.DECISION SUPPORT SYSTEM FOR DENTAL CLINIC

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ABSTRACT

Decision Support System for Dental Clinic is a web based application. This system is providing to implement process in the Dental Clinic starting with patient registration until dentist or nurse settled the patient treatment. The objective of this project is develop Decision Support System for Dental Clinic that provide information about the dentist and nurse profile, patient information include patient personal detail, patient treatment, patient appointment, patient billing, and dental treatment and disease. Dental treatment and disease module provide information about the cause of tooth extraction and tooth filling. It is allow the dentist or nurse to trace whether the patient needs to make tooth extraction or tooth filling. During the system development Macromedia Dreamweaver 8 is used in order to create interface and coding. The MySql database is create using XAMPP. This system is gives advantages to the all both users clinic staff and end user especially patient, where the two users can access the system.

ABSTRAK

Sistem ini merupakan aplikasi berasaskan web. Sistem ini disediakan untuk melaksanakan prosese pengurusan dalam klinik gigi semasa menyimpan maklumat rawatan pesakit. Tujuan projek ini untuk mengembangkan Sistem Pendukung Keputusan untuk klinik gigi yang menyediakan maklumat mengenai maklumat doktor gigi dan jururawat, maklumat pesakit termasuk butiran peribadi pesakit, maklumat rawatan pesakit, temujanji bersama pesakit, bayaran rawatan dan maklumat rawatan gigi dan penyakit. Modul penjagaan gigi dan penyakit mengandubgi maklumat tentang penyebab cabutan dan tampalan gigi. Hal ini membolehkan doktor gigi atau jururawat untuk mengesahkan sama ada pesakit perlu membuat cabutan gigi atau tampalan gigi. Dalam membangunkan sistem ini, Macromedia Dreamweaver 8 digunakan untuk menghasilkan reka bentuk sistem. XAMPP 2.5 digunakan untuk menghasilkan pangkalan data. Sistem ini memberikan keuntungan kepada semua kakitangan baik kakitangan klinik dan pengguna akhir terutama pesakit, di mana dua pengguna boleh mengakses sistem secara atas talian.

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	SUPERVISOR'S DECLARATION	ii
	STUDENT'S DECLARATION	iii
	DEDICATION	iv
	ACKNOWLEDGEMENT	v
	ABSTRACT	vi
	ABSTRAK	vii
	TABLE OF CONTENTS	viii
	LIST OF TABLES	xi
	LIST OF FIGURES	xii
	LIST OF APPENDICES	xiv
1	**INTRODUCTION**	1
	1.1 Introduction	1
	1.2 Problem Statement	2
	1.3 Objectives	3
	1.4 Scopes	3
	1.5 Organization of the Thesis	4
2	**LITERATURE REVIEW**	5
	2.1 Introduction	5
	2.2 Overview of the Current System	6
	2.3 Study Existing System	7
	2.3.1 Dental Information management System	7
	2.3.2 Dental Clinic Management System	11
	2.3.3 SaralDent 4.0	14

	2.3.4 Analysis of Existing System	18
	2.4 Studies about Development Tools and Database Management	19
	2.4.1 Development Tools	19
	2.4.1.1 Visual Studio Basic.Net	20
	2.4.1.2 Oracle Report and Oracle Form	21
	2.4.2 Database Management	21
	2.4.2.1 Microsoft Access	22
	2.4.2.2 SQL Server	22
	2.4.2.3 Oracle SQL	23
	2.5 Studies on Dental Treatment and Disease	24
	2.6 Chapter Summary	26
3	**METHODOLOGY**	28
	3.1 Introduction	28
	3.2 Project Method	28
	3.2.1 Requirement Planning	30
	3.2.2 User Design	31
	3.2.2.1 System Design	32
	3.2.2.2 Database Design	39
	3.2.3 Construction	41
	3.2.3.1 Overall Interface Design	42
	3.2.3.2 Interface Development	42
	3.2 Cut Over Phase	43
	3.3 Development Tools	43
	3.3.1 Software Requirement	44
	3.3.2 Hardware Requirement	46
	3.5 Chapter Summary	47
4	**IMLEMENTATION**	48
	4.1 Introduction	48
	4.2 Development of DSSDC	49

5	**RESULT AND DISCUSSION**	65
	5.1 Introduction	65
	5.2 Result Analysis	65
	5.3 Project Constraints	67
	5.4 Suggestion and improvement	67
6	**CONCLUSION**	68
	REFERENCES	70
	APPENDICES	71
	APPENDIX A Gantt Chart	72
	APPENDIX B Data Material	74
	APPENDIX C Sample Article	80

LIST OF TABLES

TABLE NO	TITLE	PAGE
2.1	Development Tools and Database Management	19
2.2	Symptom of Tooth Disease, Problem and Prevention	25
3.1	Software Requirements	45
3.2	Hardware Requirements	46

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE
2.1	Login Form(DIMS)	8
2.2	Patient Record (DIMS)	9
2.3	Schedule New Appointment (DIMS)	10
2.4	Patient Tooth Part (DCMS)	12
2.5	Guide of Tooth Chart (DCMS)	13
2.6	Registered Patients (SARALDENT 4.0)	15
2.7	Tooth Examination Form (SARALDENT 4.0)	16
2.8	Appointment (SARALDENT 4.0)	19
3.1	Rapid Application Developments	28
3.2	Use Case of Decision Support System for Dental Clinic	34
3.3	Sequence Diagram: Basic Flow (Registration)	35
3.4	Sequence Diagram: Basic Flow (Patient Tooth Treatment)	35
3.5	Sequence Diagram: Basic Flow (Decision of Treatment Disease)	36
3.6	Sequence Diagram: Basic Flow (Appointment)	37
3.7	Sequence Diagram: Basic Flow (Billing)	38
3.8	ERD of Decision Support System for Dental Clinic	40
3.9	Design of Decision Support System for Dental Clinic	42
4.1	Login Form	49
4.2	Coding of Login Form	50
4.3	Patient Registration	51
4.4	Coding of Patient Registration	52
4.5	Patient Searching Form	53
4.6	Coding of Patient Searching Form	54
4.7	Patient Waiting Form	55
4.8	Coding of Patient Waiting Form	55
4.9	Patient Examination Form	56

4.10	Record of Treatment Form	57
4.11	Coding of Treatment Record Form	58
4.12	Patient Appointment Form	59
4.13	Dentist Profile Form	60
4.14	Coding of Dentist Profile Form	60
4.15	Patient Billing Information Form	61
4.16	Dental Chart Code Form	62
4.17	Coding of Dental Chart Code Form	62
4.18	Cause of Tooth Extraction and Tooth Filling Form	63
4.19	Symptom of Tooth Disease Table	64
4.20	Coding of Tooth Disease Symptom	64

LIST OF APPENDICES

APPENDIX	TITLE	PAGE
A	Gantt Chart	75
B	Data Material	80
C	Sample Article	86

CHAPTER 1

INTRODUCTION

1.1 Introduction

Basically, Decision Support System for Dental Clinic developed to implement process in the dental clinic starting with patient registration until dentist or nurse settled the patient treatment. This system functions to implement process of the dental clinic that record about dentist profile, patient personal detail, patient treatment, patient appointment, patient billing, and dental treatment and disease. Patient personal detail consists the information about general information, previous medical history and previous dental history. Patient treatment module consist the information about the tooth examination and record and list of treatment that has done. Besides that, cental treatment and disease module provide information about the cause of tooth extraction and tooth filling. It is allow the dentist or nurse to trace whether the patient needs to make tooth extraction or tooth filling. Decision Support System for Dental Clinic is an independence management solution for managing information in the non-government clinic. The propose system is also focuses to improved the current system in part of record patient tooth treatment.

1.2 Problem Statement

Current system of the Non-Government Dental Clinic already has the window based solutions it is naming Decision Support System for Dental Clinic. It is windows based medical billing software, designed to manage medical billing, scheduling, management and managed care. This system is all about saving time, improving cash flow, and helping better manage the data as computerized.

Even though the dental clinic had a system, but they still do not use the application. It is because there are facing several problems during process management. The current system is just window based solution where the user from outside cannot use the system. So, people from outside cannot view their treatment examination that they have done in the dental clinic. There are also problem when the patient forgot their appointment time because they cannot check their appointment schedule through online. Although the appointment schedule was provided in the manual, it is possible that the paper will be missing.

Other than that, the problem has been occurring during record the patient tooth examination. As example, in patient treatment examination form, there are provided picture of all teeth. The form is also looked like crowded and not easy to use. There are not provide user manual or guide that can help user use the system. The problem is, it will take longer time when the nurses want to record and examine patients. This activity cannot do as simultaneously. Besides that, the existing structures of tooth treatment form are wrongly design refer Figure 2.7: Tooth examination form. The element of tooth surface is difficult to mark.

1.3 Objective

The objectives of the project are:

i. To develop Decision Support System for dental clinic.
ii. To improve part of record patient examination form.
iii. To analysis the cause of tooth disease, prevention and treatment.

1.4 Scope Project

Two users can use this system:

i.Dentist / Nurse

- Responsible to record patient treatment.
- Responsible to update their profile.
- Nurse able to decide the appointment between patient and dentist since the treatment just can handled by the dentist.
- Dentist is responsible to handle the patient appointment.
- Able to analyse the cause of tooth extraction and tooth filling.

ii.Patient

- Able to review their treatment examination and appointment schedule.
- Able to view the information about the tooth disease and take the hygiene care based on the propose prevention.

This system consists of two modules. There are modules for dentist and patient. It is web base application which is the user can use an online system. A case study for this project is dental clinic that located at Jalan Besar, Parit Perak Darul Ridzuan.

1.5 Organization of the thesis

This thesis consists of six chapters. Chapter one is explain about the project that develop include introduction, problem statement, objective, scope of the project, and organization of the thesis.

In chapter two, it briefly explains about the reviews for the chosen project. This chapter is divided into two sub-topics that require to study to get complete information about the project. This chapter also explains about the technique or technology that can be use during the project development.

The methodology in chapter three is discussed on software process or flow process for Decision Support System for Dental Clinic (DSSDC). This chapter also explains about the system development life cycle besides software and hardware specification that are needed for this project development.

Chapters four will describe all processes that involve in the development of this project. This chapter explains about the designed project development. The content in this chapter depends on the project. How to designate user interface is developed, either using IDE tool or source code should be included in this chapter.

Chapter five is about the result and data analysis that include result analysis, project limitation and suggestion and project enhancement.

At the last chapter in Chapter six will conclude all this project system from the beginning of the project until the end of the project. The conclusion will explain overall of this system.

CHAPTER 2

LITERATURE REVIEW

Literature review refers on interview, book, and Internet to get some information about this project to give a clearance perspective in developing for this project. This chapter will be discussed about overview of the manual system, study on the development tools and database management system. Its ultimate goal is to bring the reader up to date with current literature on a topic and forms the basis for another goal, such as the justification for future research.

2.1 Introduction

In computer science, information system is all about information technology and mediates the two opposing worlds of human activity (Steve Elky, 2006). Current system of the dental clinic also has the system that can handle the process management as a computerized. But, there are a few problem during using the system and that cause they used the manually system. So, this literature review has been covered about the process of the manual system that cause the current system is difficult to use.

Then, study about the problem of existing system can help to define why the system still not ready to use that cause they still use the manual system. The question here what was the problem and how to improved the incorrectly of the system? What are the lack of the current system that we want to cover to propose others system that have a same of level abstraction without change the unmodified area of the system? Study about existing is focuses about to describe function and flow process of the each module that wants to improve especially tooth treatment module and appointment module. Three of sample selected system has been review and tools that used to develop the system have been compared. Next, discuss about the technique that will be use to develop new system and others technology that related.

2.2 Overview of the Current System

The clinic that used the current system is located at No 12, Jalan Besar, 32800 Parit Perak Darul Ridzuan. Actually, this clinic already has the systematic system where all the information of the clinic is record as computerized. The system is function to implement process of the dental clinic that record about patient profile, staff profile, dentist profile, information of the treatment and prepared bill. But, there are a few problem during using the system and that cause they still used the manual system.

Firstly, staff will request the patient identity card (IC). Staff will search the patient profile belong the last number identity card. For the first time come to dental clinic, staffs need to register new patient. During the treatment, dentist or staff need preview the last record and update the patient health status. Staff or dentist will treat the patient and record the tooth examination form.

After the treatment staffs need to print out the payment receipt. Although staff can be the dentist, staff cannot handle some treatment such as sental surgery, dental x-ray, dental space maintainer and the other. The treatment just can handle by the dentist.

So, the treatments maybe need to postpone and staff need to decide new appointment between patient and dentist. Staff will set the appointment if the treatment cannot finish at that day. Sample of patient information form and billing form provide in Appendix B.

However, the current system not provides decision support system to trace the treatment of health problem and prevention. Dentist will handled the treatment based on their knowledge about the tooth disease.

2.3 Studies on existing System

This part will be discussed about the existing system that has been analyzed through the research.

2.3.1 Dental Information Management Software (DIMS)

DIMS is a software coding that done by Djuric Zoran (2001) from Codegroups Software Development Team. DIMS is a window based solution for medical billing services. The system also offers a complete suite for medical billing, managed care, scheduling and patient charting automation software and services. DIMS is practice management software with a range of experience in practice management industries, particularly focused on small to medium sized practices. Codegroups technological has offer to minimize the time of their clients spend on practice management, medical billing and accounting especially about patient care (Djuric Zoran, 2001).

2.3.1.1 Login Form

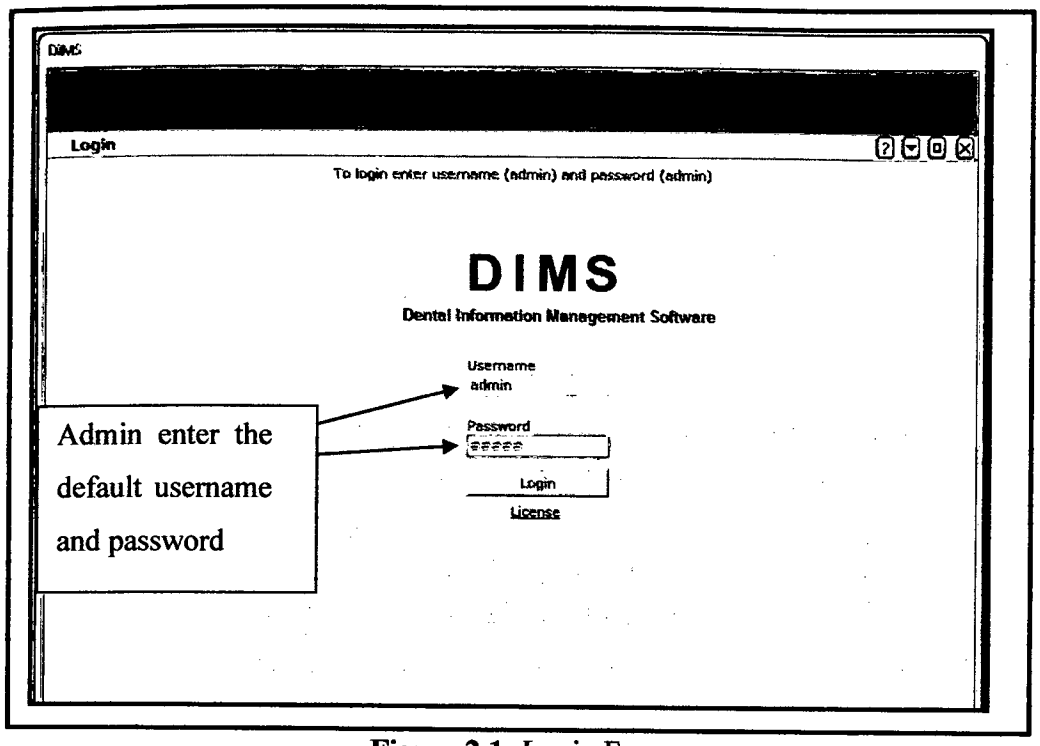


Figure 2.1: Login Form

In login page shown as Figure 2.1, When software starts, password and username are needed to login. Only employee with proper name and password will be granted to work in software. User from outside cannot login to the system.

2.3.1.2 Patient Record

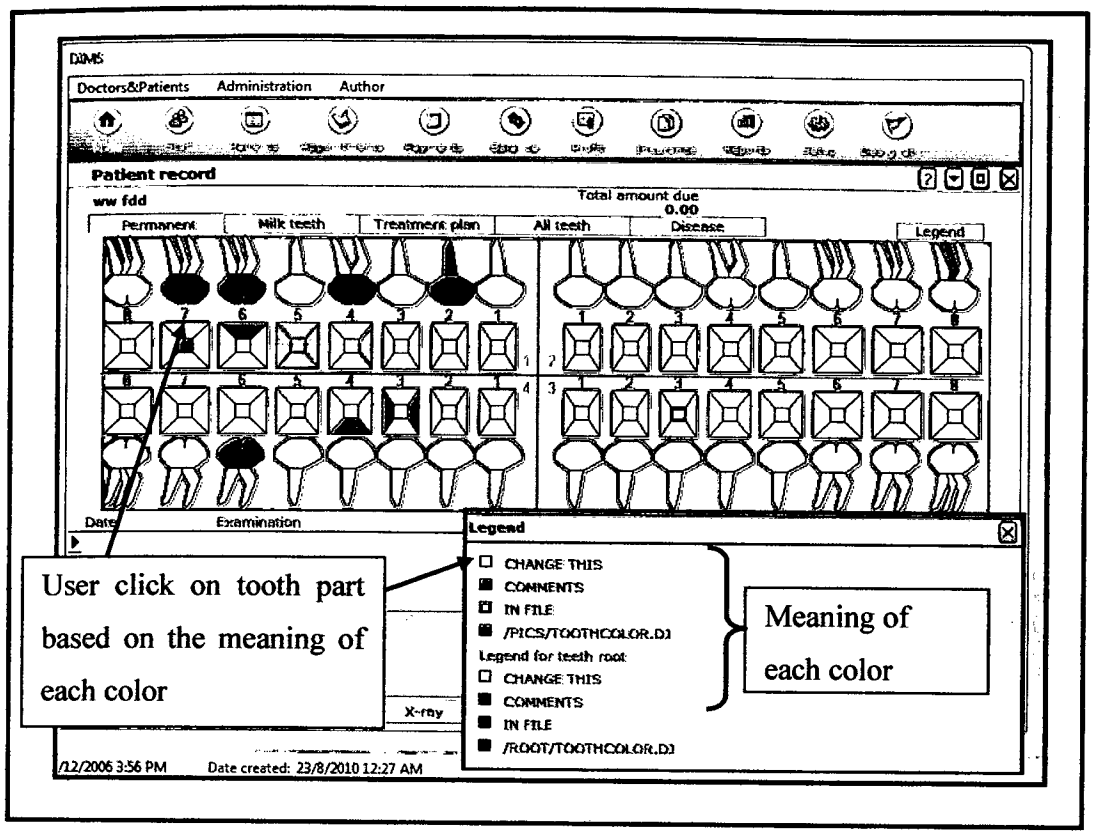


Figure 2.2: patient record

On this form there have all needed data for check-up. This form has provided pictures of all patient teeth. Dentist will update the tooth examination form by clicking on tooth number. To change tooth "colour/shape" they need to click on tooth part. Each click will change tooth colour. The problem is, current dental clinic used the tooth code number (refer appendix B-examination and record) to mark the tooth form. This form is not allowing user to mark the tooth design.

2.3.1.3 Schedule new Appointment

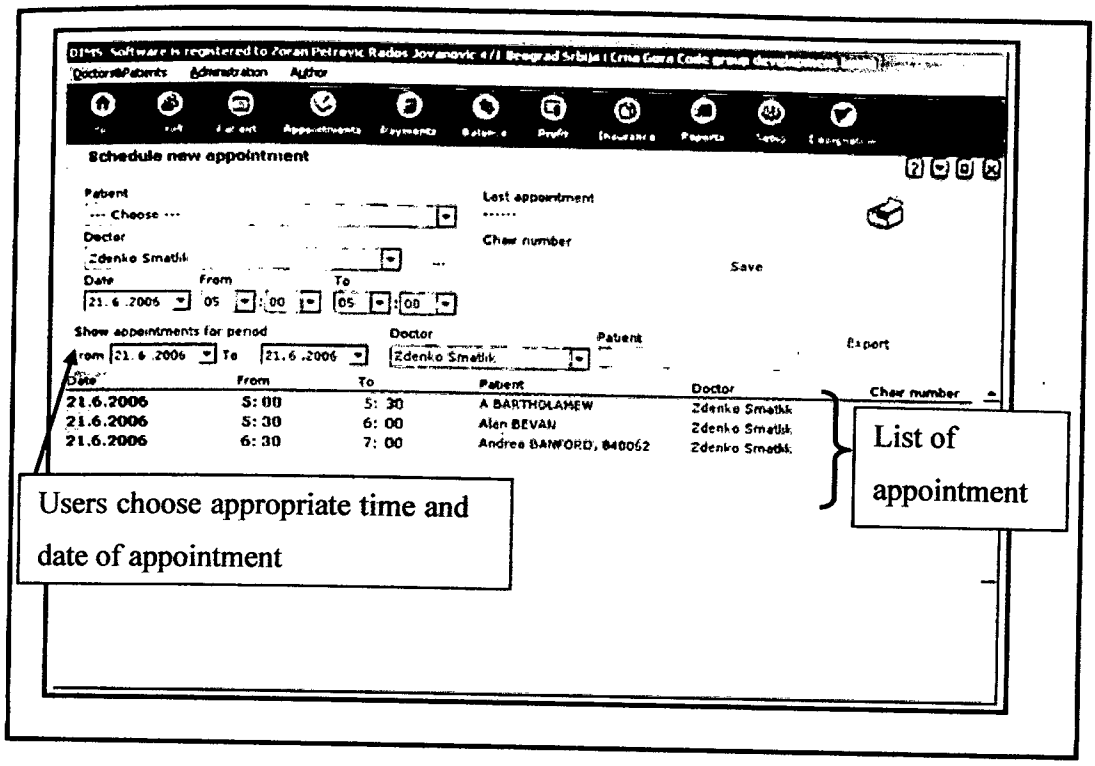


Figure 2.3: Schedule new Appointment

In the schedule new appointment page shown as Figure 2.3, user can view or print list of appointments for selected date or time period. Firstly, users need to select patient from patient list and doctor from doctor list. Then, enter date and time for new appointment. Press save button after finish. User change appointment data, just need to select appointment from appointment list, change data and press 'Save' button. For deleting appointment, they just need to select appointment from list and press 'Delete' button. Employee can see appointments for some time period (just choose appropriate date and time). When this application only can access by employee, patient cannot check or view their appointment schedule.

2.3.2 Dental Clinic Management System (DCMS)

DCMS is software products that develop on April 2009 by Fadzhila Binti Sabri during develop the project last years for diploma student. This system is standalone application which this system is just to save the data as computerized and not connected to any network. Although this means it cannot share resources with any other computers, this system is also give an advantage, as it can make the computer more secure. During the system development Microsoft Visual Basic.Net 2008 is order to create interface. The database is creating in Microsoft Access 2003 to run and compile system.

Although the main purpose in developing this system is to bring advantages to the Government Dental Clinic that do the process management in the clinic, but there still have lacking in this application as listed below:

i. There is no admin page that functions to reset the user id if the user is lost their password.
ii. There is no appearing the staff Id in the patient profile form that show about who handled the patient. It is difficult to recognize the staff and dentist profile if something happened during the treatment.
iii. Part of patient tooth chart (refer figure 2.4) is difficult to use because the interface is not user friendly and guide of tooth chart (refer figure 2.5) come out in different form.

2.3.2.1 Patient Tooth Chart

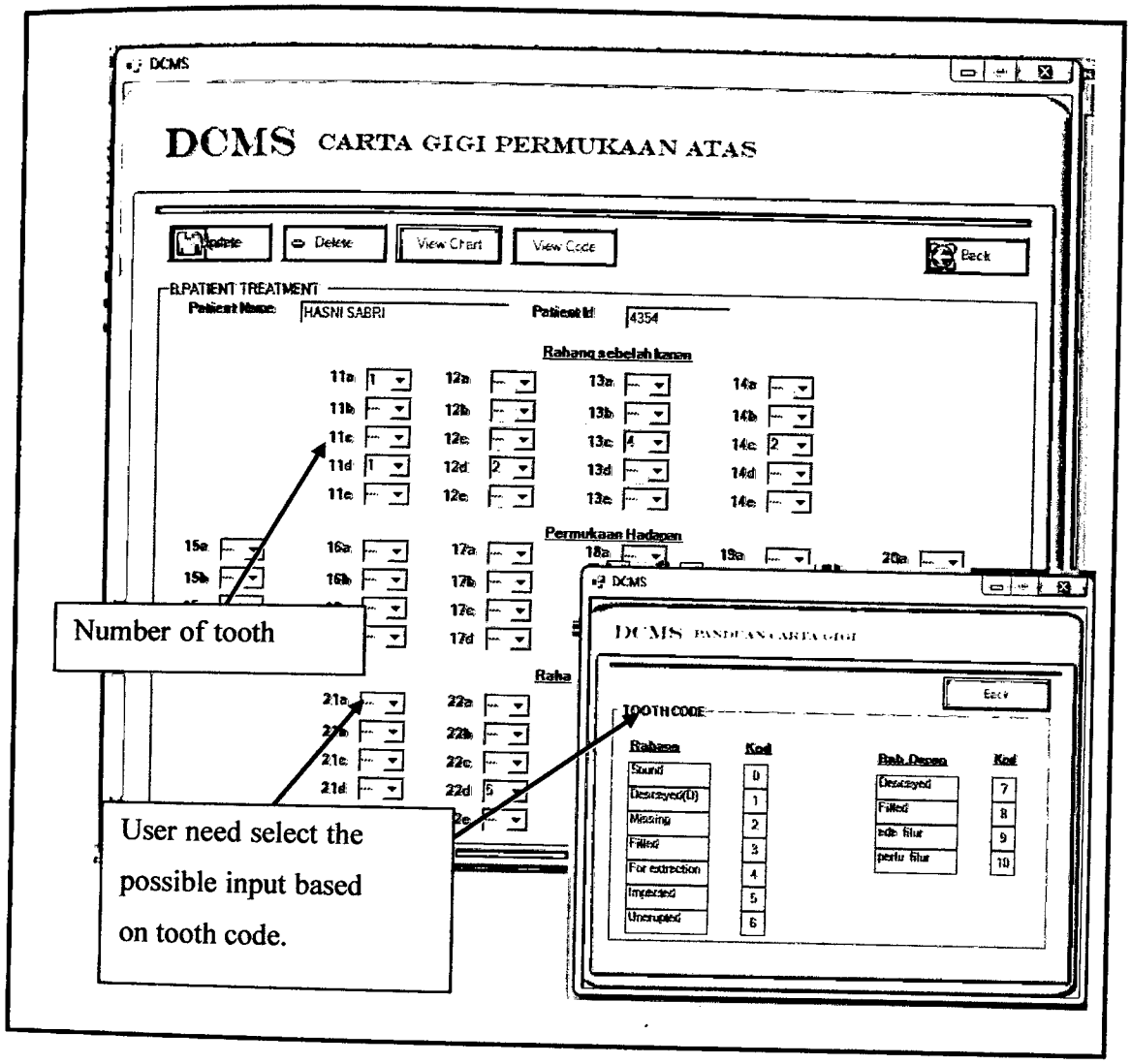
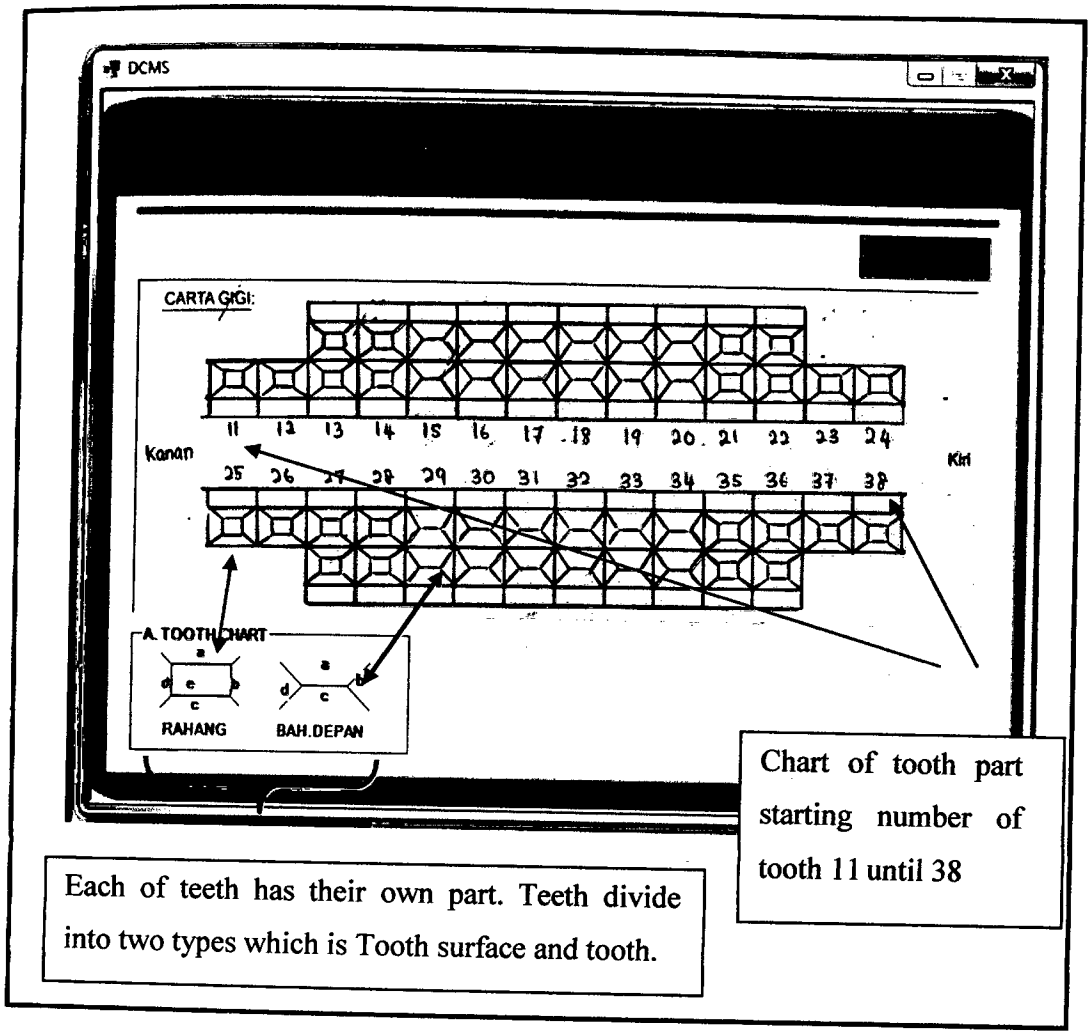


Figure 2.4: Patient Tooth Chart

Based on the figure above, there are show the form of upper tooth part include the number of tooth part and provide drop down box that enable user to select the possible input of tooth code. Possible input of tooth code starting with number one until number ten. User can click the 'view code' button that allow the form of tooth code appear on screen. User can select the input based on the tooth code as a reference. User also can click the view chart button to view the picture of tooth chart (refer figure 2.5). This form is not easy to use and take long time during record the tooth treatment. It is because, the form of interface used drop down function which is the user need to click the mouse to select the possible input.

2.3.2.2 Guide of Tooth Chart



igure 2.5: Guide of Tooth Chart

Figure 2.6 show the guide of tooth chart form that appear when user click the 'view chart' button in Patient Tooth Part form (refer figure 2.5). This chart also not easy to understand because this chart divide into two categories which is chart of all tooth and chart for each tooth. Chart of all tooth show the number of tooth start with number 11 until number 38. The charts of each tooth divide into two categories which tooth surface and tooth.

2.3.3. SaralDent 4.6

SaralDent 4.6 is software products that develop on 2008 by Sarals Group Company located at Mumbai India. SaralDent 4.6 have provide dynamic charts for patient treatment form that give client to update patient information treatment on a chronological basis in an easy to comprehend graphical format. It also enables client to easy enter the data with minimum typing because there are also provide a simple drag and drop interface (Ghatkoper, 2008). Client will find the SaralDent Chart easy to use and understand. SaralDent Charts will increase client productivity while making the whole clinical charting process easier (Ghatkoper, 2008).