dentist.** 1. User delete dentist detail. **[A-1, A-2, A-3]** 2. System save dentist detail. 3. System display back the dentist detail. **[E-1]** **A-3 View Dentist.** 1. User view dentist detail. **[A-1, A-2, A-3]** 2. System save dentist detail. 3. System display back the dentist detail. **[E-1]**
Exception Flow	**E-1 Invalid Detail** 1. System display error message. 2. Continue step 1.
Post-Conditions	Patient details displayed.
Rules	Not applicable.
Constraints	Not applicable.
Sequence Diagram	Refer Appendix A-1.3: Manage Dentist

3.4 MANAGE APPOINTMENTS

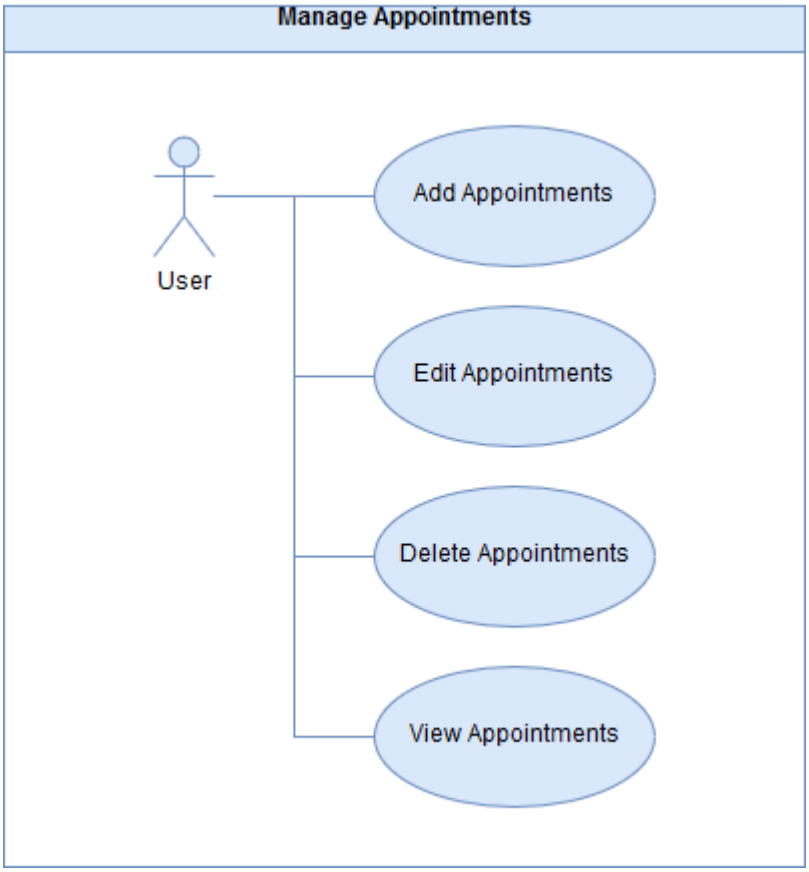

Figure 3-4 Manage Appointment UC

Table 3-4 Manage Appointment UCD

Use Case ID	SRS_MAPP_001
Brief Description	This use case describes how user can use manage appointments function.
Actor	User
Pre-Conditions	User currently view patient's info and intent to add an appointment with that patient.
Basic Flow	**Add Appointment.** 1. User add appointment date. **[A-1, A-2, A-3]** 2. User add appointment time.

	3. System save date and time of appointment. **[C-1]** 4. System display back the date and time of appointment. **[E-1]**
Alternative Flow	**A-1 Edit Appointment.** 1. User edit appointment date. 2. User edit appointment time. 3. System save date and time of appointment. **[C-1]** 4. System display back the date and time of appointment. **[E-1]** **A-2 Delete Appointment.** 1. User delete appointment date. 2. User delete appointment time. 3. System save date and time of appointment. **[C-1]** 4. System display nothing on date and time of appointment. **[E-1]** **A-3 View Appointment.** 1. User select appointment date. 2. User select appointment time. 3. System check date and time of appointment. **[C-1]** 4. System display detail of appointment. **[E-1]**
Exception Flow	**E-1 Invalid Detail** 1. System display error message. 2. Continue step 1.
Post-Conditions	Appointment details displayed.
Rules	Not applicable.
Constraints	**C-1 Internet Connection** 1. Database update appointment only when there is internet connection.
Sequence Diagram	Refer Appendix A-1.4: Manage Appointments

3.5 MANAGE TREATMENT

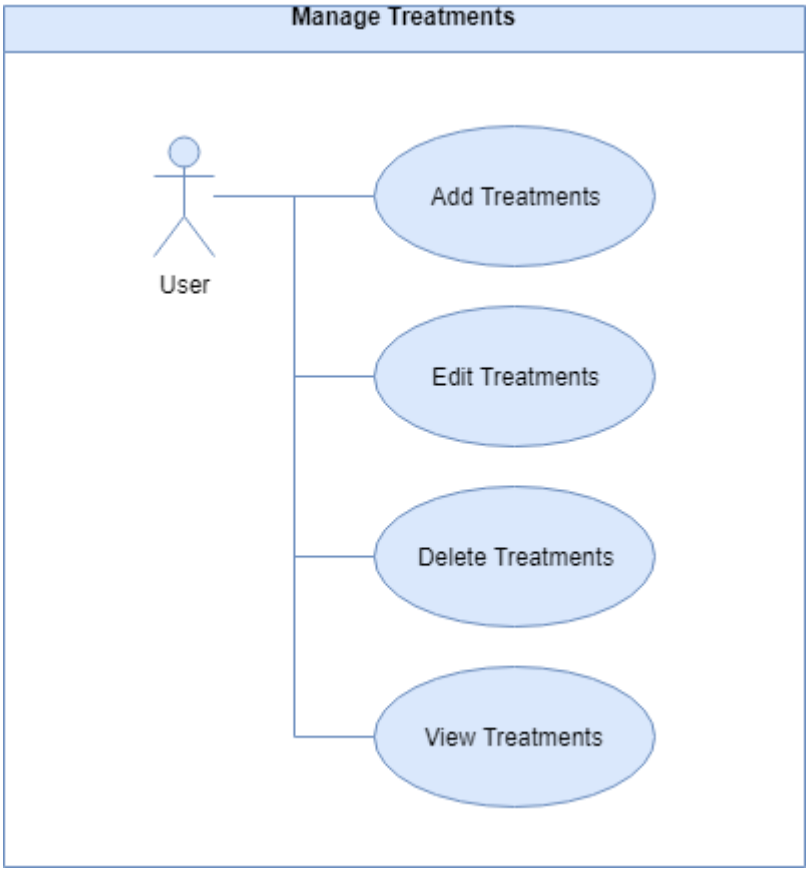

Figure 3-5 Manage Treatment UC

Table 3-5 Manage Treatment UCD

Use Case ID	SRS_MTRE_001
Brief Description	This use case describes how user can use manage treatment function.
Actor	Admin. Dentist.
Pre-Conditions	User click on Manage Treatment button.
Basic Flow	**Add Treatment.** 1. User add treatment detail. **[A-1, A-2, A-3]** 2. System save treatment detail. 3. System display back the treatment detail. **[E-1]**

Alternative Flow	**A-1 Edit Treatment.** 1. User edit treatment detail. **[A-1, A-2, A-3]** 2. System save treatment detail. 3. System display back the treatment detail. **[E-1]** **A-2 Delete Treatment.** 1. User delete treatment detail. **[A-1, A-2, A-3]** 2. System save treatment detail. 3. System display back the treatment detail. **[E-1]** **A-3 View Treatment.** 1. User view treatment detail. **[A-1, A-2, A-3]** 2. System save treatment detail. 3. System display back the treatment detail. **[E-1]**
Exception Flow	**E-1 Invalid Detail** 1. System display error message. 2. Continue step 1.
Post-Conditions	Treatment details displayed.
Rules	Not applicable.
Constraints	Not applicable.
Sequence Diagram	Refer Appendix A-1.5: Manage Treatments

4.0 REQUIREMENT TRACEABILITY

Table 4.1 below shows the requirement traceability of DCMS.

Table 4-1 Requirement Traceability of DCMS

Requirement	Description
SRS_LGN_001	User (Admin, Dentist, Patient) login to the system using his registered login details.
SRS_REG_001	Patient register his/her account to get their treatment.
SRS_MDEN_001	Admin can manage dentist which mean add, edit, delete and view dentist information.
SRS_MAPP_001	User (Admin, Dentist, Patient) can manage appointment which mean add, edit, delete and view appointment information.
SRS_MTRE_001	User (Admin, Dentist) can manage treatments for each patient.

APPENDIX A-1

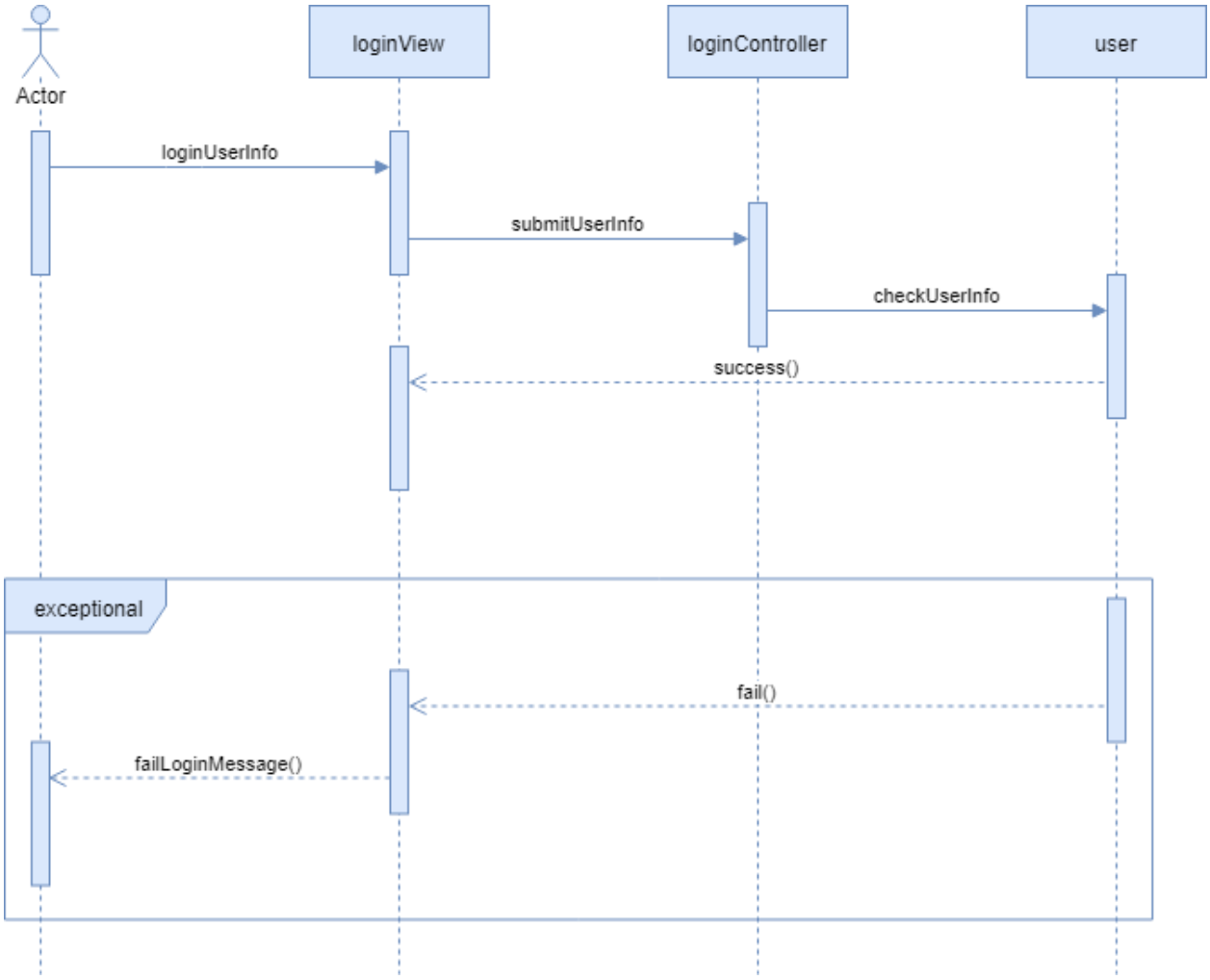

Figure A-1 Login SD

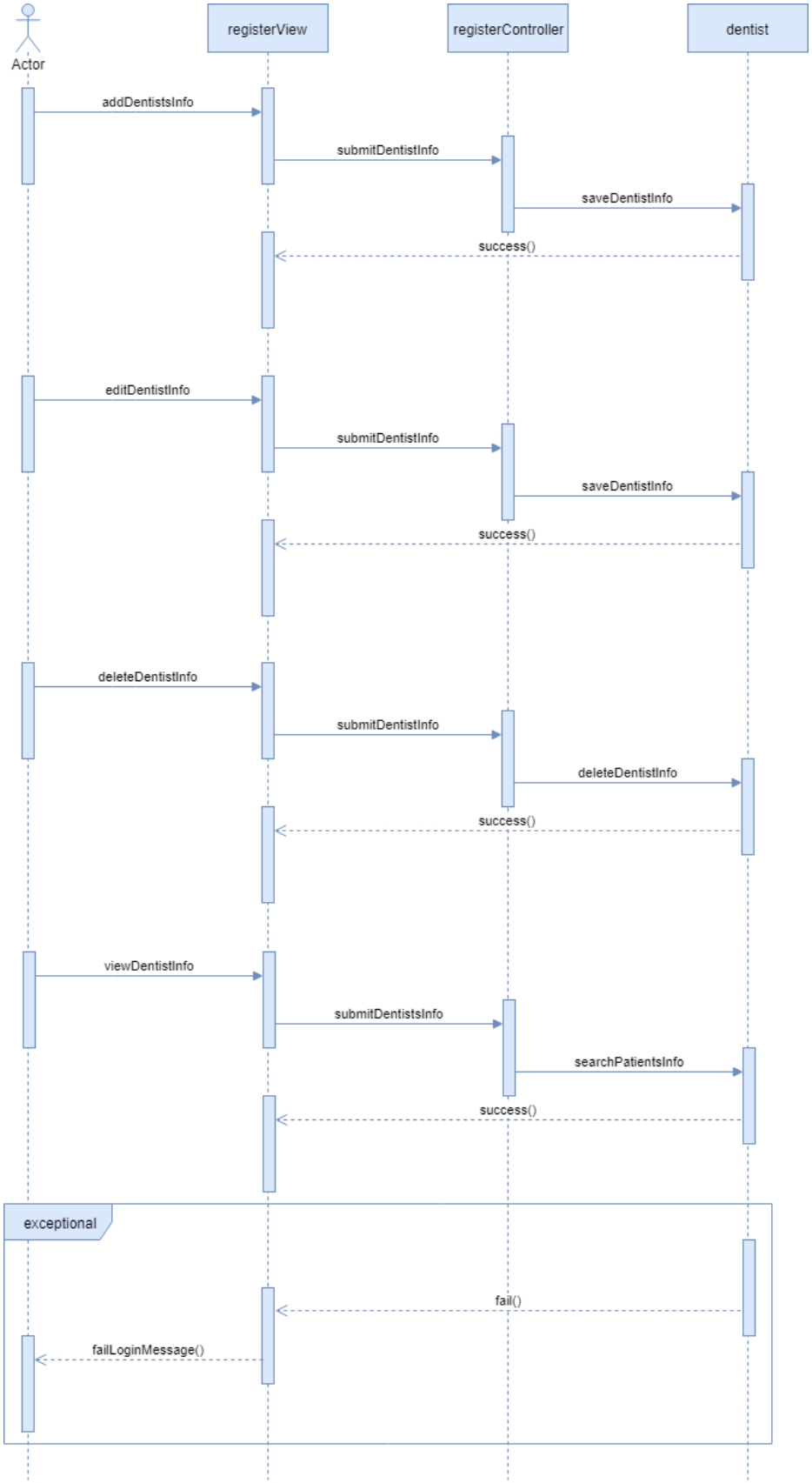

Figure A-2 Register SD

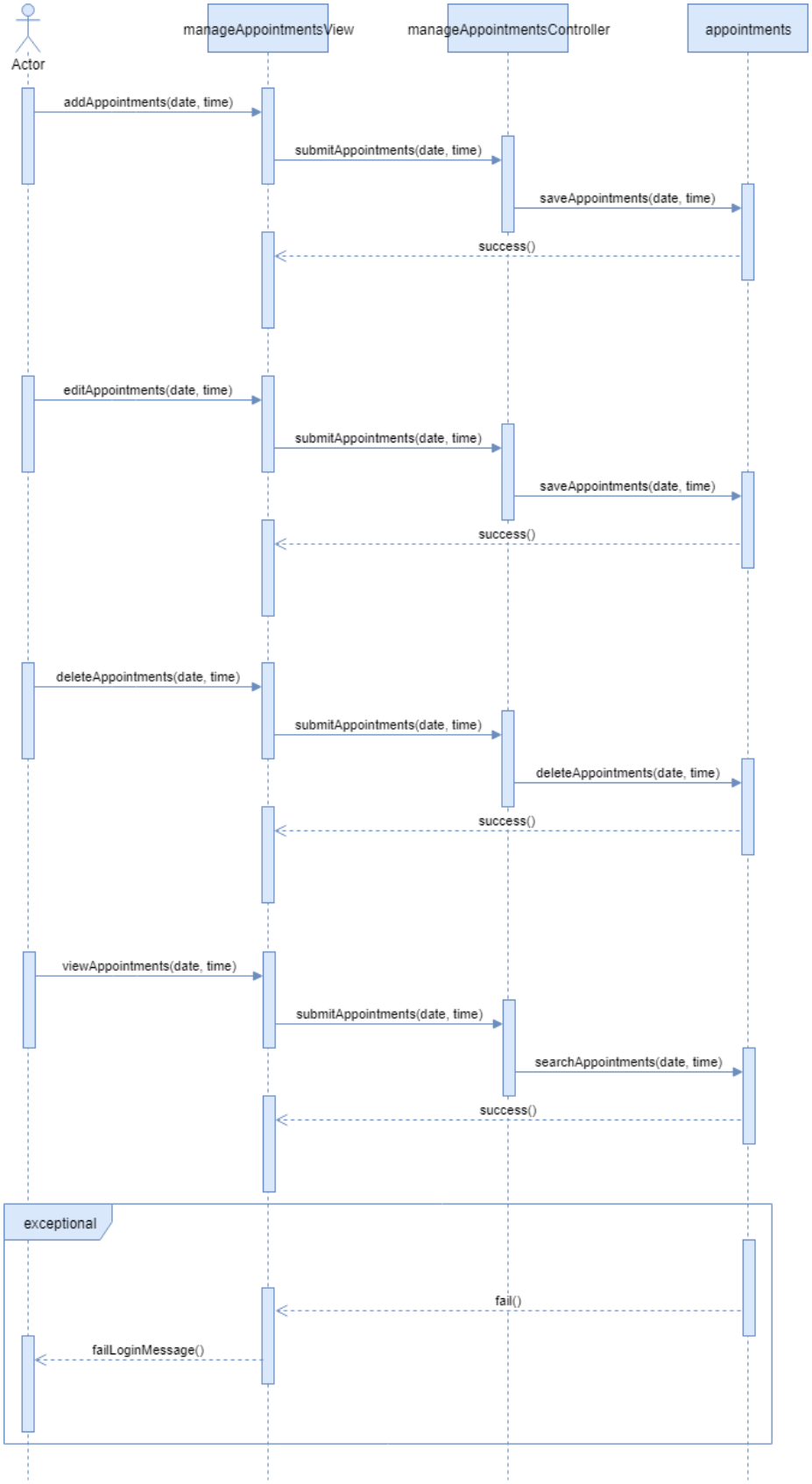

Figure A-3 Manage Dentist SD

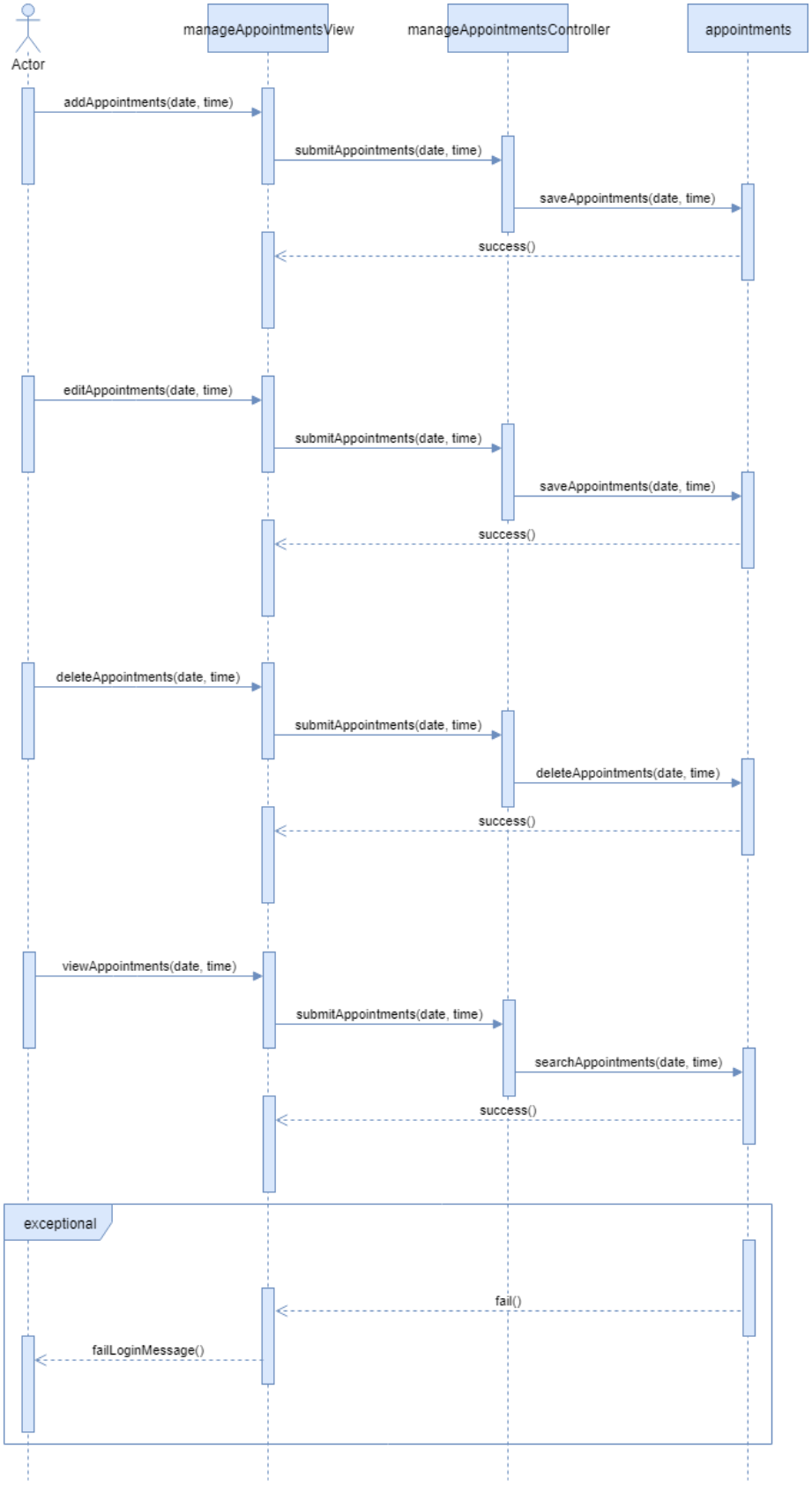

Figure A-4 Manage Appointment SD

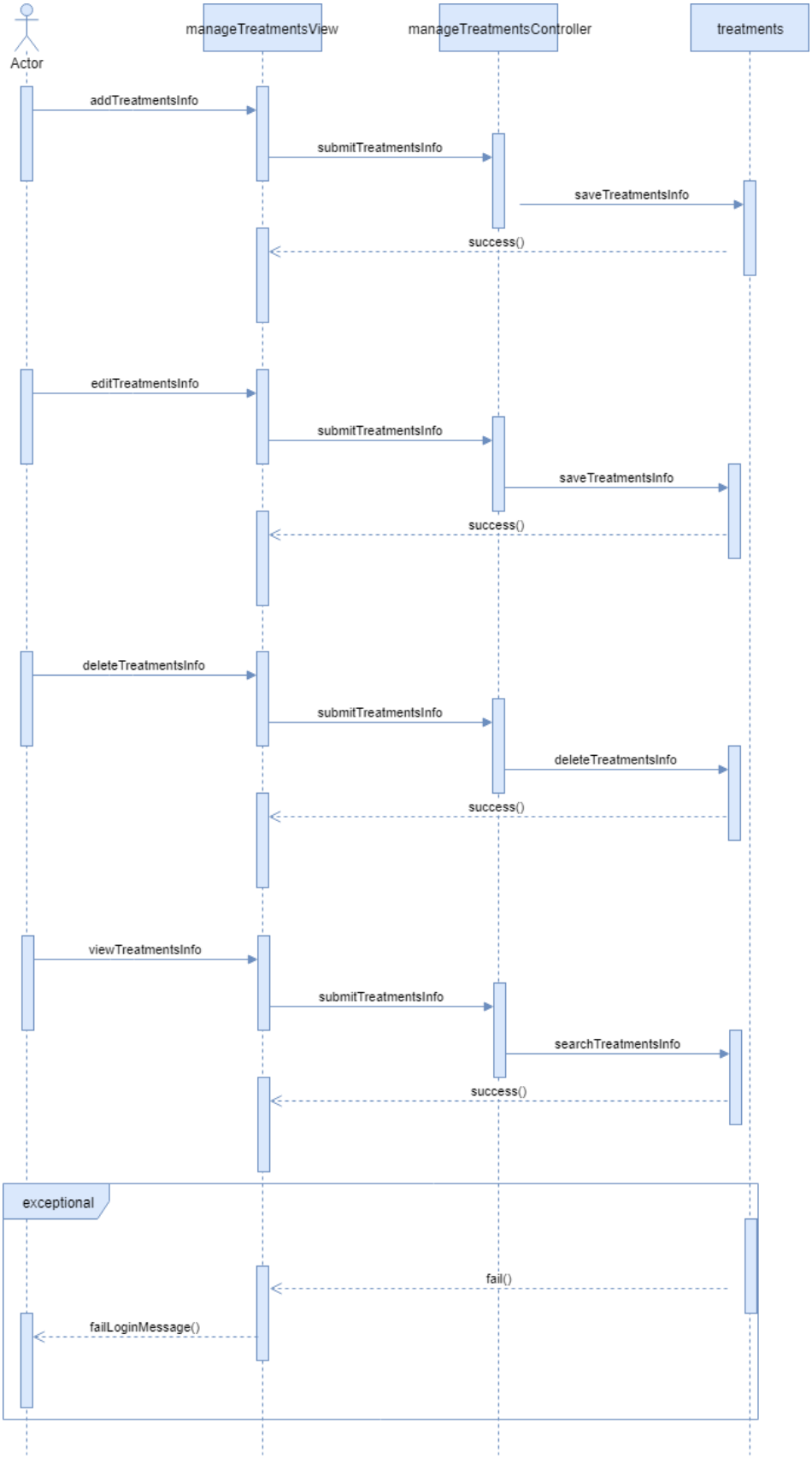

Figure A-5 Manage Treatment SD

APPENDIX B

Software Design Specification (SDD)

2018

SOFTWARE DESIGN DOCUMENT (SDD)

DENTAL CLINIC MANAGEMENT SYSTEM

HASSAN BIN AHMAD (CB14068)
To be submitted to the Final Year Project
Bachelor of Computer Science (Software Engineering)

TABLE OF CONTENT

CHAPTER 6LIST OF FIGURES

1.0 SCOPE

This section mostly about the scope of the SDD documentation. SDD

1.1 Identification

Organization name: Klinik Pergigian Doktor Fatain

System name: Dental Clinic Management System

Abbreviation: DCMS

System ID No: KPDF_DCMS_SDD_V01

1.2 Overview of the System

The DCMS will overcome most of problems faced by old management system in a dental clinic. These include the space used to store data, effort to keep and retrieve big data manually, upgrade to digitally database backup, safety and security of patients' health record and many more. In addition, DCMS also will support patient to apply for an appointment online.

This is one of the most important advantages in a dental clinic business because it is efficient in managing time of both patients and clinic. Most patients prefer to make an appointment online rather than walk in to the dental clinic. As planning, DCMS will be balance in managing the clinic (records, dentists, patients, bill, treatments and many more) and patients (appointments, history, and bill). So, the DCMS will be a great management system of a dental clinic once it is complete developed.

1.3 Overview of the SDD Document

This paragraph summarizes the purpose and contents of Software Design Document (SDD). It specifies the requirement aspects related to the Dental Clinic

Management System. In general, this SDD is divided into 5 sections as the following:

Chapter 1 Describes the scope identification, system overview and the document overview.

Chapter 2 Overview documents and reference documents.

Chapter 3 Describes the preliminary design for the CSCI. The preliminary design will identify CSC, the description of each CSC design, the characteristics of each CSC and the traceability of requirements set forth in SRS and IRS.

Chapter 4 Describes the detail design.

2.0 REFERENCED DOCUMENT

This section lists the document number and document name referenced in this document. Any discrepancies of this document in describing the software development process should be covered by the documents listed in this chapter. The following documents were referred as the basis for this SDD preparation.

Copies of specification, standards, drawings and publication requested by suppliers in contact with the specified supplying functions may be obtained by contacting the agency or directly through the contracting office.

2.1 Overview of the Document

Below is the list of standards that been used.

1016-1998 - IEEE-SA Standards Board (23 September 1998). IEEE Recommended Practice for Software Design Descriptions. Retrieved from: http://goo.gl/u6FzsA

ANDIOS, (17 January 2013), Software Design Document Version 1.1 Mobcoll Project. Retrieved from: http://161.139.18.27/14152/pluginfile.php/315714/mod_resource/content/1/SDD%20Mobcoll.pdf

CS 480 / CS 481 ~ Project. Software Design Description (SDD) Guidelines. Retrieved from: http://goo.gl/XyRYT7

Michiel van der Wulp, (2009), ArgoUML User Manual: A tutorial and reference description. Retrieved from: https://goo.gl/QRPlhv

2.2 Reference Document

This section consists of the contractual documents and non-contractual documents.

FSKKP, UMP SDD_Template

3.0 PRELIMINARY DESIGN

3.1 System Architecture

Figure 3-1 shows the Use Case Diagram of DCMS.

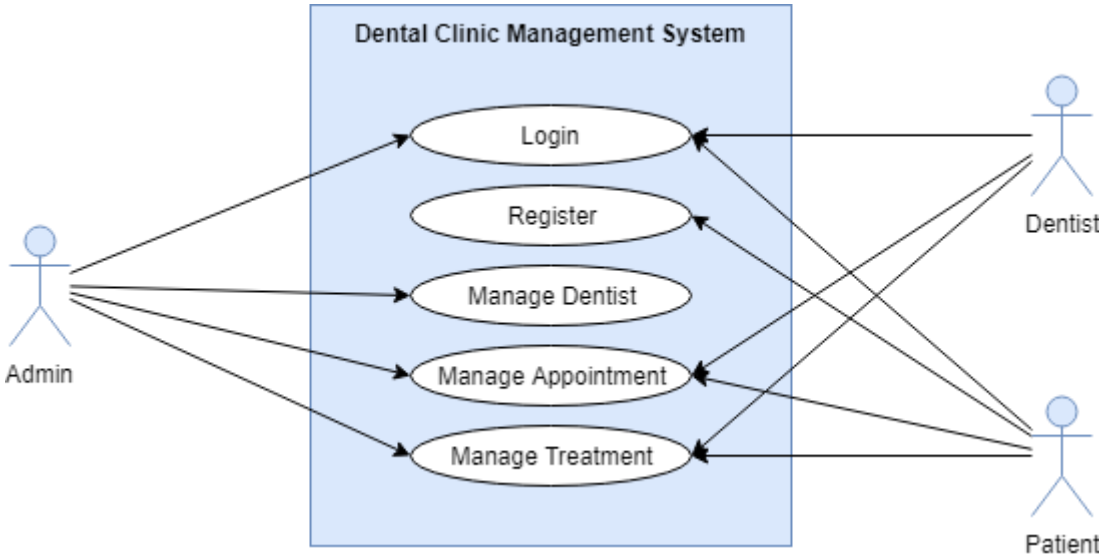

Figure 3-1 Use Case Diagram

3.1.1 Static Organization

The static organization is about the static on every module in DCMS. Figure 3.2 shows the Static Organization of DCMS.

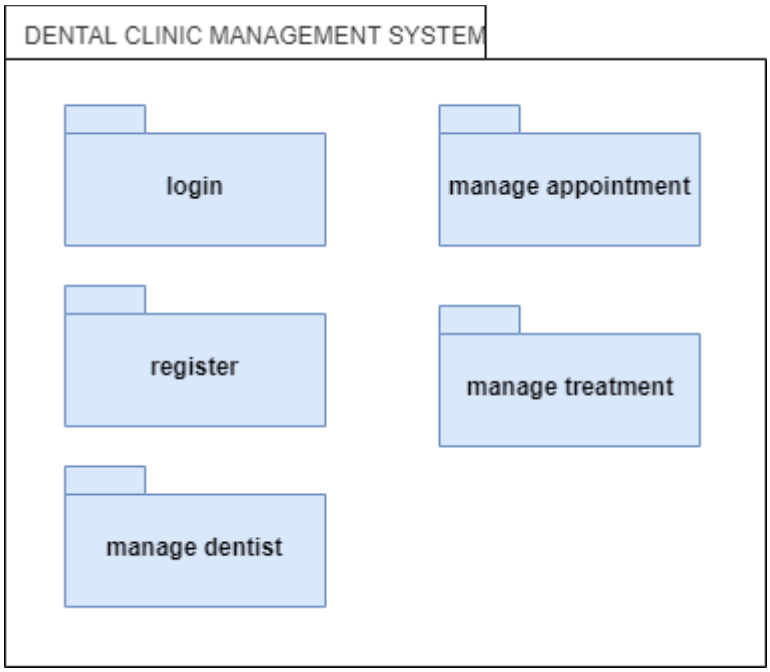

Figure 3-2 Static Organization

The following are details on each use case illustrated on figure 3-2.

Login

Allow user (admin, dentist, patient) to login the DCMS by input login detail. Login information must be valid/registered first. The detail that must be input are username and password.

Register

Patient register to access DCMS through online system in registration form. The details in the registration form must be filled up as per requested.

Manage dentist

Manage dentist function is where admin can register his/her new dentist and manage detail of the existing dentist.

Manage appointment

All 3 users have their own role to the appointment;

Patient book appointment > admin and dentist get notified > admin and dentist can manage the appointment

Manage treatment

Admin can add a new treatment provided by the clinic through this function. Hence, the web content view will be updated with added treatment. Admin also can edit the existing treatment using this function.

3.1.2 Dynamic Organization

The dynamic organization is about the dynamic on every module in DCMS. Figure 3.3 shows the Dynamic Organization of DCMS.

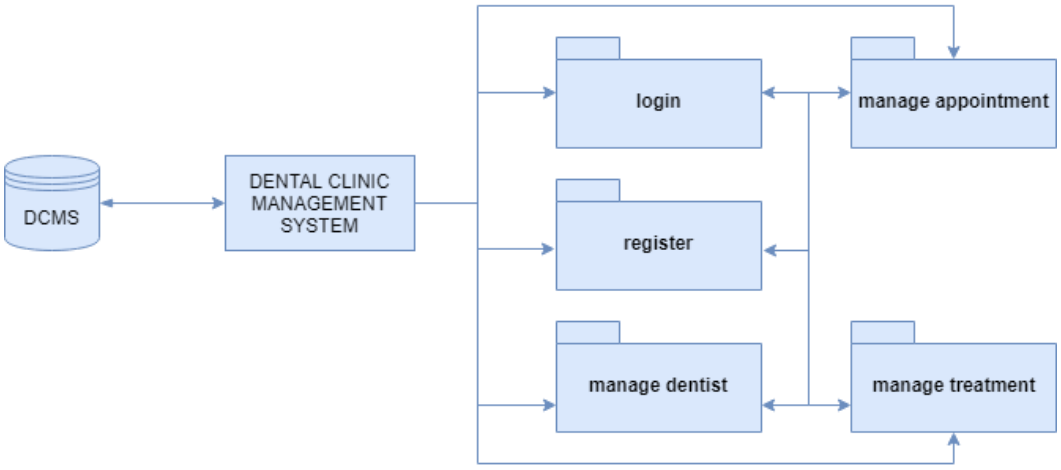

Figure 3-3 Dynamic Organization

4.0 DETAILED DESIGN

The detailed design is detail proposed of the table that DCMS have.

4.1 Login

Class Name: Login

Class Type: Entity Class

Responsibility: User login to the system.

Login

```
CREATE TABLE IF NOT EXISTS `login` (
  `UserID` varchar(50) NOT NULL,
  `Password` varchar(40) NOT NULL,
  `UserLvl` int(11) NOT NULL DEFAULT '2',
  PRIMARY KEY (`UserID`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

Figure 4-1 Login DB

4.2 Register

Class Name: Register

Class Type: Entity Class

Responsibility: User register an account to DCMS.

```
CREATE TABLE IF NOT EXISTS `patient` (
  `Username` varchar(55) NOT NULL,
  `FirstName` varchar(100) NOT NULL,
  `LastName` varchar(100) NOT NULL,
  `Email` varchar(55) NOT NULL,
  `PhoneNo` varchar(22) NOT NULL,
  `Age` int(11) NOT NULL,
  `Address` text NOT NULL,
  PRIMARY KEY (`Username`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

Figure 4-2 Register DB

4.3 Manage Dentist

Class Name: Manage Dentist

Class Type: Entity Class

Responsibility: User manage either add, edit, delete, view dentist.

```
CREATE TABLE IF NOT EXISTS `dentist` (
 `DentistID` varchar(55) NOT NULL,
 `FirstName` varchar(55) NOT NULL,
 `LastName` varchar(55) NOT NULL,
 `Email` varchar(55) NOT NULL,
 `PhoneNo` varchar(12) NOT NULL,
 `Age` int(11) NOT NULL,
 `Experience` int(11) NOT NULL,
 PRIMARY KEY (`DentistID`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

Figure 4-3 Manage Dentist DB

4.4 Manage Appointment

Class Name: Manage Appointment

Class Type: Entity Class

Responsibility: User manage either add, edit, delete, view appointment.

```
CREATE TABLE IF NOT EXISTS `reservation` (
 `ID` int(11) NOT NULL AUTO_INCREMENT,
 `ReservationID` varchar(55) NOT NULL,
 `BookedDate` date NOT NULL,
 `TreatmentID` varchar(55) NOT NULL,
 `Qty` int(11) NOT NULL,
 `TotalPrice` decimal(11,2) NOT NULL,
 `Status` varchar(55) NOT NULL DEFAULT 'Processing',
 `UserID` varchar(55) NOT NULL,
 `Prescription` text NOT NULL,
 `ReservationDate` date NOT NULL,
 `SlotID` int(11) NOT NULL,
 `PaymentProof` text NOT NULL,
 `DentistID` varchar(55) NOT NULL DEFAULT '-',
 PRIMARY KEY (`ID`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1 AUTO_INCREMENT=27 ;
```

Figure 4-4 Manage Appointment DB

4.5 Manage Treatment

Class Name: Manage Treatments

Class Type: Entity Class

Responsibility: User manage either add, edit, delete, view treatments.

```
CREATE TABLE IF NOT EXISTS `treatment` (
  `TreatmentID` varchar(55) NOT NULL,
  `Name` varchar(100) NOT NULL,
  `Description` text NOT NULL,
  `Image` text NOT NULL,
  `Price` decimal(11,2) NOT NULL,
  `Max` int(11) NOT NULL,
  PRIMARY KEY (`TreatmentID`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

Figure 4-5 Manage Treatment DB

APPENDIX C

User Acceptance Test (UAT)

USER ACCEPTANCE TEST (UAT)

1.0 Testing Report

The purpose of this section is to outline the User Acceptance Testing (UAT) process for Dental Clinic Management System (DCMS). Approval for this testing implies that reviewers are confident that following the execution of the test plan, resulting system will be considered fully-tested and eligible for implementation. The user will go through each of the instruction in the user manual. Any errors or problem found must be noted on this form.

2.0 Login Use Case

Event	Test Data	Expected Result	Actual Result	Pass/Fail	Comment
Correct username & password	Username Password	User logged in to DCMS	User logged in to DCMS	Pass	
Incorrect username	Username	Error message pop-up	Error message pop-up	Pass	
Incorrect password	Password	Error message pop-up	Error message pop-up	Pass	
Incorrect username & password	Username Password	Error message pop-up	Error message pop-up	Pass	

No input	No input at all	Error message pop-up	Error message pop-up	Pass	

3.0 Register Use Case

Event	Test Data	Expected Result	Actual Result	Pass/Fail	Comment
Complete detail	All register details filled up	Successful registered	Successful registered	Pass	
Incomplete detail	Some register detail not filled up	Error message pop-up	Error message pop-up	Pass	
Fake detail	Fake register detail filled up	Error message pop-up	Successful registered	Fail	DCMS still registered even fake register detail filled up.

4.0 Manage Dentist Use Case

Event	Test Data	Expected Result	Actual Result	Pass/Fail	Comment

Complete detail	All dentist details filled up	Dentist registered to DCMS	Dentist registered to DCMS	Pass	
Incomplete detail	Some dentist detail not filled up	Error message pop-up	Error message pop-up	Pass	
Fake detail	Fake detail filled	Error message pop-up	Dentist registered to DCMS	Fail	DCMS still registered data even it is fake.

5.0 Manage Appointment

Event	Test Data	Expected Result	Actual Result	Pass/Fail	Comment
Correct date & time	Date Time	Appointment reserved to DCMS	Appointment reserved to DCMS	Pass	
Incorrect date	Date	Error message pop-up	Error message pop-up	Pass	
Incorrect time	Time	Error message pop-up	Error message pop-up	Pass	

Incorrect date & time	Date Time	Error message pop-up	Error message pop-up	Pass	
No input	No input at all	Error message pop-up	Error message pop-up	Pass	

6.0 Manage Treatment

Event	Test Data	Expected Result	Actual Result	Pass/Fail	Comment
Complete detail	Treatment detail registered is correctly filled up	Treatment saved to DCMS	Treatment saved to DCMS	Pass	
Incomplete detail	Some treatment detail filled is left blank	Error message pop-up	Treatment saved to DCMS	Fail	DCMS still saved even incomplete treatment detail.