

Development of Intelligent Student Information System

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ABSTRACT

The main idea behind the study is to give the administration and the students an easy way to just obtain necessary information and important forms on the fingertips. The forms that are required by the students at various levels during their stay in the university require lot of paper work that leads to wastage of time and misuse of the resources. This study helps the students to get all the forms and details available at the click of the mouse and then the same can be printed with information and least error. The student affair is the main user of the study along with the students who will be able to get their information. The study also attempts to provide all the information in a very systematic manner so that it can be arranged. Moreover, it attempts to facilitate the students' ability to give information in a technical manner so that paperwork can be reduced, and all the information can be saved in the form of databases easily. In addition, it facilitates the administration office with the ease of collecting the information. Furthermore, it provides complete statistics of the students in the system. Finally, it facilitates administration displaying any information as is required.

Keywords: Artificial intelligence; System; Design; UML; Development; Smart universities; Sustainability; Location; Model; University.

1. Introduction

When a student enters the University he is required to submit all the information which persist for him and the information which she had given is in the form of plain papers which needs to be updated and managed in the administration office [1]. As a matter of problem we are trying to sort out the issue of such information storage and information retrieval whenever it is required by the Administration affairs or by the students [2], [3]. This study is entitled student information system in which we are planning to provide an interface on the mobile phone services which will help the students to fill all the information online with the help of a mobile phone in order to receive the paperwork required by the registration office [4].

The system that is proposed for the solution of the problem stated above contains the use of the Internet and the resources of the University in order to provide a paperless and less cumbersome job [5]. The system proposed here mainly contains four important entities as below:

1. Student
2. Administration
3. Forms
4. Admin/Dean

All the entries that are listed above are involved in the system in order to provide the facility to the students to save their time and get all the documents which is required by them in a very easy and effective manner for which you have to spend a lot of time by manual system [6]. This system of approval of documents is required for the administration and student affairs in order to provide fast documents which is needed by the students in the form of

some fixed formats prescribed by the University [7]. These formats are taken from the registration and student affairs Department where the students are enrolled for the first time and are provided with all the necessary documents for any kind of work that the students might need during any time of their studies [8].

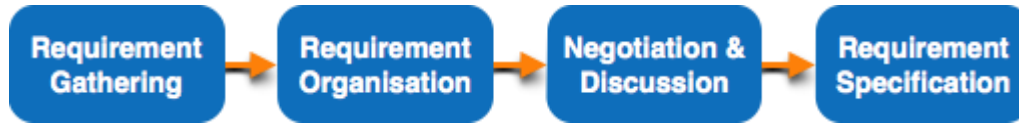


Figure 1. Adapted Procedure for the study development

1.1. Study Objectives

The main focus behind the system's development are represented as below: (1) How to assist the students to overcome the problem of submitting the information in a systematic manner. (2) How to provide the administration to access the information of any student in a fast time. (3) How to provide the information available wherever it is required in the system of the University. (4) How to avoid the usage of paper and the wastage of printing and to minimize the cost of printing and paper both. (5) How to provide facilities to the student in order to obtain his information in a very systematic manner that can be used for the future prospects. (6) To facilitate the administrative process and reduce the time. (7) To convert the process, manual to electronic. (8) To improve the image of the university. (9) To provide all the information in a very systematic manner so that it can be arranged. (10) To facilitate students to give information in a technical manner so that paperwork can be reduced and all the information can be saved in the form of databases easy. (11) To provide complete statistics of the student in the system.

2. Background

It has been a matter of thoughtfulness to identify the functional requirement of a system in order to facilitate a user to work with the system in the university environment by bringing their required device [9], [10], [11]. The system we are going to propose will try to provide the following functional requirements:

1. A new student should be able to register himself into the system.
2. Student affairs must be able to register students in the system.
3. Student affairs must be able to upload new forms and formats that are required by the students into the system.
4. Students must be able to view forms for themselves.
5. Students must be able to print forms with their details already available in the form.
6. Manager should be able to view all the student details.
7. Manager should be able to create all the forms.
8. Student affairs should be able to add or delete students from the database.
9. Supervisor must be able to manage is a students in the system.
10. Students must be able to email the documents if required.

Following are the non-functional requirements that are identified for the study which are required to be used for the study and need to be updated on a regular basis [12]. Non-functional requirements may also describe aspects of the system that don't relate to its execution, but rather to its evolution over time:

- non-functional requirement 1 – consistent uptime

The new system will be able to stay up and running at least 98% of the time. Any downtime would be due to maintenance or upgrades.

- non-functional requirement 2 – load and concurrency

The system must be able to serve up to two thousand users concurrently without crashing.

- non-functional requirement 3 – real-time feedback

The new information system should display the student's information and show the changes made to it in real-time as the "student affair" adds and drops forms.

- non-functional requirement 4 – dealing with large quantities of data:

The developed system will have to deal with large quantities of data and a large number of users accessing the data at once.

System requirements specify the need for the minimum configuration of hardware and the software in order to run the study. In our case the requirement for the system at the testing level can be a personal computer with the minimum capability of managing 50 clients that can log into the application and try to use the application

3. UML Analysis of the System Design

Any system must be modelled correctly and accurately before the development stage begins. To develop the system, various concerns must be taken care of [13]. This section will include the system analysis results illustrated by UML Diagrams, class diagrams, activity diagrams, database diagrams, entity relationship diagrams, and flowcharts to elaborate the system in detail.

3.1. Activity Analysis

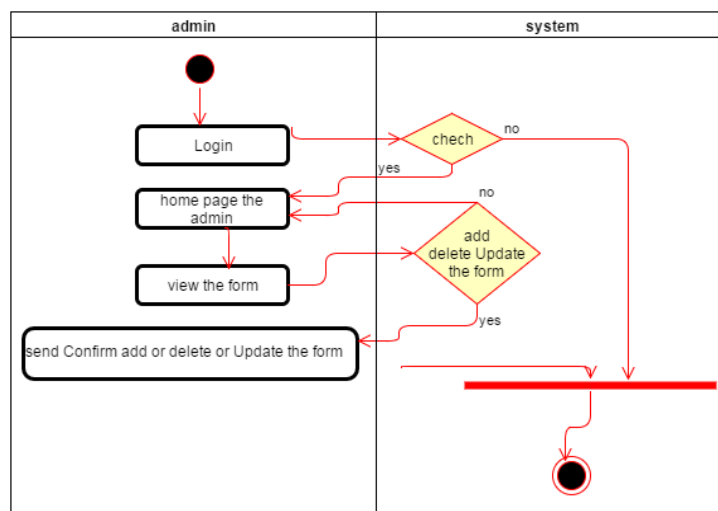


Figure 2. Activity Diagram I

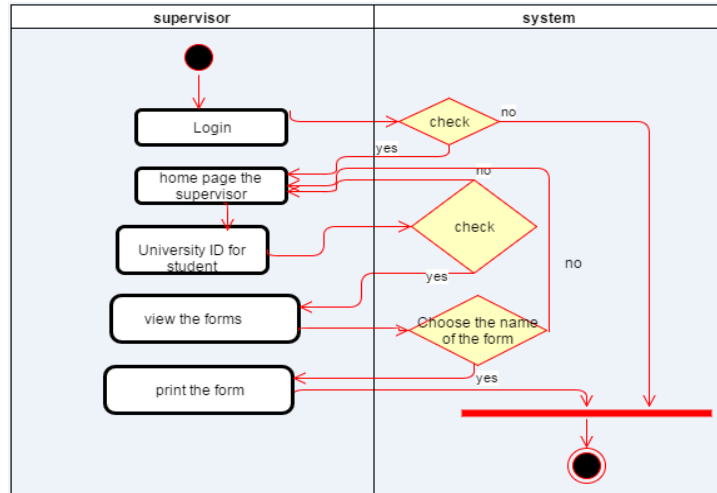


Figure 3. Activity Diagram II

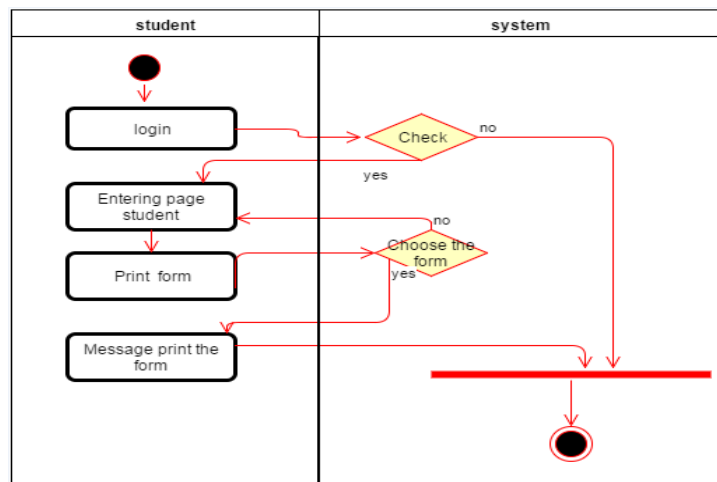


Figure 4. Activity Diagram III

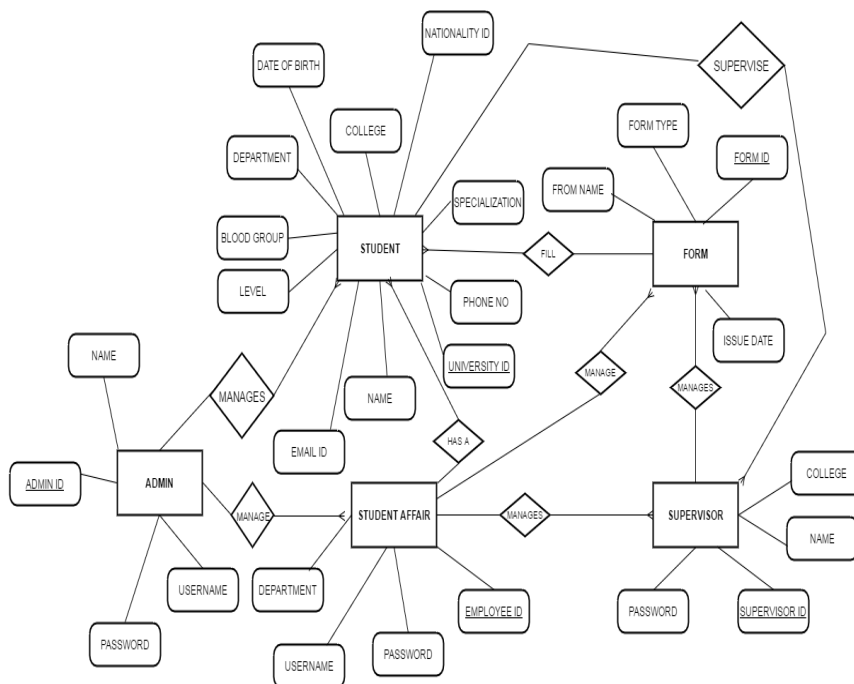


Figure 5. Study Database Diagram

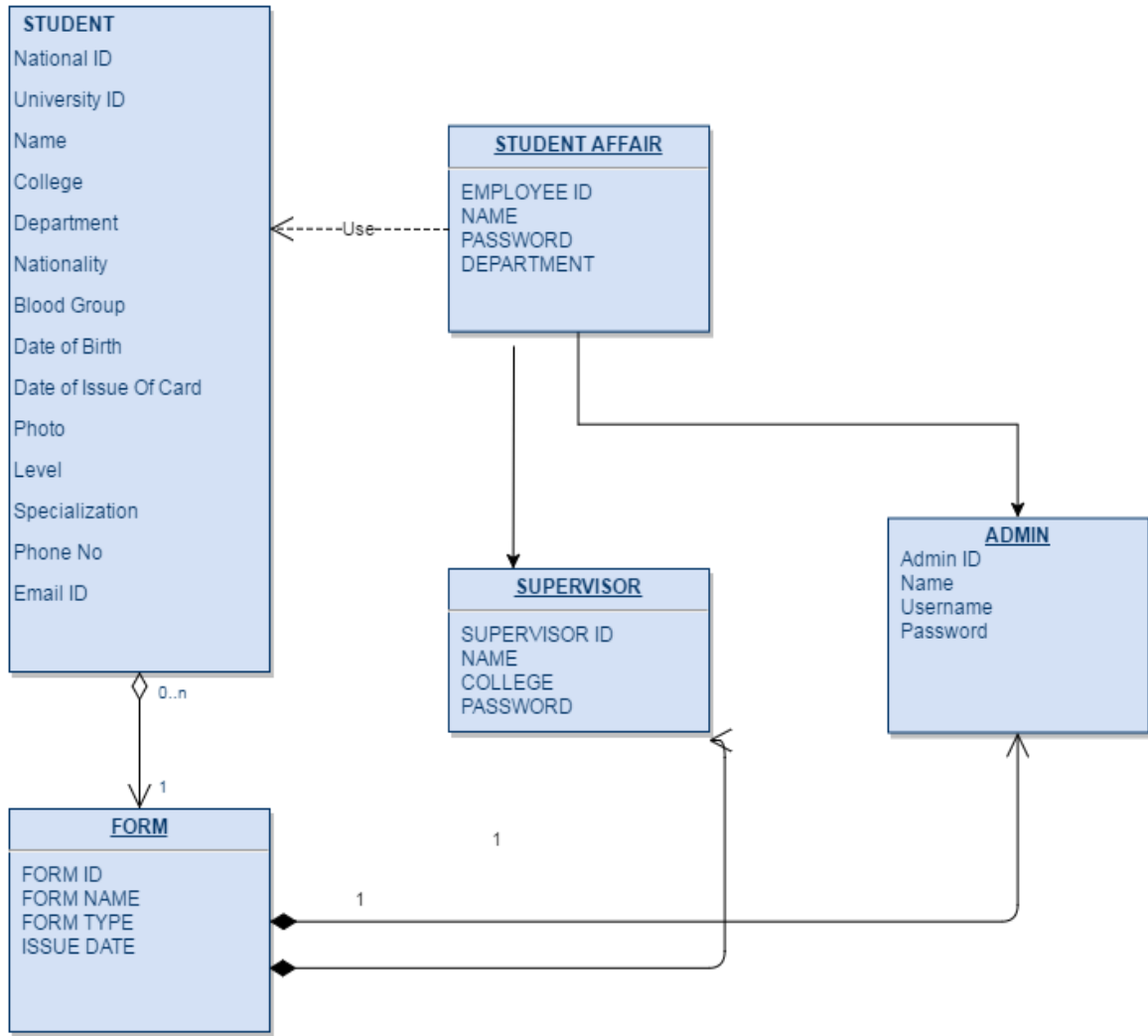


Figure 6. Database Diagram for the study

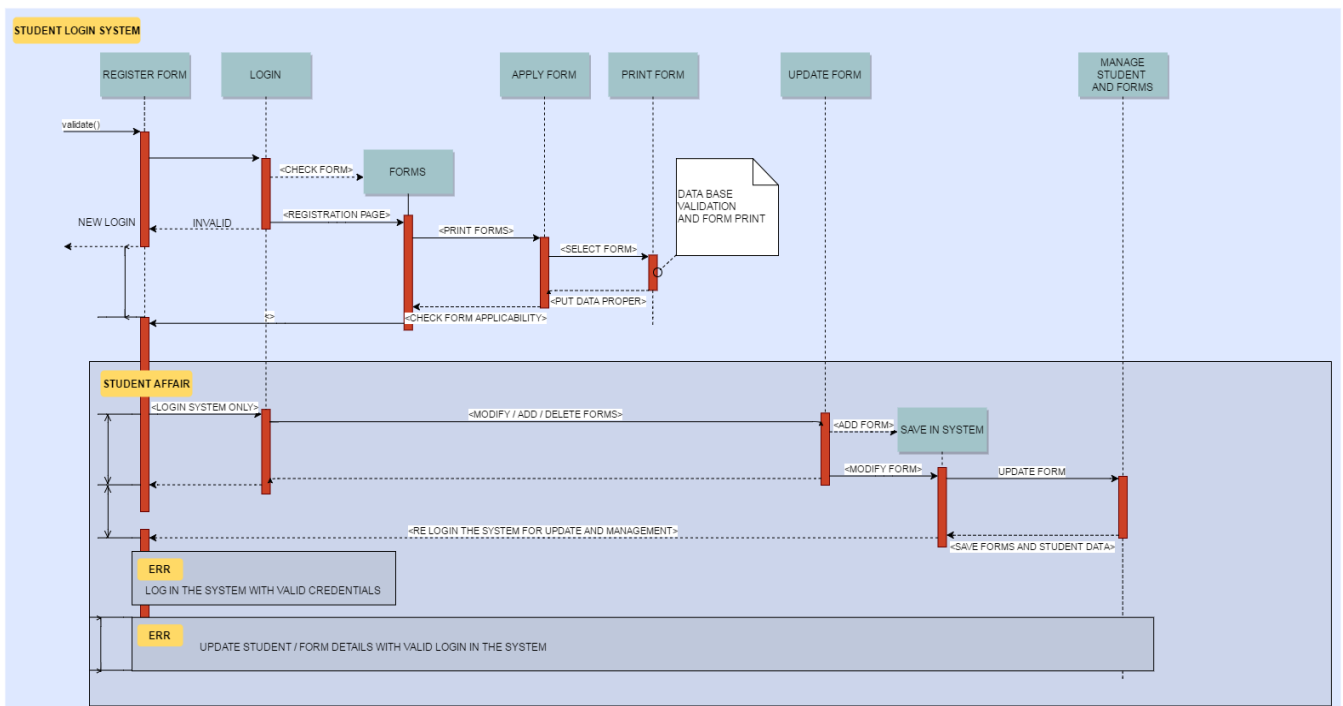


Figure 7. Complete Activity Diagram Students Portal

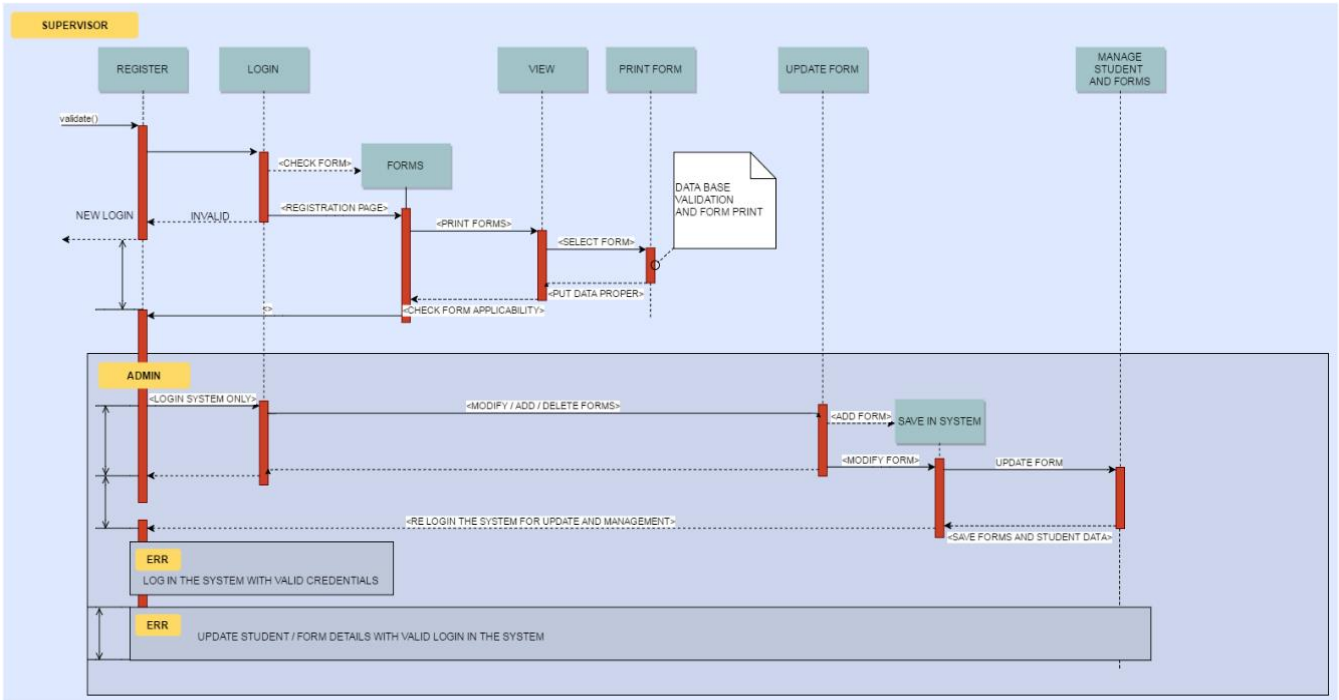


Figure 8. Complete Activity Diagram Supervisor Portal

3.2. Use Case Diagram for the Proposed System

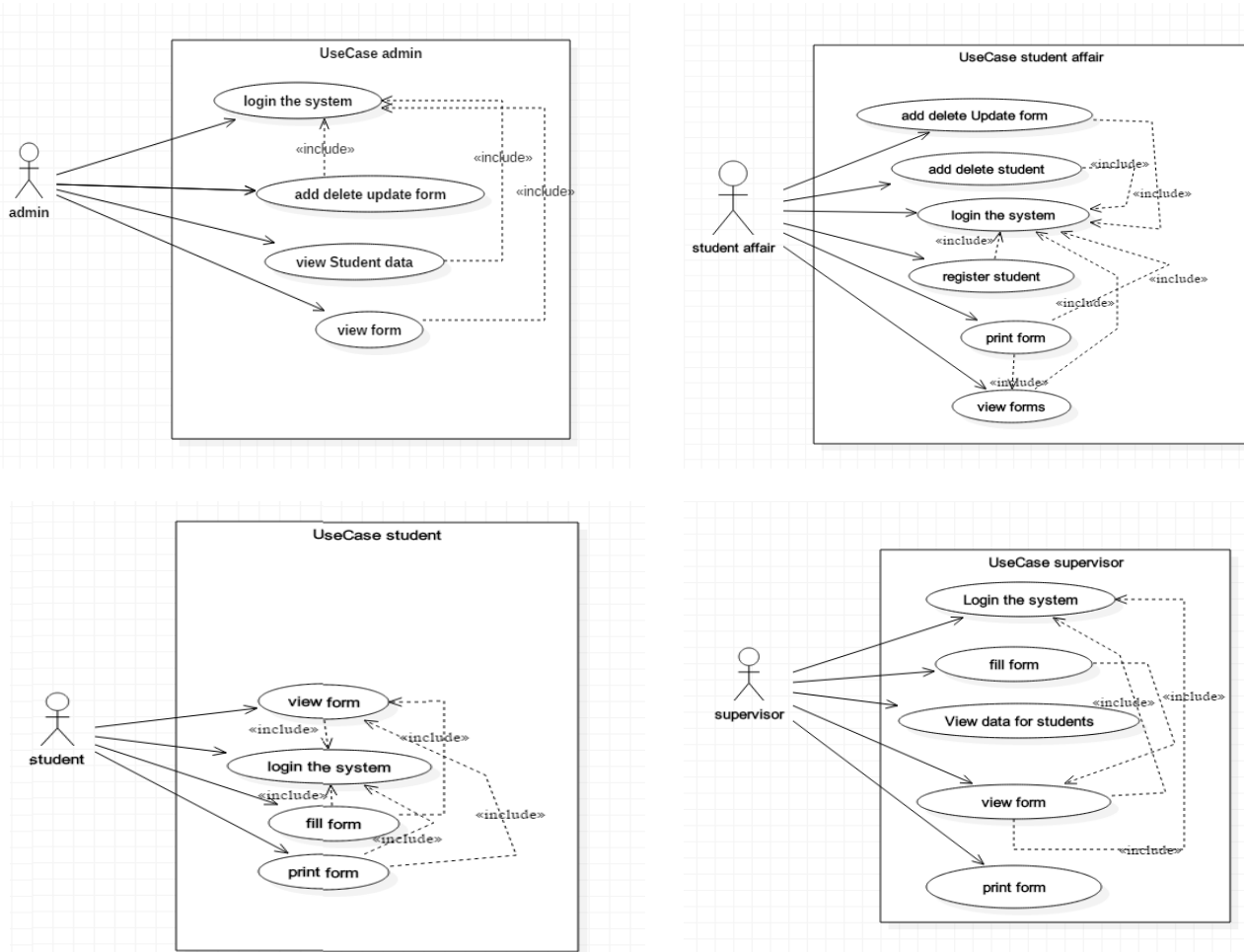


Figure 9. (a-d) Use Case Diagram for the Proposed System

4. Results and Discussion

The study aims to develop an application to help users who have been entering a particular city for the first time and would require certain services. The services are available to users who have already registered and are working in the system. The services offered by a particular user in the system shall be made available easily with the help of those concerned who are going to help. The system design will consist of various goals as follows:

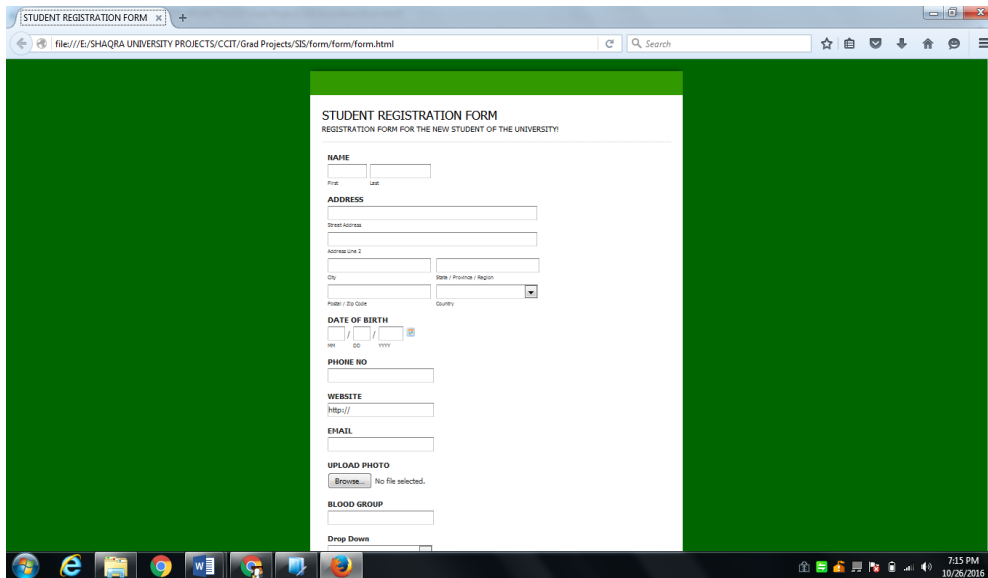


Figure 10. Design Information for the proposed system

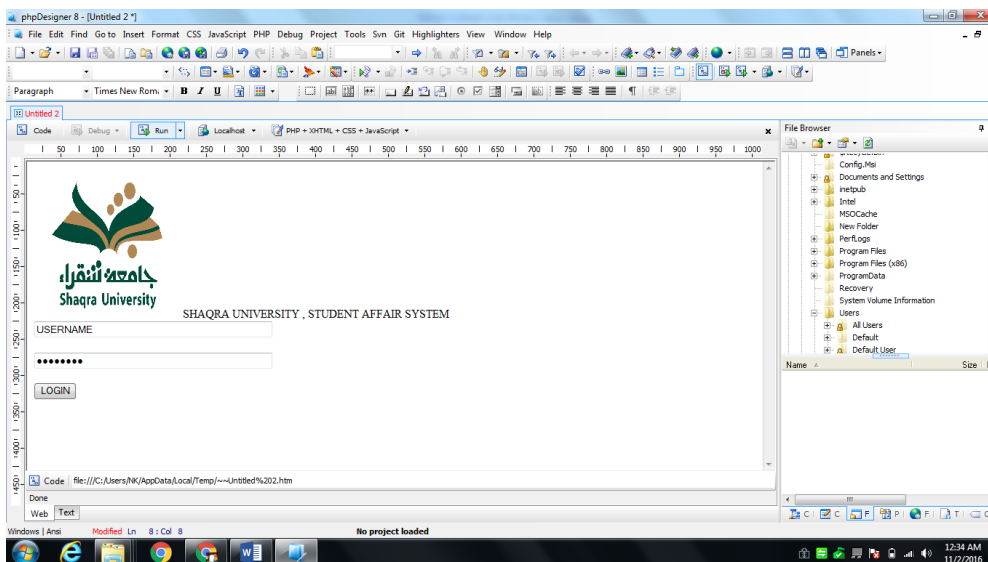


Figure 11. Development Information for the proposed system

5. Conclusion

An intelligent system capable of delivering the above-stated points is developed in this study. This ensures that the services needed by the people are available on the move. The system can provide proper real-time information, and users will be able to access it upon appropriate registration. The study had a wide scope to be updated and modified in the future. The main highlighted points that can be done with this study are: [1] Digital Document creation for the system. [2] Digital Signatures for the system. [3] Automated Document Recovery for the students. [4] Data

warehousing for the system in the university. [5] Database management in the cloud at the university. [6] Mobile application for the same. [7] System to relate to international level transcript verification system to supply the grades and scores of the students in various universities abroad. [8] Scaling of the system at university level across all campus of the university.

6. Future Enhancements

There are several future enhancements, such as integrating payment systems, linking the system with the motion timeline, availability of advertisements in the application, etc. However, these improvements will be reflected in further versions of the system.

Declarations

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This study did not receive any grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing Interests Statement

The authors have not declared any conflict of interest.

Consent for publication

The authors declare that they consented to the publication of this study.

Authors' contributions

All the authors took part in literature review, analysis, and manuscript writing equally.

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