Applied Information Technology And Computer Science Vol. 2 No. 2 (2021) 1265-1274

AITCS

Homepage: http://publisher.uthm.edu.my/periodicals/index.php/aitcs
e-ISSN :2773-5141

Clinic Management System for Hope Clinic Bukit Serdang

Chang Bing Hui, Mohd Najib Mohd Salleh*

Faculty of Computer Science and Information Technology,
Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Johor, MALAYSIA

DOI: https://doi.org/10.30880/aitcs.2021.02.02.079
Received 30 July 2021; Accepted 04 October 2021; Available online 30 November 2021

Abstract: Clinic Management System is developed to support the clinic daily operation before this is done manually. This system will involve all the clinic operation starting from patient and doctor registration until patient reviewing. The important thing is it will become easier for the data record and retrieval. This system will be able to generate report regarding the clinic operation. For example, the number of patients per day and total disease per day. The target user for this system are staff of the clinic, doctor, patient, and admin management. The scope of this project includes mapping in appointment module, login/Register module, reviewing module, reporting module and notifying user. Waterfall approach is applied while developing this system. This will involve an iterative process to make this system is usable and easy to use by the user. The design for the system is using the System Development Life Cycle (SDLC) approach. The design will involve entity relationship diagram (ERD) and Data Flow Diagram (DFD) to show the logical flow for the system. For the implementation, Apache is used as a web server, MySQL as a database, PHP as a scripting language and browser. The main important while developing any system is to make the system usable.

Keywords: Clinic Management System, Appointment

1. Introduction

Clinic management system is a type of management information system. Its makes control easier and improve performance. It increases data processing and storage capabilities. The problem of Clinic Hope is Clinic Hope System doesn't have a system that manage all the information. The patient and doctor data using handwriting. The clinic does not have appointment system, login module, review rating module. This help Clinic Hope to manage their system more efficiently. The scope of this project includes mapping in appointment module, login/Register module, reviewing module, reporting module and notifying user.

*Corresponding author: najib@uthm.edu.my

2. Related Work

From Table 1Comparison of User Interface, Clinic Mediviron Puchong Avenue have login module for user to login and appointment module for user to make appointment. It may give feedback to clinic and can purchase medical resource for user. Orthopedic Clinic in Singapore have a good appointment system for user to make appointment with doctor. But it did not have a login module and review module. User may fill their email, name and phone number after booking.Dr Abby Clinic have review module for user to review the clinic. But it did not have login module for user login and appointment module for user appointment. Its system too depends on WhatsApp and phone call even its "Make Appointment" button is link to WhatsApp.

Table 1: Comparison of User Interface

Module	Clinic Mediviron Puchong Avenue	Orthopedic Clinic in Singapore	Dr Abby Clinic
Registration	Yes	No	No
Appointment	Yes	Yes	No
Review	Provide feedback	No	Yes
Rating	No	No	Yes

3. Methodology/Framework

To develop a system, a systematic approach should use is Software Development Life Cycle (SDLC) *(W.W. Royce,1970*). The SDLC model for develop this system is Model Waterfall. Waterfall approach was first SDLC Model to be used widely in Software Engineering to ensure success of the project. In "The Waterfall" approach, the whole process of software development is divided into separate phases. In this Waterfall model, typically, the outcome of one phase acts as the input for the next phase sequentially[1].

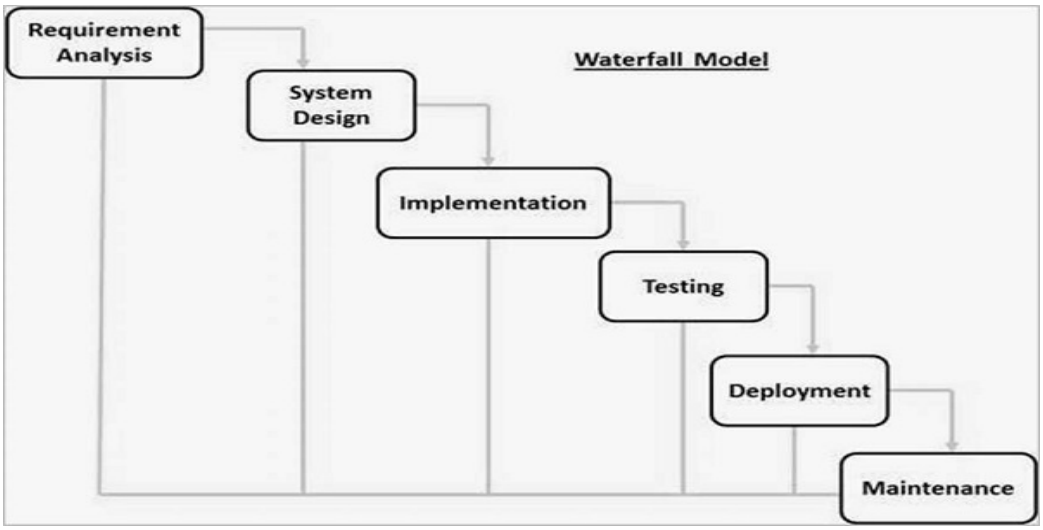

Figure 1: Waterfall model

3.1 Analysis Phrase

For Analysis phrase, its analysis all possible requirements of the system to be developed are captured in this phase and documented in a requirement specification document.

3.2 Design Phrase

For Design phrase, its helps in specifying hardware, system requirements and helps in defining the overall system architecture. When the requirement specifications from first phase are studied in this phase and the system design is prepared.

3.3 Implement Phrase

With inputs from the system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality, which is referred to as Unit Testing.

3.4 Testing Phrase

All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.

3.5 Maintenance phrase

There are some issues which come up in the client environment. To fix those issues, patches are released. Also, to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.[1]

Table 2: List activities and deliverable of each phrase in waterfall model

Phrase	Task	Output
Planning	The use of the system and time to develop.	Proposal Gantt chart
Analysis	Analysis system requirement.	Requirement
Design	Design system develop process.	ERD DFD
Implement	Implement the code using PHP, HTML, CSS, JS.	Code program
Testing	Test every part of part of code for every user in the system. Evaluate and improve the system.	Test case
Maintenance	To make sure the system works properly.	Fix issues

4. Results and Discussion

4.1 System Requirement Analysis

Requirements analysis focuses on the tasks that determine the needs or conditions to meet the new or altered product or project, taking account of the possibly conflicting requirements of the various stakeholders, analyzing, documenting, validating and managing software or system requirements[2].

4.2 Functional Requirement and Non-Functional Requirement Analysis

A function requirement defined what has been done by identifying the necessary activity task or action that must be accomplished [3]. Non-functional requirements specify the criteria that can be used to judge the operation the operation of a system, rather than specific behavior [3]. The functional requirement and non-functional requirement of this project was described in table below:

Table 3: Functional Requirement Analysis

No	Module	Functionalities
1	Registration	• The system should allow user login and sign-up account. • The system should allow input valid id and password. • The system should alert for any invalid input. • The system should allow user to change password. • The system should redirect user to dashboard after successful login.
2	Doctor	• The system should have doctor account. • The system should allow access the patient diagnose report. • The system should show the patient that make appointment to the doctor.
3	Patient	• The system should have patient account. • The system should show recent appointment. • The system should show the report and bill of patient.
4	Appointment	• The system should allow patient to making appointment. • The system should allow doctor to making appointment. • The system should allow cancel appointment. • The system should display valid appointment day to patient. • The system should notify user when appointment had made.
5	Reporting	• The system should able to show diagnose analysis report. • The system should able to show number patient report for a day, a month and a year. • The system should able to show profit from clinic.
6	Review	• The system should allow patient review the clinic and doctor. • The system should allow patient to edit their review.

Table 4: Non-functional Requirement Analysis

No	Requirement	Description
1	Performance	• The interaction between the user and the system should not be more than 10 minutes. • The system should be able for use anytime.
2	Operation	• The system should be user friendly. • The system should be easily maintained and update. • The system should be able to work on any web browser.
3	Security	• Only admin can generate the report. • User can only access their own account with user name and password.

4.3 Hardware and Software Requirement Analysis

Hardware components and software requirement analysis are required to defined what hardware and software are needed to support the system. The hardware and software requirement of this project was described in table below:

Table 5: Hardware requirement

No	Hardware	Specification
1	CPU	Intel Core i5-8250U 1.6GHz with Turbo boot up to 3.4GHz speed or higher
2	RAM	4GB or more
3	Hard drive	1TB HDD

Table 6: Software requirement

No	Type	Software	Functionality
1	Programing tool	Visual studio code	Develop system
2	Programing language	PHP, HTML, CSS, JS	Develop environment for building system
3	Server application	XAMPP	Web server building and as a platform for access to the database.
4	Database	MySQL	Build and design database
5	Operating system	Microsoft window 10	An operating system to develop this system

4.4 User Requirement Analysis

User requirement shows what users require from the system in detail. In other words, user requirement presents user's expectation about what the software be able to do. The user requirement of this project was described in table below:

Table 7: User Requirement

No	User Requirements
1	All user should be able to input user id and password for registration and login purpose respectively.
2	Patient and doctor able to make appointment
3	Patient and doctor able to view and edit personal detail
4	Patient able to view their report and bill of each appointment.
5	Patient able to view or cancel their appointment detail.
6	Doctor able to view their appointment detail.
7	Admin able to view reports and update information
8	Admin able to view and edit all user information.

4.5 Data-flow diagram (DFD) level 0

At 1.0 diagram, patient and doctor will login to their account. If it has new patient, then need register account. At 2.0 diagram, the patient and doctor can make or view their appointment. Doctor will add the sick report into appointment data. Cashier may add receipt into the patient appointment after the appointment has done. At 3.0 diagram, the patient will add their review for their appointment. At 4.0 section, the admin will receive report information of the data.

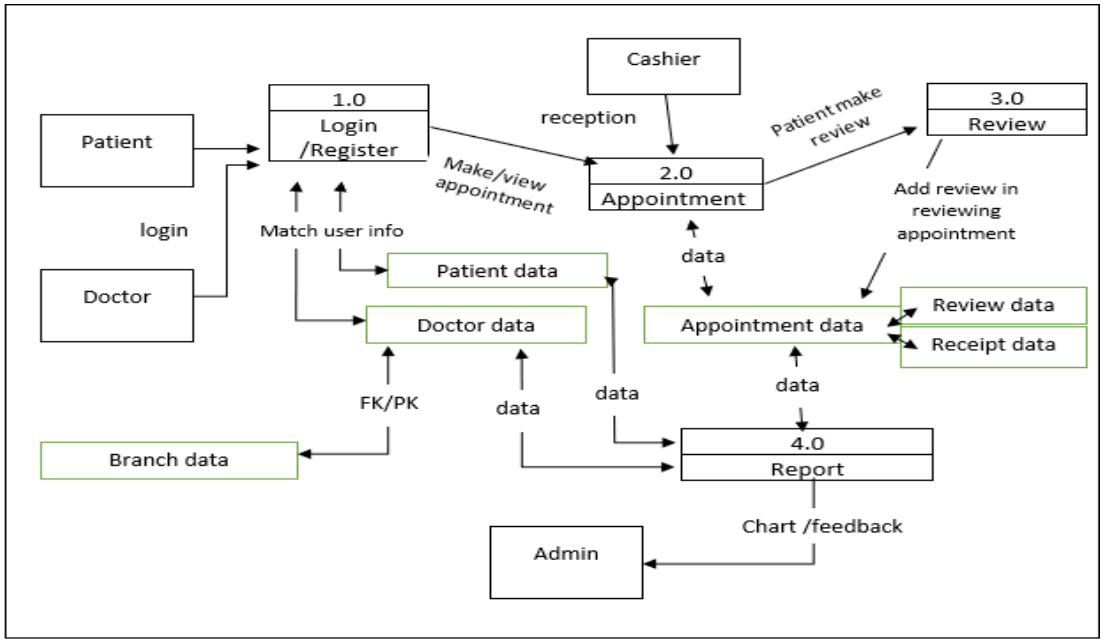

Figure 2: DFD level 0

4.6 Entity Relationship Diagram (ERD)

Figure 3 shows 1 Patient can only make 0 or more appointment. 1 appointment can only make 1 review and 1 receipt. 1 doctor have many appointments. 1 branch have 1 doctor.

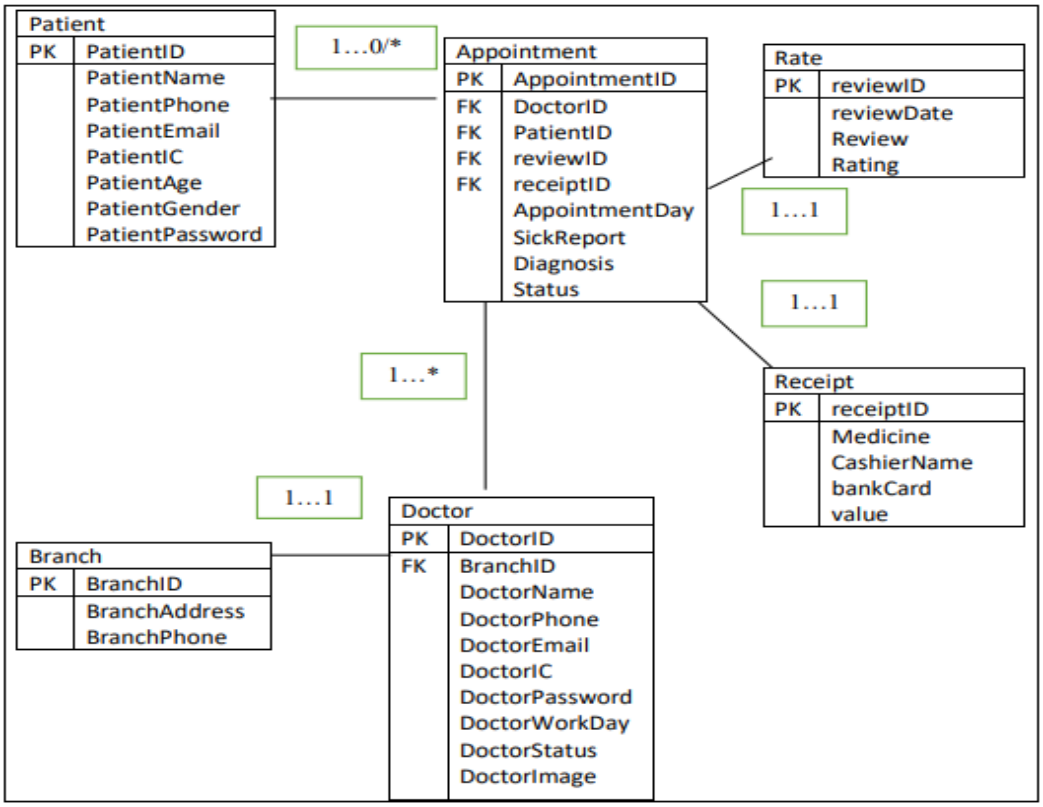

Figure 3: ERD

4.7 System Design

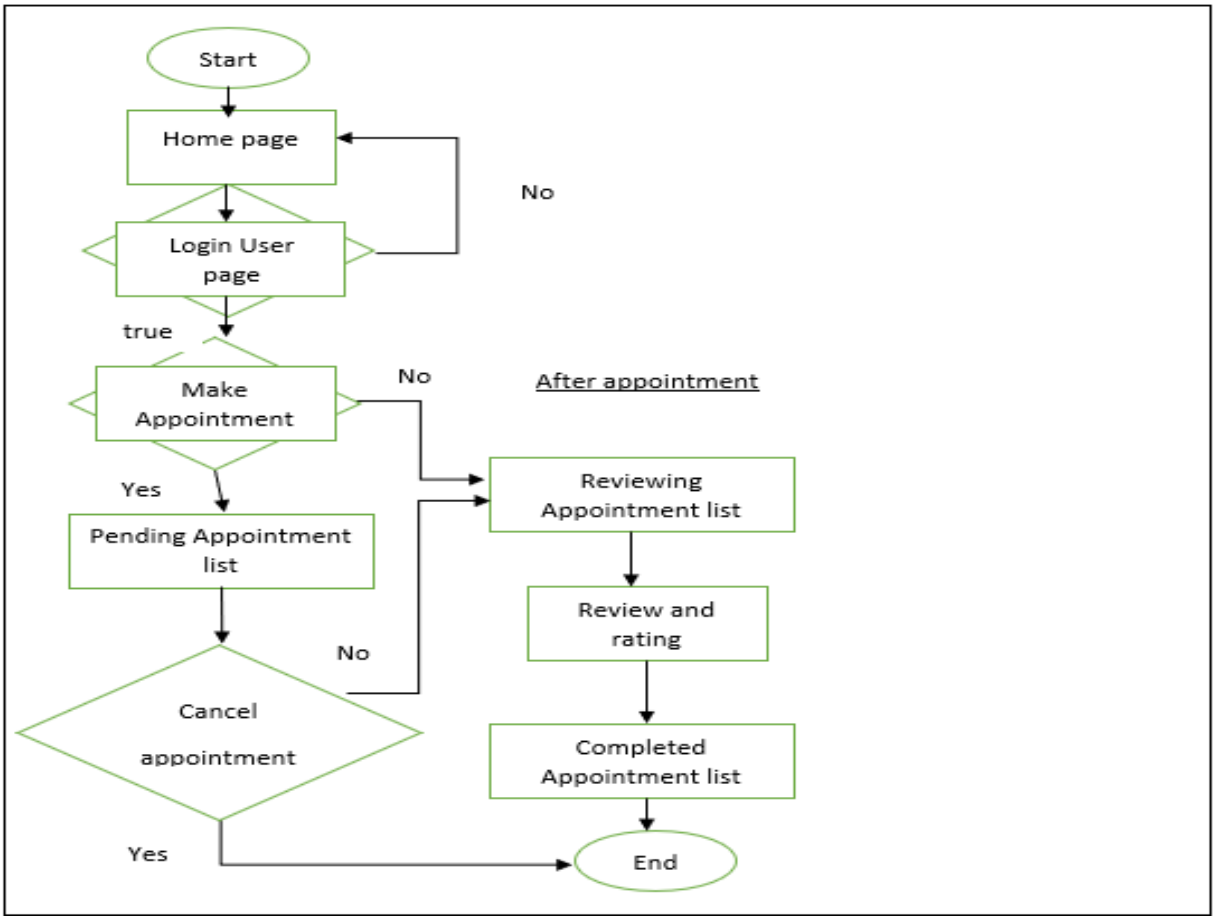

Figure 4: User Flow Chart

4.8 User interface

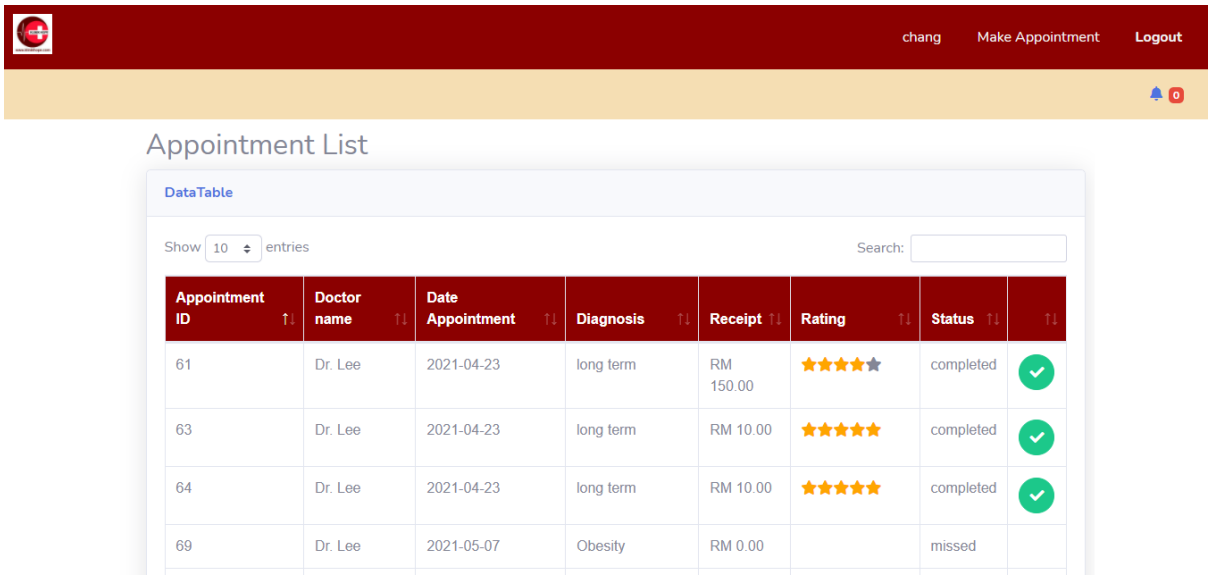

Figure 5: Patient Home Page

Figure 5 shows that patient home page will display the appointment record that made by patient and the status and history record have been made. Patient able to make appointment with doctor and view their profile.

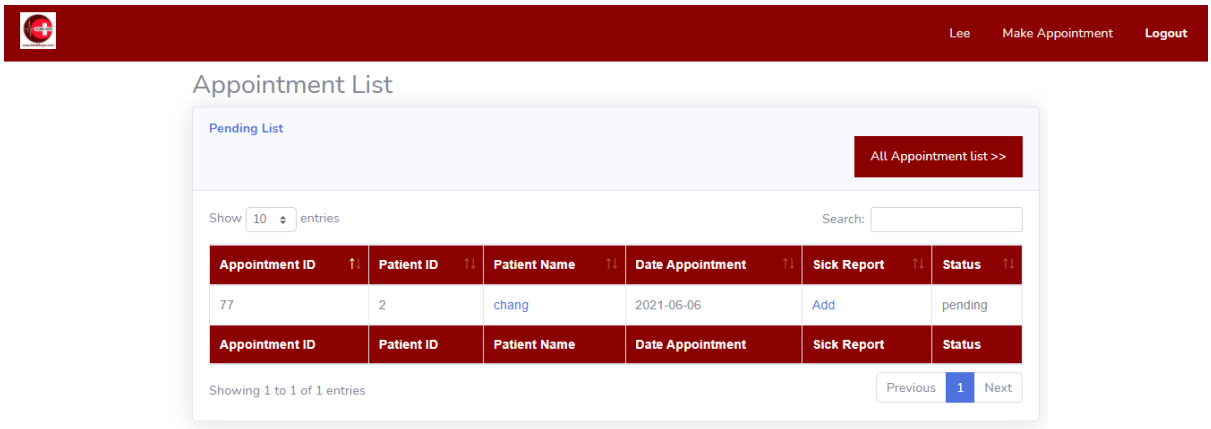

Figure 6: Doctor Home Page

Figure 6 shows doctor homepage have the record of their patient, the patient history record, and able the doctor makes sick report to their patients. Doctor also able to make appointment with their patient and view their profile.

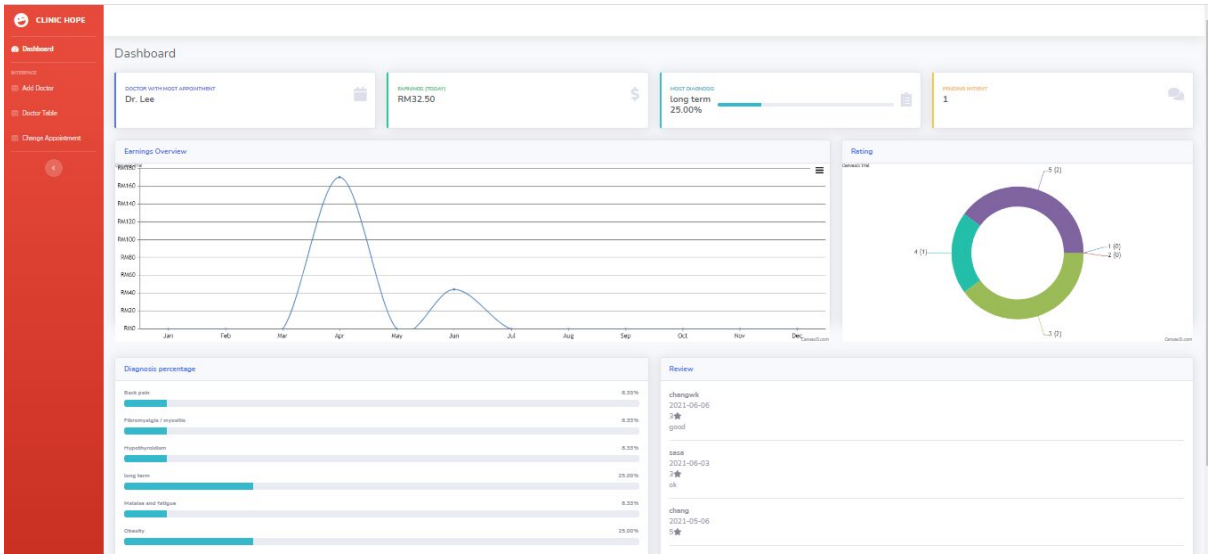

Figure 7: Admin Page

Figure 7 show the admin page, admin able to view the review, financial, diagnosis, pending patient report of clinic Hope. Admin also can add, edit, view the record of doctor and change the doctor appointment if the doctor no available at that day.

4.9 User satisfaction

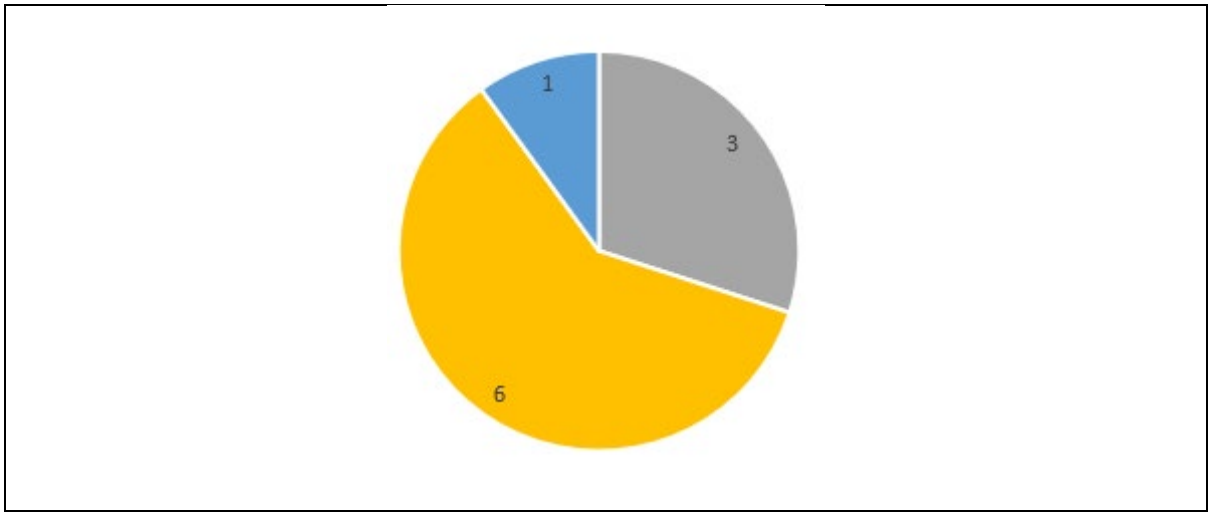

Figure 8: User Satisfaction

Figure 8 shows the user satisfaction, there are 3 out of 10 people giving normal rate. 6 out of 10 people giving good rate.1 out of 10 people giving excellent rate.

5. Conclusion

In conclusion, the Clinic management system is applied in clinic Hope. This project includes mapping in appointment module, login/Register module, reviewing module, reporting module and notifying user. Waterfall approach is applied while developing this system. This will involve an iterative process to make this system is usable and easy to use by the user. The design for the system is using the System Development Life Cycle (SDLC) approach. The design will involve entity relationship diagram (ERD) and Data Flow Diagram (DFD) to show the logical flow for the system. For the implementation, Apache is used as a web server, MySQL as a database, PHP as a scripting language and browser. The main important while developing any system is to make the system usable [4][5].

Acknowledgement

The authors would like to thank the Faculty of Computer Science and Information Technology, Universiti Tun Hussein Onn Malaysia for its support and encouragement throughout the process of conducting this study.

References

[1] Tutorialspoint, “SDLC - Waterfall Model”, [Online]. Available: https://www.tutorialspoint.com/sdlc/sdlc_waterfall_model.htm

[2] Wikipedia, “Requirementsanalysis”,[Online]. Available: https://en.wikipedia.org/wiki/Requirements_analysis

[3] UTHM, “Chapter 4 SAD” [Online]. Available:https://flipbookpdf.net/web/site/e2e268da160240205870ded3a230685345cb58f4202011.pdf.html

[4] ANG HWEE KWAN, “CLINIC MANAGEMENT SYSTEM”, Degree of Bachelor of Information Systems Engineering, Perak Campus, UTAR, JAN 2015 http://eprints.utar.edu.my/1558/1/CLINIC_MANAGEMENT_SYSTEM.pdf

[5] MOHD ARIFF BIN ANUAR, "CLINIC MANAGEMENT SYSTEM", Degree of Bachelor of Computer Sciences, Faculty Computer Sciences and Information Technology, UNIVERSITI MALAYSIA SARAWAK, 2006 https://ir.unimas.my/id/eprint/6551/1/CLINIC%20MANAGEMENT%20SYSTEM%20(24%20pgs).pdf