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A Personal Student Advising System

Talal H. Maghrabi
INFORMATION AND COMPUTER SCIENCE DEPARTMENT
KING FAHD UNIVERSITY OF PETROLEUM AND MINERALS
Dhahran 31261, Saudi Arabia.

FACP07E@SAUPM00.BITNET

ABSTRACT

Advising is one of the major services provided by faculty members to students in universities and academic institutions. The need for advising is very high during the registration periods when students have to decide on courses they want to take in the current or next semester. Some of the factors that affect students' registration are: time conflicts between students and advisors, large number of advisees per advisor and the research and teaching commitments of advisors. These may result in some inconvenience to students such as delays in graduation and/or degradation in performance. Therefore, it is important and appropriate to provide the students with a system that they can use to help them in getting an appropriate consultation before they make the actual registration with their advisors.

This paper describes an automated advising system that was developed in the Information and Computer Science department at KFUPM using Microsoft Access Database program. The system will be used by the students themselves as personal systems which they can use to follow up their academic progress and register the appropriate courses when they need.

1 Introduction

Academic advising is one of the major and important duties required by faculty members in universities and academic institutions. University students always need some guidance, help and advise. Most of this help is needed during the registration periods when students add/drop courses and want to do so without violating any university regulations.

Unfortunately, due to several commitments of faculty members such as teaching, research, committee work, etc., advisors sometimes do not perform the advising duty well. This sometimes results in delays in students' graduation, violation of university regulations, or other inconveniences.

One of the solutions to this problem is to get the help of computers in advising. This is achieved by developing an advising system that can be used by students to help them to obtain the right advise. This technique of automatic advising is already used and practiced in many universities [1, 2, 3, 4, 5]. The systems described in these papers vary between big systems on the mainframes and small ones on Personal Computers (PCs).

In this paper we present an automatic advising system that will be used by the students in the Information and Computer Science (ICS) department at King Fahd University of Petroleum and Minerals (KFUPM). The system was developed in the department [6]. It is PC based with a user-friendly interface. The rest of this paper is divided as follows: Section 2 gives an overview of the advising process at KFUPM. Section 3 briefly describes the undergraduate program in the ICS department. Section 4 describes the advising system and how it works. Finally, Section 5 concludes the paper by describing the system's main features, limitations and possible future enhancements. It also describes how the system can be modified so that it can be used in other departments.

2 An Overview of the Advising Process at KFUPM

When the undergraduate student finishes his preparatory year, or if he is directly promoted to the Freshman level, he is automatically assigned an academic advisor from the department he wishes to major in. Although the purpose of assigning an advisor to the student is to help him in all his academic life in the university, the main interaction and consultation between the student and his advisor occurs mostly during the registration periods.

KFUPM, as many of the universities around the world, has three academic semesters: Fall, Spring and Summer. In the middle of the Fall semester the registration for the Spring semester is done, while the registration for both the Summer and Fall is done in the middle of the Spring semester. This registration is called the *pre-registration* to distinguish it from the regular registration that is done at the beginning of each semester.

In the pre-registration period the students choose the courses that they would like to take in the next semester(s). Normally, a default list of the courses that the student should take is prepared by the Registrar's office for each student based on his major degree plan. However, most of the time students would like to change that list based on some preferences. It is the responsibility of the advisor to make sure that while students can choose their courses, their choice should not affect their graduation plan or violate any of the university regulation.

Based on the pre-registration of each student and his performance on the previous semester, the student receives his schedule at the beginning of the semester and is given

a period, called the *registration* period, in which he can add and/or drop courses to his given schedule. His advisor again is responsible for making sure that such a process is done correctly.

KFUPM considers advising as a very important duty of its faculty members. The university provides a yearly award for distinguished advisors who are selected by committees from different colleges based on the students' evaluation. Such an award encourages faculty to do a good job for their advisees.

3 The Undergraduate program of the Information and Computer Science Department

KFUPM was the first university in the Kingdom of Saudi Arabia that introduced a Computer Science program in its academic departments in 1979. Through the years the undergraduate program for Computer Science has gone through several phases and changes. Currently KFUPM has an Information and Computer Science (ICS) department which offers a program in Computer Science (CS) and a program in Information Systems (IS).

An ICS student is required to finish 140 semester-credit hours distributed as follows: 63 credits from general education requirements (e.g. Math, Physics, etc.) and 77 credits comprise core requirements from ICS, Computer Engineering (COE), Systems Engineering (SE) and other electives courses. Some of these electives have to be from other departments and they are called *technical electives*, while others have to be taken from the non required ICS courses. These are called *ICS electives*. Both general and core courses have some great dependencies between them, and if they are not registered properly, the result may be a major delay in students' graduation.

4 Description of the System

The Automated Advising System (AAS) described in this paper is a computer program that was developed in the Spring and Fall semesters of 1993. Initially, the objective was to develop a system that will be used by advisors to help and follow up there advisees' registration and progress. Due to the limited time available from the advisor to each advisee and to the frequent data entry needed by the system, it was found that the system will be of little use for such a purpose. The system was then tailored to be used by the student himself to help him in preparing an acceptable and good registration plan before he visits his advisor.

AAS is a PC database program developed using Microsoft Access for windows. The system was developed with the main goal in mind to make it as simple as possible to use.

4.1 AAS Major Components

The major components of the AAS are shown in the block diagram in Fig. 1:

1. **Courses Information Table**
   This database table contains all the information about all the courses that an ICS student can or should take. This includes their titles, numbers, description, prerequisite(s) and corequisite(s).

2. **Required Courses Table**
   This database table contains the course number of all the courses required by the ICS students. It is used by the main program whenever the student adds or drops courses during pre-registration or regular registration to make sure that the student is registering an acceptable required course. It is also used for help purposes when the student wants to know the required courses.

3. **Elective Courses Table**
   This database table contains the course number of all the courses that can be taken by an ICS student as either an ICS or a technical elective. It is used by the main program to make sure that the student is registering an acceptable elective course. It is also used for help purposes when the student wants to know what elective courses he can register.

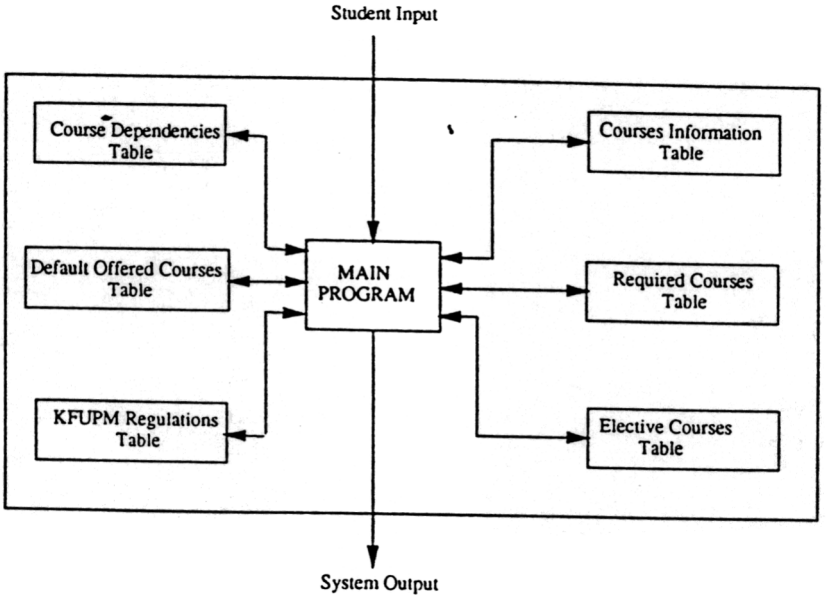

Figure 1: Block Diagram for AAS

4. **Default Offered Courses Table**
   This table contains a default list of the courses that are normally offered by all departments in a specific semester. The student has the capability to add to and delete from the default courses of a specific semester based on the actual list prepared by the Registrar's office in that semester. This table is used mainly to verify that the courses a student is registering are actually offered in that semester.

5. **Courses Dependencies Table**
   This table is used during registration (and pre-registration) to verify that a course is added only when the student has already taking all its prerequisites, and that a course cannot be dropped if the student is taking a corequisite course in the same

semester. It is also used for help purposes when the student wants to know the dependencies between courses.

6. **KFUPM Regulations Table**
   In this table the set of the university's registration regulations is stored. The table is used whenever a registration action is to be taken to make sure that the action is not violating existing rules.

7. **Main Program**
   This is the heart of the system and its engine. In addition to obtaining all needed information from the above tables it allows the student to provide it with whatever data he needs to be used in his registration. It then uses all information available to provide its output which is basically the desired registration schedule beside any help or warning messages needed by the user.

How AAS Works?

When the system starts as a regular MS ACCESS application it will display the main menu shown in Fig. 2 (The pull-down menus appear only when they are selected by the user. They are shown in the figure for description purposes). Here we will briefly describe each of these pull-down menus and its submenus. More details can be found in [6].

Registration	Courses	Electives	Help	Exit
1. Pre-registration	1. Change Grade	1. ICS	1. KFUPM Regulations	1. Exit
2. Formal-registration	2. Course Offered	2. CS		
	3. Add to Courses Offered	3. IS		
	4. Courses Information	4. TECH		
	5. Course Dependency	5. Add Elective		
	6. Term Courses Grades	6. Delete Elective		
	7.Change Grade			

Figure 2: AAS Main Menu.

Registration

This is the main menu of the system with which most of the work is done. It has two options: Pre-Registration and Formal Registration.

Pre-Registration
This sub-menu is used by the student in the pre-registration periods. It gives him the options to register for the Summer and Fall semesters or for the second semester. The system will display the necessary forms for the student with the appropriate

buttons to help him through the process easily. Finally, the student will take his schedule and visit his advisor to make the actual registration.

2. Formal-Registration
   This sub menu is used by the student in the actual registration periods. Since it begins at the beginning of the semester it starts by asking the student to enter his grades for the previous semester. The system will then apply these grades and stores it in the student records. After this is done the system will display to the student the courses he pre-registered for and allows him to make any necessary changes.

4.2.2 Courses

This menu has all the options that are related to the ICS required courses. The menu consists of the following sub-menus:

1. Course Information
   This menu is used by the student to get all the information he needs about any required course. This includes its title, number, credits, description, prerequisites and corequisites. If the course is not a required course then an appropriate message will be displayed.

2. Change Grade
   The student uses this menu to change a grade of a course he took before. This can be a change an I grade to other grades or a regular change done by the instructor following the appropriate procedures.

3. Courses Offered
   The student uses this menu to initialize the courses offered in a particular semester. He will choose from three different semesters, and then the system will copy the default courses offered in that semester to the appropriate table.

4. Add to Courses Offered
   Most of the time there are courses that are offered from department which are not in the default list or courses that are in the list but they are not offered or canceled. The student can use this option to add and/or delete all these courses from the courses offered table.

5. Course Dependency
   Sometimes the student wants to know if he already took the prerequisite(s) of a certain course before he registers it. Using this option and by entering the desired course number the student will know all the prerequisites and corequisites of that course.

6. Term Courses Grades
   Using this option the student can check his courses' grades (or transcript) for a particular semester.

7. Student Transcript
   By using this option the student can get a copy of his transcript up to the current semester.

4.2.3 Electives

1. ICS & ICS-CS & ICS-IS
   These options display to the student the elective courses that he can take from ICS whether he is an IS or CS major.

2. TECH
   By this option the student can know what KFUPM courses he can register as technical electives.

3. Add & Delete Elective
   These options allow the student to update the list of electives whenever it is changed by the department.

Help and Exit

The Help sub-menu allows the student to get some help about the registration system. Currently the only option available is a display of KFUPM regulations. By choosing the Exit sub-menu the student will quit from AAS

5 Conclusion

In this paper we have presented an automated advising system that will be used by undergraduate students in the ICS department at KFUPM. At the beginning of each new year a copy of the system will be distributed to those students who do not have them. After the proper initialization of the system it will be ready and the student can use it anytime during his academic years in the university. In the following subsections we outline the main features of AAS in addition to its limitations and how they can be improved in the future.

AAS Main Features

AAS has the following main features:

(a) It is a PC-based system. This makes it easy to use by students in their homes or rooms where there are no computer terminals connected.

(b) It has a nice graphical user interface. This encourages students to use them since it provides its messages, information and interaction in a very simple manner.

(c) It is personal. Therefore the students can use his system freely without being afraid to affect other students. By frequent backing up of data files the student can re-initialize the system whenever he destroys his original copy.

(d) It was developed using a very nice, user friendly and powerful database program, i.e. ACCESS. This allows changes to be made to the system to fit other departments easily.

5.2 AAS Limitations and Possible Future Enhancements

As with everything in the world, AAS also has some limitations:

(a) The system currently is not in an executable form, i.e. the user has to have both MS Windows and MS ACCESS to be able to run the system. Although almost all PCs have Windows installed not all users have ACCESS, and they do not have to. Recently Microsoft has developed a distribution kit for MS ACCESS. By using this kit we will be able to produce an executable module of AAS and hence overcome the above limitation.

(b) Currently, the system does not provide the student with a tentative or a default schedule in case the student does not want to change his plan. The student has to enter the courses he wants to register one by one.
An enhancement to AAS will be done by first providing the student with a tentative schedule of which he can accept as is or make changes.

5.3 How can AAS be used in other Departments

Although the system is developed for ICS students at KFUPM, it can be changed and modified to be used by other departments and universities. Choosing a package such as MS ACCESS was mainly done because it is simple to use and provides a nice and friendly user interface. By accessing the appropriate database tables and forms, the ICS (or KFUPM) dependent information can be easily modified to reflect the need of other departments.

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