IUS System Management

DESIGN DOCUMENT

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1. Introduction

IUS Management system is an application that allows administrator to manage data which is required for each single university. Although, at the beginning it was decided to define three different roles for using this application, but due to lack of time and some complexities, two roles were eliminated and only administrator role left.

In general, these kind of applications help universities to collect their needed data faster and enter them to their system more accurate. The needed data includes information about faculties, courses, professors, staff, students and classes. It means they should collect huge amount of names and numbers, which without using an application, it may take so much time.

Another important advantage of this application is that it allows you to sort data for each part in a way that you want. For example, you can sort students' information by their Age, Name or Field of study. Simplicity is one of the main factor which was considered during designing and creating the application. I believe that complex application creates new problems for the user and makes him tired.

Considering technical stuff and programing language, C# was used in Visual Studio 2017 for creating and designing different part of the application. Also Microsoft SQL Server Management Studio 17 was used for managing the data in database. There are few reasons that why C# is chosen for this application which the most important one is C# is a modern language with many and many features. Also since it is open-source language, it is not limited to Microsoft platforms.

In this document, mainly we focus on system design, functional decomposition, dynamic models, diagrams and user interface. We try to show how each function performs and what are the inputs and outputs of that function.

2. System Decomposition/Design

System decomposition is the process of breaking down a system into its subsystems and show the relations between these subsystems.
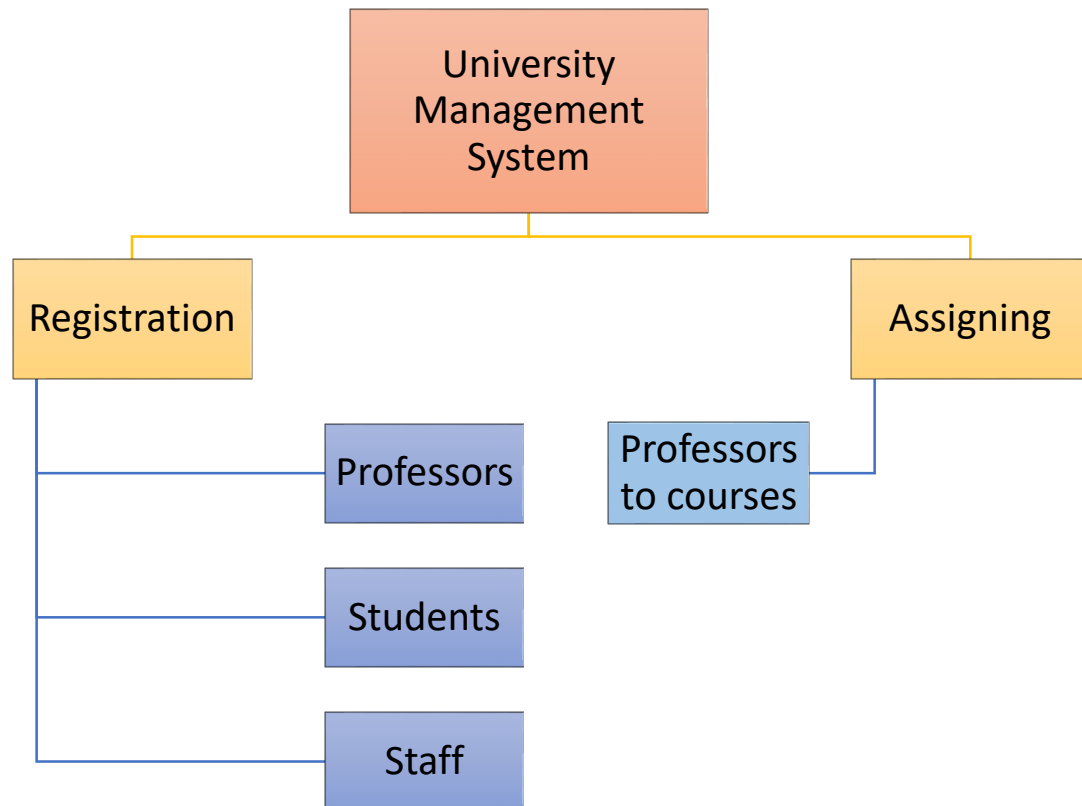

Figure 1. University Management System Decomposition

Registration professors: Here the administrators enters all the required information such as "Professor ID", "Name", "Surname", "ID number", "Academic degree", "Field of study", "Mobile number", "Email" and "Address" for each professor.

The same information is required for the students, except that for students, administrator needs to enter "Date of Birth", "Place of Birth", "Faculty" and "Registration Year" as well.

Staff needs less information compare to professors and students. Administrators have to enter "Position" of the staff beside the basic information of him.

I should mention that when user register these people into the system, they will get unique ID as well in the database. Therefore it prevents user to duplicate a person in the system and face problem later.
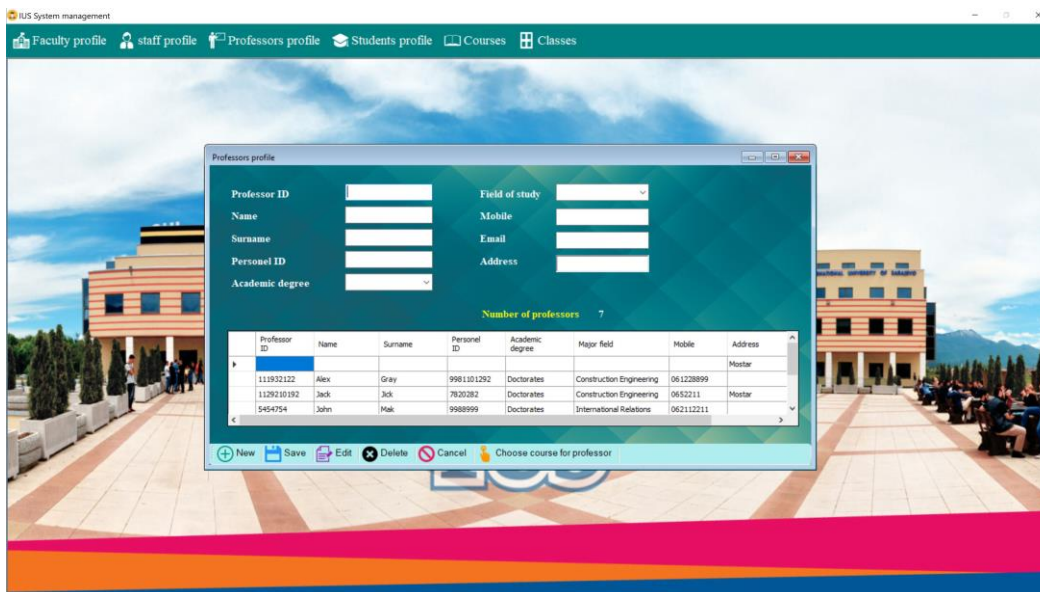
Figure 2. Professors profile in IUS Management System

Figure 2 represents the professors' profile and how a new professor can be added to the system. In order to add new professor, first the user should click on the "New" button at the bottom of the page. Then the user should enter all required information and after that, click on the "Save" button. As we can see in this figure, we have "Edit" and "Delete" buttons as well. In order to use edit button, the user first should select one professor, and by doing that, all the information which were entered before, will be appeared in the fields. By changing any of those information and clicking on Edit, the new data will be saved in the system. If the user wants to delete an item, he should just select that item (professor) and click on Delete button. The same process we have for the staff and students for adding, editing and deleting them.

At the bottom the professors profile we can see that we "Choose course for professors". Before clicking on that button, the user should select a professor from the list, and then he can click on that button. By clicking that, another window will open which shows the courses that are assigned to the professor. Above that part, we have searching part which allows user to search courses and select new courses for the professor.
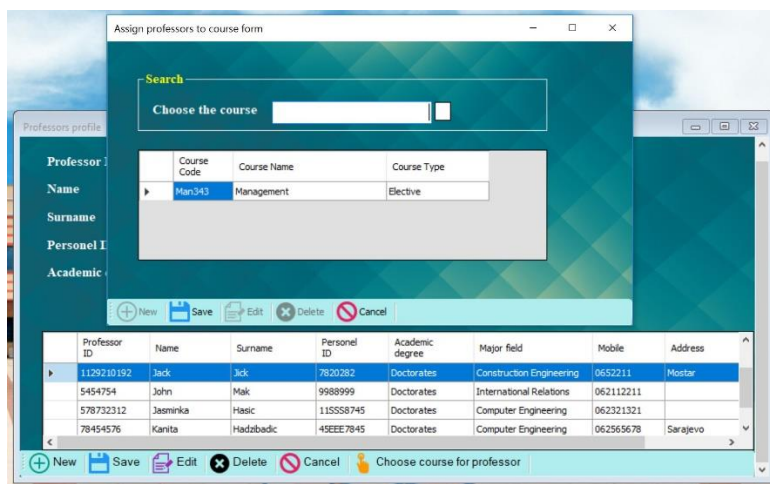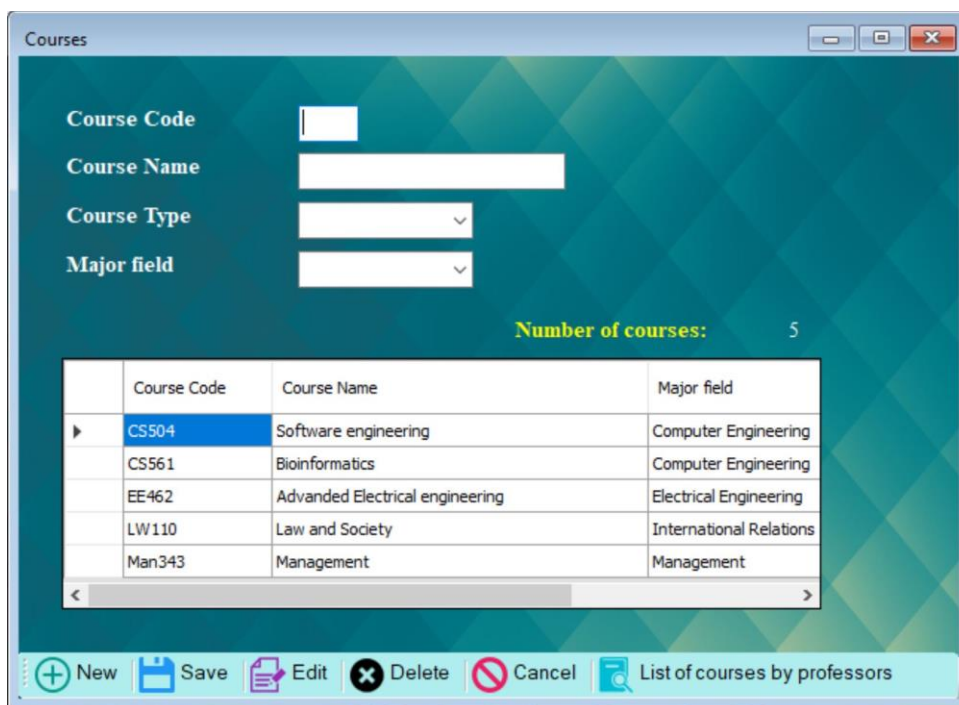

Figure3. Assign professor to courses

Besides these three tabs which are mentioned so far, we have "Faculty", "Courses" and "Classes" in our system as well. The faculty profile, provides information about existing faculties in the

university and the user can add new faculty, change some information about existing faculty or even delete the one. "Faculty Code", "Faculty Name", "Faculty Manage", "Number of classes", "Telephone", "Email" and "Fax" are the fields which should be filled in order to add new faculty to the system. Here we should know that how many available classes for each faculty to be able to decide how many students we can have for each faculty and course.

Faculty profile also tells us which faculty in the university has the most students compare to others and this can help the university director to know which faculty is more interesting for students and they applied more for that.

The next tab is courses which allows administrator to manage information about the courses which are offered at the university. Each course is defined by four factors which are "Course Code", "Course Name", "Field of study" and "Course type". Figure 3 shows the course profile of IUS.

Figure 4. Courses profile

If the user wants to add new courses to the system, first he has to click on New button and then he can fill the fields. We have two course type: Elective and Required. The required course is the one that student must take while elective courses are those which student can choose one from a number of optional choices.

Field of study is drop-down list which contains 8 major fields of study. Computer Engineering, Mechanical Engineering, Electrical Engineering, Industrial Engineering, Construction Engineering, Economics, Management and International Relations are fields of study for this application.
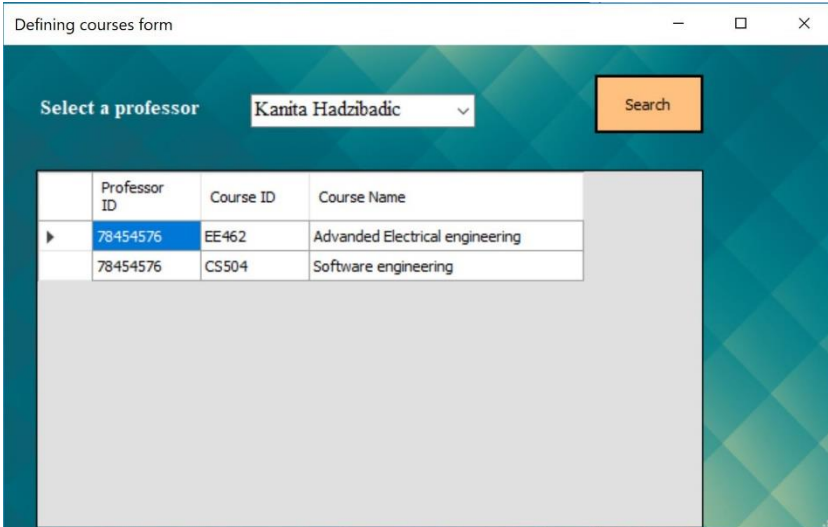
Another button which is new on this window is "List of courses by professors". The user can has access to list of all courses which are taught by single professor. For doing that, he clicks on the button, the new window will be opened which asks user to select one professor and then press search button. By that, the user can view list of courses which are assigned to that professor.

Figure5. List of courses which are assigned to single professor

The last tab on main window is classes. This tab provides information about the number of classes and their capacities in the university. But why these information is important for user? Of course each university has some limitation about number of students and number of courses which want to offer registered students. The board of directors should know how many students they have annually, how many courses they can offer and how many available seats they have each year.

Having all of these information together and through this application, helps board of directors to manage the university better and have easier access to the information which they require.

3. Diagrams

Faculty
- -ID
- -Code
- -Name
- -Manager
- -Telephone
- -Email
- -Fax

Class
- -ID
- -Number
- -Capacity

Course
- -ID
- -Code
- -Name
- -Type
- -Field of study

Professor
- -ID
- -University ID
- -Name
- -Surname
- -Personal ID
- -Academic degree
- -Field of study
- -Mobile
- -Email
- -Address

Staff
- -ID
- -University ID
- -Name
- -Surname
- -Personal ID
- -Academic degree
- -Position
- -Mobile
- -Email
- -Address

Student
- -ID
- -University ID
- -Name
- -Surname
- -Personal ID
- -Academic degree
- -Faculty
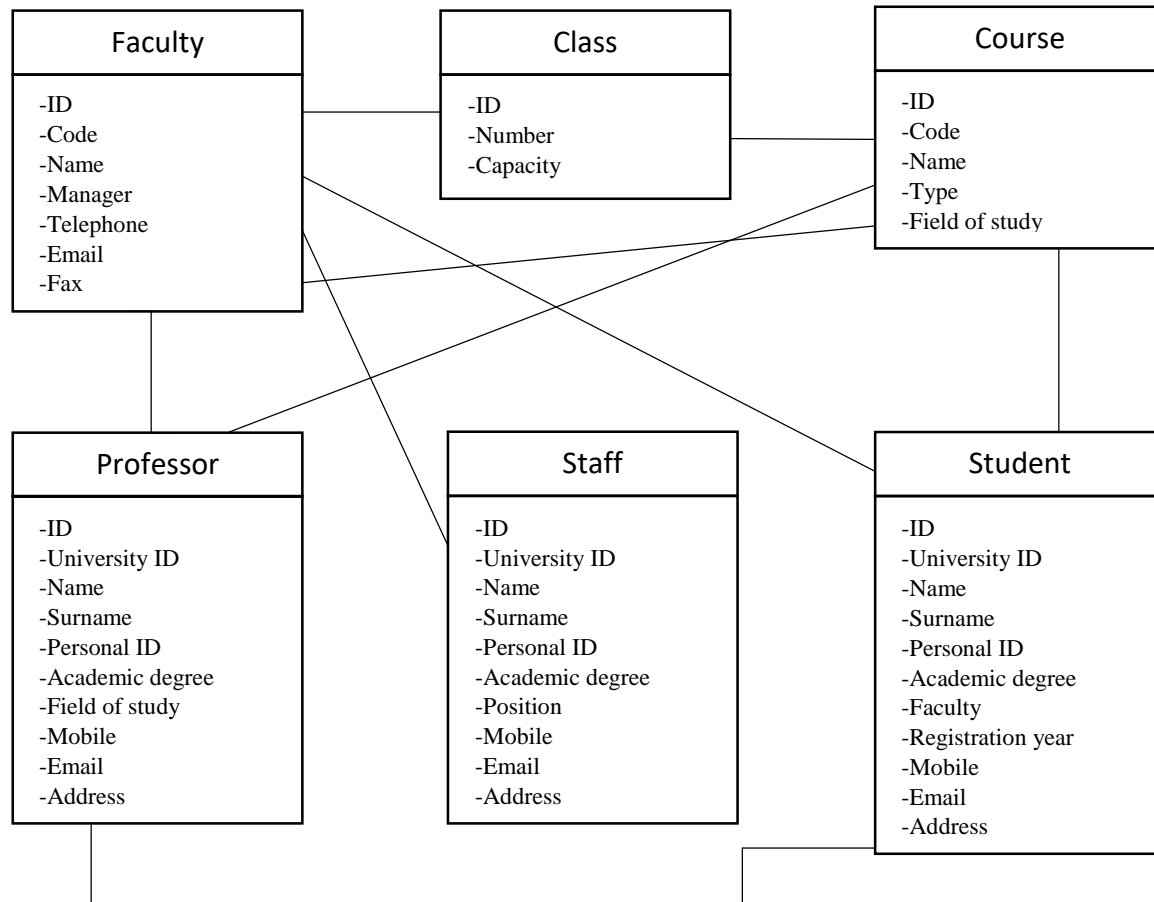- -Registration year
- -Mobile
- -Email
- -Address

Figure 6. Class diagram

As figure 6 shows, we have 6 tables in our system, which all of them has unique ID as their primary key. The faculty table has connection with all the other tables which means each faculty can have one or more classes, courses, professors, staff and students. Class has connection with Faculty and courses and it can be assigned to more than one faculties and courses as well.

Each professor can be assigned to one or more faculties, courses and students. Student can have only one faculty while its connection to courses and professors is one-to-many.