Developing an Effective e-Learning Platform

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ABSTRACT

Modern institutions, corporations, schools and universities in developed countries believe that e-Learning is a way for educating larger number of students in less time and lesser amount of resources. This research aims to design and develop a web-based e-learning system to make the environment of e-learning more adaptive and intelligent for the learners. The main values of the proposed research are accessibility and interoperability that make learning applications and components share data more easily and communicate more effectively. The proposed work was developed and designed using ASP.Net, SQL, XML and the Unified Modeling Language (UML) programming languages.

Keywords : Student; E-Learning Platform and Unified Modeling Language (UML).

I. INTRODUCTION

The last years has been witness to important change across wide areas of our cultural, social and physical systems. Education has also must adapt change reflected in the constantly growing population of students, which occupy places on current or newly created courses covering a wide range of subjects. The consequences of these changes are increasing the ration of student/staff, lessening in contact hours of the student which, if traditional educational methods persist, will cause a diminishing quality in the offered learning experience [1-5].

E-Learning was described as using the telecommunication technology for delivering, supporting and enhancing learning and teaching [1, 2, 6-8].

Basically, E-Learning is a web-based system which makes knowledge or information available for the learners or users and disregards geographic proximity or time restrictions, allows interactions between instructors and learners, or between learners themselves [1]. The online educational system development for a university seminar course or coop training was attributed to several causes:

- It is easier for many participants to more completely and successfully get the educational content.
- Reduced expenses and time waste of the students for traveling to the class location;
- Improved impression of the instructor/teacher and the institution which arranged the instruction;
- Accessible financial resources that make the effort and time financially valuable;
- It is a chance to join the modern trends and master new educational technologies.
- Assess the cost-effectiveness of investment into e-learning.

II. RELATED WORKS

"EDMODO" It is a free social platform that provides teachers and students with a safe environment for communication and cooperation, and the exchange of educational content and digital applications in addition to homework, grades and discussions [9, 10]. It combines the features of Facebook and Blackboard Learning Management System, and uses Web 2.0 technology. The platform is currently used by more than 47 million members, teachers, students, school administrators, and parents. It deserves the title of the first and largest social learning network in the world. **"Blackboard"** is an integrated e-learning management system, as it manages the educational process in a synchronous and asynchronous manner, and provides a safe learning environment, teachers provide their decisions and lectures through the addition of multimedia (text, pictures, audio, video, graphics), in which they meet Learners browse content as needed, and communicate with each other through multiple communication tools [11-13].

"Moodle" is a Learning Platform or course management system (CMS). The system is transforming the work of educational organizations from traditional to e-work, which is very similar to the BlackBoard e-learning system used in many universities around the world [11, 12]. Where the Moodle system can accelerate the educational process and ensure its quality significantly, which is easy to use either by the administration or the educational staff and even students who benefit from the system, and the educational organization can easily install it on its website and change the design to match the identity of the educational organization. This system may greatly benefit educational charities, such as the Quran memorization societies, all non-profit schools, institutes and universities, and others.

The technological revolution influenced everything [14-91]. Nowadays; the artificial intelligent (AI) algorithms were used extensively in solving many difficult problems, such as Healthcare Monitoring [54, 65], river flow forecasting [46, 92, 93], image segmentation [17, 35, 36, 51, 94-98], medical image analysis [37, 41, 99-101], patterns recognition and information retrieval [24, 30, 32, 39, 40, 45, 50, 102-106] and nurse rostering problem [107]. Recently; a number of researchers used the AI algorithms in order to enhance and improve the LMS [108-112].

III. METHODOLOGY

The Unified Modeling Language (UML) is a graphical programming language used to visualize, specify, construct, and document a software-intensive system artifacts. UML offers a way to write a system's blueprints, with conceptual things such as system functions and business processes as well as concrete things such as reusable software components, database schemas, and programming language statements [52, 53, 62, 63, 66, 68, 69, 72, 76, 81, 82, 88, 113-120].

3.1 Use Case Diagram

Use Case diagrams provide a very good overview of the entire system on a highly abstract level [113-116]. They describe functionality - services and activities to be performed - from the view of the user, and act as the interfaces to the environment. In the proposed application, the actors are the Admin, Manager, Teacher, Student and Visitor. Figure 1 shows the use case diagram for the proposed system.
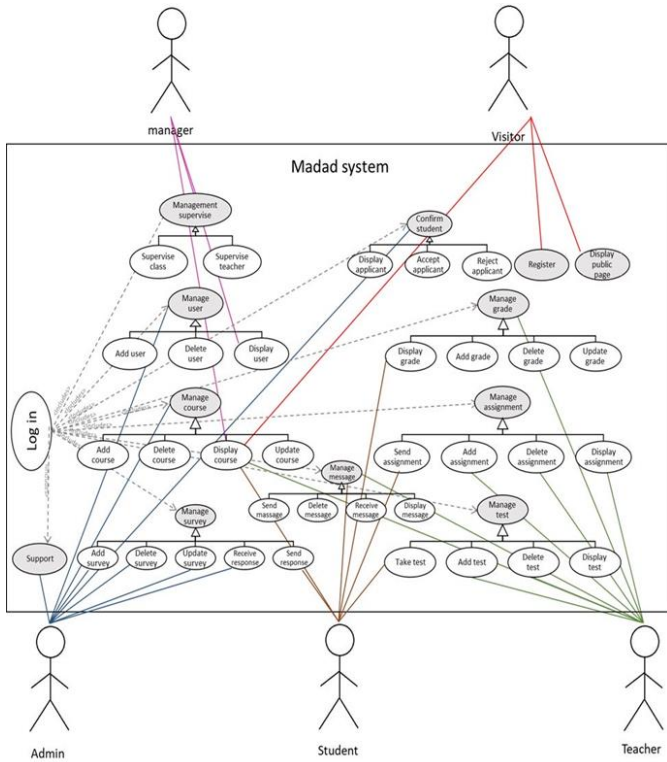
Figure 1: Use case diagram for the proposed system

3.2 Context diagram

A context diagram is a graphical natation of a system with single process to denote the entire system and does not define all the processes deliberately so as to prevent people getting get involved in complicated details at the very beginning [113-116]. Figure 2 represents the context diagram of the proposed system.
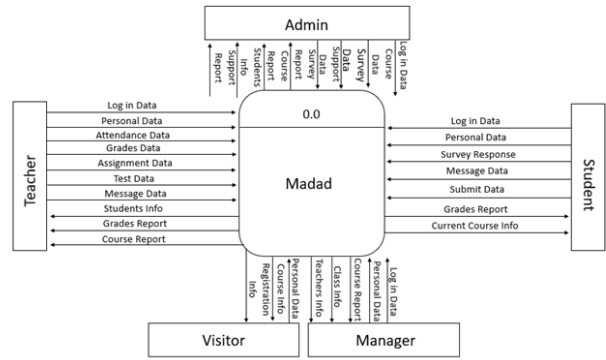

Figure 2: context diagram of the proposed system.

3.3 Entity Relationship Diagram (ERD)

An entity relationship diagram (ERD) demonstrates the relationships of entity sets in a database. In this context, the entity is an object which is component of data. An entity set is a group of entities that are similar, it can have attributes to describe its properties [113-116]. Figure 3 shows the ER diagram for the proposed system.
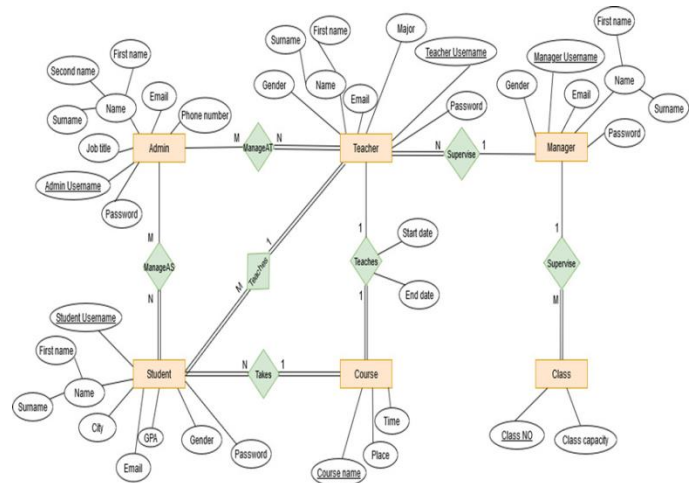

Figure 3: ER diagram for the proposed system.

3.4 Database Testing and Construction

Database testing is commonly done on all types of apps. It is important to consider using quality tools to test based on the necessity. There are different types of available tools for database testing. Most of them are commonly designed to perform set of tasks. To implement the database of the proposed system SQL

was utilized. Tables 1 and 2 below are example of the created tables.

Table 1: Students table

Table 2: Teachers table

Table 3: Managers table

3.5 Interface design

User interface design denotes the design of visual user interfaces in computerized devices or software. It's the total design, the way of presenting information, and the way of users interaction with the website. The below figures are examples of the designed interfaces.
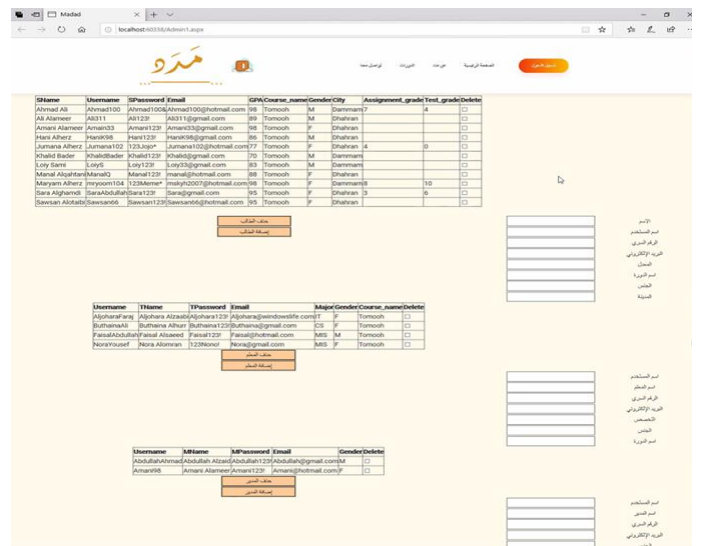

Figure 4: Registration page.

Figure 5: Supervisor page.
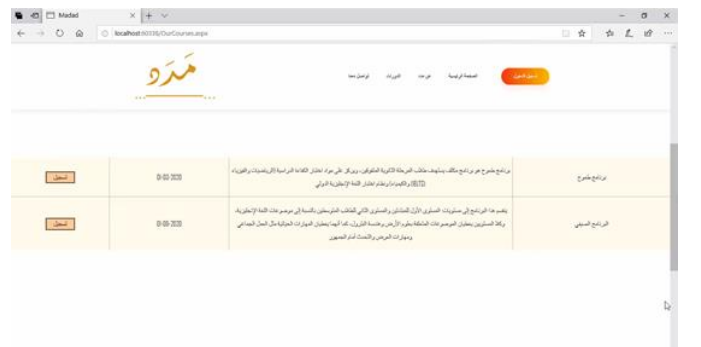

Figure 6: Attendance page.

Figure 7: Training page.

IV. DISCUSSION

To evaluate the system, we invited 20 students from the Imam Abdurrahman Bin Faisal University (IAU)

at the College of Applied Studies and Community Service for using the proposed system. A brief description of the system interface and usage was illustrated to the students. after tested the system, the student answered a survey which consists of 10 items to measure the user satisfaction level (as shows in table 4). As can be interpreted from the result, the majority of users agree that the system is easy to use, beneficial and achieves the primary objective of the project.

Table 4: collected data results from the 20 students.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Strongly disagree										
Disagree										
Neutral	6	5	6	4	3	2	1	3	4	5
Agree	5	9	7	7	6	8	11	3	12	11
Strongly agree	9	6	7	9	11	10	8	14	4	4

V. CONCLUSION

This research designed and developed a web-based e-learning system to make the environment of e-learning more adaptive and intelligent for the learners. The main values of the proposed research are accessibility and interoperability that make learning applications and components share data more easily and communicate more effectively. The proposed work was developed and designed using ASP.Net, SQL, XML and the Unified Modeling Language (UML) programming languages.

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