FSKKP FINAL YEAR STUDENT-SUPERVISOR MATCHMAKING EXPERT SYSTEM

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ABSTRACT

FSKKP Final Year Student-Supervisor Matchmaking Expert System is build to help students to assess the ability of supervisors follow by their chosen field. Using this system, it also will help student to choose their correct supervisor and thus making their final year projects will be established under the guidance of supervisors who have the same field with the title of their project.

Besides, this will strengthen the secure of data storage. It is developed using Adobe Dreamweaver and PHP SQL ; key in data using insert and delete function, relocate required items using search function and update of progress are acknowledge faster.

FSKKP Final Year Student-Supervisor Matchmaking Expert System consist of 6 main modules which are 'Login, 'Home', 'Publication', 'Research' , 'Supervision', 'Education', 'Area of Expertise', 'Teaching Specialist' and another extra modules that display general information. In this project, the algorithm is used to get the highest index of lecturer.

ABSTRAK

FSKKP Final Year Student-Supervisor Matchmaking Expert System dibina untuk membantu pelajar untuk menilai kemampuan supervisor mereka mengikut bidang mereka. Dengan penggunaan sistem ini, ia juga akan membantu pelajar untuk memilih supervisor yang sesuai dan sekaligus akan menjadikan project akhir mereka lebih mantap dibawah bimbingan supervisor yang memiliki bidang yang sama dengan judul projek mereka.

Selain itu, ini akan menguatkan sistem keselamatan simpanan data. Sistem ini dibangunkan menggunakan Adobe Dreamweaver dan PHP SQL, dengan menggunakan fungsi 'tambah', 'hapus', 'cari', dan 'kemaskini'. FSKKP Final Year Student-Supervisor Matchmaking Expert System terdiri daripada 6 modul utama iaitu 'Login, 'Home', 'Publication', 'Research' , 'Supervision', 'Education', 'Area of Expertise', 'Teaching Specialist' dan modul tambahan lain yang memaparkan maklumat umum. Dalam projek ini, algorithm digunakan untuk mencari nilai index terbesar bagi pensyarah.

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LIST OF ABBREVIATIONS

ASP	-	Active Server Pages
CASE	-	Computer-Aided Software Engineering
CBR	-	Case-based reasoning
CD – ROM	-	Writable & Permanent Compact Disc
FSKKP	-	Faculty of Computer Systems & Software Engineering in University Malaysia Pahang
HTML	-	HyperText Markup Language
ISO	-	International Organization of Standardization
JAD	-	Joint Application Development
PHP	-	Hypertext Preprocessor
PSM	-	Project Sarjana Muda
RAD	-	Rapid Application Development
SDLC	-	Systems Development Life Cycle
SGML	-	System Generalized Markup Language
SQL	-	Structured Query Language
VB	-	Visual Basic
XML	-	Extensible Markup Language
XMLDOM	-	Extensible Markup Language Document Object Mode
W3C	-	World Wide Web Consortium

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Expert system is a program that capable of performing at the level of human expert in a narrow domain that uses artificial intelligence and computer program to solve problems within a specialized domain that ordinarily requires human expertise (Michael, 2005).

Basically conventional programs process data and use algorithm, a series of well-defined step-by-step operation. The difference of expert system from the conventional system is separation knowledge from its processing. These make the expert system to much more easy to build and maintain (Michael, 2005).

Bachelor's Degree Project (PSM) is the study or research to meet some of the conditions required for final year students to be awarded a degree in their respective fields. In particular, PSM is a process for students to develop their skills in solving an

issue or problem in the form of self-study. Cooperation between students and supervisors play an important role in determining the success of a project developed by the student.

Faculty of Computer Systems & Software Engineering in University Malaysia Pahang (FSKKP) are still using form to register students to choose topics and supervisors for their final project. To overcome this problem, the idea of FSKKP Final Year Student-Supervisor Matchmaking Expert System has made to helps students to assess the ability of supervisors follow by their chosen field. This is one of the reasons why this thesis of application is being carried out.

By using this system user will know the information and area of expertise about their future supervisor. The system will be suggesting the suitable lecturers that related to their project field. This FSKKP Final Year Student-Supervisor Matchmaking Expert System will help student to make their own decision and choose the best lecturer to be their supervisor.

1.2 Problem Statement

As a compulsory requirement for graduation in the faculty of Computer System and Software Engineering, student must undertake an undergraduate project of their choice. However, students currently very busy with their schedule and extra-curriculum so they do not have much time to research the appropriate lecturers to be their supervisor to help them in final project. Mostly, they will get all the information about lecturers through their friend and also because of the lecturers ever thought them before this. The most important part is through their friend or just knowing lecturers basic information, student do not ever know whether the lecturers they know is suitable with their project

field or not. By using this system, it will help them to make a better decision about their future supervisor based on their interest and project field. Other than that, they do not have to spend a lot of time to find the suitable lecturers to be their supervisor because all the information about lecturer has provided in this system.

In this thesis, problems are investigated according to these questions:

i. What is the best solution to replace manual technique in determining the suitable supervisor for students?
ii. What is the simplest way for student to find about the lecturer's information?
iii. How the expert system will be implemented to save time and effort?

1.3 Objectives

The objectives to develop the system are:

i. To produce FSKKP Final Year Student-Supervisor Matchmaking Expert System to help student in making decision about their supervisor based on student interest.
ii. To develop prototype for student matchmaking application system.
iii. To recommend the student and the suitable lecturer that provides information related to the student's interest.
iv. To develop system into computerized system that combines all information that is needed by students.

1.4 Scope

The scope of this project has been search before the system is build. The scope of project is important because to make sure that the system meet their requirement. The scopes for this project are:

i. This system only for the use of student in Faculty of Computer Science and Software Engineering (FSKKP).
ii. This system only focusing on the students that take PSM1 (proposing the title with suitable supervisor).
iii. Only the listed student's name can be evaluated by using this system.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter will explain about the expert system, expert system tools, study on existing system, study on the programming language and methodology that used to develop the system.

2.2 Introduction to Expert System

Expert systems is an important branch of artificial intelligence's branch, which are designed to represent and employ the knowledge of specific fields in problem solving. Expert system use knowledges, facts, and reasoning techniques to solve

problem that normally require the abilities of human experts. Some of experts systems goals are to help human experts, training new experts, assimilating the knowledge and experience of several human experts, and providing requisite expertise to projects that cannot afford scarce expertise on site (Morsy, 1992). Expert system imitates the expert's reasoning processes to solve specific problems or narrow problem area efficiently and effectively (Watern, 1986) and typically, pertains to problemsaht can be symbolically represent (Liebowitz, 1988). Experts systems are distunguished from conventional computer programs in two essential ways (Bar, ohen et al. 1989).

Every expert system consists of two principal part: the knowledge base and the reasoning, or inference, engine. The knowledge base of expert systems contains both factual and heuristic knowledge. Factual knowledge is that knowledge of the task domain that is widely shared , typically found in textbooks or journal, and commonly agreed upon by those knowledgeable in the particular field. *Heuristic knowledge* is the rigorous, more experiential, more judgemental knowledge of performance. In contrast to factual knowledge, heuristic knowledge is rarely discussed, and is largely individualistic. *Knowledge representation* formalizes and organizes the knowledge. One widely used representation is the *production rule*, or *simply rule* (Engelmore, 1993).

Morsy (1992) explained that with the development widespread use of shells the range of expert systems application has tremendously increased globally. The introduction of expert system shells has played a major role in expanding expert system application into areas such psychology, management , finance, office automation, computer selection and networking, legal processes, manufacturing, equipment training, personnel training, education , transportation and science . Expert system are computer programs that use expertise to assist peaople in pérforming a wide variety of function, including programs that mimic the advice-giving human experts (Brule, 1986) and it also offer the intelligent advice or make an intelligent decision about a processing function.

The typical approach to representing human decision making in simulation models is try to elicit the decision rules from the decision maker. In some cases this amounts to little more than a guess on the behalf of the modeller. The rules are the included in the model using the constructs of the simulation language or simulator. This is normally requires the use of a series of looping statements. Medeiros et al., (1998) have developed one approach to overcoming the problems of handling large amounts of code that is difficult to interpret and even harder to change might be to use an expert system to represent the human decision maker, and link it with a simulation model. This could be implemented in two ways : elicit the decision rules from the expert and represent them within an expert system, and use the simulation model to prompt the expert to make decisions, building up a set of examples from which an expert system could learn. Figure 2.1 and Figure 2.2 shows different between simulation process.

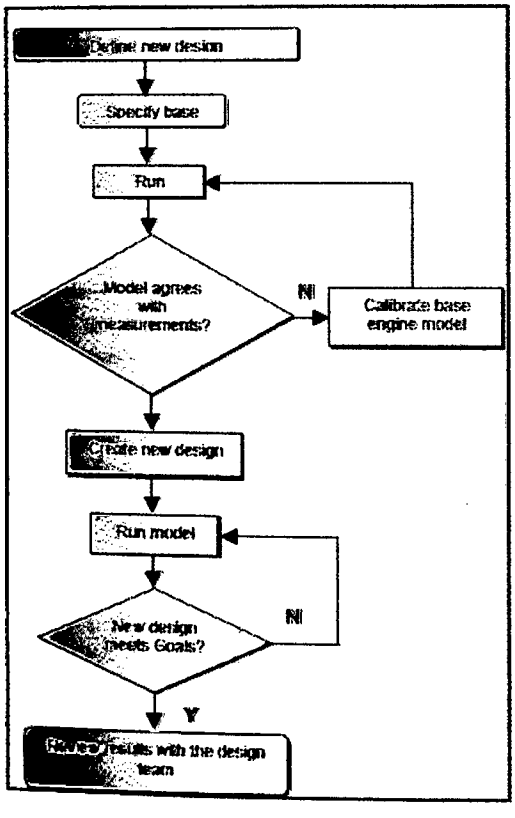

Figure 2.1 Tradisional Simulation-Based Design Process

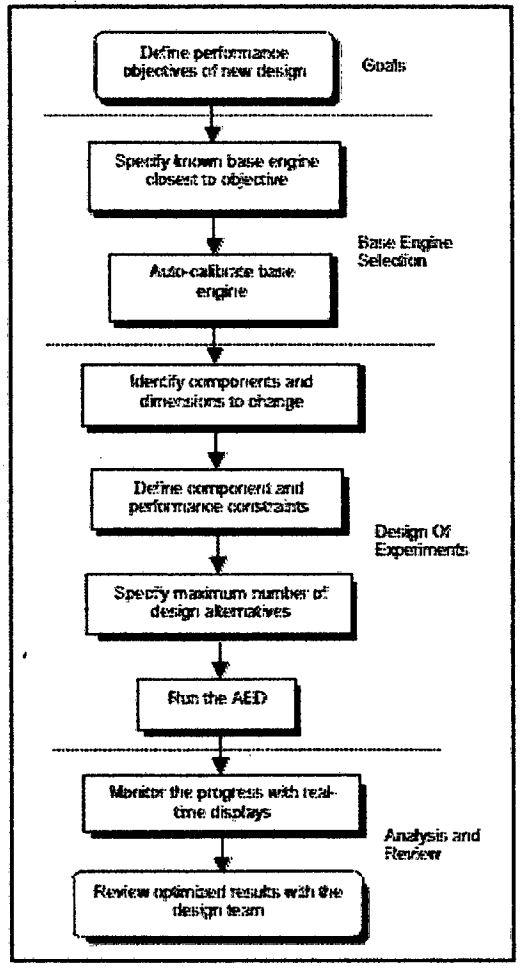

Figure 2.2 Simulation-Based Automated Design Process

One of the most powerful attributes of expert system the ability to explain reasoning. Since the sytem remember its logical chain of reasoning, a user may ask for an explanation in providing a particular recommendation. This attributes enhances user confidence in the recommendation and acceptance of the expert system (Michael, 2005). Table 2.1 explain about the Comparison Between Expert System, Conventional System and Human Expert.

Table 2.1: Comparison between Expert System with Conventional System and Human Expert (Michael, 2005).

Human Expert	***Expert System***	***Conventional System***
Use knowledge in the form of rules of thumb or heuristic to solve problem in narrow domain	Process knowledge expressed in the form of rules and use symbolic reasoning to solve problem in a narrow domain	Process data and use algorithm, a series of well defined operation, to solve general numerical problem.
In human brain knowledge exist in a compiled form	Provide a clear separation of knowledge from its processing	Does not separate knowledge structure to process this knowledge.
Capable of explaining a line of reasoning and providing the details	Traces the rules fired during a problem-solving session and explain how a particular conclusion was reached and why specific data was needed.	Do not explained how particular result was obtained and why input data was needed
Use inexact reasoning and can deal with incomplete, uncertain and fuzzy information	Permit inexact reasoning and can deal with incomplete, uncertain and fuzzy data	Work only on problems where data is complete and exact
Enhance the quality of problem solving via years of learning. This process is slow, inefficient and expensive	Enhance the quality of problem solving by adding new rules or adjusting old ones in the knowledge base. When new knowledge is acquire, charge are easy to accomplish	Enhance the quality of problem solving by changing the problem code, which effect both knowledge, making changes difficult.

Expert systems have many advantages such as:

i. **Permanence:** Expert system does not forget, but human expert may.

ii. **Reproducibility:** Many copies of an expert system can be made, but to train new human expert need the time and cost.

iii. **Consistency:** With expert systems similar transaction handled in the same way.

iv. The system will make comparable recommendation for like situation.

v. **Documentation:** An expert system can provide permanent documentation of the decision process.

vi. **Completeness:** An expert system can review all the transactions, a human expert can only review a sample.

vii. **Timeliness:** Fraud and/or errors can be prevented. Information is available sooner for decision making.

2.3 Expert System Features

In expert systems, there are a number of features which are commonly used .Some shells provide most of these features, and others just a few. Customized shells provide the features which are best suited for the particular problem. The major features are:

i. Goal driven reasoning or backward chaining. An inference technique which uses IF THEN rules to repetitively break a goal into smaller sub-goals which are easier to prove.

ii. Coping with uncertainty. The ability of the system to reason with rules and data which are not precisely known.

iii. Data driven reasoning or forward chaining - an inference technique which uses IF THEN rules to deduce a problem solution from initial data.

iv. *Data representation* - the way in which the problem specific data in the system is stored and accessed.

2.3.1 Goal-Driven Reasoning

Goal-driven reasoning, or backward chaining, is an efficient way to solve problems that can be modelled as "structured selection" problems. That is, the aim of the system is to pick the best choice from many enumerated possibilities. For example, an identification problem falls in this category. Diagnostic systems also fit this model, since the aim of the system is to pick the correct diagnosis.

The knowledge is structured in rules which describe how each of the possibilities might be selected. The rule breaks the problem into sub-problems. For example, the following top level rules are in a system matchmaking supervisor-final year student.

IF
lecturer expert in network and
have research project

THEN
Students who choose the network will be selected.

IF
lecturer expert in Image Processing and
have research project

THEN
Students who choose the Image Processing will be selected.

Figure 2.3 Goal-Driven Reasoning