MOBILE THALASSAEMIA DIAGNOSIS SYSTEM USING CASE-BASED REASONING

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MOBILE THALASSAEMIA DIAGNOSIS SYSTEM USING CASE-BASED REASONING

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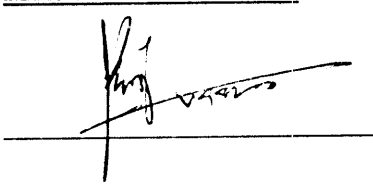
(Signature) : 

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ABSTRACT (BAHASA MELAYU)

Sifat semulajadi pekerjaan seorang pengamal perubatan yang sentiasa bergerak demi keperluan tugas membatasi capaian mereka kepada maklumat digital pada masa yang diperlukan. Oleh itu, peranti mudah alih adalah alternatif yang sesuai untuk kegunaan mereka. Dengan perkembangan pesat peranti mudah alih, keupayaan pemprosessan juga berkembang untuk memenuhi keperluan yang lebih mencabar. Bukan sahaja capaian kepada maklumat, pengamal perubatan juga perlu merujuk kepada kes-kes yang lalu bagi membuat keputusan atau diagnosis. Dengan itu *Case-Based Reasoning (CBR)*, iaitu satu cabang teknik kepintaran buatan dilihat sesuai untuk membantu pengamal perubatan membuat keputusan. CBR membandingkan kes baru dengan kes-kes sedia ada dan mencadangkan penyelesaian bagi kes baru berdasarkan penyelesaian yang telah dibuat untuk kes-kes yang sedia ada. Proses ini hampir menyamai cara manusia membuat keputusan. CBR memberi penjelasan terhadap cadangan yang dikemukakan dengan menunjukkan contoh penyelesaian yang telah dibuat kepada masalah yang hampir serupa. Untuk membangunkan sistem CBR, pengumpulan kes-kes lalu adalah merupakan tugasan utama jika dibandingkan dengan tugasan sistem pakar yang perlu mentafsir kepakaran seseorang pakar. Thalassaemia, sejenis ganguan genetik darah, telah dipilih sebagai bidang (domain) bagi sistem diagnosis dengan menggunakan kaedah CBR ini.

ABSTRACT (ENGLISH)

Nomadic nature of physicians restricts their access to digital information at times when it is needed. Thus, mobile device is seen as a plausible alternative. With the rapid development of mobile devices, its processing power also increases to cater to challenging computing task. Not only access to information, physician also needs to refer to past cases to make decision or diagnosis. Therefore, case-based reasoning, (CBR) a subset of AI technique is perceived to be useful in assisting physicians in making diagnosis. CBR compares new case with existing past cases in the case base and if there is similarity, the past solution is suggested as solution to the new case. This somewhat resembles human decision making. CBR provides justification and better explanation by depicting previous instance(s). As oppose to expert system, the task of knowledge elicitation turns into case histories gathering for CBR. Thalassaemia, a genetic blood disorder, is opted as the domain for this mobile CBR diagnosis system.

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LIST OF ABBREVIATION

AI	Artificial Intelligence
AlDeHbF	Alkaline Denaturation for Haemoglobin Feotus
CBR	Cased-based reasoning
Hb	Haemoglobin
HbA2s	Haemoglobin A2 Estimation
HbEl	Haemoglobin E lectrophoresis
HInc	Haemoglobin Inclusion
MCH	Mean Corpuscular Haemoglobin
MCHC	Mean Corpuscular Haemoglobin Concentration
MCV	Mean Corpuscular Volume of Red Cells
MOP	Memory organization packets
PDA	Personal Digital Assistance
RAD	Rapid Application Development
SeFe	Serum Feritin
SQLCE	SQL Server 2000 Windows CE Edition
TRBC	Total Red Blood Cells
UML	Unified Modeling Language

CHAPTER 1

INTRODUCTION

In this chapter, the first section describes the overall idea in this study from the motivation to the idea of implementation and the benefit of project. It is followed by the problem statement, the objectives of the study, the significance of the study, the scope of the study and finally the organization of the thesis.

1.1 Motivation

The increasing number of Thalassaemia cases in Malaysia is rather alarming and it becomes the concern of many parties including medical practitioners and the authorities as well as the government. It is estimated that there are about 600 thousand to one million Thalassaemia patients in this country. To make the matter worse, it is estimated that about 150 to 150 babies are born with Thalassaemia each year. These babies might not survive their childhood without treatment (The Reader's Digest, 1989). Treatment for Thalassaemia patients includes blood transfusions. Roughly, these patients need about 20 blood transfusions per year. As a result of these blood transfusions, the patients would need chelating agent to get rid of iron overload as the consequences of the blood transfusion. Patients need about RM1000 for this chelating agent. This would be very costly for the patients who are in the lower income group.

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