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Article

Technology transfer through the development of software for extracurricular workshops for ENOI

Transferencia de tecnología mediante el desarrollo de un software para talleres extracurriculares para ENOI

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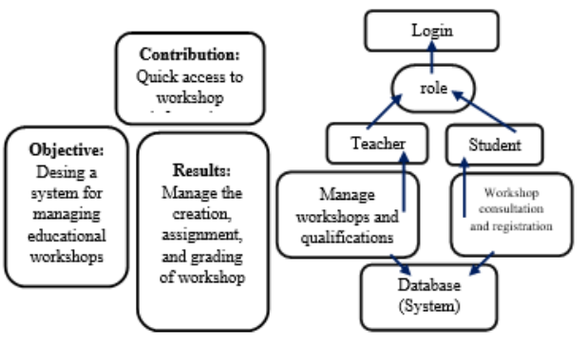
Resumen

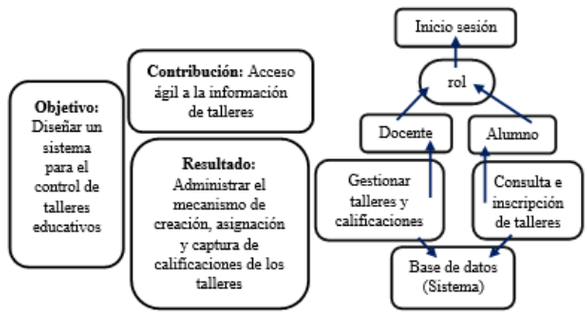
En la actualidad, el uso de herramientas tecnológicas es esencial en el ámbito educativo. Este proyecto es relevante para la Escuela Normal Oficial (ENOI), especialmente para el departamento de talleres, que carece de un sistema para gestionar los talleres impartidos por los docentes. Esta ausencia afecta a los estudiantes, que no tienen fácil acceso a la información de los talleres. El objetivo del proyecto es desarrollar un sistema web que permita asignar talleres, capturar calificaciones y recopilar información sobre talleres y docentes. Esto mejorará la gestión y accesibilidad de la información, beneficiando tanto a estudiantes como a docentes, y apoyará la toma de decisiones para el mejoramiento de la oferta educativa de la ENOI.



Workshops, Administration, Software

Abstract

Currently, the use of technological tools is essential in education. This project is relevant for the Escuela Normal Oficial (ENOI), especially for the workshops department, which lacks a system to manage the workshops given by teachers. This absence affects students, who do not have easy access to workshop information. The project's objective is to develop a web system to assign workshops, capture grades, and gather information about workshops and teachers. This will improve the management and accessibility of information, benefiting both students and teachers, and support decision-making for enhancing the educational offerings at ENOI.



Talleres, Administración, Software

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Introduction

The Escuela Normal Oficial de Irapuato (ENOI) is a consolidated institution of higher education with academic leadership and generator of innovative proposals in the initial training, professional development and updating of teachers.

Its commitment is to the educational quality of our society in the area that corresponds to it, carrying out its teaching work in an environment congruent with its philosophical principles, where its members have the opportunity to achieve an integral development. The history of the ENOI dates back to 1951, when Professor Juana Hidalgo Gómez, director of the school until 1974, took steps to establish an educational centre to prepare young men and women interested in the noble task of educating children.

Currently, the school control department of the ENOI does not have a system to provide or administer the workshops taught at the institution. For this reason, a control and administration system will be developed to allow the management of workshops, the assignment of grades and the registration of students. This will ensure better management and organisation of the workshops and facilitate access to information for students and teachers.

Programming Language

A programming language, simply put, is the set of instructions through which humans interact with computers.

A programming language allows us to communicate with computers through algorithms and instructions written in a syntax that the computer understands and interprets in machine language.

Html

HTML (HyperText Markup Language) is the most basic component of the Web. It defines the meaning and structure of web content. In addition to HTML, other technologies are generally used to describe the appearance/presentation of a web page (CSS) or the functionality/behaviour (JavaScript). MDN, HTML: (Hypertext Markup Language, 2022).

Css

CSS stands for Cascading Style Sheets. Basically, it is a language that handles the design and presentation of web pages, i.e. how they look when a user visits them. It works together with the HTML language that handles the basic content of the pages. They are called ‘cascading’ style sheets because you can have several sheets and one of them with properties inherited (or ‘cascaded’) from others.

JavaScript

JavaScript is a scripting or programming language that allows you to implement complex functions in web pages, any time a web page does more than just sit there and display static information for you to view, it displays timely content updates, interactive maps, 2D/3D Graphics animation, scrolling video player machines, etc., you can bet that JavaScript is probably involved. It's the third layer of the standard web technologies pie, two of which (HTML and CSS) we've covered in much more detail elsewhere in the Learning Area.

Php

PHP is a general-purpose programming language used primarily in the web development environment. This language is generally used to develop the backend of a website, the server side. Even so, it has numerous frontend utilities. This is why it is one of the main programming languages in the world of web programming.

Web page

We say web page to an electronic portal that contains multimedia information (textual, audiovisual, images, links, among others). A page of this type is adapted to what we know as WWW (World Wide Web) and can be found from a web browser. Web pages are usually in a format known as HTML and can link to other web pages.

Server

Definition Server (software): A software-based server is a program that provides a special service that other programs called clients can use locally or over a network.

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The type of service depends on the type of server software. The basis of communication is the client-server model and, as far as data exchange is concerned, service-specific transmission protocols come into play.

Database

A set of tables describing a larger entity. The tables may have relationships between them and be complementary.

Typically, to describe or work with a system, it is necessary to have more than one table to understand the whole, and there are relationships between them.

Sql

Structured Query Language (SQL) is a standardised programming language used to manage relational databases and perform a variety of operations on the data they contain.

MySql

It is the name of a system that allows the management of databases. It is the most widely used option for web-based applications (Pérez Porto, 2019).

Methodology

This project is an initiative to support the ENOI Educational Institution within the Computer Systems Engineering degree. It consists of developing a web page that allows to keep order in the school control department, providing teachers and students the facility to access and interact with a web platform.

To carry out this project, the waterfall model, also known as the classical life cycle, will be implemented. A systematic and sequential approach to software development is recommended, starting with the clarification of customer requirements, through planning, modelling, building and implementation, and ending with support for the finished software. As shown in Figure 1.

Box 1

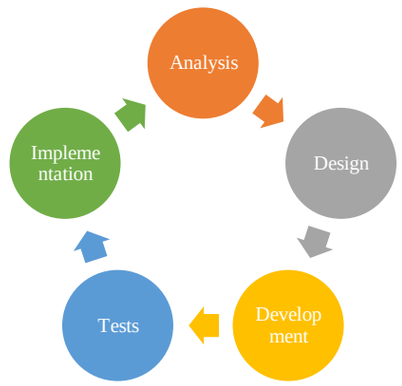

Figure 1
Cascading Life Cycle
Source: Own elaboration

It was decided to use the above life cycle, as it was considered sufficiently long and allowed end users to use the system for a relatively short period of time, taking into account three important parts of its development: programming, usability labs and proposals for improving the application. As shown in Table 1.

Box 2

Table 1
Activity and stages of the cycle.

Activity	Stage
Analysis	Analysis
Design	
Implementation/Verification	Programming
Maintenance	Final Presentation

Source: Own elaboration

Analysis

As a first step in the development of the system, the analysis must be taken into account. It is important because it meets the requirements that the system has to fulfil. In the first part, data collection is carried out with the following instruments:

- What type of system do you currently have?
- How are workshops allocated?
- How are workshops administered?
- How do teachers deliver grades?
- How do you generate the certificates and how are they handed out?

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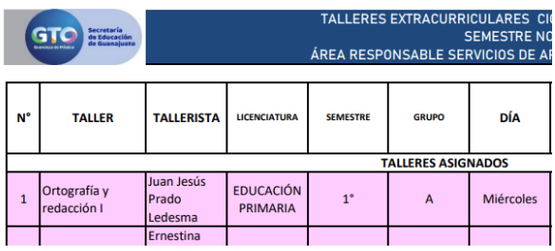
- How are students registered for open participation workshops?

- Where is student data stored?

- On which platform can learners view their status at the end of the workshop?

Box 3



TALLERES EXTRACURRICULARES CI
SEMESTRE NO
ÁREA RESPONSABLE SERVICIOS DE AP

N°	TALLER	TALLERISTA	LICENCIATURA	SEMESTRE	GRUPO	DÍA
TALLERES ASIGNADOS						
1	Ortografía y redacción I	Juan Jesús Prado Ledesma	EDUCACIÓN PRIMARIA	1°	A	Miércoles
		Ernestina				

Figure 2

Allocation of workshops

Source: Own elaboration

Extracurricular workshops, there are various data such as workshop, workshop leader (teachers), type of degree, semester, group, the day the workshop is given, unique timetable, assigned classroom, the total number of students enrolled (male and female), the mode of attendance (compulsory) or virtual (optional).

Another data to consider is the part of ‘optional workshops’ within the institution in which the student decides to take any of the workshops by making a registration. As shown in Figure 3. Optional Workshops.

Box 4

TALLERES DE PARTICIPACIÓN ABIERTA				
Participación Abierta	Sábado	9:00 - 11:00	N/A	REGISTRATE AQUÍ
Participación Abierta	Miércoles	9:00-10:50	23	REGISTRATE AQUÍ
Participación Abierta	Sábado	9:00 - 11:00	N/A	REGISTRATE AQUÍ
Participación Abierta	Sábado	9:00 - 11:00	Plaza Cívica	REGISTRATE AQUÍ
Participación abierta	Miércoles	9:00 - 10:50	Estacionamiento	REGISTRATE AQUÍ
Participación Abierta	Miércoles	9:00 - 10:50	20	REGISTRATE AQUÍ
Participación Abierta	Miércoles	9:00 - 10:50	21	REGISTRATE AQUÍ
Participación abierta	Miércoles	9:00 - 10:50	Sala de lectura	REGISTRATE AQUÍ
Participación Abierta	Miércoles	9:00 - 10:50	22	REGISTRATE AQUÍ
Participación Abierta	Miércoles	9:00 - 10:50	24	REGISTRATE AQUÍ

Figure 3

Workshop registration

Source: Own elaboration

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Programming and Visualisation

The analysis of the database that is required to operate the various data that will be used to make the registration part of the workshops functional was also carried out.

The database will be highly interrelated, so it must be well designed with reference to the requirements obtained through surveys of the institution's staff. The programme "**phpmyadmin** ’ will be used to access, manage and organise the database tables and records. As shown in Figure 4.

Box 5

Figure 4

Coding (Backend)

Source: Own elaboration

On the other hand, we show in Figure 5, the programming carried out to meet the requirements requested, implementing html.

Box 6

```
<!DOCTYPE html>
<html>
<head>
    <title>Workshop Management</title>
</head>
<body>
    <h1>Available Workshops</h1>
    <form method="POST">
        <label for="student_id">Student ID:</label>
        <input type="text" id="student_id" name="student_id" required><br><br>

        <label for="workshop_id">Select Workshop:</label>
        <select id="workshop_id" name="workshop_id" required>
            <?php
            if ($result->num_rows > 0) {
                while($row = $result->fetch_assoc()) {
                    echo "<option value='" . $row["id"] . "'>" . $row["title"] . "</
```

Figure 5

Basic structure and minimum functionality of the system

Source: Own elaboration

Results

Box 7

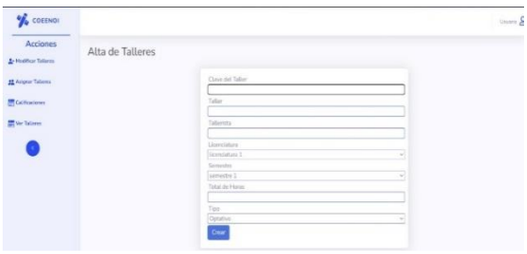

Figure 6
Workshop registration
Source: Own elaboration

The design of the website consists of different interfaces. The workshop creation screen is used to generate the necessary information from the various data requested. By registering each of these. Figure 6.

Box 8

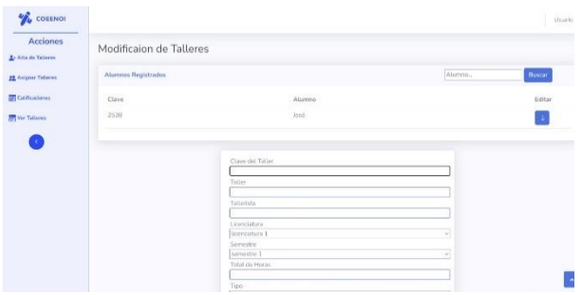

Figure 7
Edition of the workshops
Source: Own elaboration

The next screen shows Figure 7, workshop modification, which is used to update existing workshop information. Another interface shown is Figure 8, qualifications. Entering the status of each of the learners.

Box 9

Figure 8
Qualifications
Source: Own elaboration

The following interface shows the view of each workshop created where the user can edit each workshop or delete it if required by the administrator. As shown in Figure 9 Workshops View.

Box 10

Figura 9
Workshop view generation (Postulations)
Source: Own elaboration

It is also essential to have a certificate of completion of the workshop, where the data of the institution, the student and the workshop are specified, as follows, an example of the above mentioned document. Figure 10 Certificates.

Box 11

Figure 10
Generation of certificates
Source: Own elaboration

Conclusions

In conclusion, this software project has demonstrated that the use of technological tools is essential in academia. Although carrying out a project of this magnitude requires time and effort, the results obtained fully justify the hard work invested.

Thanks to this project, I have not only broadened my technical knowledge, but I have also acquired new practical skills in the development of web systems.

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This project has allowed me to strengthen my teamwork skills by collaborating in an organised and committed way with the team members.

It has also challenged me to step out of my comfort zone and develop new skills, which has enriched my professional and personal growth.

The experience has shown me the importance of dedication and commitment of the team to achieve the proposed objectives.

A significant learning experience has been identifying and leveraging the individual strengths of each team member. Recognising and maximising everyone's talents has been fundamental to the success of the project. This experience underlines the importance of making the most of all the possibilities that each individual can bring to the table.

Declarations

Conflict of interest

The authors declare that they have no conflicts of interest. They have no known competing financial interests or personal relationships that might have appeared to influence the article reported in this paper.

Authors' contribution

Rodríguez-Campos, Juan Carlos: I contributed to the project idea, development, research and editing.

Rico-Chagollán, Mariana: I contributed to the development of the project.

Vidal-Ortiz, Gabriela: I contributed to the project idea, method, review, editing, data analysis.

Availability of data and materials

Further information on data availability or programming methodology during this study is available from the author.

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Abbreviations

CSS	Cascading Style Sheets
ENOI	Escuela Normal Oficial de Irapuato
HTML	Hypertext Markup Language
ITESI	Tecnológico Superior de Irapuato
MySQL	My Structured Query Language
PHP	Hypertext Preprocessor
TecNM	Tecnológico Nacional de México

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