

Development and deployment of a web application to control and query school assessments

Desarrollo y despliegue de una aplicación web para el control y consulta de calificaciones escolares

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Abstract

This document describes the development and deployment of a web system based on open-source technologies and dedicated to the control and query of school grades, which is a flexible and easily administrable method for people who do not have notions of databases or systems.

Assessments, Control, Deployment, Development, Databases, Web application

Resumen

El presente documento describe el desarrollo y despliegue de un sistema web basado en tecnologías de código abierto y dedicado al control y consulta de calificaciones escolares el cual es un método flexible y fácilmente administrable para personas que no tienen nociones de bases de datos o sistemas.

Calificaciones, Control, Despliegue, Desarrollo, Bases de datos, Aplicación web

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Introduction

Social distancing due to the expansion of COVID-19 has caused changes and has forced us to take on various challenges in all sectors; the educational field is no exception. According to the National Institute for the Evaluation of Education (INEE), the pandemic affected approximately 30 million students of all educational levels, forcing both them and all those involved in the teaching-learning process to move to an online or Telesecundaria system. For all the mention above, one of the main problems behind the economic and geographical differences has consisted in providing the necessary tools for students and teachers to avoid the greatest number of problems regarding to communication and in order to obtain the maximum benefit from distance education, so the communication of grades where usually exists the greatest number of problems. The before is because of parents and students are often not fully aware of the large number of options of technological tools, which is why there is usually a high failure rate. The present work consists of showing the development and validation of a software dedicated to the control and consultation of school grades, which addresses the need to have a system solely dedicated to this task and thanks to which communication and knowledge of the student are facilitated. work history and grades assigned.

Objetives

- Create and validate a software that allows control and query school assessments.
- Benefit as many people as possible by making an open-source software.
- Make the software have the least possible number of requirements for its administration and update.
- Allow the software to be flexible enough that it can be used for any kind of subjects.

Concepts and definitions

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.

Instead of lots of commands to output HTML (as seen in C or Perl), PHP pages contain HTML with embedded code that does "something" The PHP code is enclosed in special start and end processing instructions `<?php and ?>` that allow you to jump into and out of "PHP mode", what distinguishes PHP from something like client-side JavaScript is that the code is executed on the server, generating HTML which is then sent to the client.

The best things in using PHP are that it is extremely simple for a newcomer, but offers many advanced features for a professional programmer [1].

Bootstrap

Bootstrap is the most popular CSS Framework for quickly design and customize responsive mobile-first sites and nowadays is the world's most popular front-end open source toolkit, featuring Sass variables and mixins, responsive grid system, extensive prebuilt components, and powerful JavaScript plugins [2].

Database

A database is a tool for collecting and organizing information. Databases can store information about people, products, orders, or anything else. Many databases start as a list in a word-processing program or spreadsheet. As the list grows bigger, redundancies and inconsistencies begin to appear in the data. The data becomes hard to understand in list form, and there are limited ways of searching or pulling subsets of data out for review. Once these problems start to appear, it's a good idea to transfer the data to a database created by a database management system (DBMS) [3].

A database is usually controlled by a database management system (DBMS). Together, the data and the DBMS, along with the applications that are associated with them, are referred to as a database system, often shortened to database. Data within the most common types of databases in operation today is typically modeled in rows and columns in a series of tables to make processing and data querying efficient. The data can then be easily accessed, managed, modified, updated, controlled, and organized. Most databases use structured query language (SQL) for writing and querying data [4].

Comma-Separated Value File: CSV

A comma-separated value (CSV) file is a type of file used to exchange data between disparate applications, such as multiple spreadsheet programs [5].

Although there are several specifications and implementations for the CSV format, it has never been formally documented; that is, there is no existing specification, and this allows for a wide variety of interpretations for CSV files. The most recognized format is the one in which the rows are separated by line breaks, while the columns are separated by commas [6].

These files are often used as databases and due to their simplicity, anyone can create one with a text editor or a spreadsheet processor, the second option being more recommended as it allows applying a series of filtering operations, order and generate detailed reports from the available information. Files in this format will have the extension .csv.

Web hosting

Web hosting is a service that allows organizations and individuals to post a website or web page onto the Internet. A web host, or web hosting service provider, is a business that provides the technologies and services needed for the website or webpage to be viewed in the Internet. Websites are hosted, or stored, on special computers called servers [7].

Although hosting services usually have a cost, it is possible to obtain some for free with certain limitations such as: limited bandwidth, little storage space or advertisements of the provider.

Domain name

A domain name (often simply called a domain) is an easy-to-remember name that's associated with a physical IP address on the Internet. It's the unique name that appears after the @ sign in email addresses, and after www. in web addresses. For instance, the domain name example.com might translate to the physical address 198.102.434.8. Other examples of domain names are google.com and wikipedia.org.

Using a domain name to identify a location on the Internet rather than the numeric IP address makes it much easier to remember and type web addresses. Anyone can purchase a domain name. You just go to a domain host or registrar, find a name no one else is using, and pay a small annual fee to own it [8].

Materials and methodology

Materials

- Personal Computer.
- Web host.
- Domain name.

Methodology

- Download or create a CSV file based on school assessments.
- Acquire a free or paid web hosting.
- Acquire a free or paid domain name.
- Generate the proposal in PHP7 for backend and Bootstrap for frontend.
- Create an intuitive and customizable interface for the user.
- Validate the proposed software.

Results

In summary, the proposed software has only two restrictions:

The first one is that a column in CSV file should be named as "correo", this column will be where the ID of each student is entered, it can be an email or student number; the second one is that the file should be named "lista".

Some software systems as classroom make it easy to download the total grades in CSV format, reducing the work to rename the downloaded file. To illustrate this, the process is described in Figures 1 and 2.

First is selected any classwork as is shown in Figure 1:

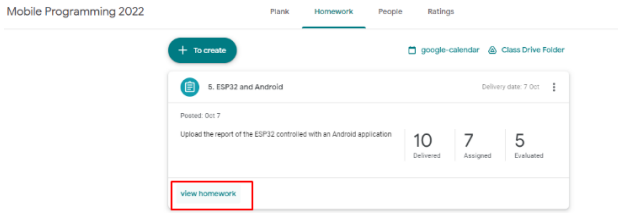


Figure 1 Classwork selection process

Then in options is selected the option which avoid us to download all the assessments this process can be seen in Figure 2:



Figure 2 Download process for assessments file in CSV

As a result, the file obtained from the above process can be opened using excel and then only the final score is calculated with the spreadsheet to get a file as is shown in Figure 3

	A	B	C	D	E	F	G	H	
1	Surnames	Name	Email	0. Diagnostic	1. Class activ	2. My first ap	3. Farm App	4. WebView	5. E
2	ALMAZAN CE ADALID		rt20100041@	100	100	100	100	100	
3	GALEANA DI ANDRIV JOSI		rt20100005@	100	80	100	79	100	
4	NARVAEZ CC BRAYAN		rt20100028@	100		100	100	100	
5	ORTIZ MARTI EROS YERED		rt20100008@	80		100	100	100	
6	MARTINEZ E EVERLIN		rt20100002@	100		0	100	100	
7	ORTIZ MARTI IRAD YOAS		rt20100009@	100		100	100	100	
8	DOMINGUEZ IVAN		rt20100027@	100			100	100	
9	AVILA LEON/JOSE JARED		rt20100044@	100		100	100	100	
10	JUSTINIANO JOSE LUIS		rt20100012@	100		100	100	100	
11	PITA HERNAN JUAN CARLO		rt20100017@	100		100	100	100	
12	VALENTIN HI JUAN CARLO		rt20100031@	100		0	100	100	
13	HERNANDEZ JUAN FRANC		rt20100024@	100		100	100	100	
14	MARQUINA KAROL ELVIR		rt20100039@	100		100	100	100	

Figure 3 CSV final file

After the file is done, is needed to get a web hosting service, then it is update with two PHP files which are the search interface (see Figure 4) and the result interface (see Figure 5)

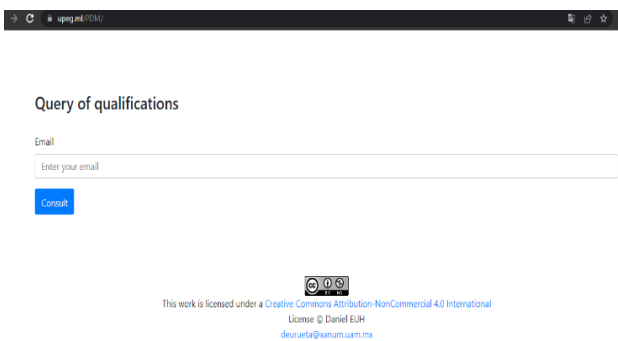


Figure 4 Search interface

Name	Email	0. Diagnostic test	1. Class activity: Mobile OS	2. My first application
BRAYAN	rt20100028@upeg.edu.mx	100		100

Figure 5 Results interface

Consequently, since the frontend was made using bootstrap, both of the interface is responsive (see Figure 6).

Query of qualifications

Email

Consult



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Figure 6 Search interface seen from a mobile device

In addition to the system, it is important to mention that as long as the restrictions of the file name and the field called "mail" are met, it is not necessary to make additional modifications and in case of wanting to update the grades, simply download the CSV file again. or edit it manually, therefore the system is flexible enough and easy to use with minimal knowledge.

Currently the described system is being implemented in the networks and telecommunications career of the Universidad Politécnica del Estado de Guerrero (see Figure 7 and 8), this system can be consulted from [9]

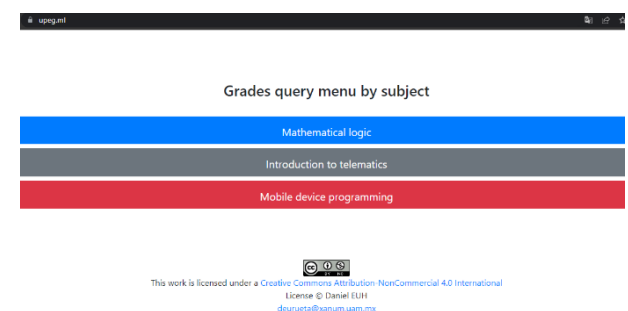


Figure 7 System implementation

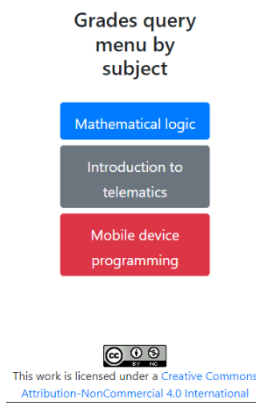


Figure 8 Responsible system implementation

Conclusions

In conclusion, the proposed software was correctly validated in terms of functionality, this software allows the common users to have a system for free and in few steps to control and query school assessments.

Thanks to the structure in which the project is developed, if the user needs to update the database, it can be done using excel o downloading the CSV file from classroom without the needed to edit the code. However, is the flexible enough to modify this code according to the needs of the end user.

On the other hand, the system has as a result that fewer students having doubts regarding their current grade and has allowed teachers to have a more private way of communicating final grades.

Finally, as future work, it is expected to improve the visual design, create multi-language support and create a section to configure the file name and required field without having to open the source code.

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