

Development and implementation of the academic portal for optimization of services

Desarrollo e implementación del portal académico para la optimización de servicios

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DOI: 10.35429/JOTE.2023.17.7.6.12

Received January 25, 2023; Accepted June 30, 2023

Abstract

The Escuela Normal Oficial de Irapuato (ENOI) emerged in 1951 and has distinguished itself as a higher-level Institution dedicated to the training of professionals in preschool, primary, and inclusion education, through the proper operation of its plans and current programs. Nowadays, technology has allowed people to communicate or transmit information through the internet. Despite that, there are still institutions that do not have these technologies, as was the case of ENOI which lacked an official page website with its domain. The lack of an official site meant that the public did not have easy access to information related to the institution. The objective of this project was to facilitate the administration and display of the information presented on their page through a system that allows them to update it without the need to know any programming language, as well as to give the page its own identity. of the institution, set up the website on its own server with its unique domain, and develop different profiles or roles for information management. With this, it was possible to give the ENOI a place where it can share relevant information and serve as a main page where you can enter other sites of interest for people related to the institution. of the institution and spread false information.

Administration, Domain, Website

Citation: ROURA-VÉLEZ, Ernesto, RODRÍGUEZ-CAMPOS, Juan Carlos, RICO-CHAGOLLÁN, Mariana and VIDAL-ORTIZ, Gabriela. Development and implementation of the academic portal for optimization of services. Journal of Technical Education. 2023. 7-17:6-12.

Resumen

La Escuela Normal Oficial de Irapuato (ENOI) surge en el año de 1951 y se ha distinguido por ser una Institución de nivel superior dedicada a la formación de profesionales de la educación preescolar, primaria e inclusión, a través de la adecuada operación de sus planes y programas vigentes. Actualmente la tecnología ha permitido que las personas comuniquen o transmitan información por medio de internet. A pesar de ello, todavía hay instituciones que no cuentan con estas tecnologías, como era el caso de ENOI que carecía de una página web oficial con su propio dominio. La falta de un sitio oficial provocaba que el público en general no tuviera un fácil acceso a información relacionada con la institución. El objetivo de este proyecto fue facilitar la administración y el despliegue de la información que se presenta en su página mediante un sistema que les permita actualizar la misma sin necesidad de tener conocimientos en algún lenguaje de programación, así como resguardar el sitio web en un servidor propio con su dominio único y desarrollar diferentes perfiles o roles para la administración de la información. Con esto se consiguió darle a la ENOI un lugar donde puede compartir información relevante además de servir como nexo donde se puede ingresar a otros sitios de interés para las personas relacionadas a la institución.

Administración, Dominio, Sitio Web

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Introduction

In the past, information was transmitted orally from person to person, but as time went by, technology began to develop to such an extent that nowadays information can be transmitted regardless of distance and through different media. One of the largest and most important means of communication today is the Internet.

Many public institutions (such as the Instituto Tecnológico Superior de Irapuato (ITESI)) and private institutions (companies such as Grupo BIMBO) have evolved the way they communicate, using web pages that can be accessed from the Internet where they display relevant information for the public.

Despite this, there are places or institutions that do not have a tool like this, as is the case of the Escuela Normal Oficial de Irapuato (ENOI). For this reason, the objective of this work is the development of a new website that allows the ENOI to have a place to share the information it generates to the general public, as well as for people who belong to the institution. With the addition of facilitating the administration and publication of information by developing a system capable of updating the web page without the need to know any programming language.

Programming language

Buitrago Conde (2010, p.60) comments that "The programming language is the means of communication between a programmer and a computer; it is through the programming language that the programmer 'tells' the computer what actions to execute in order to solve a computational problem".

World Wide Web

The World Wide Web (WWW) is a large global network of computers connected through the Internet. Millions of multimedia contents can be accessed through the WWW.

Web page

It is a digital document hosted on a server that can contain different multimedia content such as text, sound, video and others. It has a format adapted to be able to access this document from a web browser connecting to the World Wide Web or some other network.

HTML

In web programming different languages are used such as HTML, which is an artificial language that computers are able to interpret and designed for programmers to write instructions that browsers execute to create the web page. That is, HTML is a programming language, or a "language that the machine understands and processes to give a response" (Equipo Vertice, 2009).

CSS

The CSS web programming language is one of the most widely used languages in web programming: it is a language for defining the style or appearance of web pages, written with HTML or XML documents. CSS was created to separate content from form, while allowing designers to maintain much more precise control over the appearance of pages (Angel Alvarez, 2014).

JavaScript

With JavaScript you can create different functions that help to have a dynamic web page: JavaScript is presented as a client/server application development language over the Internet. The JavaScript program has the particularity that it is inserted within the HTML document itself, which presents it to the user and is therefore not a separate program (SanchezMaza, 2012). (SanchezMaza, 2012)

PHP

According to Arias (2017, p. 13) PHP is "a free interpreted language, originally used only for the development of applications present and acting on the server side, capable of generating dynamic content on the World Wide Web".

SQL

According to Escofet (2002) SQL "is the ANSI/ISO standard language for defining, manipulating and controlling relational databases. It is a declarative language: you only have to indicate what you want to do".

Roles

Roles are a set of permissions granted to a type of user. Each role is capable of doing different things within a computer system. With roles you can have control of what a user can and cannot do in order to have control of the system.

Databases

A database is a set of classified and ordered information usually stored in a digital medium and administered using specialized applications for the management and administration of the information.

XAMPP

XAMPP is one of the most useful tools when testing the performance of a web site: XAMPP is a development tool that allows you to test your PHP-based web development on your own computer without the need for internet access. If you are a web designer or web developer just starting out, it is not necessary to know about server configurations (yet), as XAMPP provides you with a fully functional configuration from the moment you install it. (Garcia, 2020)

PhpMyAdmin

During the development and maintenance of a website it is necessary to manage its database: PhpMyAdmin is a web application that serves to manage MySQL databases in a simple way and with a friendly interface. It is a very popular software based on PHP. The advantage of using a web application is that it allows us to connect to remote servers, which are not always accessible using graphical interface programs (García de Zúñiga, 2021).

Methodology

The basic idea on which the system is developed is to allow all users of the different departments to enter images, texts, links, etc., without the need of a programming language, creating their own news in real time. A prototype-based life cycle is used for the development of this project.

This model follows a similar approach to the waterfall life cycle which according to Pressman (2010) follows five steps as shown in Figure 1. In the prototype-based life cycle the first four steps of the waterfall model have iterations each resulting in a prototype which can be shown to the customer for feedback. After completing all iterations the project reaches the maintenance phase as depicted in Figure 2.

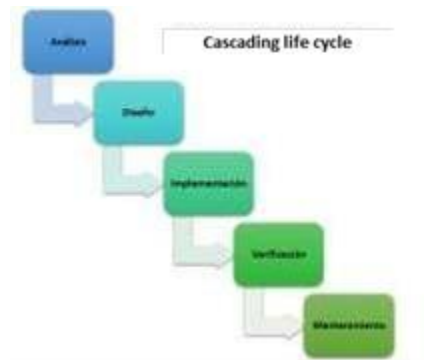


Figure 1 Cascading life cycle.

Source: Own elaboration

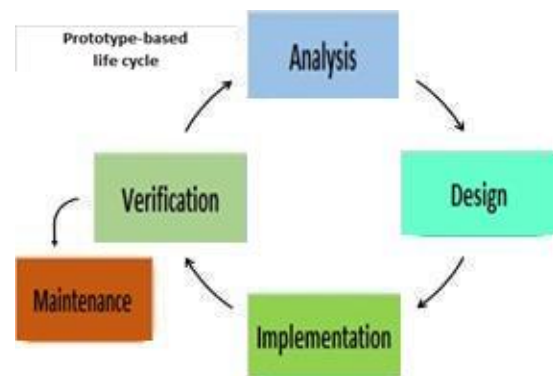


Figure 2 Prototyping-based prototyping life cycle prototypes

Source: Own elaboration

The life cycle based on prototypes was chosen because the project was intended only for the ENOI and frequent meetings could be held with the institution's personnel to receive their comments. In this way, a clearer vision of the final product could be shared with the stakeholders and the staff could better express their corrections.

As can be seen in Table 1, 3 prototypes were made and had 3 essential stages for their development: analysis, programming and presentation.

Activity	Stage
Analysis	Analysis
Design	Programming
Implementation	
Verification	Presentation

Table 1 Stages of the project cycle

Source: Own elaboration

Analysis

In the first stage of the development of each prototype, the analysis section is the most important because it is where all the requirements that the system must meet are obtained. In the first iteration (prototype 1) data collection was done through interviews using a survey applied to the institution's personnel as the main means.

Some of the questions asked in the survey were:

- What information should the web page display?
- What is the information of interest that candidates who want to join the institution need?
- Who will be in charge of updating the web page?
- Which sections of the web page should be edited by a normal user?
- Which sections of the web page should be edited by an administrator?
- Which sections of the web page should be edited by a web designer?
- What are the security requirements?
- What do you expect the system to accomplish?

During the development of the web system, XAMPP, shown in Figure 3, will be used to host the web site locally. In this way tests can be done to check the operation of the web system without the need to host it on a server or hosting.

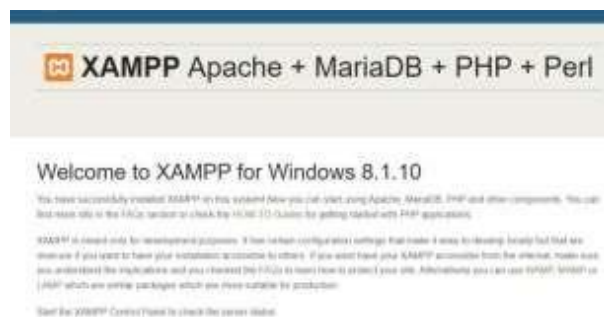


Figure 3 XAMPP platform for local hosting of the web page

Source: Own elaboration

To test the Internet connection and to make the web page compatible with most of the current devices, as well as with the most popular browsers, the free INFINITY FREE hosting is used, as shown in figure 4. At the end of all iterations of the project the web system will be hosted on the school's own server.



Figure 4 Free hosting control panel INFINITY FREE

Source: Own elaboration

In this project the interface of the web system and the database are highly related so it is essential to make a good design taking as a reference the requirements obtained through the interviews to the workers of the institution. The PHPMYADMIN program is used to access, manage and organize the tables and records of the database as shown in Figure 6.



Figure 6 Database manager to organize the database

Source: Own elaboration

Each time a prototype is presented, the comments made by the institution's personnel are taken into account, thus initiating the analysis of the next prototype in which new functions are designed or those already created are corrected in order to comply with the requirements obtained during the analysis made at the beginning of the project. An example of this can be seen in Figure 7.

Noticias	
Id_Noticia	INT (PK)
Título_Noticia	VARCHAR
Imagen_Noticia	VARCHAR
Cuerpo_Noticia	MEDIUMTEXT
Id_Usuario	INT (FK)
Estatus_Noticia	VARCHAR
Directorio Departamentos	
Id_Departamento	INT (PK)
Nombre_Departamento	VARCHAR
Teléfono_Departamento	VARCHAR
Correo_Departamento	VARCHAR
Información_Departamento	MEDIUMTEXT
Estatus_Departamento	VARCHAR
Usuarios	
Id_Usuario	INT (PK)
Nombre_Usuario	VARCHAR
Contraseña_Usuario	VARCHAR
Id. Departamento	INT (FK)

Figure 7 Sketches of project database designs
Source: Own elaboration

Programming and presentation

Throughout the project, different prototypes were programmed to demonstrate the capabilities of the web system in a visual way. During the development of the first prototype, the objective is to show how the page works, leaving the design (colorimetry, content orientation, font, etc.) in the background. For example, Figure 8 shows the area where the administrative role can create and control users. The page is fully functional allowing to update the database from it, but the design of the form, the place where the web elements are placed and the colors of the page are not the definitive ones.



User Name	Password	Area	Action
Admin	admin123	Administración	Ver detalles
Usuario	usuario123	Usuarios	Ver detalles
...

Figure 8 First prototype of the user administration area.
Source: Own elaboration

Figure 9 shows the section for publishing a news item and viewing the news items currently published. In this section of the web system the user can enable or disable the news published by himself through a form that uploads the information to the database hosted on the server. The administrative role can view the news created by all users.

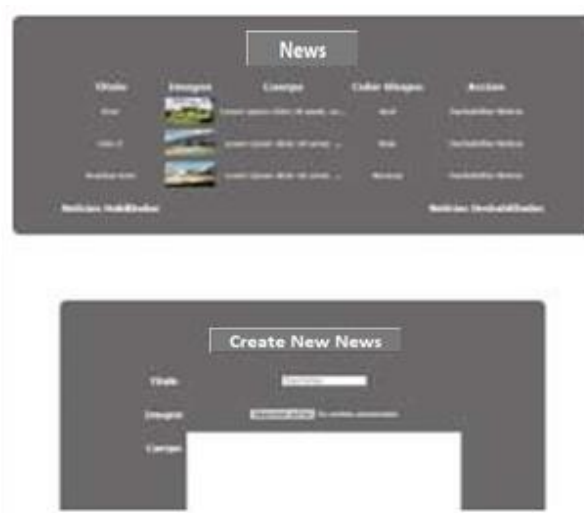


Figure 9 First prototype of the news management section
Source: Own elaboration

During the design, it was taken into account that the news published by the user could be seen by anyone with Internet access, so a way of displaying the news hosted in the database was programmed as shown in Figure 10.



Figure 10 First prototype of the website's news display.
Source: Own elaboration

All programming is carried out with HTML 5 programming language to create the web page, PHP to control requests to the server and display information from the database and the BOOTSTRAP framework to give a more polished design to the website. The Visual Code editor is used to code and edit the code.

Results

Thanks to the implementation of the web system, it was possible to generate a user-friendly environment in which the user can manage the information displayed on the web page in real time, in addition to allowing the user to add or update the contents that appear on the home page and its different thematic blocks.

[Figure 11 shows the control panel where an administrator can see all the news published.

Figure 11 Table showing the news published
Source: Own elaboration

Figure 12 shows the news already displayed on the web page, which are updated when a new news item is added and enabled.



Figure 12 News displayed on the web page
Source: Own elaboration

Conclusions

Communication between an institution and the people it serves must be developed in an efficient way, with secure, open and reliable channels where a user can easily find the information he/she needs. Those in charge of communication must use all the tools at their disposal, evolving the way of communicating as the world advances and finds new ways of transmitting information.

With the elaboration of this project, the needs of ENOI were met, developing a web system that manages to display the necessary information for the public that wants to know more about the institution, allowing different managers to edit and generate new information without the need to know about web page programming.

Establishing new ways of transmitting and generating information as well as updating existing information has helped to improve the relationship between the ENOI and its students by providing them with better service. With the development of this web system, students now have a place where they can receive the most important information about their institution, in addition to having a link where they can find the necessary tools during their academic development.

References

- Ángel Álvarez, M. (11 de 2014). Manual de CSS 3. Recuperado de DesarrolloWeb.com: <https://www.mardeasa.es/descargas/recursos-paginas-web/css/manuales/manual-css3-nov2014.pdf>
- Arias, M. A. (2017). Aprende Programación Web con PHP y MySQL IT Campus Academy.
- Buitrago Conde, B. H. (2010). EL LENGUAJE DE PROGRAMACIÓN COMUNICACIÓN PROGRAMADOR Y COMPUTADORA. Journal Boliviano de Ciencias, 60-62. Recuperado de http://www.revistasbolivianas.ciencia.bo/scielo.php?script=sci_arttext&pid=S2075-89362010000300012&lng=pt&nrm=iso
- Equipo Vertice. (2009). Diseño básico de páginas web en HTML. Málaga: Editorial Vertice
- García de Zúñiga, F. (25 de 11 de 2021). ¿Qué es phpMyAdmin y cómo usarlo? Obtenido de Blog de arsys.es: <https://www.arsys.es/blog/phpmyadmin>
- García, M. (30 de 05 de 2020). ¿QUE ES XAMPP Y COMO PUEDO USARLO? Recuperado de Nettix Perú: <https://www.nettix.com.pe/blog/web-blog/que-es-xampp-y-como-puedo-usarlo/>

Martín Escofet, C. (2002). El lenguaje SQL. Barcelona: Digitalia Hispánica.

Pressman, R. S. (2010). Ingeniería del software. Un enfoque práctico. New York: McGraw-Hill Education.

Sánchez Maza, M. Á. (2012). *JavaScript*. INNOVACIÓN Y CUALIFICACIÓN.