Postgraduate Advisory Expert System for Advising Postgraduate Students

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Abstract— Providing accurate advices to postgraduate students during their postgraduate program and directing them toward a proper courses selection with their interests are an essential process in postgraduate stage. In this paper, we propose and develop an expert system for advising postgraduate students instead of the traditional way in advising by the department's advisors.
The proposed system enables the students to select and get a plan to each semester without needing to consult advisors.

Keywords— Expert system, advising system, postgraduate student.

I. INTRODUCTION

An expert system is a computer system that emulates the decision-making ability of a human expert [7]. Expert systems are designed to solve complex problems by reasoning knowledge. It is used in different fields; one of these fields is student advising.
Student advising is one of the core responsibilities for the academic faculty in universities. For both new students and enrolled ones, they have to meet their advisors in order to plan for their schedules. The advising system is very important to postgraduate students in order to prevent wrong choices based on trends or peers. On the other hand, the current advising system puts a huge burden on the academic advisors, because it is time consuming and they could face a monotonous process by answering the same questions over and over. Changes may apply on prerequisites, processes or curricula courses by the university and the advisors may not know about them, also new faculty members could face problems in the advising process because of the lack of knowledge.

For all of the above points, the authors develop PAES (Postgraduate Advisor Expert System) that aims to assist the Postgraduate students in CS department at selecting the appropriate subjects for their schedules.

The system can provide an accurate and non-conflict proposal courses for the postgraduate student .PAS works as an advisor, it gives the postgraduate student a plan with the appropriate subjects according to the courses that have been taken, prerequisites, and thesis scope if it is already determined by him/her

RELATED WORK

There are many studies which focused on proposing students advising systems, all of them concentrate on undergraduate student. Contrary to this work which has the ability to provide advice for undergraduate students; it has the ability to provide advice for postgraduate students commensurate with their thesis scope.

IS A-DVISOR is a prototype that had been developed as advising expert system in Information System-IS department in Ajman University[1] .This system assess students and their advisors to make academic plan that suits the student. This system is based on knowledge base component and reasoning strategies in its inference engine components, it also based on Object-Oriented (OO) architecture of its database.

ONLINE ADVISOR is a web-based decision support tool [2], this tool is proposed to help the advisor and student to interact with each other and make the decision for choosing a suite courses. This system can help the advisors to offer the appropriate advices to their students through showing student information, courses that had been taken or not by the student and changes in courses requirement.

JESS-Java Expert System Shell- is a prototype that had been used to develop a Student Advising Expert System as a
Graduate Program Advisor for Industrial Technology Department in California State University-Frenso.[3]. The need of the system was to minimize the student forestallment and eases the burden on faculty advisors by answering almost

the same questions. The prototype has a graphical user interface (GUI)-based expert system and had been developed using JESS and java.

SAES-Student Advisor Expert System- this prototype had been tested on 1000 candidates students in India, which they attend to enroll in under graduate majors for Engineering Department in Thaphar University [4]. The main goal of this system is to help students in choosing the highest successful major for them, by providing major suggestions are yet classified into strongly, mildly and weakly recommended.
SAES is a combination of rule based and case based expert system.

INVESTA - Interactive Virtual Expert System for Advising - this prototype can work with either small or middle sized universities [5], it had been lunched in a middle sized university at the department of Computer and Information Science of Delaware State University. This system is helpful to advisors and students as well. The proposed system is java based with an object-relational data base and enables users to access system functionality by a web-based interface.

BUADVIS is a decision support system that had been developed to advice student through registration stage [6].
This system had been improved to help students and advisors in Bogazici University to make a decision about what courses must be taken by student through a semester. The important considerations that had been taken in this system related such as rules regulations, and courses prerequisites.

APE SYSTEM is a knowledge based system that proposed to advice and assistance academic student for planning their studies to get academic degree [8]

.It has the capability of planning a courses program which meets the student degree requirement .It also took student preferences and student strength into account. The system is capable of given a correct advice on prerequisites and exemptions.

POSTGRADUATE ADVISOR EXPERT SYSTEM (PAES) ARCHITECTURE

The architecture of the PAIS model consists of four components: Knowledge Base (KB), Processing Unit, User Interface, and scheduler. Figure 1 shows the architecture components and the interactions between them.

A. Knowledge Base (KB)

The KB component consists of Database (DB) and Rule
Base (RB). The system use the DB to store and retrieve the information about courses, students, prerequisites, core and elective subjects, sub-fields(thesis area) and the advising related information.
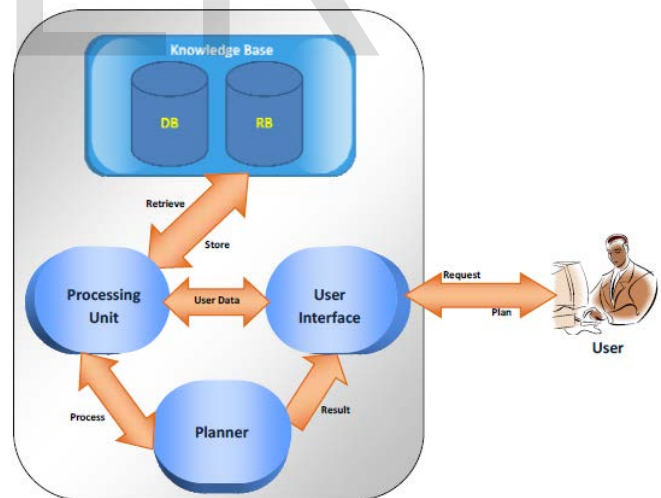

Figure 1. PAES ARCHITECTURE

B. Processing Unit:

The processing unit is responsible for receiving the postgraduate student request and analyzes it. It makes appropriate DB queries and checks if they meet the conditions. Then it gets an appropriate solution and passes it to the planner.

C. Planner:

The Planner receives the solution from processing unit and arranges it by the priority. Then it displays the suggested plan to student.

D. User Interface (GUI):

The user interface was designed by Python language. There are five windows interfaces: login window, register student window, student status with prerequisites window, sub-field window, and plan window.

CONCLUSION

In this paper, the advising system had been proposed to assist postgraduate student to appropriate selections of courses in their study in Computer Science. The proposed system is different from all previous systems by targeting the postgraduate student taking into account their thesis field. The result was as expected where most of the postgraduate students, who tested PAIS system, were very amused and satisfied.

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