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JUDUL: DISEASES DIAGNOSIS BASED ON BLOOD TEST REPORT
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DEDICATION

To my mother and father,
Whose boundless love and support replenishes and enriches my soul
During the long hours of writing

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ABSTRACT

The development of Sistem Diagnosis Penyakit Berasaskan Ujian Darah was carried out for the staff laboratory of Phatology Department Hospital Kuala Lumpur to manage computer diagnosis system and using operation in most effectively. Variety of resources and references was used to develop the system with the using of Visual Basic application for users understand the concept and ruling of using the system. The significant reduction in time, effort and finance are a few of the benefits obtained from the implementation of this system. Besides that, collecting information, storing data and creating timetable will be easy and manageable by replacing the manual system that we are using now with this system. This system is fully recognize because it had been through a conscientiously development phases and the whole process involved the end users.

ABSTRAK

Pembangunan Sistem Diagnosis Penyakit Berasaskan Ujian Darah ini bertujuan membolehkan kakitangan makmal bahagian Jabatan Patologi Hospital Tengku Anis bagi mengurus operasi mendiagnosis dan penggunaan komputer di dalam sesebuah makmal dengan lebih berkesan. Pelbagai sumber dan rujukan telah dijadikan asas di dalam membangunkan sistem ini di samping penggunaan aplikasi Visual Basic 6.0 yang di ketahui mesra pengguna dalam memudahkan pengguna memahami konsep dan tatacara penggunaan sistem ini. Pelbagai kesan dapat dilihat hasil dari pengaplikasian sistem ini seperti penjimatan masa, tenaga dan penggunaan kertas yang seterusnya mengurangkan masalah kewangan. Selain itu, operasi semasa seperti pengumpulan maklumat, penyimpanan data dan pembinaan jadual penggunaan yang lebih teratur dapat dilakukan dengan menggunakan sistem ini bagi menggantikan kaedah manual yang digunakan sekarang. Sistem ini diakui kemampuannya kerana telah melalui beberapa fasa pembangunan yang teliti di samping penglibatan pengguna di dalam keseluruhan proses.

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CHAPTER 1

INTRODUCTION

1.1 Project Introduction

Tengku Anis Hospital is one of the medical centers that exist in the state of Kelantan which is responsible to provide patient's treatments. There are certain departments that handle several types of treatments including such as the Lab Department which receiving the most patients acceptance. These departments are the one that responsible in managing the blood sample testing process. Reports of the tested blood will be viewed or print out after a detailed analysis are done by the expert doctor in order to ensure the type of illness or disease suffered by the patients.

Its will takes time for the patients to knowing the testing result. As for this, a research was done to look more clearly on the available approach, ensuring the problem statement and proposed a suitable yet effectives support system in handling the disease/illness result.

Other then that, the manual system that still been used has showed that it's required a long period of time in establishing the progress action. The processes of system are also slow. This sometimes might cause problems if there are not enough expert doctors in handling chronics types of diseases or illness.

Patient data managing in Lab test is slow, this is because of the navigation toward the data is done by manually and worst of all is the doctor could not produce the final result at the mean time because of the late arrive of the data itself

The proposed finishing toward the problem is to concentrate and focus on how to speed up the managing process of data analyzing in the Test Lab. The answer to this is to develop a system that is efficient and systematically.

This solving method will ease the doctor job toward the problem cases, the doctor only have to declare either the result could be produce or not based on the possibility of the diagnosis that have been done toward the infected virus.

“Diseases Diagnosis Based on Blood Test Lab Report” is a system, which capable of facilitate the doctors in ensuring the types of critical diseases/illness that faced by the patients. Normally the result that received by the patients required a long period of time process.

The diagnosis systems are built for a stand-alone environment. This system was develop using ascertain software such as Visual Basic 6.0 for the programming language, Apache as the server and Microsoft SQL Server as the database.

Lastly, it is hoped that this system will gives the benefit to all system users in increasing the health life for the Malaysian citizen through earlier detection and treatments.

1.2 Project Objective

This system contains a few main objectives such as:

- a. Converting the manual system of the blood-tested diagnosis made by doctor to system that involved computer based.
- b. Build a system that capable of producing result that faster and accurate to the patient through the blood-tested report that has been held.
- c. Developed a system that can be access by any side of department that required it and for the hospital that have no enough doctors to work on the blood diagnosis.
- d. The information and also the patient blood result report can be saved and can be used as a reference for future used

1.3 Project Scope

According to research that have been done, the scope for this system development have been identified. It's concluded of a few parts that involved the patient illness/disease diagnosis. The scope for this project are focused on the expert system development that capable of diagnosing the patient illness or diseases where all the blood tested data and other types of data are kept on the database. The scope is given below.

1.3.1 Illness/Diseases Diagnosis

The illness/diseases diagnosis is a support system that worked as a decisions making according to the verifying information that was given by the system user. Decision will be made after the information that was been recognized through comparison process with the main data that have been inserted to the system.

1.3.2 Local Area Network

“Diseases Diagnosis Based on Blood Test Lab Report” was developed through ‘Local Area Network’ and the user will be among the trained staffs. This is done to ensure that the trained staff can manage the system well such as inserting the right data of the blood tested result and can noticed or read the result that viewed by the system.

1.3.3 Data Saving

Any information that involved with the patients that made a treatment must be saved inside the database. This data saving are important as its will be used by the hospital side from time to time

1.3.4 Data Searching

Data that contained inside the database needed to be well access functioning as the data searching will be more faster process in getting certain types of data or information from the database.

1.4 Project Significant

It's been expected that this project will be good to all the side of users involve in the matter. These will essentially increase the quality and efficiencies in the management work force for today and the ulterior.

1.5 Conclusion

What can be conclude from chapter one is, development of this system have its own advantages and also disadvantages. From the research result it's clearly that the system will collect all the data that been inserted by the user and do a diagnosis according the nearest information to get to the expected result. The final result will be only permitted by the real doctor. Through this, the entire information of the patients will be handle and taken care systematically and also efficiently.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Literature researches are needed in developing a perfect system. These researches are used as a method in collecting information and in order to identify certain problems. This will surely increase organization potential that was used as a research case. Using this literature research, the system requirement and its problems will be known and identified easily. Through this, the ideas of handling the problems will be listed and will be taken as an action.

There are many step of conducting a research. Research started by knowing the organization background. These are done to ensure whether the system that was proposed is match up with the organization needs. The second step is by conducting an interview with the organization management and also its staff. This is important in achieving information about the system operation and also the problems involving the systems or its environments.

Research are done toward identifying the techniques and the method that already been used by other system that have the same or similar functions as the system that are build by the developer. Thus, proposed solutions for the case research are also been held as one of the system development process.

Other that, all process involving the system must be take as an intention, from the beginning till the end of the development process. Other techniques are also been used in making the information more perfect. As for examples, reading technique that was also been implemented in order to make the system more understandable especially toward the technology involvement for the proposed system. On the last session of this chapter, has made a conclusion in describing the whole research that have been done toward the system.

2.2 Case Research

For the project process planning, has makes references on available information system that was developed by graduate student from higher education instituted.

2.2.1 “Sistem Hospital di Dalam Talian”

“Sistem Hospital di Dalam Talian (SHDT)” by Florinda David (2000) is a system has public patient information such as names, identification card numbers, age, gender, place of birth, treatment (number of checkup attend by the patient) , status, type of illness, type of medicine, registration date, current address.

This “Sistem Hospital di Dalam Talian” operated by receiving input from the user This are done in order to come with the information output display for each patient that get a treatment from the hospital. All patients’ data will be display on the computer screen and each patient will get a turn number that will be print out by the system user or the hospital staff. If there is a new patient wants to get a treatment, a new form will be given by the system user. The patient must fill on the form.

This system are used by the system user or also known as the hospital staffs that are trained to handle the system operation. The database for this system contains records of the patients’ registration and also patient diagnosis record. Microsoft Access and MySql are used as a platform for the data access for the system database.

The strength of this system is that it’s included a function of search and also data access involving the patients’ information using the certain *quires*. The system user just need to type in the key word that is the patient identity card number in order to access the data needed. This will surely saved time for the hospital staff in key-in the data of the patients. The system user also will not need to find the patient information manually as it also known as the patient treatment card.

The weakness for this system is that its can not saved too many data. This problem will then lead to data interferences and also cause unsaved database.

The result that was achieved from this researched showed that the searching function method and data access using queries are needed for creating a better database system.

2.2.2 Malaria Diagnostic Expert System For Children

Malaria Diagnosis Expert System For Children by Loo Lai Kuan is system research showed that system is focused on detecting the malaria disease that affected children. The blood test that was taken from the blood lab is analyzed. The system user then will keep the data in the database

This system will come with result according to the information received by the system user. The patients will not have to wait long in order to get the result from the system analysis. This system was build for the patient to achieve information on how to handle the disease before next treatments are given. This information have make it easier for the patient in making a earlier decision such as making an appointment with the doctor in proceeding the next treatment for the disease.

The developments of this system are based on the available system at that time that is the MYCIN. The MYCIN was developed by Stamford University since 1972. The system that was mentioned is based on expert system, which could come with decisions that similar with the decision that will be made by the expert doctor.

The strength of this system is that user can manage the system easily as the systems itself are user-friendly. User can directly get the test result that was analyzed and less time is needed in conducting the test.

The weakness for this system is that the test result are not hundred percent accurate. This system is designed only for analyzing data for children among one to twelve years old.

Research showed that ‘Malaria Diagnostic Expert System For Children’ is the earliest disease results that are taken from the patient tested data. This result will help on preventing any critical situation in the future.

2.2.3 MYCIN

“System Diagnosis Penyakit” by NorAini bte Ahmad (1999) system developer has made a research on a system that contains a same medical method system with system that was build by the developer.

It was known as “Projek Pengaturcaraan Heuristik Universiti Stanford”. This project has started its development since 1972 and all the programming side for this are taken from medical expert system that work at Stanford Hospital. MYCIN functioned as a medical supervisor, involved in computer terminal and in the same time provided an advice on how further treatment can be done.

The strength of this system is that it’s capable in given an advice that was needed by the patient in knowing any illness or disease. Advices that were viewed out are as same as the advice that will be given by an expert doctor.

Although the system is capable of given an advice, there is still a view disease or illness that cannot be recognize by the system. This might happen if the data is to complex to be analyzed and needed human helped.

2.2.4 Expert System.

System that was known ‘Expert System’ was developed using CBR-Express that was designed as solution of solving domain problems (Levine 1988). This computer system was well inserted with expert knowledge that was taken from one or many expert doctor’s experience in solving problems (Hunt 1986).

There are many definition of expert system according to system researcher's perspective. (McGraw 1989)

- a. Mishkoff (1985) has make a definition on expert system as a system that base on knowledge of computer programming which contains declaration knowledge (such as object, situation fact) and procedural knowledge (such as action information) for balancing the process that was made by domain expertise for certain aspect.
- b. Hannon & King (1985) stated that expert system is an intelligence synthetic program that was designed as an expert representation in certain domain.

Management engine contains program that instructing and handling the expert system operation (McGraw 1989). In other word, the management engine work as a guide for the system operation by knowing the program that will be generated, how its can be used, when the process ended, and when did solution can be proposed on. Management engine contains needed instructions from the knowledge base that will be used in solving problems.

This component is also known as program translator or control structure (Hunt 1986). This part actually contains solution knowledge for problem solving medium. It's designed for generating logics, references, and knowledge management that was programmed by the expert system. Management engine is categorized based on management and controlled strategies. As for example, the management engine for MYCIN used the 'modus ponens' and backwards chained.

Observation from the past researches showed that the theories and method for the system can also be used by developer in developing the diagnosis system. Lastly, from the researches that have been made, MIS (Management Information System) is the right method for developing this project. It was said to be a perfect manager decision making with accurate information according to the manager requirement itself.

As for this, the MIS is said contained the same characteristic as the diagnosis system according to its data and information that was inserting into the database. This data then will be converting to report writing and to mathematical models. Through this report writing, patient data report for blood tests analyze can be viewed and the mathematical models will calculate the receiving data value.

Lastly, all data or information is process for creating a perfect decision making for organization and doctors in solving problems.

2.3 Conclusion

As a conclusion for this chapter, the research results showed that the system that was developed by the developer was already build by other system developer. The differences are only toward its functions and some added items. The available system was used as a reference by the developer in developing more sufficient system. A comparison has been made toward the system and the conclusions are such as written below.

Firstly, the system was build for nowadays used as the system itself was developed to fulfill the market requirement Secondly, the system was implemented using difference types of methodology among it. Thirdly, the system that was developed are actually have a long period of time according to its implementation phases and its information resources.

As for this, the developer has chosen the system development life cycle for conducting the research case for this project. This selection was made as the methodology has its own strength. The available system approaches are also been used as references in ensuring that the system research meets with its target.

CHAPTER 3

PROJECT METHODOLOGY AND PLANNING

3.1 Introduction

This project must be implemented according as planned. This can be done at the first phases of selecting a project names till the implementation phases take place. Other that, the selection of a right methodology and the requirements specifications must be made to ensure that the system development processes are in the right track and meets with its objectives and also its scopes.

A well schedule planning is important in ensuring that the project flow for the system development process fulfill the task that already been defined. The system development had to follow the work schedule planning as to avoid any task delay and also to keep it on track.

Methodology is known as line activities, which are needed in achieving the main project objective for the system. The methodology selection must be taken seriously as it can be used as a guideline for developing a system and for defining the right way on managing the development system. Methodology provided a set of technique that can be used for others types of activities. In developing a system, planning phase is important as the whole systems might be affected if the developer made a bad selection for the phase. Time and cost might also be effected due to this bad selection.