

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION

Federal State Autonomous Educational Institution of Higher Education

“South Ural State University (National Research University)”

School of Electrical Engineering and Computer Science

Department of Computer Science

THESIS IS CHECKED

Reviewer,

Cand. Sci., Assoc. Prof. CSU

_____ A.U. Makovetskii

“ ” _____ 2019

ACCEPTED FOR THE DEFENSE

Head of the department, Dr. Sci., Prof.

_____ L.B. Sokolinsky

“ ” _____ 2019

**DEVELOPMENT OF INFORMATION SYSTEM FOR REGISTRATION
DEPARTMENT OF AL-AMEEDA UNIVERSITY**

GRADUATE QUALIFICATION WORK

SUSU–02.04.02.2019.308–648.GQW

Supervisor

Cand. Sci., Assoc. Prof.

_____ T.Yu. Makovetskaya

Author,

the student of the group CE-229

_____ Z.H. Rasool

Normative control

_____ O.N. Ivanova

“ ” _____ 2019

Chelyabinsk–2019

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION

Federal State Autonomous Educational Institution of Higher Education
“South Ural State University (National Research University)”
School of Electrical Engineering and Computer Science
Department of Computer Science

APPROVED

Head of the department,
Dr. Sci., Prof.

_____ L.B. Sokolinsky

“ ____ ” _____ 2019

TASK

of the master graduate qualification work

for the student of the group CE-229

Zahraa Hameed Rasool

in master direction 02.04.02

“Fundamental Informatics and Information Technologies”
(master program “Database Technologies”)

1. The topic (approved by the order of the rector from 25.04.2019 No. 899)

Development of Information System for Registration Department of Al Aameeda University

2. The deadline for the completion of the work: 05.06.2019.

3. The source data for the work

3.1. Rumbaugh J., Jacobson I., Booch G. The Unified Modeling Language Reference Manual, 2nd ed. – USA: Addison Wesley, 1999. – 568 p.

3.2. Doyle M. Beginning PHP 5, 3. – USA: Wiley Publishing, Inc., 2010. – 775 p.

3.3. Seyed M.M. Tahaghoghi, Hugh E. Williams. Learning MySQL, 1st ed. – USA: O'Reilly & Associates, Inc., 2006. – 585 p.

4. The list of the development issues

4.1. Describe and Analysis of the subject area.

- 4.2. Make a comparative analysis of analogs sites.
- 4.3. Declare functional and non-functional requirements for the system.
- 4.4. Design use case diagram for the system.
- 4.5. Design a database schema.
- 4.6. Choose development tools for the implementation of the system.
- 4.7. Realization of the system.
- 4.8. Test the system.

5. Issuance date of the task: 08.02.2019.

Supervisor

Cand. Sci., Assoc. Prof.

T.Yu. Makovetskaya

The task is taken to perform

Z.H. Rasool

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	5
INTRODUCTION.....	6
1. PROJECT AREA	9
1.1. Problem Description.....	9
1.1.1. Registration Department	9
1.1.2. Disadvantages of Present Manual Working System.....	10
1.2. Comparative Analysis of Current Universities Sites	11
2. DESIGN OF THE WEB APPLICATION	13
2.1. Requirements.....	13
2.2. Use Case Diagram.....	15
2.3. Database Design	18
2.4. Interface Design	23
3. IMPLEMENTATION OF THE WEB APPLICATION.....	36
3.1. Definition of Platform for Modern Technologies for Web development....	36
3.2. Deployment Diagram for Web Application.....	38
3.3. Several Segment of PHP-Code for Implementing the Basic Functionality.	39
4. TESTING OF THE WEB APLPLICATION.....	43
4.1. Functional Testing.....	43
4.2. Interfaces of Web Application	43
CONCLUSION	49
REFERENCES.....	50
APPENDIX	53

ACKNOWLEDGEMENTS

In the beginning, thanking God for my conciliation in completing this scientific procession.

And I would like to thank the distinguished doctor, Associate Professor Tatyana Makovskaya, for her guidance, support, and encouragement to me throughout the project.

I would also like to thank my father, mother, brothers, and sisters for their support, and I thank my dear husband for his support, encouragement throughout my study period.

INTRODUCTION

Education system forms the backbone of every nation. And hence it is important to provide a strong educational foundation to the young generation to ensure the development of open-minded global citizens securing the future for everyone. Advanced technology available today can play a crucial role in streamlining education-related processes to promote solidarity among students, Professors and the university staff [25].

Automation is the utilization of technology to replace human. By automating documents that took up many large storage rooms can be stored on a few disks or server. Transcript images can be annotated. It reduces the time to retrieve old transcripts from hours to seconds, and it reduces the waste of money and effort in this area, and thus we get more accurate results, to manage our educational institutions [23].

Registration department of Al Ameen University its strong belief in the great and effective role it plays in serving the educational process at the university has been and continues to strive to overcome all the difficulties faced by students with the great belief in the need to communicate between the university and the students.

Based on the sense of responsibility towards our young generations, we have created this website. Al Ameen University has a wide internet space where no learner or science is hindered by geographical or time constraints [3].

As we are in registration department we apply the educational system in accordance with the regulations, rules, and rules in force in the university in terms of admissions policies and registration and transfer procedures and follow-up of the educational process for students from admission to graduation. It was incumbent upon us in this prestigious university to make a special path for ourselves. In line with the development and openness to the world and adapt to the requirements of modern scientific and technological progress [17]. This has been translated through several procedures, including the establishment of this website, which we tried to

serve the university students on the one hand providing the information that the student may need, such as study plans, in addition to the laws, regulations, and instructions applicable to the university and the various advertisements. We also tried through this site to provide different services for site surfers and researchers looking for information about the admission mechanisms for the various disciplines offered by the university, How happy we are when we provide accurate information to those looking for it from anywhere in this wide world to be the link between us and them.

Goal and objectives

Goal of research is create a web application to manage student's information in the registration department of Al Ameen University by using automated student database management system in place of papers.

In order to achieve the general objective, the following list of specific objectives is set:

- design and create a database to store university data;
- design a web application for manage database of the university;
- choose tools for realization system;
- realization of the university management system;
- testing of the web application.

Structure of the thesis

The thesis consists of four chapters, introduction, conclusion and reference list.

In chapter one, the project area and problem statement are presented, a brief description of the registration department at the university, as well as disadvantages of present manual working system and given comparative analysis of current universities sites.

In chapter two, there is a description of functional and non-functional requirements, use case diagram, database scheme and the design of the application interfaces.

In chapter three, we defined the platform for modern technologies for web development, show deployment diagram for web application and show several segment of PHP-code for implementing the basic functionality.

Chapter four for testing of the web application, we presented functional testing and some interfaces of web application.

The thesis has 58 pages and list of references contains 28 resources.

1. PROJECT AREA

This chapter works, analyses and discuss the needing this website, the problem of the current website, the best current website development technologies available, and technologies used to development present working system.

1.1. Problem Description

In this project, we are discussing the data management system of Al Ameen University. Al Ameen University consists of five departments: Department of Electronics and Communication Engineering (ECE), Department of Medical instruments Techniques Engineering (MITE), Department of Electrical Power Techniques Engineering (EPTE), Department of Computer Engineering and Information Technology (CEIT), Department of Dentistry.

1.1.1. Registration Department

Al Ameen University is an educational institution with 5000 students, this number is incrementable. The registration department at Al Ameen University is responsible for registering the students at the university and managing their data.

When registering a new student at the university, the Dean records all the information about the student such as name, phone number, email, gender, country, birthdate, gives the student the username and password to use the electronic system, and also when transferring a new teacher to the university. The Dean records all the information about the teacher such as name, gender, birthdate and add it to the department by the teacher's specialty and give it the username and password to use the system. Then, the Dean classifies students enrolled in the university according to the specific scientific department. According to the stage of the study, each department has study materials and has specific scientific tasks, at the end of the semester there is an authority for the Dean and the teacher to evaluate the student scientifically by degrees.

When the teacher is added to a specific department, the teacher is responsible for teaching a specific course of study with a number of hours and units and taught by the teacher to a special stage in a particular semester, The teacher can also add

tasks in the courses he is studying where each task has a title and a text with a date for the start and end of the task, and he can also add a mark to the student in a special course taught by the teacher.

When adding a student to a specific department, where the student can see the courses he is studying and also can see the tasks that are added to each course by the Dean or teacher and also he can solve that task and send it and can see the marks that added by the teacher or Dean.

The Department of Registration at the Al Ameen University requires an electronic system to manage students' information. To achieve this electronic system, must build a database to keep information teachers and students and arranges them to deal with them and complete the administrative processes. In addition to that retrieving records of students who have graduated of years ago has been a difficult task and the manual system also has a difficulty of producing different reports which are required by the stakeholders such as Professors, administrators or officials.

1.1.2. Disadvantages of Present Manual Working System

- The data storage is relatively difficult in papers, files, and registers. The retrieval of any data is time-consuming;
- possibility of loss of data;
- the possibility of errors during the transfer of grades from the exam paper to the records of grades;
- number of workers dealing with the student information management;
- this paper system requires big material cost, in addition to the information that is managed by the paper system, which is exposed to penetration and change by persons who are not authorized to do so;
- important data managed by the paper system are susceptible to damage due to burning or drowning;
- difficulty in extracting student data from old documents;
- the paper system needs large size to store paper documents;

- the difficulty of access to the important data for the production of statistical reports used in the development of Al Ameer University at the scientific and physical levels.

To help promote students achievement and success, the university must have access to complete, accurate, and timely information about students. One of the benefits of this system that the student record system will simplify retrieval of the required information and is a great instrument for university improvement by taking measures from the information acquired.

We use Web-based applications because are easier to develop, more useful for your users, easier to install, maintain and keep secure [28].

1.2. Comparative Analysis of Current Universities Sites

Here a comparative analysis of two analogical systems in different universities is discussed.

There is an analogical site with the same functionality. It is the site of the University of Baghdad. It has on the home page the following sections: the navigation bar has logo of university and buttons for (home, about, university formation, journal and scientific research, student and graduate, it services) and has icon for search and icon for translate to another language and has news about university [2]. Fig. 1 shows the Home page of University of Baghdad.

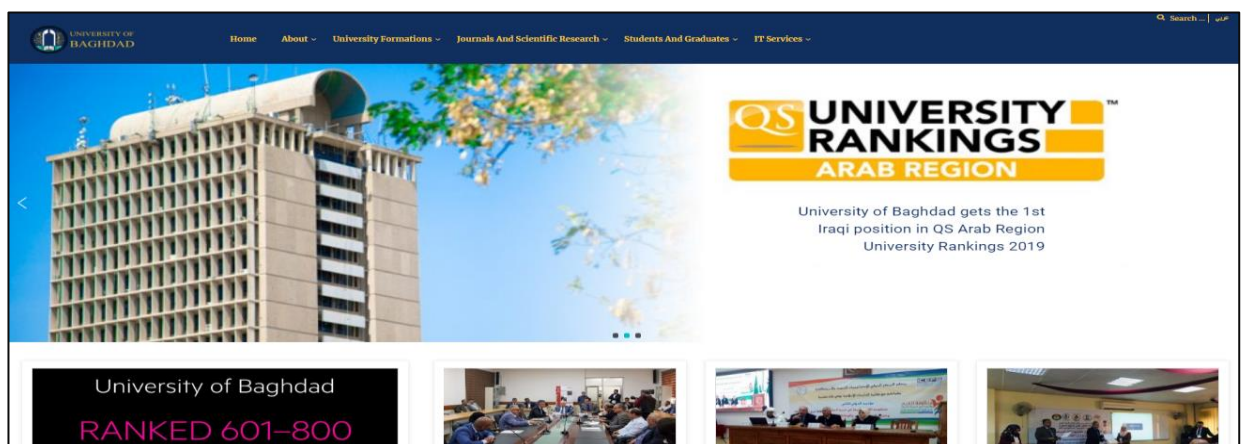


Fig. 1. Home page of university of Baghdad

Here we compare with the site of the University of Babylon where the official website of the University contains a bar at the top containing the logo of the university and some functions: presidency, news, journals, conferences, facilities and centers and three buttons at the top of the search and about the university and the staff and button to convert the site from English to Arabic and has a lot of news about university and scholarship [1]. Fig. 2 shows the Home page of University of Babylon.

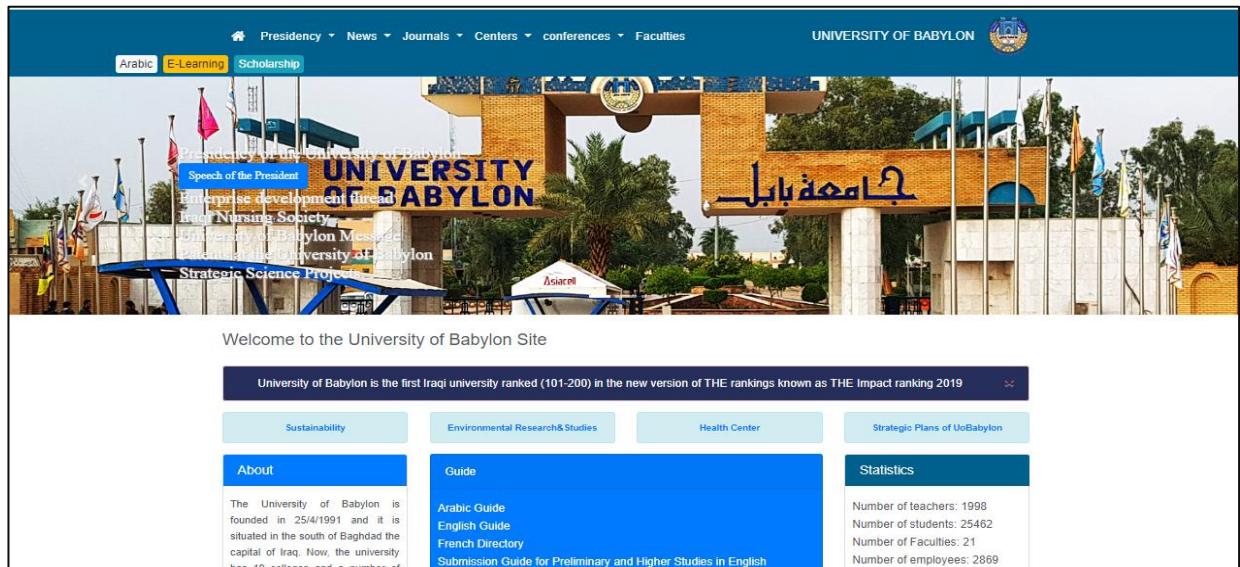


Fig. 2. Home page of university of Babylon

These sites reported the most important news about the university, our site, in addition to presenting the most important and latest news about the university, is an educational site benefiting the students, Where it contains all the courses that the student must study in the university and contains the tasks required to be solved by the student in specific courses and also contains an evaluate to student all these things can be found in our site.

2. DESIGN OF THE WEB APPLICATION

2.1. Requirements

The requirement phase involves the gathering of necessities and demands of each category of user dean, teacher and student .then prioritizing these requirements like software system availability [26].

The requirements are of 2 types:

Functional Requirements

Administrator (dean) Requirement.

1. To create a user-friendly interface this is easily interpretable.
2. To have a stable system performance.
3. To provide security for the portal to avoid the intervention of outsiders
4. To have easy maintainability of the portal
5. To be able to integrate the portal with an additional feature in the future with disturbing the portal basic structure and framework.

The features that are available for the Dean.

1. The dean can add a new student.
2. The dean can add a new teacher.
3. The dean can add a new department.
4. The dean can add and update personal information to users of the students and teachers.
5. The dean can add, update and delete course for students.
6. The dean can add, update and delete marks for students.
7. The dean can add, update and delete tasks for students.
8. The dean can pass students to a new stage.

The features that are available for the Teacher.

1. The teacher can view department.
2. The teacher can view the course.

3. The teacher can view information about himself and information about other teacher and other students.

4. The teacher can add, update and delete marks for students.

5. The teacher can add, update and delete tasks for students.

The features that are available for the Student.

1. The student can view the department.

2. The student can view the course.

3. The student can view marks.

4. The student can view tasks.

5. The student can view information about himself and information about other student and other teachers.

Non-Functional Requirements:

A) Security.

We are going to develop a secured database. There are various group of users namely Administrator, Teacher, Student who will be viewing either all or some specific information from the database. Depending on the group of user the arrival rights are determined. It means if the user is an administrator then he can be able to change the data, append, etc. All other users only have the rights to return the information around the database.

B) Performance.

The suggest system that we are going to develop will be used as the major performance system for providing support to the university in managing the whole database of the student studying in the university.

C) End User Criteria.

Usability is the scope to which specified users to attain specified goals with activity, efficiency, and satisfaction in a specified case of use can use a product. From the end users' view, the system should be designed in such a way that it is easy to learn and use, efficient and having few errors if any [1].

D) Maintainability.

The system should be easily extensible to add new functionalities at a later stage. It should also be easily updated to make changes to the features and functionalities.

E) Safety.

The database may get destroyed at any sure time due to virus or operating system fail. Therefore, it is required to take the database backup.

System Requirements:

System Development Software Tools:

- MySQL database to store and secure information;
- HTML, CSS, JavaScript, PHP to develop the system;
- PhpMyAdmin for testing the application during development.

System Hardware Development Tools:

- Microprocessor: Intel(R) Core(TM) i5-6200U CPU @ 2.3 GHz;
- RAM: 8 GB of RAM;
- Hard Disk: 1 terabyte (TB) on installation drive Operating Systems;
- Windows 10 Pro 64 bits Operating System for developing this system.

2.2. Use Case Diagram

UML Unified Modeling Language is a standardized modeling language consisting of an integrated set of diagrams, developed to help system and software developers for visualizing, constructing, specifying and documenting the artifacts of software systems, as well as for job modeling and other non-software systems[4]. The UML represents a set of best engineering practices that have certain success in the modeling of large and complex systems. The UML is a very important part of developing object-oriented software and the software development process. The UML uses generally graphical notations to express the design of software projects. Using the UML helps project teams explore potential designs, communicate, and validate the architectural design of the software.

A use-case model describes a system's functional requirements in expressing of use cases [19]. It is a model of the system's intended functionality (use cases) and its environment (actors). Use cases enable you to link what you need from a system to how the system delivers on those needs.

Fig. 3 shows the Use case diagram for the university management system.

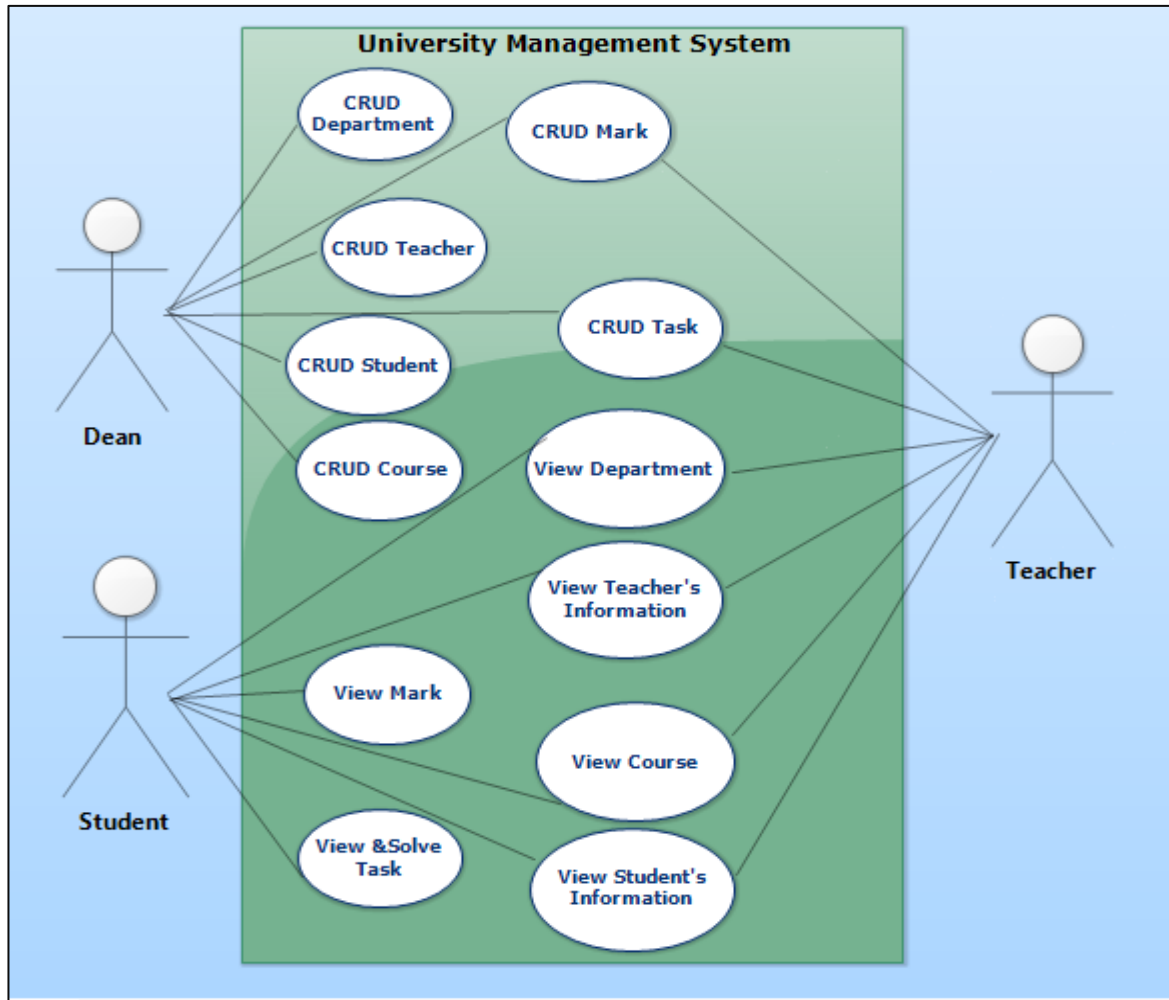


Fig. 3. Use case diagram

Use case diagram consists of three actors Dean, Teacher, and Student, and consist of twelve use case.

(Create, Read, Update, Delete)

Use case “CRUD department” this use case can be controlled by dean only.

Use case “CRUD teacher” this use case can be controlled by dean only.

Use case “CRUD student” this use case can be controlled by dean only.

Use case “CRUD course” this use case can be controlled by dean only to add a new course to a special department.

Use case “CRUD mark” this use case can be controlled by dean and teacher to add a mark to students.

Use case “CRUD task” this use case can be controlled by dean and teacher to add a task to students in special courses.

Use case “View department” this use case available to teacher and student.

Use case “View course” this use case available to teacher and student to show the courses.

Use case “View mark” this use case available to the student to show his mark.

Use case “View & solve task” this use case available to the student to show the tasks and solve it.

Use case “View student’s information” and Use case “View teacher’s information” these use cases available to the dean, teacher, and student.

2.3. Database Design

Database design is the organization of data according to a database model. The designer determines what data must be stored and how the data elements interrelate [13]. With this information, they can begin to fit the data to the database model. Database design involves classifying data and identifying interrelationships. Databases form the common component of many software systems, including mission-critical transaction processing systems and multi-tier Internet applications.

A database schema is the skeleton structure that represents the logical view of the entire database [5]. It defines how the data is organized and how the relations among them are associated. It formulates all the constraints that are to be applied to the data.

We decided to specify the following tables of the database:

- the table Department that saved the name of departments;
- the table for the Teacher that adds scientific degree to teacher and add a teacher to the department;
- the table for the Course that saved the information of Courses like Course name, Hours, Units, Stage, Semester, Department, and Teacher;
- the table for the Task that saved the information of tasks like Task Title, Text, Course, Start Date, and End Date;
- the table for the Student that add a student to the department and stage;
- the table for the Student Task that saved the information of student's task like Task, Student, Date, and Result;
- the table for the Mark that saved the information of marks like Course, Student, Mark, and Date;
- the table for the User that saved the information of users like Username, Password, Firstname, Lastname, Email, Phone, Birthdate, Gender, User type, and Country;
- the table Country that saved the name of countries.

The database schema is shown in the fig. 4. It contains 9 tables, Described below.

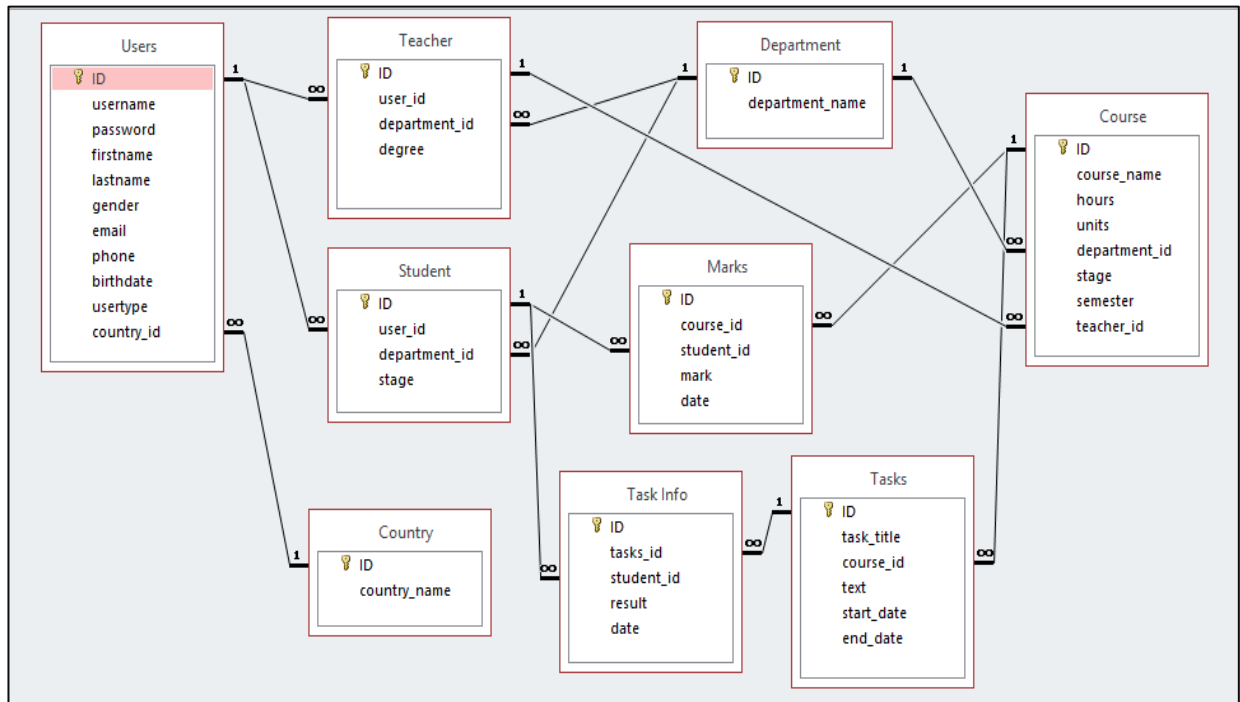


Fig. 4. Database scheme

The table “Department” save the department that added by the dean in university, it contains id and department name. It contains 2 fields as in the fig. 5.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
<input type="checkbox"/>	1 id	int(11)			No	None		AUTO_INCREMENT
<input type="checkbox"/>	2 department_name	varchar(50)	utf8_general_ci		No	None		

☐ Check all With selected: ☐ Browse ☐ Change ☐ Drop ☐ Primary ☐ Unique ☐ Index

Fig. 5. Structure of table “Department”

The table “Teacher” contains information to add scientific degree to teacher and add a teacher to the department by the Dean in university, it contains id, user_id, department_id and degree. It contains 4 fields as in the fig. 6.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
<input type="checkbox"/>	1 id	int(11)			No	None		AUTO_INCREMENT
<input type="checkbox"/>	2 user_id	int(11)			No	None		
<input type="checkbox"/>	3 department_id	int(11)			No	None		
<input type="checkbox"/>	4 degree	varchar(20)	utf8_general_ci		No	None		
<input type="checkbox"/> Check all With selected: Browse Change Drop Primary Unique Index								

Fig. 6. Structure of table “Teacher”

The table “Course” save the courses that added by the dean to the student in university, the course table includes: course_id, course name, teacher_id, department_id, hours, units, stage and semester. It contains 8 fields as in the fig. 7.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
<input type="checkbox"/>	1 course_id	int(11)			No	None		AUTO_INCREMENT
<input type="checkbox"/>	2 teacher_id	int(11)			No	None		
<input type="checkbox"/>	3 course_name	varchar(100)	utf8_general_ci		No	None		
<input type="checkbox"/>	4 hours	int(11)			No	None		
<input type="checkbox"/>	5 semester	int(11)			No	None		
<input type="checkbox"/>	6 department_id	int(11)			No	None		
<input type="checkbox"/>	7 stage	int(11)			No	None		
<input type="checkbox"/>	8 units	int(11)			No	None		
<input type="checkbox"/> Check all With selected: Browse Change Drop Primary Unique Index								

Fig. 7. Structure of table “Course”

The table “Task” save the tasks added by the dean or by the teacher to student in university, it contains t_id, task_title, course_id, text, start_date, and end_date. It contains 6 fields as in the fig. 8.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
<input type="checkbox"/>	1 t_id	int(11)			No	None		AUTO_INCREMENT
<input type="checkbox"/>	2 task_title	varchar(50)	utf8_general_ci		No	None		
<input type="checkbox"/>	3 course_id	int(11)			No	None		
<input type="checkbox"/>	4 text	text	utf8_general_ci		No	None		
<input type="checkbox"/>	5 start_date	date			No	None		
<input type="checkbox"/>	6 end_date	date			No	None		
<input type="checkbox"/> Check all With selected: <input type="checkbox"/> Browse <input type="checkbox"/> Change <input type="checkbox"/> Drop <input type="checkbox"/> Primary <input type="checkbox"/> Unique <input type="checkbox"/> In								

Fig. 8. Structure of table “Task”

The table “Student” contains information to add the student to a department and stage by the Dean in university, it contains id, user_id, department_id, and stage. It contains 4 fields as in the fig. 9.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
<input type="checkbox"/>	1 id	int(11)			No	None		AUTO_INCREMENT
<input type="checkbox"/>	2 user_id	int(11)			No	None		
<input type="checkbox"/>	3 department_id	int(11)			No	None		
<input type="checkbox"/>	4 stage	int(11)			No	None		
<input type="checkbox"/> Check all With selected: <input type="checkbox"/> Browse <input type="checkbox"/> Change <input type="checkbox"/> Drop <input type="checkbox"/> Primary <input type="checkbox"/> Unique <input type="checkbox"/> In								

Fig. 9. Structure of table “Student”

The table “Task Info” It stores information about student’s task it contains id, tasks_id, student_id, result, and date. It contains 5 fields as in the fig. 10.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
<input type="checkbox"/>	1 id	int(11)			No	None		AUTO_INCREMENT
<input type="checkbox"/>	2 tasks_id	int(11)			No	None		
<input type="checkbox"/>	3 student_id	int(11)			No	None		
<input type="checkbox"/>	4 result	varchar(50)	utf8_general_ci		No	None		
<input type="checkbox"/>	5 date	date			No	None		
<input type="checkbox"/> Check all With selected: <input type="checkbox"/> Browse <input type="checkbox"/> Change <input type="checkbox"/> Drop <input type="checkbox"/> Primary <input type="checkbox"/> Unique <input type="checkbox"/> In								

Fig. 10. Structure of table “Task Info”

The table “Mark” save the marks that added by the dean or by the teacher to student in university, it contains id, course_id, student_id, mark, and date. It contains 5 fields as in the fig. 11.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
<input type="checkbox"/>	1 id	int(11)			No	None		AUTO_INCREMENT
<input type="checkbox"/>	2 course_id	int(11)			No	None		
<input type="checkbox"/>	3 student_id	int(11)			No	None		
<input type="checkbox"/>	4 mark	int(11)			No	None		
<input type="checkbox"/>	5 date	date			No	None		

☐ Check all With selected: ☐ Browse ☐ Change ☐ Drop ☐ Primary ☐ Unique

Fig. 11. Structure of table “Mark”

The table “User” contains the information of the users that register in the university. This table saves user_id and the username of the user and saved the encrypted password to maintain from the hacker and save all information about the users like FirstName, LastName, email, gender, phone, birthdate, country and UserType student or teacher. It contains 11 fields as in the fig. 12.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
<input type="checkbox"/>	1 user_id	int(11)			No	None		AUTO_INCREMENT
<input type="checkbox"/>	2 username	varchar(50)	utf8_general_ci		No	None		
<input type="checkbox"/>	3 password	varchar(50)	utf8_general_ci		No	None		
<input type="checkbox"/>	4 firstname	varchar(50)	utf8_general_ci		No	None		
<input type="checkbox"/>	5 lastname	varchar(50)	utf8_general_ci		No	None		
<input type="checkbox"/>	6 email	varchar(50)	utf8_general_ci		No	None		
<input type="checkbox"/>	7 gender	varchar(50)	utf8_general_ci		No	None		
<input type="checkbox"/>	8 phone	int(50)			No	None		
<input type="checkbox"/>	9 birthdate	date			No	None		
<input type="checkbox"/>	10 usertype	varchar(50)	utf8_general_ci		No	None		
<input type="checkbox"/>	11 country_id	int(11)			No	None		

☐ Check all With selected: ☐ Browse ☐ Change ☐ Drop ☐ Primary ☐ Unique ☐ Ind

Fig. 12. Structure of table “User”

The table “Country” save country_id and country_name. It contains 2 fields as in the fig. 13.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
<input type="checkbox"/> 1	country_id	int(11)			No	None		AUTO_INCREMENT
<input type="checkbox"/> 2	country_name	varchar(50)	utf8_general_ci		No	None		

☐ Check all With selected: ☐ Browse Change Drop Primary Unique Index

Fig. 13. Structure of table “Country”

2.4. Interface Design

Providing a successful web application is required a good user interface, UI design can make or break the success of your website or application in web design, great user interface, or UI design, is all about helping the user to perform a specific task as simply and efficiently as possible [24].

We will implement future views of an application. Fig. 14 shows the “Home page” for the web site of the university. It contains the navigation bar in the top of the page is contained in the left side Logo for university (Al Ameen University) and contains: “Home”, “Department”, “Contact Us”, “About Us”, “Useful Links”, “Login” and in the right side we see search box with button to submit search. Slider in the middle of the main page that shows in it the photo of university, and down of slider we show “Services of University” Like (Our Message, Our Vision, Goals) and we can show the “Latest News” about the university and can read the welcome word to the dean, and contain the social media that the user can follow the university, and footer, in the end, contain (© 2018-2019), this page accessible by all users.

Logo icon	Al Aameed University	<u>Home</u>	Department	Contact Us	About Us	Useful Links	Login	Search
--------------	-------------------------	-------------	------------	------------	----------	-----------------	-------	--------

Photo

OUR SERVICES

Our Message

Our Vision

Goals

Welcome

Photo

Text

Latest News

Photo

Text

Photo

Text

Photo

Text

Follow Us

Footer

Fig. 14. "Home page"

Fig. 15 shows the page for "Login". In this page the user must enter username and password, after that press button "Sign in" to use windows web application, it's accessible by all user in university.

Logo icon	Al Aameed University	Home	Department	Contact Us	About Us	Useful Links	<u>Login</u>	Search
--------------	-------------------------	------	------------	------------	----------	-----------------	--------------	--------

UserName:

☐

Footer

Fig. 15. "Login page"

Admin (Dean) Interfaces

Fig. 16 shows “index page” this page contains all main functions in the system for admin (dean).

Logo icon	Welcome Dean	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	--------------	------	------------	------------	----------	--------------	--------	--------

Featured	<div>Welcome To Data Management System of Al Ameer University</div>
Courses	
Department	
Marks	
Pass Students	
Students	
Tasks	
Teachers	
Users	

Footer

Fig. 16. “Index page”

Fig. 17 shows “Add Course”. This page contains all the information about adding a new course to students like Course Name, Hours, Units, Stage, Semester, Teacher and Department, it can be accessed by the dean.

Logo icon	Welcome Dean	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	--------------	------	------------	------------	----------	--------------	--------	--------

Featured	<div>Add Course Course Name <input type="text"/> Hours <input type="text"/> Units <input type="text"/> Stage <input type="text"/> Semester <input type="text"/> Teacher <input type="text"/> Department <input type="text"/> <input type="button" value="Save"/> <input type="button" value="Close"/></div>
Courses	
Department	
Marks	
Pass Students	
Students	
Tasks	
Teachers	
Users	

Footer

Fig. 17. “Add Course”

Fig. 18 shows “Course Information”. This page contains all the information about the course that added by Dean to the students where the Dean can add a new course by pressing the button to add a new course, and he can update or delete the existing course, it can be accessed by the dean.

Logo icon	Welcome Dean	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	--------------	------	------------	------------	----------	--------------	--------	--------

Featured Courses Department Marks Pass Students Students Tasks Teachers Users	<table border="1"> <thead> <tr> <th>Course Name</th> <th>Hours</th> <th>Units</th> <th>Stage</th> <th>Semester</th> <th>Teacher</th> <th>Department</th> <th>Edit</th> <th>Delete</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Edit</td> <td>Delete</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Edit</td> <td>Delete</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Edit</td> <td>Delete</td> </tr> </tbody> </table>	Course Name	Hours	Units	Stage	Semester	Teacher	Department	Edit	Delete								Edit	Delete								Edit	Delete								Edit	Delete
	Course Name	Hours	Units	Stage	Semester	Teacher	Department	Edit	Delete																												
								Edit	Delete																												
								Edit	Delete																												
								Edit	Delete																												
	<input type="button" value="Add New Course"/>																																				

Footer

Fig. 18. “Course Information”

Fig. 19 shows “Add Mark” this page contains all information to add a mark to the student like Course Name, Student Name Mark and Date, it can be accessed by dean or teacher to add a mark to the student in a special course.

Logo icon	Welcome Dean	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	--------------	------	------------	------------	----------	--------------	--------	--------

Featured Courses Department Marks Pass Students Students Tasks Teachers Users	Add Mark		
	Course Name	Student Name	Mark
	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Date		
	<input type="text"/>		
	<input type="button" value="Save"/>		

Footer

Fig. 19. “Add Mark”

Fig. 20 shows the “Pass Student “. This page contains the name of the department, the stage, the year, and contain table with three columns: First name, last name of the student and column for select student, and contain pass button below the table, where the Dean selects a group of students through the box in the select field and pressing the button to pass Students into a new stage, which can be accessed by the dean of the university.

Logo icon	Welcome Dean	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	--------------	------	------------	------------	----------	--------------	--------	--------

Featured
Courses
Department
Marks
Pass Students
Students
Tasks
Teachers
Users

Department Name:
Stage:
Year:

First Name	Last Name	Select
		<input type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>

Pass

Footer

Fig. 20. “Pass Students”

Fig. 21 shows “Add Student to Department” In this page, the dean can add a student to a special department with a special stage and also the Dean can display all information about the student by calling from the user table.

Logo icon	Welcome Dean	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	--------------	------	------------	------------	----------	--------------	--------	--------

Featured
Courses
Department
Marks
Pass Students
Students
Tasks
Teachers
Users

Student Name
Department
Stage

Save

First Name	Last Name	Gender	Email	Phone	BirthDate	Stage	Department	Edit	Delete
								Edit	Delete
								Edit	Delete
								Edit	Delete

Footer

Fig. 21. “Add Student to Department”

Fig. 22 shows “Add Task” this page contains all information to add a task to the student like Course Name, Task Title, Text, Start Date and End Date, it can be accessed by dean or teacher to add a new task to the student in a special course.

Logo icon	Welcome Dean	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	--------------	------	------------	------------	----------	--------------	--------	--------

Featured
Courses
Department
Marks
Pass Students
Students
Tasks
Teachers
Users

Add Task

Course Name
Task Title

Text

Start Date
End Date

Save

Footer

Fig. 22. “Add Task”

Fig. 23 shows “Add Teacher to Department” In this page, the dean can add a teacher to a special department with a special degree and also the Dean can display all information about the teacher by calling from the user table.

Logo icon	Welcome Dean	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	--------------	------	------------	------------	----------	--------------	--------	--------

Featured
Courses
Department
Marks
Pass Students
Students
Teachers
Users

Teacher Name
Degree
Department

Save

First Name	Last Name	Gender	Email	Phone	BirthDate	Degree	Department	Edit	Dele
								Edit	Dele
								Edit	Dele
								Edit	Dele

Footer

Fig. 23. “Add Teacher to Department”

Fig. 24 shows “Add User” this page contains all information to add new users like UserName, Password, UserType FirstName, LastName, Gender, E-mail, Phone, Birthdate and Country it can access by the dean to add a new user to system either teacher or student.

Logo icon	Welcome Dean	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	--------------	------	------------	------------	----------	--------------	--------	--------

Featured Courses Department Marks Pass Students Students Tasks Teachers Users	Add Users		
	UserName	Password	UserType
	<input type="text"/>	<input type="text"/>	<input type="text"/>
	FirstName	LastName	Gender
	<input type="text"/>	<input type="text"/>	<input type="text"/>
	E-mail	Phone#	BirthDate
	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Country	<input type="text"/>	
<input type="button" value="Save"/>		<input type="button" value="Close"/>	

Footer

Fig. 24. “Add User”

Teacher Interfaces

Fig. 25 shows “Index page” it contains all main function that Available to the teacher in the system.

Logo icon	Welcome Teacher	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	-----------------	------	------------	------------	----------	--------------	--------	--------

Featured Courses Marks Students Tasks Teachers	Welcome To Data Management System of Al Ameen University	
--	---	--

Footer

Fig. 25. “Index page”

Fig. 26 shows “Course page” it contains Department Name and Courses, the teacher can choose any course in any department he wants, to see information about this course.

Logo icon	Welcome Teacher	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	-----------------	------	------------	------------	----------	--------------	--------	--------

Featured Courses Marks Students Tasks Teachers	Department Name	Courses
		Courses
		Courses
		Courses
		Courses
		Courses
		Courses

Footer

Fig. 26. “Course page”

Fig. 27 shows “Course information” this page contains Course Name, Hours, Units, stage, semester and teacher, the teacher can see this information about the course that he selected in a special department.

Logo icon	Welcome Teacher	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	-----------------	------	------------	------------	----------	--------------	--------	--------

Featured Courses Marks Students Tasks Teachers	Course Name	Hours	Units	Stage	Semester	Teacher

Footer

Fig. 27. “Course Information”

Fig. 28 shows “Mark page” it contains Course Name and Add Mark, the teacher can add a mark to the student in any course taught by the teacher.

Logo icon	Welcome Teacher	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	-----------------	------	------------	------------	----------	--------------	--------	--------

Featured Courses Marks Students Tasks Teachers	Course Name	Add Mark
		Add Mark
		Add Mark
		Add Mark
		Add Mark
		Add Mark

Footer

Fig. 28. “Mark page”

Fig. 29 shows “Add Mark” this page contains all information to add a mark to the student like Course Name, Student Name, Mark and Date, it can be accessed by dean or teacher to add a mark to the student in a special course.

Logo icon	Welcome Teacher	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	-----------------	------	------------	------------	----------	--------------	--------	--------

Featured Courses Marks Students Tasks Teachers	Add Mark		
	Course Name	Student Name	Mark
	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Date		
	<input type="text"/>		
	<input type="button" value="Save"/>		

Footer

Fig. 29. “Add Mark”

Fig. 30 shows “Task page” it contains Course Name and Add Task the teacher can add a Task to the student in any course taught by the teacher.

Logo icon	Welcome Teacher	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
--------------	--------------------	------	------------	------------	----------	-----------------	--------	--------

Featured Courses Marks Students Tasks Teachers	Course Name	Add Task
		Add Task
		Add Task
		Add Task
		Add Task
		Add Task

Footer

Fig. 30. “Task page”

Fig. 31 shows “Add Task” this page contains all information to add a task to the student like Course Name, Task Title, Text, Start Date, End Date, it can accessed by dean or teacher to add a new task to the student in a special course.

Logo icon	Welcome Teacher	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
--------------	--------------------	------	------------	------------	----------	-----------------	--------	--------

Featured Courses Marks Students Tasks Teachers	Add Task	
	Course Name	Task Title
	<input type="text"/>	<input type="text"/>
	Text	
	<input type="text"/>	
	Start Date	End Date
<input type="text"/>	<input type="text"/>	
<input type="button" value="Save"/>		

Footer

Fig. 31. “Add Task”

Student Interfaces

Fig. 32 shows “Index page” this page contains all main function that available to students in the system.

Logo icon	Welcome Student	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	-----------------	------	------------	------------	----------	--------------	--------	--------

Featured	<div>Welcome To Data Management System of Al Ameen University</div>
Courses	
Marks	
Students	
Tasks	
Teachers	

Footer

Fig. 32. “Index page”

Fig. 33 shows “Mark page” this page contains Course Name and Show Mark the Student can view mark in any course he had studied.

Logo icon	Welcome Student	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	-----------------	------	------------	------------	----------	--------------	--------	--------

Featured	<table border="1"><tr><td>Course Name</td><td>Show Mark</td></tr><tr><td></td><td>Show Mark</td></tr><tr><td></td><td>Show Mark</td></tr><tr><td></td><td>Show Mark</td></tr><tr><td></td><td>Show Mark</td></tr><tr><td></td><td>Show Mark</td></tr></table>	Course Name	Show Mark		Show Mark		Show Mark		Show Mark		Show Mark		Show Mark
Course Name		Show Mark											
		Show Mark											
		Show Mark											
		Show Mark											
		Show Mark											
	Show Mark												
Courses													
<u>Marks</u>													
Students													
Tasks													
Teachers													

Footer

Fig. 33. “Mark page”

Fig. 34 shows “Show Mark” this page contains Course Name, Year, student Name, and Mark the Student can view mark in any course he had studied and selected to show the mark.

Logo icon	Welcome Student	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	-----------------	------	------------	------------	----------	--------------	--------	--------

Featured
Courses
Marks
Students
Tasks
Teachers

Course Name:
Year:

Student Name	Mark

Footer

Fig. 34. “Show Mark”

Fig. 35 shows “Tasks page” this page contains Course Name and Show Task the Student can view tasks in any course he had studied.

Logo icon	Welcome Student	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	-----------------	------	------------	------------	----------	--------------	--------	--------

Featured
Courses
Marks
Students
Tasks
Teachers

Course Name	Show Task
	Show Task
	Show Task
	Show Task
	Show Task
	Show Task

Footer

Fig. 35. “Task page”

Fig. 36 shows “Show Task” this page contains all information about the task like Course Name, Year, Task Title, Text, Start date, End Date and Solve, the Student can view task in any course he had studied and selected to show the task and he can press the button to solve the task if he wants to solve it.

Logo icon	Welcome Student	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	-----------------	------	------------	------------	----------	--------------	--------	--------

Featured

Courses

Marks

Students

Tasks

Teachers

Course Name:
Year:

Task Title	Text	Start Date	End Date	Solve Task
				Solve Task
				Solve Task
				Solve Task

Footer

Fig. 36. “Show Task”

Fig. 37 shows “Solve Task” this page contains Course Name, Year, Student Name, Task Title, Solve and Date, the Student can solve the task in a special course he had studied it and press button submit to send the solution to teacher.

Logo icon	Welcome Student	Home	Department	Contact Us	About Us	Useful Links	Logout	Search
-----------	-----------------	------	------------	------------	----------	--------------	--------	--------

Featured

Courses

Marks

Students

Tasks

Teachers

Solve Task

Course Name:
Year:

Student Name
Task Title

Solve

Date
Submit

Footer

Fig. 37. “Solve Task”

3. IMPLEMENTATION OF THE WEB APPLICATION

3.1. Definition of Platform for Modern Technologies for Web development

Many new web technologies are ruling in the world of web application development trends nowadays and much more is yet to come. It is because of trends in web application development change at a faster rate beyond our expectation. That's why it is important to go ahead with the new web trends that are going to rise instead of focusing on the trends we have till now.

Web technologies like frameworks, programming languages and Instruments can be distributed according to these categories:

1) frameworks are sets of program libraries, tools, and components orderly in an architecture system allowing developers to build and maintain complex web application projects using active and quick approach [29]. Web Application Frameworks are designed to streamline programming and promote code reuse by setting forth folder guidelines, documentation, organization and structure, and libraries (re-usable codes for popular functions and classes) like:

- Bootstrap - a free and open-source front-end framework for developing websites and web applications. It contains HTML- and CSS-based design templates for typography, forms, buttons, navigation, and other interface components, as well as optional JavaScript extensions [22];

2) programming languages are ways to communicate with computers and tell them what to do.

Programming Languages

HTML is a (Hypertext Markup Language) which is, in reality, a backbone of any website. Every website can't be structured without the knowledge of HTML [11]. Because it is an independent language that can be used on any platform such as Windows, Linux, Macintosh, and so on. To display a document in the web it is essential to mark-up the different elements (headings, paragraphs, tables, and so on)

of the document with the HTML tags. To view a mark-up document, the user has to open the document in a browser.

CSS (Cascading Style Sheets) is used to control presentation, formatting, and layout. When changes are made in one style sheet, CSS enables these changes across all the style sheets [9]. It allows you to develop the overall look of your website. That CSS is concerned with elements of presentation such as layout, font, and color.

JavaScript is a client-side programming language which helps web developer to do Web Application Development by implementing custom client-side scripts. JavaScript helps web developers to make web pages dynamic and interactive by implementing custom client-side scripts [20]. They can even combine JavaScript, HTML, and CSS to create web pages that look good across browsers, platforms, and devices.

PHP using for developing dynamic web applications that is one of the most popularly used languages to create websites because; it is an open source which makes it really cost-effective to work on. The error detection in PHP is easier as the language is highly efficient [16]. It is among the fastest languages available and it processes the data very fast. Its high usability, it is training and acquiring talent is risk-free. PHP is a very powerful server-side scripting language, PHP script can be embedded directly into the heart of HTML code. PHP is suitable with different web servers like Microsoft's IIS and Apache as well. All the PHP scripts are run on the server and it supports different databases like MySQL, Solid, Generic ODBC, Oracle, etc. however, it is generally used with MySQL [14];

3) instruments used in web application development.

AppServ is a next-generation PHP infrastructure consisting of a lightning-fast web server completely written in PHP including additional frequently needed services in one powerful bundle. We can use all of the services or only specifically selected services in our application with no additional tweaks. In this system installed and used App server on windows 10 pro because it is Simple package for

programming that turns our PC to Web Server and Database Server [18].AppServ is a full-featured of Apache, MySQL, PHP, phpMyAdmin.

MySQL is a freely available open source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL)[21].used on the web, runs on a server, ideal for both small and large applications, very fast, reliable, and easy to use, compiles on a number of platforms, free to download and use. MySQL is the most popular database system used with PHP [7].

PhpMyAdmin is a free and open source administration tool for MySQL and Maria DB. As a portable web application written primarily in PHP, it has become one of the most popular MySQL administration tools, which is frequently used for web-based interactive programs [6] .phpMyAdmin translates what your entry into the web browser, sends queries to the MySQL database, and translates the returned information back to web format.

InnoDB – A (database engine) is the underlying software component that a DBMS uses to create, read, update and delete (CRUD) data from a database [3].This is the default storage engine for MySQL. It provides transaction-safe tables, supports FOREIGN KEY referential-integrity constraints [15].

3.2. Deployment Diagram for Web Application

Deployment diagram is a structure diagram which shows the architecture of the system as a deployment (distribution) of software artifacts to deployment targets. Artifacts represent concrete elements in the physical world that are the result of a development process. Examples of artifacts are executable files, libraries, archives, database schemas, configuration files [8]. Fig. 38 shows deployment Diagram.

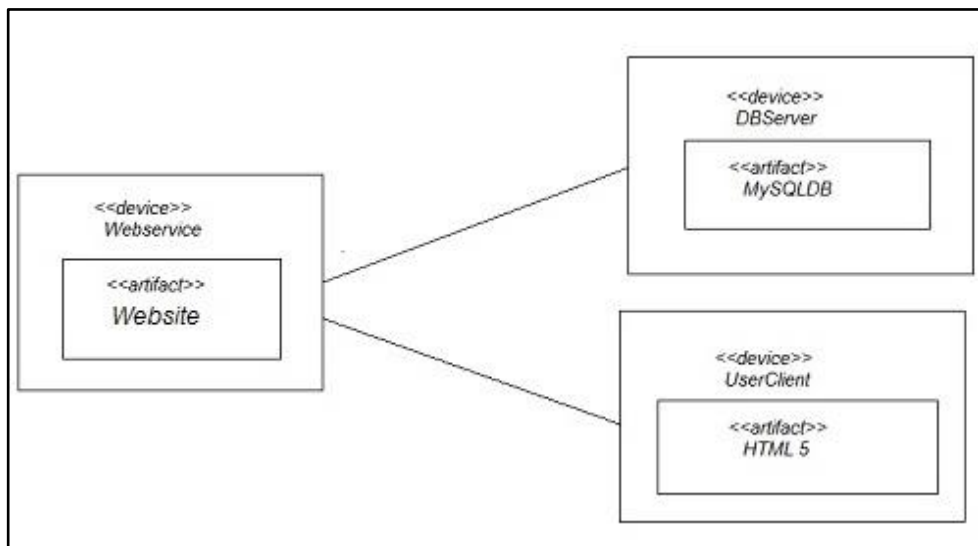


Fig. 38. UML deployment Diagram

3.3. Several Segment of PHP-Code for Implementing the Basic Functionality

Fig. 39 shows the function for login in the system by entering the username and password for the user.

```

<div class="col-8">
<?php
if(isset($_POST['login'])) {
    $name = $_POST['name'];
    $pass = $_POST['password'];
    $passmd5=md5($pass);
    $sql = "SELECT * FROM users WHERE username='$name' AND password='$passmd5'";
    $run_query = mysql_query($sql);
    $count = mysql_num_rows($run_query);
    if($count > 0) {
        $row = mysql_fetch_array($run_query);
        $_SESSION['uid'] = $row['user_id'];
        $_SESSION['username'] = $row['username'];
        $_SESSION['email'] = $row['email'];
        $_SESSION['usertype'] = $row['usertype'];
        $_SESSION['firstname'] = $row['firstname'];
        $_SESSION['lastname'] = $row['lastname'];
        $_SESSION['gender'] = $row['gender'];
        $_SESSION['phone'] = $row['phone'];
        $_SESSION['img'] = $row['img'];
        $_SESSION['birthdate'] = $row['birthdate'];
        header("Location: index.php");
    } else {
        echo "<div class='alert alert-danger' role='alert'>
        <a href='#' class='close' data-dismiss='alert' aria-label='close'>&times;</a>
        <b>Error In Username Or Password ...!</b>
        </div>";
    }
}
?>
</div>

```

Fig. 39. Login form

Fig. 40 shows the function for Add student or teacher to the system, this function can be controlled by dean.

```

php
if(isset($_POST['add_users'])){
    $username = $_POST['username'];
    $password = $_POST['password'];
    if(empty($username) || empty($password))
    {
        echo"
        <div class='alert alert-danger' role='alert'>
        <a href='#' class='close' data-dismiss='alert' aria-label='close'>&times;</a>
        <b>Name Field Must Not To Be Empty ...!</b>
        </div>
        ";
    }
    else{
        $username = $_POST['username'];
        $password = $_POST['password'];
        $firstname = $_POST['firstname'];
        $lastname = $_POST['lastname'];
        $email = $_POST['email'];
        $country = $_POST['country_id'];
        $usertype = $_POST['usertype'];
        $gender = $_POST['gender'];
        $phone = $_POST['phone'];
        $birthdate = $_POST['birthdate'];
        $passmd5=md5($password);
        $query_add_users = mysql_query("INSERT INTO `users` (`username`,`password`,`email`,`firstname`,`lastname`,`gender`,`phone`,`birthdate`,`usertype`,`country_id`)
        VALUES('$username','$passmd5','$email','$firstname','$lastname','$gender','$phone','$birthdate','$usertype','$country_id')");
        if($query_add_users)
        {
            echo"
            <div class='alert alert-success' role='alert'>
            <a href='#' class='close' data-dismiss='alert' aria-label='close'>&times;</a>
            <b>The users Is success Add To Database ...!</b>
            </div>
            ";
        }
    }
}

```

Fig. 40. Add student or teacher

Fig. 41 shows the function for Add Course to the department in university, this function can be controlled by the dean.

```

if(isset($_POST['add_course'])){
    $coursename = $_POST['course_name'];
    $teacherid = $_POST['teacher_id'];
    $hours = $_POST['hours'];
    $units = $_POST['units'];
    $stage = $_POST['stage'];
    $semester = $_POST['semester'];
    $department_id = $_POST['department_id'];
    if(empty($coursename) || empty($hours))
    {
        echo"
        <div class='alert alert-danger' role='alert'>
        <a href='#' class='close' data-dismiss='alert' aria-label='close'>&times;</a>
        <b>Name Field Must Not To Be Empty ...!</b>
        </div>
        ";
    }
    else{
        $coursename = $_POST['course_name'];
        $teacherid = $_POST['teacher_id'];
        $hours = $_POST['hours'];
        $units = $_POST['units'];
        $stage = $_POST['stage'];
        $semester = $_POST['semester'];
        $department_id = $_POST['department_id'];
        $query_course_add = mysql_query("INSERT INTO `course` (`teacher_id`,`course_name`,`hours`,`units`,`stage`,`semester`,`department_id`)
        VALUES('$teacherid','$coursename','$hours','$units','$stage','$semester','$department_id')");
        if($query_course_add)
        {
            echo"
            <div class='alert alert-success' role='alert'>
            <a href='#' class='close' data-dismiss='alert' aria-label='close'>&times;</a>
            <b>The Course Is success Add To Database ...!</b>
            </div>
            ";
        }
    }
}

```

Fig. 41. Add Course

Fig. 42 shows the course information.

```
<?php
$getId = $_GET['id'];
$query = mysql_query(" SELECT * FROM course
INNER JOIN department ON course.department_id = department.id
INNER JOIN users ON course.teacher_id = users.user_id
WHERE course.department_id LIKE '$getId'");
?>

<tbody>
<?php
while($row = mysql_fetch_array($query))
{
    $id = $row['course_id'];
    $course_name = $row['course_name'];
    $teachername = $row['firstname'];
    $hours = $row['hours'];
    $units = $row['units'];
    $stage = $row['stage'];
    $semester = $row['semester'];
    $departmentname = $row['department_name'];
    echo "
    <tr>
    <td>$course_name</td>
    <td>$teachername</td>
    <td>$hours</td>
    <td>$units</td>
    <td> $stage </td>
    <td> $semester </td>
    <td> $departmentname </td>
    </tr> ";
}
?>
```

Fig. 42. Show Course information

Fig. 43 shows the function for Add Task to the student, this function can be controlled by dean and teacher user.

```
<?php
if(isset($_POST['add_tasks'])) {
    $task_title = $_POST['task_title'];
    $course_id = $_POST['course_id'];
    $start_date = $_POST['start_date'];
    $end_date = $_POST['end_date'];
    if(empty($task_title) || empty($course_id))
    {
        echo "
        <div class='alert alert-danger' role='alert'>
        <a href='#' class='close' data-dismiss='alert' aria-label='close'>&times;</a>
        <b>Name Field Must Not To Be Empty ...!</b>
        </div>
        ";
    }
    else {
        $task_title = $_POST['task_title'];
        $course_id = $_POST['course_id'];
        $text = $_POST['text'];
        $start_date = $_POST['start_date'];
        $end_date = $_POST['end_date'];
        $query_tasks_add = mysql_query("INSERT INTO `tasks` (`task_title`, `course_id`, `text`, `start_date`, `end_date`)
VALUES('$task_title', '$course_id', '$text', '$start_date', '$end_date')");
        if($query_tasks_add)
        {
            echo "
            <div class='alert alert-success' role='alert'>
            <a href='#' class='close' data-dismiss='alert' aria-label='close'>&times;</a>
            <b>The Task Is success Add To Database ...!</b>
            </div>
            ";
        }
    }
}
```

Fig. 43. Add Task to Student

Fig. 44 shows the function for Add Mark to the student, this function can be controlled by dean and teacher user.

```
<?php
if(isset($_POST['add marks'])){
    $mark = $_POST['mark'];
    $student_id = $_POST['student_id'];
    $course_id = $_POST['course_id'];
    if(empty($mark) || empty($student_id)) {
        echo"
        <div class='alert alert-danger' role='alert'>
        <a href='#' class='close' data-dismiss='alert' aria-label='close'>&times;</a>
        <b>Name Field Must Not To Be Empty ...!</b>
        </div>";
    }else{
        $mark = $_POST['mark'];
        $student_id = $_POST['student_id'];
        $course_id = $_POST['course_id'];
        if((($mark)>'5')) {
            echo"
            <div class='alert alert-danger' role='alert'>
            <a href='#' class='close' data-dismiss='alert' aria-label='close'>&times;</a>
            <b>The Mark is Error ...!</b>
            </div>";
        }else{
            $mark = $_POST['mark'];
            $student_id = $_POST['student_id'];
            $course_id = $_POST['course_id'];
            $date = $_POST['date'];
            $query_add_mark = mysql_query("INSERT INTO 'marks' ('student_id','mark','course_id','date') VALUES('$student_id','$mark','$course_id','$date')");
            if($query_add_mark){
                echo"
                <div class='alert alert-success' role='alert'>
                <a href='#' class='close' data-dismiss='alert' aria-label='close'>&times;</a>
                <b>The Mark Is Success Add To Database ...!</b>
                </div>
                "
            }
        }
    }
}
```

Fig. 44. Add Mark to Student

4. TESTING OF THE WEB APPLICATION

4.1. Functional Testing

Functional testing is a type of testing which proves that each function of the software application works in conformance with the requirement description. This testing fundamentally includes black box testing and it is not interested about the source code of the application [10].

All and every functionality of the system is tested by providing suitable input, verifying the output and comparing the real results with the expected results [12]. This testing includes checking of Database, security, User Interface, APIs, client/server applications and functionality of the Application under Test. The testing can be done either manually or using automation.

Functional Testing Process:

- 1) identify test input;
- 2) compute the expected outcomes with the selected test input values;
- 3) execute test cases;
- 4) comparison of the actual and computed expected result.

According to recent info, our system functional testing was done by comparing the actual results with the expected results manually.

Full result of testing is shown in the appendix.

4.2. Interfaces of Web Application

Fig. 45 shows the “Home page” for the web site of the university. It contains the navigation bar in the top of the page it contained in the left side Logo for university (Al Ameen University) and contains: “Home”, “Department”, “Contact Us”, “About Us”, “Useful Links”, “Login” and in the right side we see search box with button to submit search. Slider in the middle of the main page that show in it photo of university, and down of slider we show “Services of University” Like (Our Message, Our Vision, Goals) and we can show the “Latest News” about the university

and can read the welcome word to the dean, and contain the social media that the user can follow the university, and footer in the end contain (© 2018-2019).

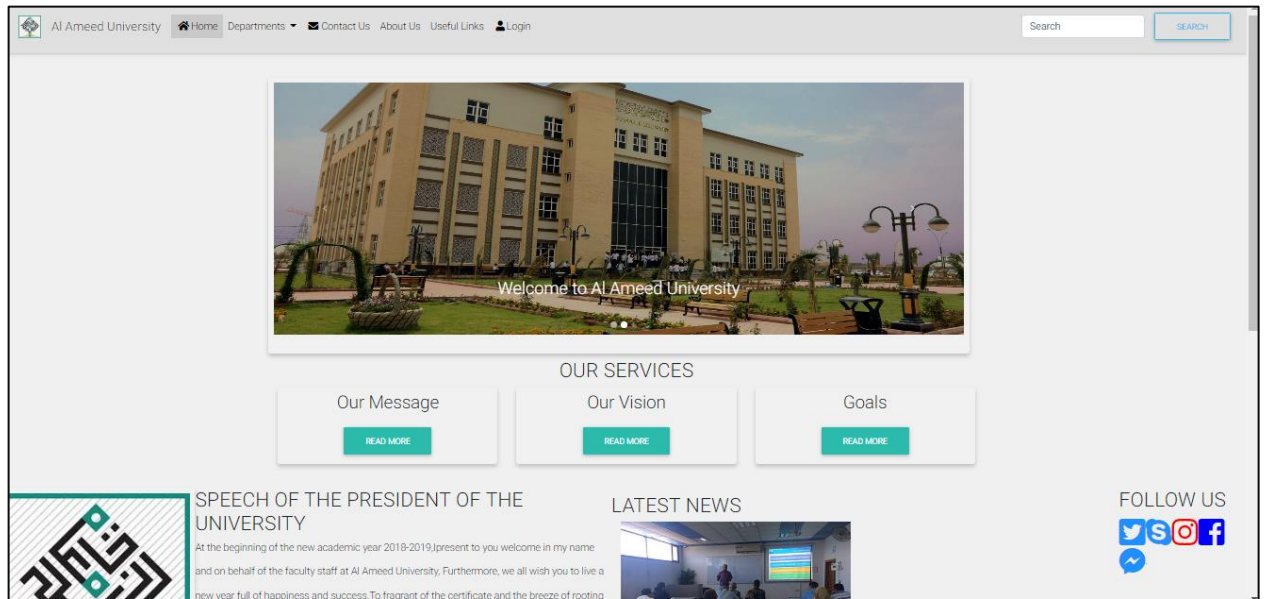


Fig. 45. The home page

Fig. 46 shows the “Login page”. Each user must enter his special username and password to “sign in” in the windows web application.

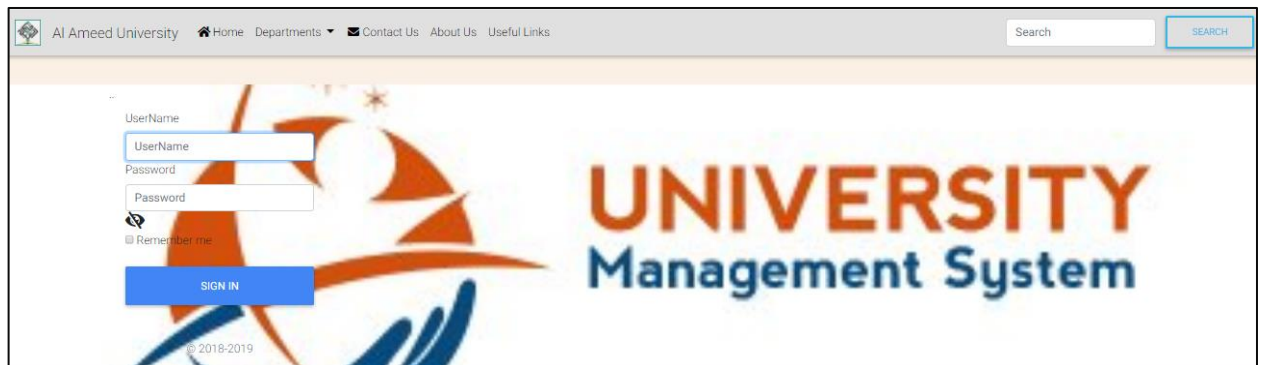


Fig. 46. “Login page”

Fig. 47 shows page for “Add User”, the dean can add a new user to system and give every user special username and password and save all information about the user, this page controlled by dean only.

Fig. 47. The page for “Add User”

Fig .48 shows the “User information” this page save the username for student and the password that is saved encrypted to secure from the hacker and UserType, if user type equal to 1 it is admin (dean) or equal to 2 it is teacher or equal to 0 it is student and saved all information about the user, the dean can search about any user he want, this page controlled by dean only.

Username	Password	Usertype	Firstname	Lastname	Email	Gender	Phone	Birthdate	Country	Edit	Delete
Teacher	9193ce3b31332b03f7d8af056c692b84	2	Ahmed	Mohamed	ah@gmail.com	Male	781344563	1981-07-10	Iraq		
Teacher	b950374c25eec626039785f8b80ce5c1	2	Batool	Rasool	bato@yahoo.com	Female	781955432	1996-12-28	Iraq		
Student	b5d5f67b30809413156655abdda382a3	0	Fatima	Hameed	fa@gmail.com	Female	784007631	2000-01-29	Iraq		
Teacher	37fff357c237d67f2365eab6706bc898	2	Hamid	Farhan	haimd@yahoo.com	Male	780133231	1964-10-06	Iraq		

Fig. 48. The page for “User Information”

Fig. 49 shows page for “Add Course”, the dean can add a new course to the special department, special stage, and special semester with the number of units and

hours and the name of the teacher who teach this course, this page controlled by dean only.

Show Course

Add New Course

Course Name

Hours

Units

Computer Networks

34

4

Stage

Semester

Teacher

Fourth

First

Haider

Department

Computer Engineering and Information

SAVE

CLOSE

Fig. 49. The page for “Add Course”

Fig. 50 shows page for “Pass Student”, the dean can pass student to a new stage, the dean selects many of student by using the checkbox and press button pass to pass to a new stage, this page controlled by dean only.

Pass students

Department : Computer Engineering and Information ,Stage : 1, Year: 2018-2019

First Name	Last Name	Select
Shahad	Haider	<input type="checkbox"/>
Sura	Ahmed	<input type="checkbox"/>
Maraim	Ali	<input type="checkbox"/>
Ali	Farhan	<input type="checkbox"/>
Fadak	Mustafa	<input type="checkbox"/>

PASS

Fig. 50. The page for “Pass Student”

Fig. 51 shows page for “Add Mark”, the dean or teacher can add a mark to student user, this page contains the name of department and the year and the name, of course, that student take mark of it and name of student and his mark and date of mark, this page controlled by dean and teacher.

Department : Computer Engineering and Information , **Year:** 2018-2019

Add New Mark

Course

Student

Mark

Date

Course	First Name	Last Name	Mark	Date	Delete
Microprocessors	Shahad	Haider	5	2019-05-01	
Microprocessors	Sura	Ahmed	4	2019-05-16	

Fig. 51. The page for “Add Mark”

Fig. 52 shows page for “Add Task”, the dean or teacher can add task to student user, this page contains the name of department and the year and the name of course that has the task and task title and the text and date of start and end the task, this page controlled by dean and teacher.

Fig. 53 “Solve Task”, shows how the student solves the task given to him by the Dean or Teacher to a special course.

Department : Computer Engineering and Information , **Year:** 2018-2019

Add New Task

Course

Computer Networks

Task_Title

LAN,WAN

Text

What is the difference between LAN and WAN ?
explain with example ?

Start Date

05/01/2019

End Date

05/15/2019

SAVE

Fig. 52. The page for “Add Task”

Course : DataBase Systems , **Year:** 2018-2019

Solve Task

Student

Mohammed

Task

Type DB

Solve

Types of database are:

1. Centralised database.
2. Distributed database.
3. Personal database.
4. End-user database.
5. Commercial database.

Date

05/14/2019

Are You Want To Submit The Solve

YES

NO

Fig. 53. The page for “Solve Task”

CONCLUSION

In this thesis presented a database management system. For the purpose of collect students' data in a server, for Store huge data and process it and for maintaining data and make them more secret and not subject to forgery, like marks, course, and personal data. And retrieve this data according to the need of it right on time, this system transferred the work in the university from the paper system to the computer-based system, enabling the user to get access to data through a user-friendly interface. In addition, this system can promote the management of the university to carry out its tasks high efficiently. The proposed system is able to reduce the time and effort required. As well as reducing the number of staff in the paper-based system, and it helps the administration of the university to speed decision-making, implemented proposed system by MySQL database to store data because it has great capacity and very good services in data management and security it.

To access the database, we created an application where stored and manage the data in server by forms, and The portals used the following for enhancing its look and functionality, Hypertext markup language (HTML) was used for building web pages, JavaScript was used for programming web pages and Cascading style sheets (CSS) were used for styling the web page. The application is used by three levels for the user, for each level has an authorization Specific.

For reaching this goal we resolved the following objectives:

- analyzed the problem statement of the application;
- analyzed modern technologies of web application development and choose which technology for project development was made;
- designed a use case diagram for the system;
- designed interfaces of the application correctly;
- designed a database of the application;
- realization of the system;
- functional testing.

REFERENCES

1. Babylon University Official site. [Electronic resource] URL: <http://en.uobabylon.edu.iq/> (the date of access: 20.04.2019).
2. Bagdad University Official site. [Electronic resource] URL: <http://en.uo-baghdad.edu.iq/> (the date of access: 20.04.2019).
3. Bell C. Introducing InnoDB Cluster: Learning the MySQL High Availability Stack. – Apress, Virginia, 2018. – 495 p.
4. Booch G., Rumbaugh J., Jacobson I. Unified Modeling Language User Guide. – Pearson Education. First Edit. Addison Wesley, 1998. – 512 p.
5. Data schemas. [Electronic resource] URL: https://www.tutorialspoint.com/dbms/dbms_data_schemas.htm (the date of access: 25.03.2019).
6. Delisle M. Mastering phpMyAdmin 3.3 for Effective MySQL Management. – Birmingham: Packt Publishing, 2010. – 412 p.
7. Delisle M. MySQL Database: Practical Design Tips and Techniques. // Packt Publishing. Birmingham: Packt Publishing, 2006. –105 p.
8. Deployment diagram. [Electronic Resource] URL: https://www.tutorialspoint.com/uml/uml_deployment_diagram.htm (date of access: 18.03.2019).
9. Duckett.j. HTML and CSS design and build websites. – Canada: John Wiley & Sons, 2011. – 510 p.
10. Functional Testing Tutorial: What is, Process, Types, & Examples? [Electronic resource] URL: <http://www.guru99.com/functional-testing.html> (date of access: 20.04.2019).
11. Gabarro S.A. Introduction to HTML. // Web Application Design and Implementation. 2015. – P. 1–36.
12. Gerrard P. A unified approach to system functional testing. // Euro-STAR, 25–28 October, 1993. – P. 36/1-36/9.

13. Harvey C. et al. Database Design and Implementation. // Databases in Historical Research. first edit. Howard Gould, 2015. – p.102–146.
14. Lerdorf R., Tatro K. Programming PHP (First edition). – USA: O'Reilly & Associates, Inc., 2002. – 508 p.
15. MySQL-storage-engines. [Electronic Resource] URL: <https://www.w3resource.com/mysql/mysql-storage-engines.php> (date of access: 15.04.2019).
16. Nixon R. Learning PHP, MySQL, JavaScript, and CSS. SECOND EDI / ed. Oram A. United States: O'Reilly Media, 2012. 1–582 p.
17. Official site for registration of Jordan University. [Electronic resource] URL: <http://registration.ju.edu.jo/home.aspx> (the date of access: 18.01.2019).
18. Official site of Appserver. [Electronic Resource] URL: <https://appserver.io/#> (the date of access: 25.11.2018).
19. Rumbaugh J., Jacobson J. The Unified Modeling Language Reference Manual. Pearson Higher Education. Second Ed. – Boston: Second Edition, 2004. 742 p.
20. Sams .J. Teach Yourself HTML, CSS and JavaScript All in One. – USA: Person Education, Inc., 2011. – 567 p.
21. Seyed M.M. Tahaghoghi, Hugh E. Williams. Learning MySQL. 1sted. – USA: O'Reilly & Associates, Inc. 2006. – 585 p.
22. Shenoy A., Sossou U. Learning Bootstrap Unearth the potential of Bootstrap to create responsive web pages using modern techniques. – Birmingham: Packt Publishing, 2014. –204 p.
23. Shobha R., Geeta R.B. S.G.T. Web Based Student Information Management System. // Int. J. Adv. Res. Comput. Commun. Eng. 2013. – Vol. 2, No. 6. – P. 2342–2348.
24. Sodiya A.S. User interface design and ergonomics. – Nigeria: National Open University of Nigeria, 2009. – 200 p.

25. Teka D. SCHOOL MANAGEMENT SYSTEM. – Addis Ababa University, 2008, June. –p. 1–62.
26. Venkata S K., Dinesh D., Suresh C. Development of a Student Database Management System for a University. // Int. J. Eng. Res. Appl, 2016. – Vol. 6, No. 8. – P. 16–24.
27. Web application development. [Electronic resource] URL: <https://www.comentum.com/guide-to-web-application-development.html> (the date of access: 25.11.2018).
28. Web-based-applications. [Electronic resource] URL: <https://www.magicwebsolutions.co.uk/blog/the-benefits-of-web-based-applications.htm> (the date of access: 21.02.2019).

APPENDIX

Table 1. The protocol of functional testing of the site

No	Function	Obtained result	Wished result	Conclusion
1.	To view the "home page"	Any visitor can view "home page" with the list of the main services and latest news about the university	Any visitor can view "home page" with the list of the main services and latest news about the university	Passed
2.	To view the "Contact Us page "	Any visitor can view "Contact Us page "	Any visitor can view "Contact Us page "	Passed
3.	To view the "About Us page "	Any visitor can view "About Us page "	Any visitor can view "About Us page "	Passed
4.	To view the "Useful Links page "	Any visitor can view "Useful Links page " it contains a list of useful links for users	Any visitor can view "Useful Links page " it contains a list of useful links for users	Passed
5.	To view the "services page"	Any visitor can see the "services page" It contains a list of the most important services provided by the university	Any visitor can see the "services page" it contains a list of the most important services provided by the university	Passed
6.	To view the "latest news page"	Any visitor can see the "latest news	Any visitor can see the "latest news	Passed

Continuation of table 1

		page “it contains latest and most important news about university	page “it contains latest and most important news about university	
7.	To allow all users the authorization to see the “login page”	The user can see the “login page” and enter username& The password to sign in to the web application	The user can see the “login page” and enter username& The password to sign in to the web application	Passed
8.	To give the user message while entered wrong username or password	Any user can see the message If he entered the wrong username or wrong password	Any user can see the message If he entered the wrong username or wrong password	Passed
9.	To allow all users the authorization to see the “index page”	Any user can see “index page” that contains a list of the main services	Any user can see “index page” that contains a list of the main services	Passed
10.	When the Dean enters the system he can CRUD courses	Only the User "Dean" can create, read, update, and delete courses to a special department	Only the User "Dean" can create, read, update, and delete courses to a special department	Passed
11.	When the Dean enters the system he can CRUD users	Only the User "Dean" can create ,read,	Only the User "Dean" can create ,read,	Passed

		update ,and delete users	update ,and delete users	
12.	When the Dean enters the system he can CRUD department	Only the User "Dean" can create, read, update, and delete department the in university	Only the User "Dean" can create, read, update, and delete department in the university	Passed
13.	When the Dean enters the system he can CRUD mark	The user "Dean" can create, read, update, and delete mark to the student in a special course	The user "Dean" can create, read, update, and delete mark to the student in a special course	Passed
14.	When the Dean enters the system he can CRUD tasks	The user "Dean" can create, read, update, and delete task to the student in a special course	The user "Dean" can create, read, update, and delete task to the student in a special course	Passed
15.	When the Dean enters the system he can add a student to university	Only the user "Dean" can add a student to the special department and a special stage in university	Only the user "Dean" can add a student to the special department and a special stage in university	Passed
16.	When the Dean enters the system he can pass student	Only the user "Dean" can pass students to next stage	Only the user "Dean" can pass students to next stage	Passed
17.	When the Dean enters the system he	Only the user "Dean" can add	Only the user "Dean" can	Passed

	can add a teacher to university	a teacher to the special department in university and add to him a scientific degree	add a teacher to the special department in university and add to him a scientific degree	
18.	When the Dean enters the system he can search	The user "Dean" can search for any information in university	The user "Dean" can search for any information in university	Passed
19.	When the Teacher enters the system he can see the courses	The user "Teacher" can see all information about the courses in the department	The user "Teacher" can see all information about the courses in the department	Passed
20.	When the Teacher enters the system he can CRUD mark	The user "Teacher" can create, read, update, and delete mark to a student in the special course	The user "Teacher" can create, read, update, and delete mark to a student in the special course	Passed
21.	When the Teacher enters the system he can CRUD tasks	The user "Teacher" can create, read, update, and delete task to a student in the special course	The user "Teacher" can create, read, update, and delete task to a student in the special course	Passed
22.	When the Teacher enters the system he can see students	The user "Teacher" can see all information about	The user "Teacher" can see all information about	Passed

		all students in the department	all students in the department	
23.	When the Teacher enters the system he can see teachers	The user “Teacher” can see all information about all teachers in the department	The user “Teacher” can see all information about all teachers in the department	Passed
24.	When the Teacher enters the system he can search	The user “Teacher” can search for any information in university	The user “Teacher” can search for any information in university	Passed
25.	When the Student enters the system he can see the courses	The user “Student” can view all information about the courses in the department	The user “Student” can view all information about the courses in the department	Passed
26.	When the Student enters the system he can see the marks	The user “Student” can view his marks in all courses	The user “Student” can view his marks in all courses	Passed
27.	When the Student enters the system he can see the tasks	The user “Student” can view his tasks in all courses and he can solve the tasks	The user “Student” can view his tasks in all courses and he can solve the tasks	Passed
28.	When the Student enters the system he can see students	The user “Student” can see all information about all students in the department	The user “Student” can see all information about all students in the department	Passed

End of table 1

29.	When the Student enters the system he can see teachers	The user “Student” can see all information about all teachers in the department	The user “Student” can see all information about all teachers in the department	Passed
30.	When the Student enters the system he can search	The user “Student” can search for any information in university	The user “Student” can search for any information in university	Passed