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Theme

**Developing Website for the
Faculty of Exact Sciences**

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Dedication and gratitude

All praise to Allah, today we fold the days' tiredness and the errand summing up between the cover of this humble work. To the utmost knowledge lighthouse, to our greatest and most honored prophet Mohamed May peace and grace from Allah be upon him , to the Spring that never stops giving, to our mothers who weave my happiness with strings from thier merciful hearts... to our mothers. To whom they strive to bless comfort and welfare and never stints what he owns to push me in the success way who taught me to promote life stairs wisely and patiently, to our dearest fathers , to whose love flows in our veins, and our hearts always remember them, to our brothers and sisters , to those who taught us letters of gold and words of jewel of the utmost and sweetest sentences in the whole knowledge , who reworded to us their knowledge simply and from their thoughts made a lighthouse guides us through the knowledge and success path , to our honored teachers and professors. to all those who helped us throughout the period of work , especially our respectful professor ***Saci Medileh*** , professor ***Othmani Samir*** and ***Ahmed Ghenabezia*** for their valuable advices and their continuous encouragement for us , we hope that this project will realize the goals which we want and the benefits for our university in general and our college specifically .

Abstract

The Faculty of Exact Sciences has a website within the university website , there are many shortcomings in the website, which necessitates rebuilding it according to the needs and the use of the faculty , the website is used from a lot of administrative and pedagogic usage , this requires a deep study of what the website should be , to meet these needs.

This work was submitted in the framework of the thesis for the Bachelor (ACADEMIC LICENCE) of Computer Science on Information Systems, the purpose of this project is to reconstruct the faculty website and improve the structure and informations available in each department of the college, to provide important announcements and dates during the university year, to publish lessons and series.

Key words : Web Application , Wordpress, UML.

Abstrait

La Faculté des sciences exacte possède un siteweb sur le siteweb globale de l'université, il existe de nombreuses lacunes sur le siteweb, ce qui nécessite de le reconstruire en fonction des besoins et de l'utilisation du collège, ce siteweb utilise pour beaucoup d'utilisation administrative et pédagogique , nous avons besoin une étude approfondie de ce que devrait être le siteweb, pour répondre à ces besoins.

Ce travail a été réalisé dans le cadre de licence académique d'informatique systems d'information ,

Le but du projet est de reconstruire le siteweb du collège et d'améliorer la structure et l'information disponibles dans chaque département du collège, pour diffuser des annonces et des dates importantes pendant l'année scolaire, pour publier des leçons et des séries.

Mots clés : Application Web, Wordpress, UML.

ملخص

تتوفر كلية العلوم الدقيقة على موقع ويب ضمن موقع ويب الجامعة ، سجلت نقائص كثيرة في الموقع مما يستدعي إعادة بنائه بما يناسب حاجة وإستخدام الكلية للموقع ، نعدد إستخدامات الكلية للموقع بين إدارية و بداعوجية و هذا يجعلنا في حاجة إلى دراسة عميقة لما يجب أن يكون عليه الموقع لتلبية هذه الإحتياجات

هذا العمل المقدم في إطار الأطروحة لنيل شهادة الليسانس، يتمثل في تطوير موقع خاص بكلية العلوم الدقيقة يهدف لتسهيل الاتصالات بين الإدارة الجامعية والأساتذة والطلاب وكذا تطوير عملية عرض الدروس بمختلف المستويات والتخصصات والنقاط الخاصة بالطلبة وكذلك الإعلانات الخاصة بالطلبة والأساتذة والموظفين

كلمات مفتاحية : تطبيق ويب ، وردبريس ، إيمال

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General introduction

General introduction

In recent years, the number of Internet users has increased significantly in the world, especially in Algeria , the Internet has become an essential part of human life and has been used in various fields , the number of Internet users in the world now exceeds three billion .

Websites are the core component of this technology , In 2013 , the number of web sites has increased by more than a third, from 630 million at the beginning of the year to more than 850 million by December , so it is very important to exploit these technologies for human service.

In this project, we will rebuild and improve the current website of the college , how can we communicate between the administration, teachers and students ? and what techniques will we use to improve the site and rebuild it ?

There are a lot of good methodologies in the world of computer , but the nature of our work requires specific methodologies , the software project management Model is **Incremental Model** and the development method for this project is Waterfall approach (CASCADE).

How can improve the structure and information available in each department of the college, to provide important announcements and dates during the school year, to publish lessons and study series ?

How can we communicate between the administration, teachers and students ? and what techniques will we use to improve the site and rebuild it?

Chapter I:

Analysis and specification of requirements

Chapter I: Analysis and specification of requirements

1. Introduction

After reviewing the previous website of the Faculty of Exact Sciences, which is included in the university website. after conducting interviews with the website administrators and developers, and conducting some tests on the website, we recorded several observations and shortcomings on the website from several sides. Now we have a clear vision , about what we want to improve on the website.

2. Study and critique of existing (Existing website)

After conducting a study on the previous website of our college , now we have some informations about it .

Firstly , it has Three-Tier Architecture and also have backup server .

2.1 What does Three-Tier Architecture mean?

A three-tier architecture is a client-server architecture in which the functional process logic, data access, computer data storage and user interface are developed and maintained as independent modules on separate platforms. Three-tier architecture is a software design pattern and a well-established software architecture [4].

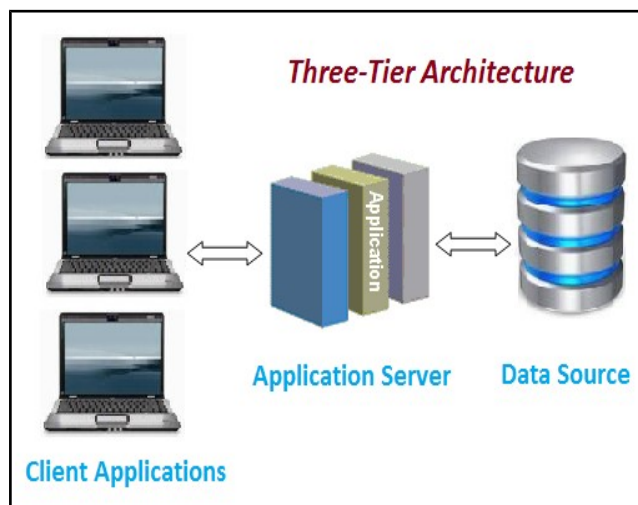


Figure 1 : Three-Tier Architecture 1

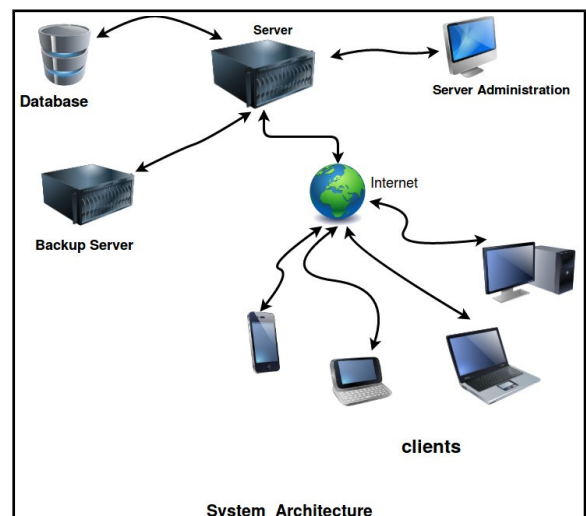


Figure 2 : Three-Tier Architecture 2

Secondly , its operating system is CentOS Linux .

2.2 What's CentOS Linux ?

CentOS Linux is a Linux distribution derived from the Red Hat Enterprise Linux. Because it is free, CentOS Linux is widely popular with Linux users, web hosts and small businesses. However, as with most free things, you do give up something. In this case, there is no direct CentOS support services offered by the CentOS team. So before you select CentOS for your next project, there are a few things you should know about using CentOS Linux [5].

Thirdly , its database management system is MySQL .

2.3 What's MySQL ?

MySQL is a relational database management system based on SQL – Structured Query Language , the application is used for a wide range of purposes, including data warehousing, e-commerce, and logging applications [6].

Fourthly , its programming language is PHP .

2.4 What's PHP ?

- PHP is an acronym for "PHP: Hypertext Preprocessor"
- PHP is a widely-used, open source scripting language
- PHP scripts are executed on the server
- PHP is free to download and use [7]

Fifthly , its content management system is Joomla .

2.5 What's a content management system (CMS)?

A content management system is software that keeps track of every piece of content on your Web site, much like your local public library keeps track of books and stores them , content can be simple text, photos, music, video, documents, or just about anything you can think of , a major advantage of using a CMS is that it requires almost no technical skill or knowledge to manage , Since the CMS manages all your content, you don't have to [8].

2.5.1 What's Joomla ?

Joomla! is an award-winning content management system (CMS), which enables you to build Web sites and powerful online applications. Many aspects, including its ease-of-use and extensibility, have made Joomla! the most popular Web site software available. Best of all, Joomla! is an open source solution that is freely available to everyone [9] .

After this study , we have now a clear idea about the previous website , now , we will talk about its disadvantages .

2.6 Disadvantages of the previous website

There is many disadvantages but we will talk about the important disadvantages .

- it is slow for navigations .
- It is not working correctly for all Internet browsers , for example the font format on Google Chrome is pretty and execute right but on Firefox the font format is changed , look the figures bellow .



Figure 3 The previous website from Firefox browser



Figure 4 : the previous website from Google Chrome browser

- It doesn't have modern design , look the figures above .
- The administrator of the website worked hard because the work not distributed .
- It doesn't have responsive design for all devices , look the figure bellow .



Figure 5 the previous website from small devices

- It has a big budget (it has 2 server by 1 000 000.00 DA) .
- If the website is on mis-configure or maintaining we don't show the website on the Internet.
- there are many URL on the website not working (it doesn't have a tools for scanning the URL) .
- It doesn't respect the user experience rules (Colors , Structure , Design , , , , ,) .
- It has some security bugs .

3. Description of actors

In our system there is three types of actors .

The actor	His work and tasks
The global administrator of the website	Has the privileges to manage any part of the website create , delete and update pages , posts members
The department administrator of the website	Has the privileges to manage any part of the site create , delete and update pages , posts from his department section
The visitors of the website	Browse the website

4. Specification of functional requirements

There are seven important functional requirements .

- ◆ Publishing faculty news and announcements .
- ◆ Publishing departments news and announcements .
- ◆ Publishing schedules and exam schedules.
- ◆ Publishing students' marks in the exams .
- ◆ Extracting the administrative documents by uploading them on the site and bringing them closer to the students at all times.
- ◆ Publishing lessons and study series for each department, specialization and level .
- ◆ Publishing News of the College Clubs .

Chapter II :

Conception

Chapter II : Conception

1. Introduction

In this section we will design the website and identify its main parts, identify the users of the system and determine how the site works and describe the database and explain some of the functions that the site provided and the way it works, in addition to structuring the site pages and site engineering.

2. Detailed design

2.1 Use Case Diagram

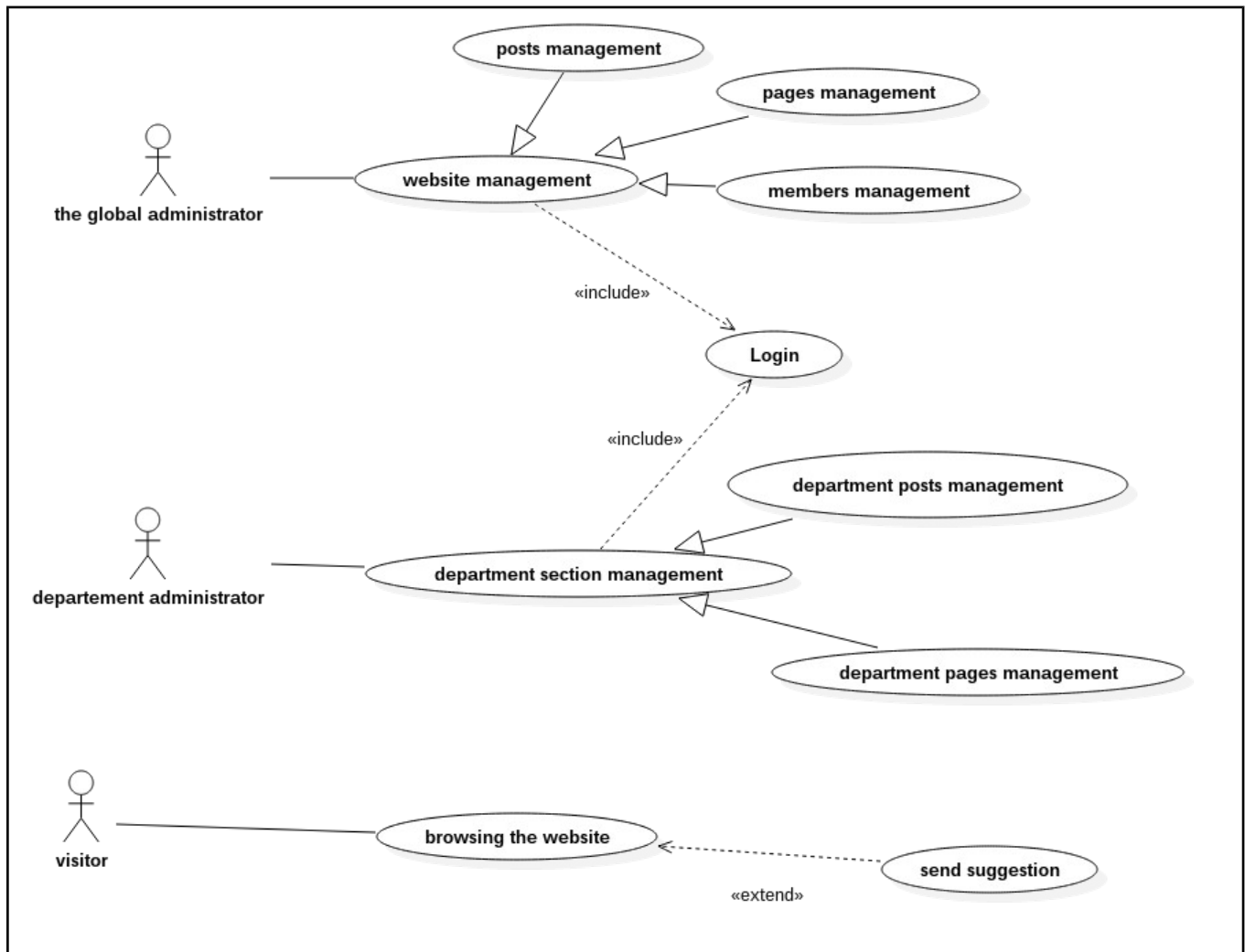


Figure 6 : use case diagram

2.2 Sequence diagram

Firstly , sequence diagram for the global administration of the website , look to the figure below .

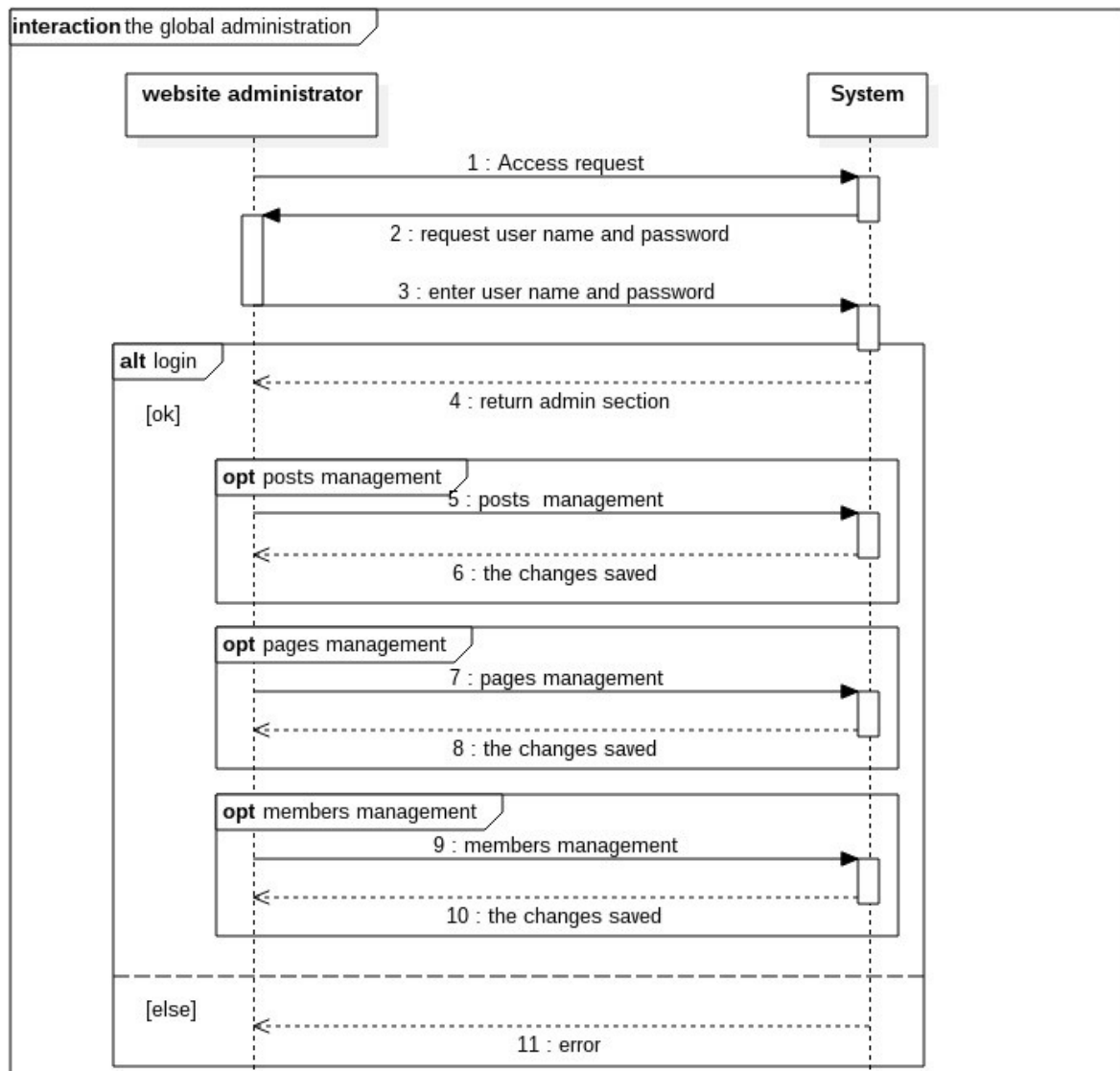


Figure 7 : Sequence diagram for the global administration of the website

Secondly , sequence diagram for the department administration of the website , look to the figure below .

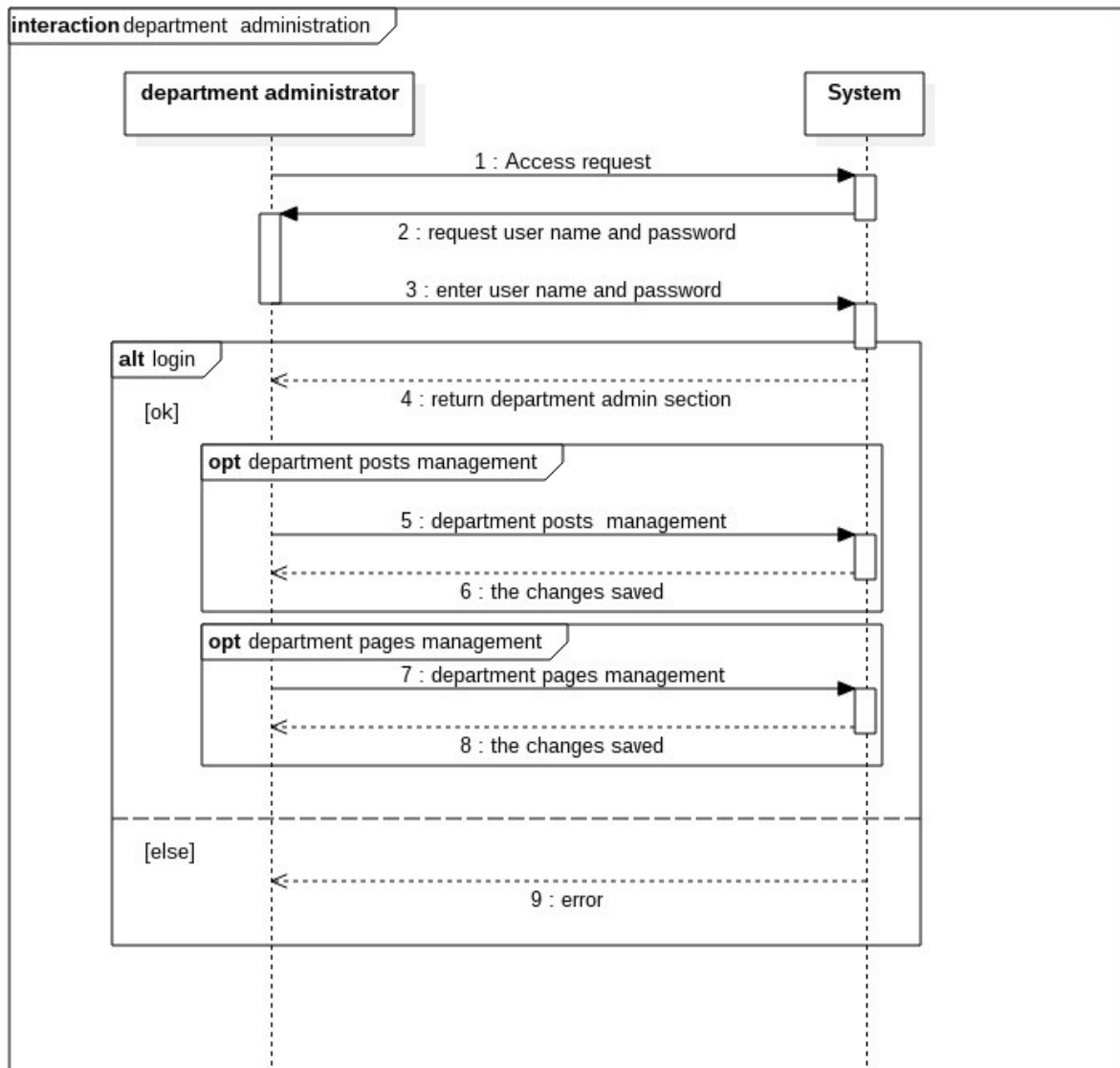


Figure 8 : Sequence diagram for the department administration of the website

Thirdly , sequence diagram for the visitors of the website , look to the figure below .

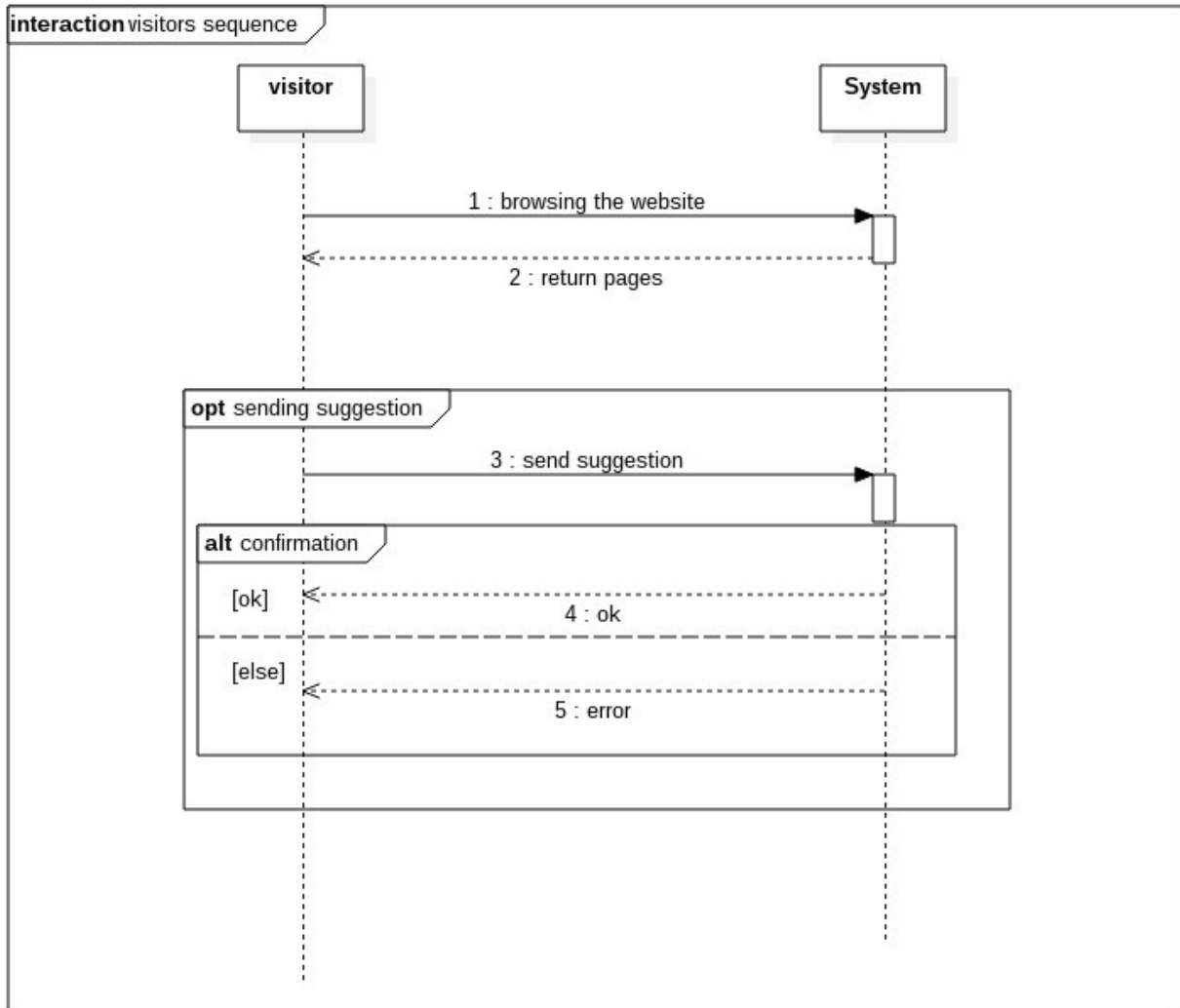


Figure 9 : sequence diagram for the visitors of the website

2.4 The application architecture

We will use client server architecture exactly Three-Tier Architecture with backup server , look to the figure bellow .

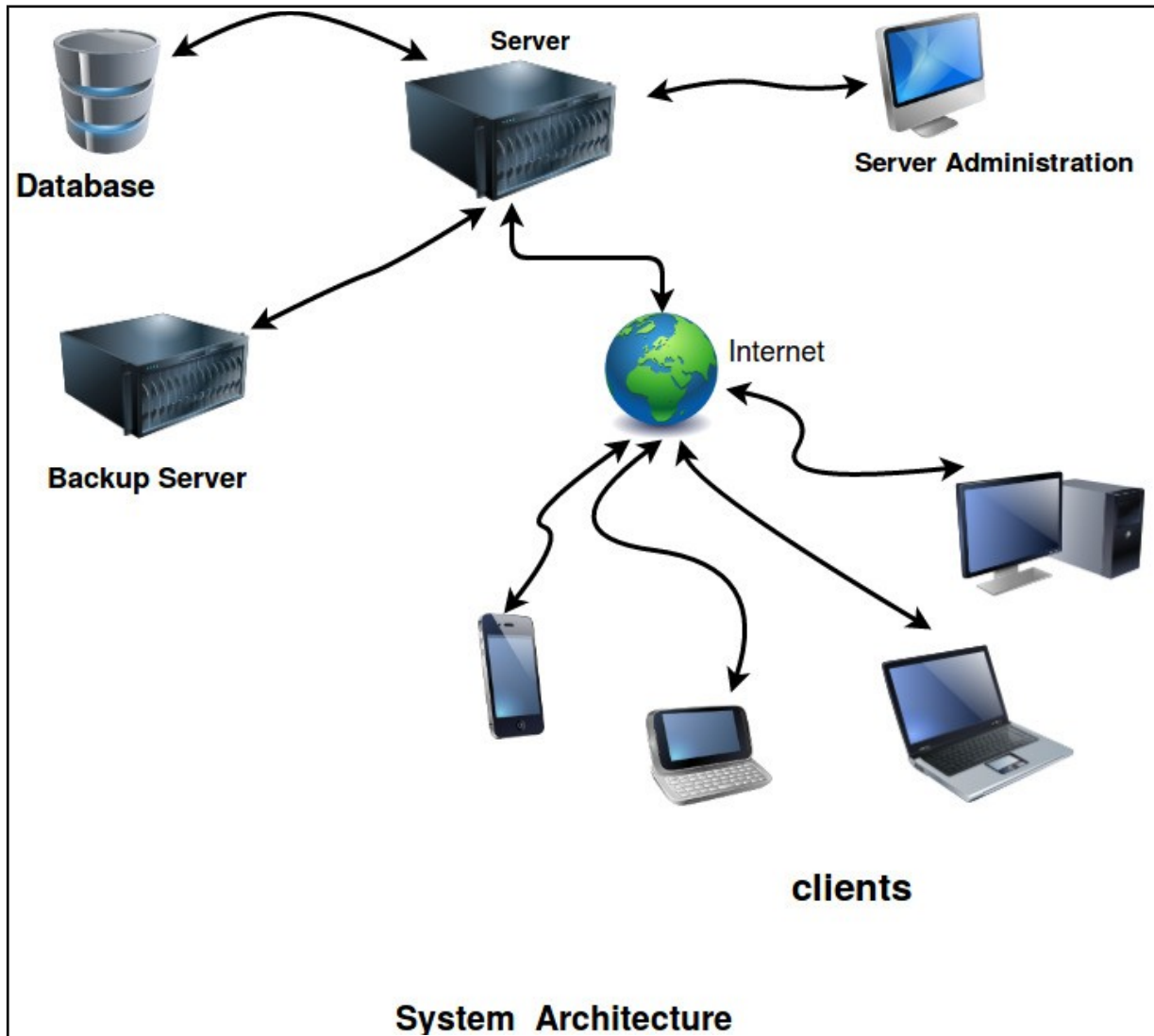


Figure 10 : The application architecture

2.5 The web pages architecture

This is the pages architecture of our website , look to the figure bellow .

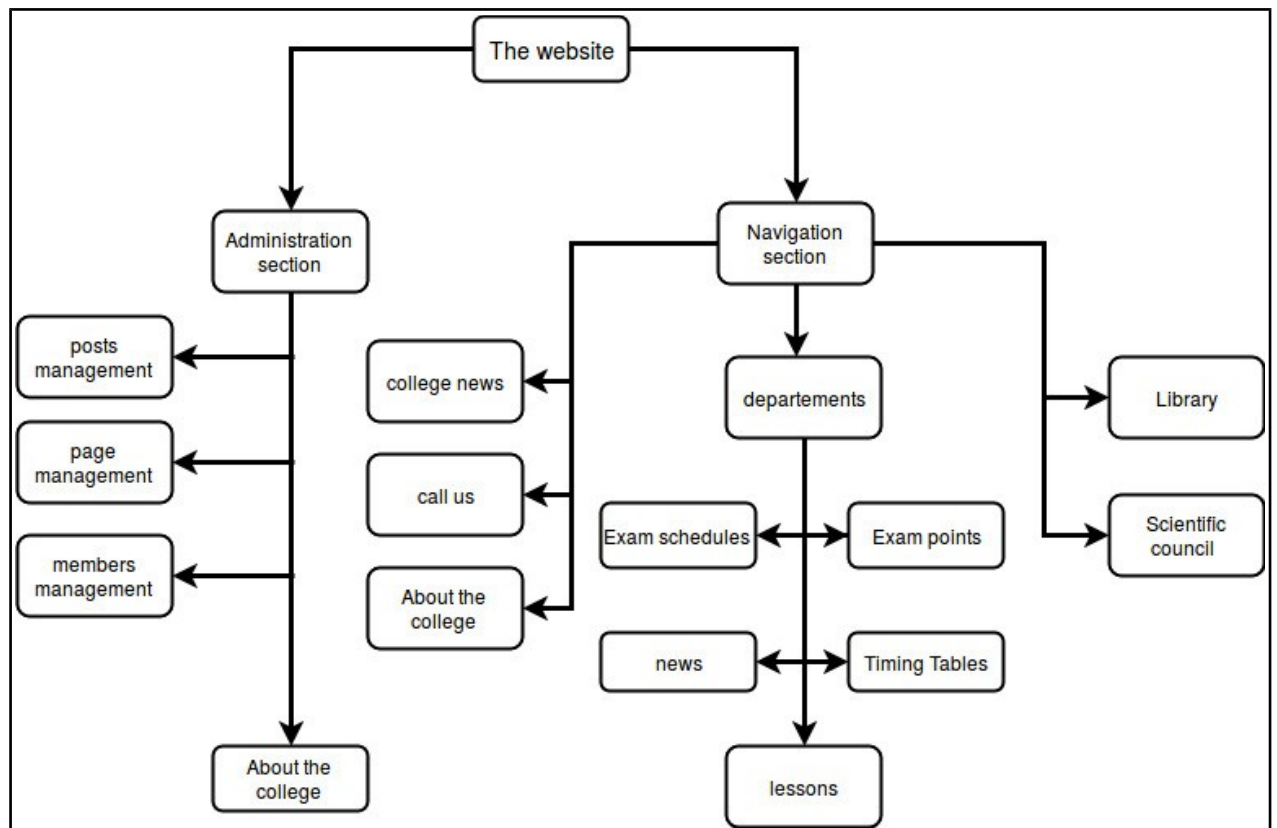


Figure 11 : The web pages architecture

2.6 Class Digram of Wordpress database

The diagram below provides a visual overview of the WordPress database and the relations between the tables created during the WordPress standard installation. The Table Overview below includes additional details on the tables and columns [1].

2.7 Wordpress Database Table Overview

This section is the overview of all the tables created during the WordPress standard installation. It is followed by specific information of what is in each table [2].

Table Name	Description
wp_commentmeta	Each comment features information called the meta data and it is stored in the wp_commentmeta.
wp_comments	The comments within WordPress are stored in the wp_comments table.
wp_links	The wp_links holds information related to the links entered into the Links feature of WordPress. (This feature has been deprecated, but can be re-enabled with the Links Manager plugin.)
wp_options	The Options set under the Administration > Settings panel are stored in the wp_options table. See Option Reference for option_name and default values.
wp_postmeta	Each post features information called the meta data and it is stored in the wp_postmeta. Some plugins may add their own information to this table.
wp_posts	The core of the WordPress data is the posts. It is stored in the wp_posts table. Also Pages and navigation menu items are stored in this table.
wp_terms	The categories for both posts and links and the tags for posts are found within the wp_terms table.
wp_term_relationships	Posts are associated with categories and tags from the wp_terms table and this association is maintained in the wp_term_relationships table. The association of links to their respective categories are also kept in this table.
wp_term_taxonomy	This table describes the taxonomy (category, link, or tag) for the entries in the wp_terms table.
wp_usermeta	Each user features information called the meta data and it is stored in wp_usermeta.
wp_users	The list of users is maintained in table wp_users.

3. Conclusion

After this part of the work , global conception and detailed conception , we have enough informations about the website which we will develop, we are now ready to start the realization of the website .

Chapter III: Realization

Chapter III: Realization

1. Introduction

This chapter talks about the final product that is the result of our work , this chapter talks about the new website of the faculty of Exact Sciences and the most important techniques used in its development , and finding solutions to the problems found in the previous website of our college .

2. Development environments

2.1 Hardware environment

To develop this application we used a machine, configured as follows:

- ✓ Memory : 8 GIB
- ✓ Processor : Intel® Core™ i5-5200U CPU @ 2.20GHz × 4
- ✓ Hard Disk : 500 GIB
- ✓ Graphics : Nvidia GeForce 2 GIB /PCIe/SSE2
- ✓ Operating System : Linux Ubuntu Desktop 15.10 64 bits

2.2 Software environment

2.2.1 Web styling language and structuring language .

2.2.1.1 HTML

HTML (Hypertext Markup Language) is the set of markup symbols or codes inserted in a file intended for display on a World Wide Web browser page , the markup tells the Web browser how to display a Web page's words and images for the user , each individual markup code is referred to as an element (but many people also refer to it as a tag) , some elements come in pairs that indicate when some display effect is to begin and when it is to end [10] .

2.2.1.2 CSS

CSS is short for Cascading Style Sheets, and is the preferred way for setting the look and feel of a website.

- *CSS stands for Cascading Style Sheets .*
- *CSS describes how HTML elements are to be displayed on screen, paper, or in other media .*
- *CSS saves a lot of work. It can control the layout of multiple web pages all at once .*
- *External stylesheets are stored in CSS files . [11]*

2.2.2 Web programming language

There are two web programming languages used in development of this project , the first web programming language is JavaScript for the client side , the second is PHP for the server side .

2.2.2.1 JavaScript

JavaScript is a programming language that allows you to implement complex things on web pages every time a web page does more than just sit there and display static information for you to look at displaying timely content updates, or interactive maps, or animated 2D/3D graphics, or scrolling video jukeboxes, etc , you can bet that JavaScript is probably involved , it is the third layer of the layer cake of standard web technologies, two of which (HTML and CSS) we have covered in much more detail in other parts of the Learning Area [12].

2.2.2.2 PHP

PHP (recursive acronym for PHP: Hypertext Preprocessor) is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML [13].

2.2.3 Web Libraries

2.2.3.1 Bootstrap

Bootstrap is the most popular HTML, CSS, and JS framework for developing responsive, mobile first projects on the web [14].

2.2.3.2 jQuery

jQuery is a fast, small, and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event handling, animation, and Ajax much simpler with an easy-to-use API that works across a multitude of browsers. With a combination of versatility and extensibility, jQuery has changed the way that millions of people write JavaScript [15].

2.2.4 Content management system (CMS) used

we use Wordpress content management system .

2.2.4.1 What is Wordpress ?

WordPress is an online open source website creation tool written in PHP , but in non-geek speak , it's probably the easiest and most powerful blogging and website content management system (or CMS) in existence today [16].

2.2.4.2 Why use WordPress?

Often beginners ask us: Why should I use WordPress? Isn't my old website good enough? Why do I need to switch to WordPress? If you're asking these questions , then you're at the right place. In this article, we have compiled a few reasons why you should use WordPress, in what ways you can use WordPress, and who is using WordPress.

People often make the mistake of classifying WordPress as just a blogging platform , although that used to be true in the past, WordPress has evolved through out the years into a versatile content management system (CMS) , while you can still use WordPress to create a simple blog, now it also allows you to create fully functional websites and mobile applications.

The best part about WordPress is that it's easy to use and flexible enough for just about anything , that's the main reason why WordPress has grown so much in popularity , according to a recent survey , WordPress powers 22.5% of all websites on the internet.

Due to it's robust features, many of the top brands use WordPress to power their websites including but not limited to: Time Magazine, Google, Facebook, Sony, Disney, Linked-In, The New York Times, CNN, e-Bay, and more. [17]

Let's take a look at why you should use WordPress .

2.2.4.2.1 WordPress is Free as in Freedom

WordPress is a free software, this means you are free to download, install, use and modify it. You can use it to create any kind of website , it is also open source which means the source code of the software is available for any one to study , modify and play with.

There are currently 2600+ WordPress themes and 31,000+ plugins available for free , you can download, install and use them on any website.

To run WordPress, all you need is a domain and web hosting , we recommend using either Bluehost or SiteGround because both of them offer our users a free domain and 50% off their hosting prices , check out our guide on why is WordPress free?

Due to the nature of open source , WordPress is a community software , it is maintained by a large group of volunteers majority of whom are WordPress consultants with active interest in growing and maintaining WordPress. Anyone can contribute to WordPress by writing patches, answering support questions, writing plugins, creating themes, translating WordPress and updating documentation.

By using WordPress you become part of that awesome community , you get free support from other community members , download free plugins and themes, and once you have little experience with WordPress you can even contribute back to the community. [18]

2.2.4.2.2 WordPress is Easy to Use and Learn

WordPress is used by millions of people and almost every day new people are joining the WordPress community by creating their first WordPress powered websites , the reason why people quickly adapt to WordPress is because it is fairly easy to use.

Our website WPBeginner has tons of articles written specifically for beginner level WordPress users , we have a detailed step by step guide on how to install WordPress and hundreds of other WordPress tutorials.

If you want someone experienced to setup your WordPress site, then our talented staff members are happy to help you get started , the best part is that we offer a Free WordPress Blog Setup service.

For any WordPress related issue, you can search the web or search our archives , and you will definitely find help. [19]

2.2.4.2.3 WordPress is Extendable by Using Themes and Plugins

Most people using WordPress are neither web designers nor programmers , as a matter of fact most folks start using WordPress without any prior knowledge of designing websites.

The reason why WordPress is such an ideal candidate is because there are thousands of free templates (themes) to choose from , so you can give your website any look you want , there is a WordPress theme for just about everything , whether you want a photography theme, magazine theme, portfolio theme, or an eCommerce theme. There is a perfect theme available for every kind of website.

WordPress themes are easy to customize because a lot of them come with their own options panel allowing you to change colors, upload logo, change background, create beautiful sliders, and do other cool things with your website without ever writing any code at all.

WordPress is super flexible and can be extended by using plugins. Just like themes, there are thousands of free and premium plugins available for you to use (What is a plugin?) ,not only these plugins can add extra functionality to WordPress, there are lots of plugins which can add a whole new platform to your WordPress site , take a look at the plugins we are using on WPbeginner. [20]

2.2.4.2.4 WordPress is Search Engine Friendly

WordPress is written using standard compliance high quality code and produces semantic mark up which makes your site very attractive to search engines.

By design WordPress is very SEO friendly, and you can make it even more SEO friendly by using WordPress SEO plugin , to understand you how to improve your site's SEO check out our WordPress SEO tips for beginners.[21]

2.2.4.2.5 WordPress is Easy To Manage

WordPress comes with built-in updater that allows you to update your plugins and themes from within your WordPress admin dashboard , it also notifies you when there is a new version of WordPress is available, so you can update it by just clicking a button ,you can keep all your WordPress content safe by setting up automated regular WordPress Backups. [22]

2.2.4.2.6 WordPress is Safe and Secure

WordPress is developed with security in mind, so it is considered quite safe and secure to run any website , However, just like the real world, the Internet can be an uncertain place.

There are intruders out there who want to get their hands on as many sites as they could , on our websites , we use Sucuri to monitor security threats and we highly recommend them.[23]

2.2.4.2.7 WordPress Can Handle Different Media Types

Using WordPress you are not just limited to writing text , it comes with built-in support to handle images, audio, and video content. You can also use for document or file management.

WordPress supports oEmbed enabled websites which means you can embed YouTube videos, Instagram photos, Tweets, and Soundcloud audio by just pasting the URL in your post. You can even allow your visitors to embed videos in comments [24].

2.2.5 Database management system and server used

2.2.5.1 MySQL

MySQL is a relational database management system based on SQL – Structured Query Language. The application is used for a wide range of purposes, including data warehousing, e-commerce, and logging applications. [6]

2.2.5.2 Xampp virtual server

XAMPP is an AMP stack which lets you install Apache, MySQL and PHP in your computer together with some other useful software , it has been designed to provide you an easy installation experience , it's free and available for Windows, Mac OS and Linux. [25]

2.2.1.3 Installation and configuration of web server

it is very easy to install , just you need to do five steps.

In **Step 1. Create a Database** enter the database name choose the best collation for your language and encoding , in Arabic case it's better to choose in the "utf8_general_ci" , and import the database .

In **Step 2. Create Database Users** enter the database user name and the password. Make sure to use a strong password. Click Create User.

In **Step 3. Add User to Database** click the All Privileges checkbox and click Next Step.

In **Step 4. Complete the task** open configuration file in our project “wp_config.php” and change the database name and user , write down the values of *hostname*, *username*, *databasename*, and the password you choose .

In **Step 5. Complete the task** put the project files in your local host files (htdocs or www) .

2.2.1.4 Website Exploitation (testing and hosting)

After the completion of the project, it was raised to the Cloud Hosting and the results were as follows .

2.2.1.4.1 Testing the website in different devices



Figure 13 : Testing the website in different devices

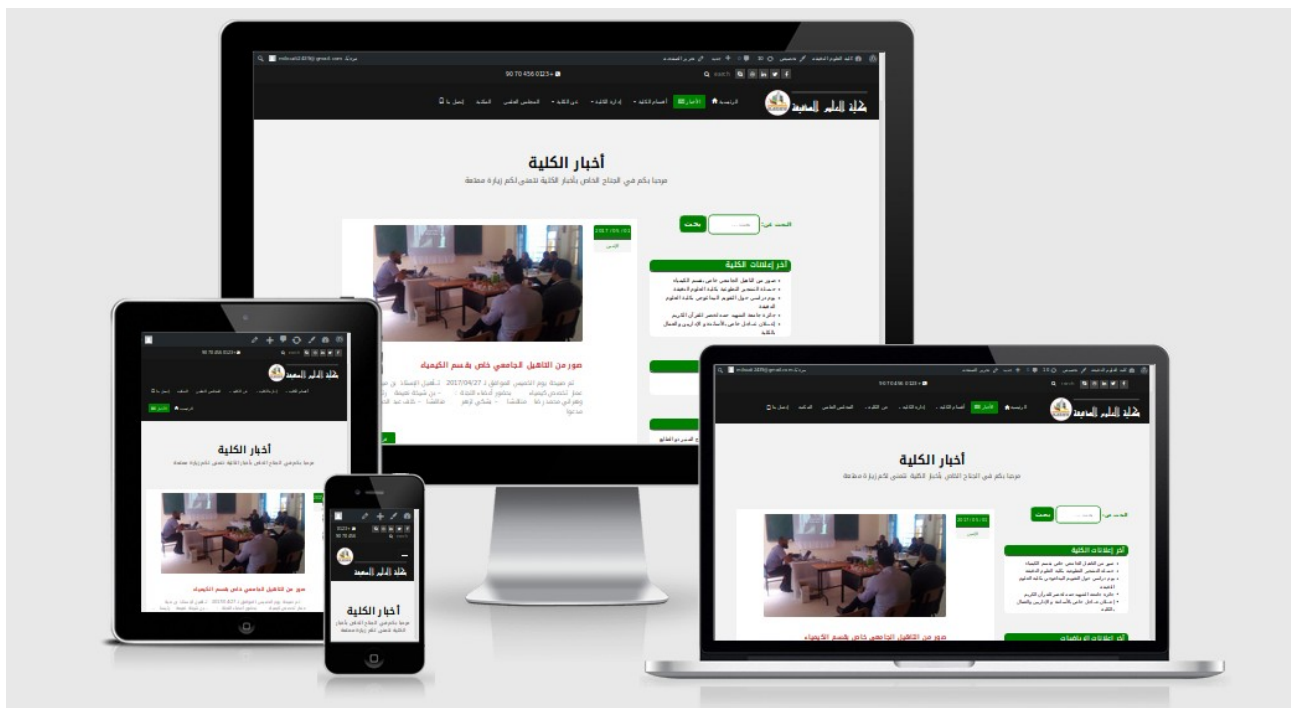


Figure 14 : Testing the website in different devices

2.2.1.4.2 Testing the website in different Most Popular web browsers

Chapter III: Realization

Firstly , on Google Chrome :

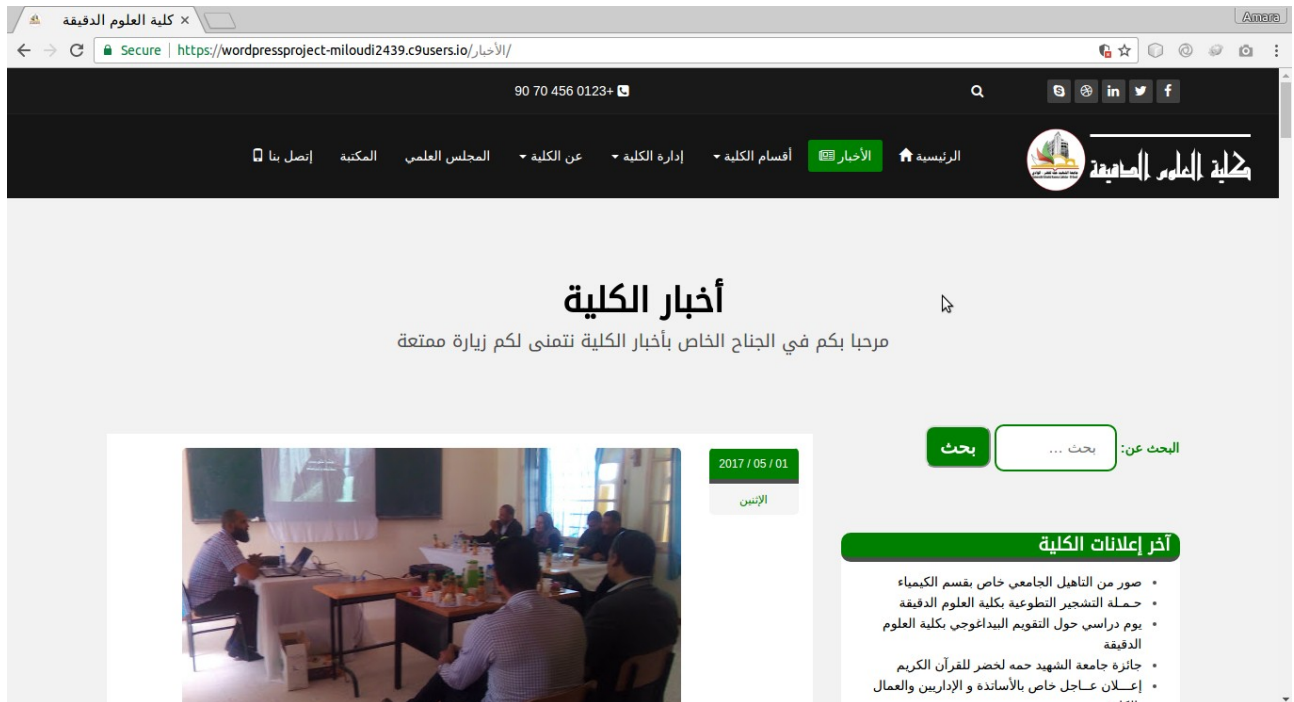


Figure 15 : Testing the website on Google Chrome

Secondly , on Mozilla Firefox :

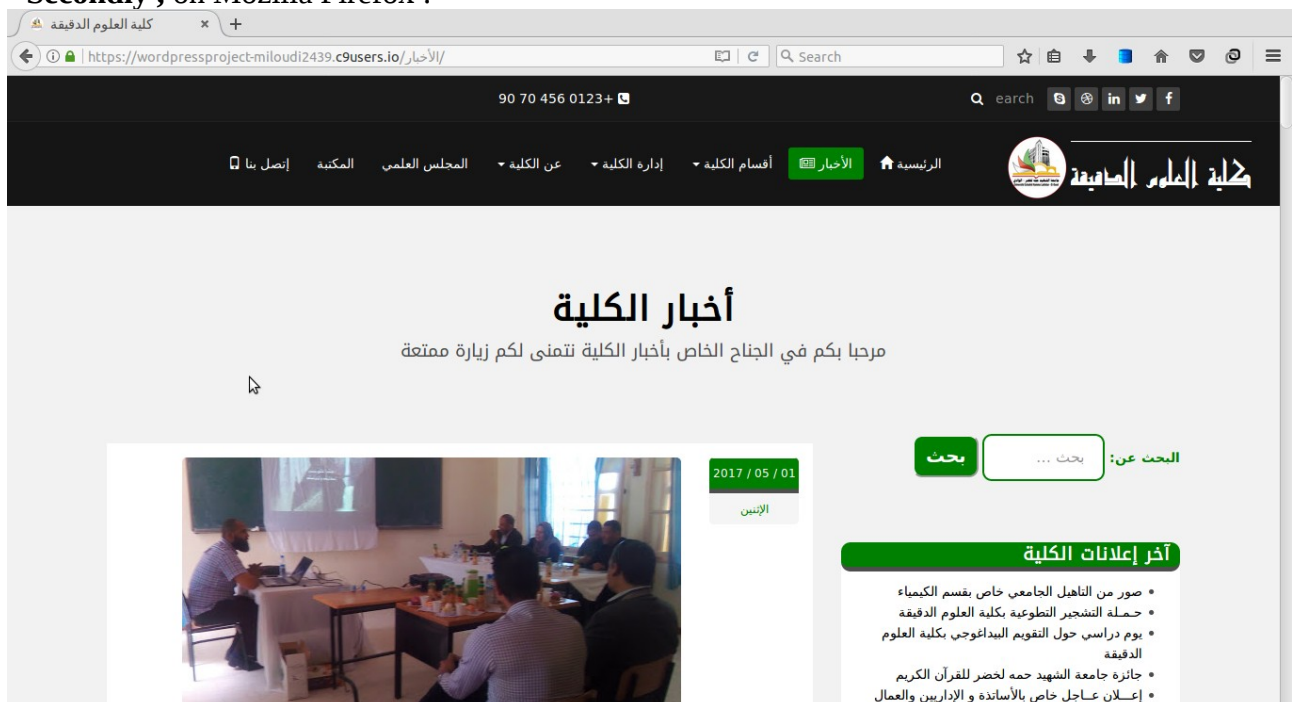


Figure 16 : Testing the website on Mozilla FireFox

Thirdly , on Opera :

Chapter III: Realization

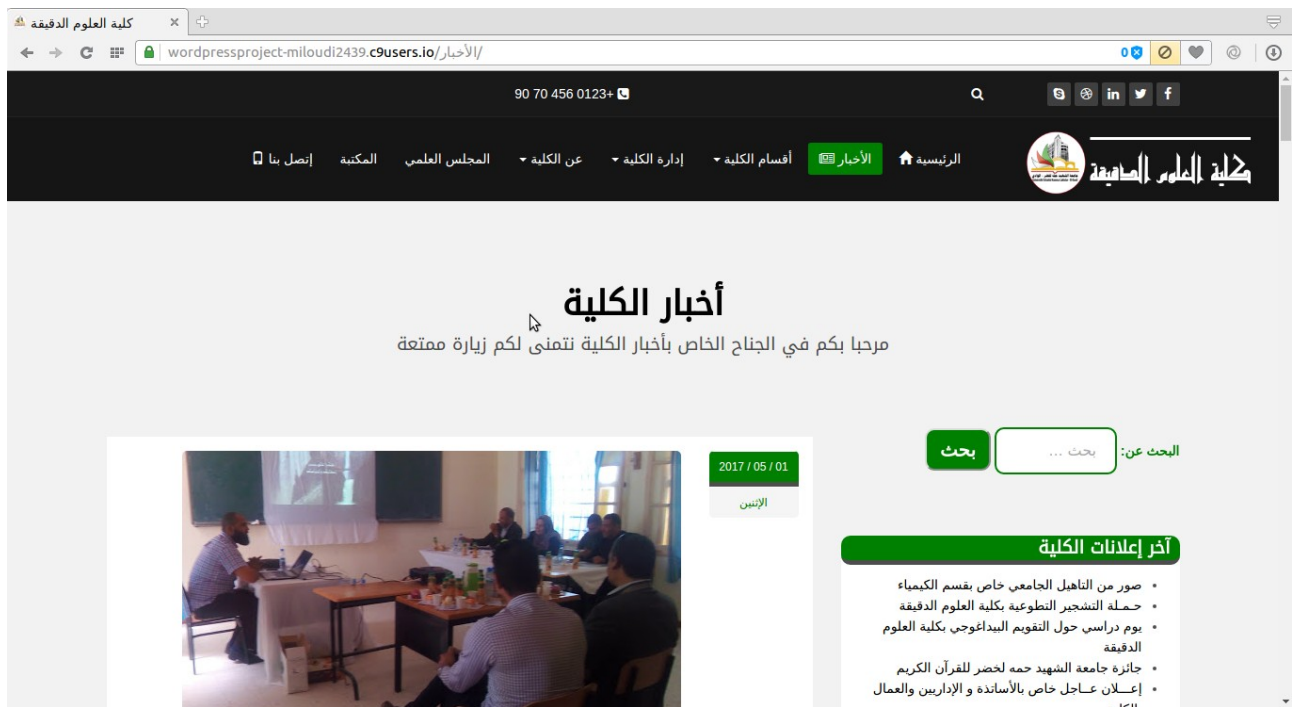


Figure 17 : Testing the website on Opera

2.2.1.4.2 the website Management

Login Administration page :

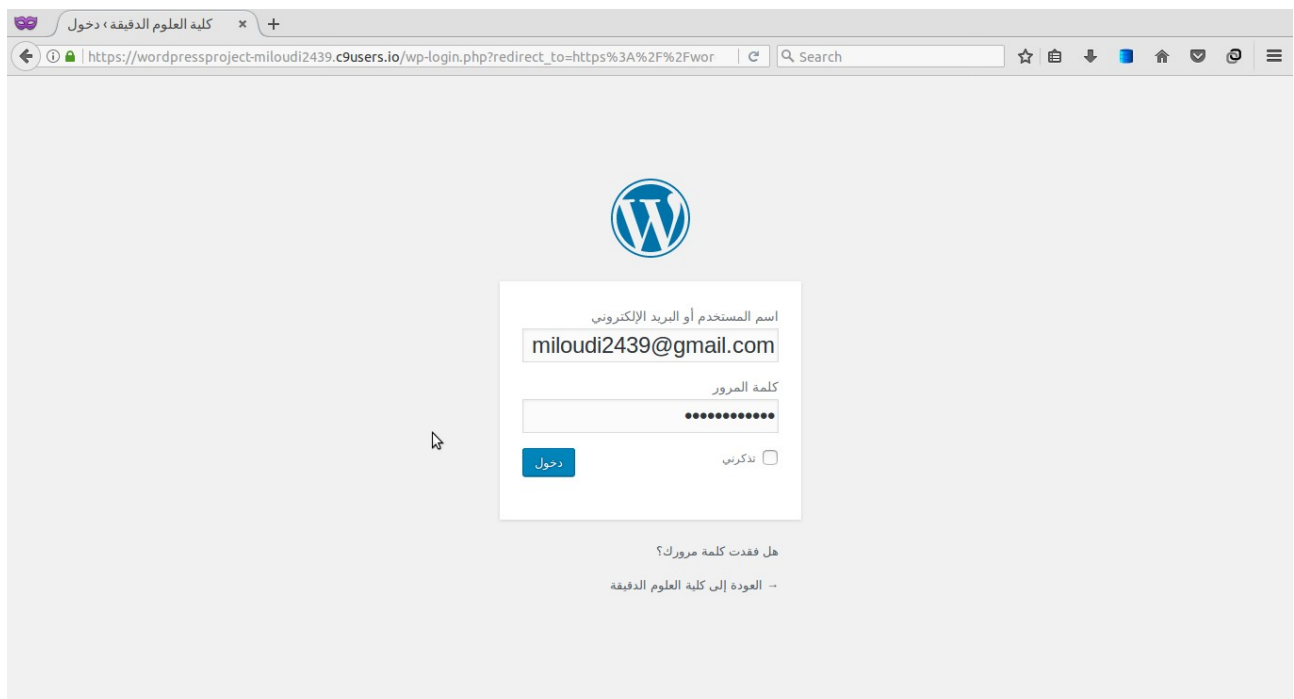


Figure 19 : login Administration page

Chapter III: Realization

dashboard page :

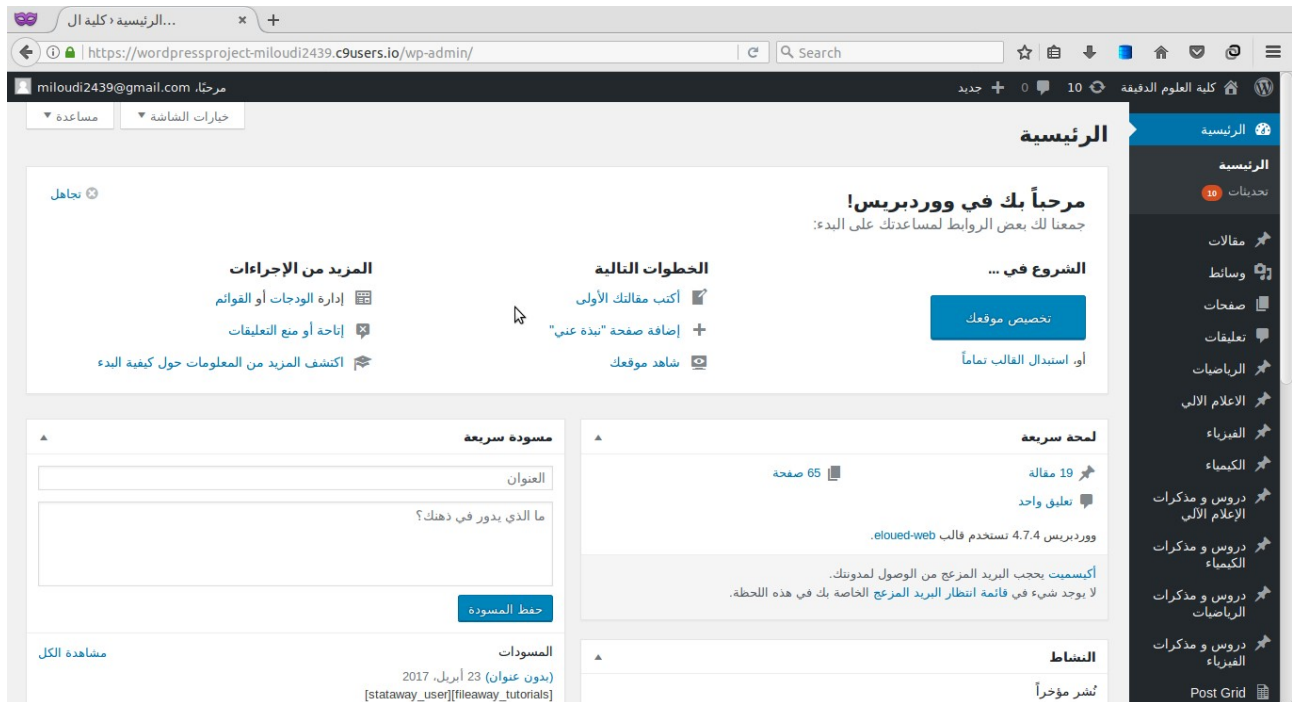


Figure 20 : Administration page

Website maintenance mode :



Figure 21: Maintenance mode

Conclusion

After this work we have a website compatible with all devices, whether Mobile phone or computer and the website is compatible with the most famous web browsers, also it is with the most famous of the content management system which is WordPress, the website easy to use and browsing, it has a modern design respects the user experience .

General Conclusion

General Conclusion

This work was submitted in the framework of the thesis for the Bachelor of Computer Science on Information Systems, the purpose of this project is to reconstruct the college website and improve the structure and informations available in each department of the college, to provide important announcements and dates during the school year, to publish lessons and series.

The website is now compatible with all devices, whether Mobile phone or computer and the website is compatible with the most famous web browsers, also it is with the most famous of the content management system which is WordPress, the website easy to use and browsing, it has a modern design respects the user experience .

After completion of the project , many of the problems that were found in the previous site were resolved, and large parts of the site were improved, from Joomla Content Management System to Content Management System which is WordPress , and this transition has many positives mentioned previously .

Finally, the purpose of the project was reached .

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