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Technology transfer through the development of a system for teacher evaluation

Transferencia tecnológica mediante el desarrollo de un sistema para la evaluación docente

SANTOYO-MEDINA, Alejandro†*, RODRÍGUEZ-CAMPOS, Juan Carlos, RICO-CHAGOLLÁN, Mariana and VIDAL-ORTIZ, Gabriela

ID 1st Author: *Alejandro, Santoyo Medina*

ID 1st Co-author: *Juan Carlos, Rodríguez-Campos* / **ORC ID**: 0000-0002-8079-9654, **Researcher ID Thomson**: S-7721-2018, **CVU CONACYT ID**: 263767

ID 2nd Co-author: *Mariana, Rico-Chagollán* / **ORC ID**: 0000-0001-6942-5902, **Researcher ID Thomson**: S-7659-2018, **CVU CONACYT ID**: 691659

ID 3rd Co-author: *Gabriela, Vidal-Ortiz*

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Abstract

This research is carried out at the School Normal Official (ENOI) for the Research area in charge of collecting and managing the data resulting from the evaluation of teachers. Currently, this department does not have a specialized software system for this process (it is carried out manually), for these third-party technologies are used, which are Google Forms and Microsoft Excel. Due to this, a large number of failures have occurred in the process, among the most frequent those related to the integrity, consistency and redundancy of the data. This results in a considerable loss of time, taking into account that the institution has 66 professors and for each one 2 documents are generated (1 Excel and 1 Word), in addition to 4 more spreadsheet documents to carry out the analysis. of the data and finally 4 documents for presentation of the results. Giving a total of 140 documents to be generated only by a single person. Taking these data, it is essential to manage the information, this allows to meet the needs of the institution in the shortest possible time, allowing strategies and work plans for the academic area to be carried out. ICTs give us the opportunity to create, modify and store information. Its development has evolved along with society, knowledge and education, allowing access to information at any time. The objective of this project is to develop an information system as a support tool to improve evaluation processes and provide a follow-up of teachers visualizing their academic work.

Process of evaluation, Administration, Software

Resumen

Esta investigación se realiza en la Escuela Normal Oficial (ENOI) para el área de Investigación encargada de recabar y administrar los datos resultantes de la evaluación a docentes, actualmente en este departamento no cuenta con un sistema de software especializado para dicho proceso (se realiza de forma manual), para esto se emplean tecnologías de terceros, las cuales son Google Forms y Microsoft Excel. Debido a esto se han presentado gran cantidad de fallos en el proceso, entre los más frecuentes se han detectado los relacionados con la integridad, consistencia y redundancia de los datos. Esto resulta en una pérdida de tiempo considerable, tomando en cuenta que la institución cuenta con 66 profesores y para cada uno se generan 2 documentos (1 de Excel y 1 de Word), además de 4 documentos más de hoja de cálculos para realizar el análisis de los datos y finalmente 4 documentos para presentación de los resultados. Dando un total de 140 documentos por generar únicamente por una sola persona. Tomando estos datos es primordial el manejo de la información, esto permite atender las necesidades de la institución en el menor tiempo posible, permitiendo realizar estrategias y planes de trabajo para el área académica. Las TIC nos da la oportunidad de crear, modificar y almacenar información. El objetivo de este proyecto es desarrollar un sistema de información como herramienta de apoyo para mejorar los procesos de evaluación y brindar un seguimiento de docentes visualizando su trabajo académico.

Procesos de evaluación, Administración, Software

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† Researcher contributing as first author.

Introduction

Throughout time, evaluations have been a fundamental part of a student's a fundamental part for the evaluation of a student's school subjects, but, above all, to know the student's general performance. For these reasons, school grades are seen as an instrument for measuring student performance and not as a sole objective, since a high level of these is not synonymous with correct learning. On the other hand, this indicator functions as a method for discovering a student's abilities in certain subjects. When there is no control or correct management of grades, any possibility of obtaining information related to the performance and skills of students is lost.

Evaluations have the main purpose of promoting student learning by providing clear and concise information about their progress, alerting teachers about the academic needs of their respective students, verifying the degree to which students have performed in the tasks and competencies evaluated by teachers and schools.

Software

Instructions (computer programs) that when executed provide the intended characteristics, function and performance; data structures that allow the programs to properly manipulate information; descriptive information in both paper and virtual forms that describe the operation and use of the programs. (Pressman R., 2003)

JavaScript

JavaScript (JS) is a lightweight, interpreted, or just-in-time compiled programming language with first-class functions. While it is best known as a scripting language for web pages, and is used in many non-browser environments, such as Node.js, Apache CouchDB, and Adobe Acrobat; JavaScript is a prototype-based programming language, multiparadigm, single-threaded, dynamic, with support for object-oriented support for object-oriented, imperative and declarative programming. (Mdn, 2022)

Programming language

A programming language is a formal language that provides a set of instructions that allow a programmer to write sequences of commands and algorithms in order to control the physical and logical behavior of a computer to produce various kinds of data. This whole set of commands and data written by means of a programming language is known as a program (Vaca, 2011).

Database

A database or database is a set of data belonging to the same context and stored systematically for later use (Peréz & Gardey, 2014).

Html 5

It is the markup language we use to structure and give meaning to our web content, for example, defining paragraphs, headers and data tables, or inserting images and videos on the page (Mdn Web Doc, Network, 2005).

CSS

A style rules language that we use to style our HTML content, for example, setting background colors and fonts, and laying out our content in multiple columns. (Mdn Web Doc N. M.,2005).

JQuery

jQuery is a fast, small, and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event control, animation, and Ajax much simpler with an easy-to-use API that works in a multitude of browsers. With a combination of versatility and extensibility, jQuery has changed the way millions of people write JavaScript (Foundation, 2021).

Life Cycle

The software life cycle consists of all the stages that precede and follow programming. The methods and techniques of software engineering fall within the framework delimited by the software life cycle, and, more specifically, by the different stages that are distinguished (Pressman R. S., 2010).

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PHP

PHP (recursive acronym for PHP: Hypertext Preprocessor) is a very popular open source language especially suited for web development and can be embedded in HTML. What distinguishes PHP from something client-side like Javascript is that the code is executed on the server, generating HTML and sending it to the client (Lerdorf, 2021).

MySql

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

Server

It is a program that offers a special service that other programs called clients can use locally or through a network. 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. (ionos.mx, 2020)

Web site

It is a set of web pages accessible via the Internet, conveniently linked and with a specific purpose. It is identified by a unique URL address, which is usually the home page or Home page. (GoDaddy,
2019).

Methodology

In this project is developed as support to the tutoring process within the Computer Systems Engineering career, by developing a progressive application that allows to keep a tutorial control of the students through the different educational models, by improving the individual accompaniment and thus strengthen the tutoring program in the coordination. For the realization of this project the waterfall model is implemented, sometimes called classical life cycle suggests a systematic and sequential approach to software development, which begins with the specification of requirements by the customer and progresses through planning, modeling and construction and deployment, to conclude with the support of the finished software. As shown in Figure 1.

Figure 1 Cascading life cycle
Source: Own elaboration

It has been decided to use the aforementioned life cycle as it is considered adequate for the time possible and allows the end user to make use of the system in a relatively short time, taking into account three important parts for its development: Programming, usability laboratory and proposals for application improvement, as shown in Table 1.

Activity	Stage
Requirements	Analysis
Design	
Implementation	Programming
Verification	
Maintenance	Final Visualization

Table 1 Stages of the project cycle
Source: Own elaboration

Analysis

As the first stage in the development of the teacher evaluation system the first step in the development of the teacher evaluation system is the analysis, for which the data collection technique will be by means of a survey to the personnel that will work with the software (administrative user) where the following instruments will be collected:

- What are your main responsibilities?
- What deliverable(s) do you need?
- Who is it for?
- Why does this problem exist and how is it solved now?
- What type of reports do you need to visualize?
- What platforms are used for this process?

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- What are your future plans for the system?
- What are your expectations regarding the usability of this application ease of use of this application?
- What types of printed and online documentation do you need?
- What are the security requirements?

For the web development and implementation, the option of setting up a server at the educational institution was chosen, so that only the services and software necessary for the proper functioning of the system will be installed and configured. This will also allow the available hardware resources to be dedicated solely to the project.

Likewise, the analysis of the database and the information of the Web Service requires configuring the communication between both for the proper functioning and it is necessary to make the relationships between the tables of the database for efficient processing and consultation, the design is done with the help of the server that will provide us with the services of MySQL, Apache Server and PHP to access, manage and easily organize the data, as shown in Figure 2 below.

Figure 2 Service management using XAMPP software
Source: Own elaboration.

Programming and final visualization

Within the programming it is important the graphical user interface, to establish a better communication between the user and the software system. This consists of different interfaces, which will be assigned to the user according to their profiles and access credentials.

Figure 3 shows the interface for the use of administrative personnel, in which they will have at their disposal a control panel for the activation or deactivation of the teacher evaluation surveys and downloading of reports.

Figure 3 Main graphical interface for managing teacher evaluation
Source: Own elaboration.

For the teaching users, they will have the possibility of visualizing the general results of the evaluations made by the students to whom they teach, besides being able to download the specific reports of each subject they are teaching in the current semester, we can see this interface in figure 4.

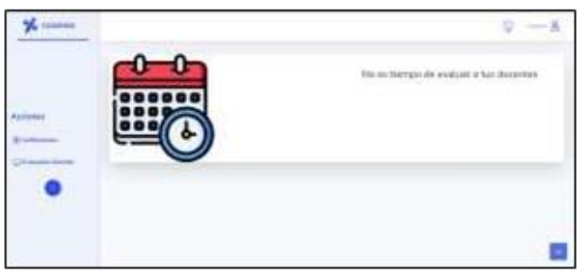

Figure 4 Student graphical interface for accessing teacher evaluation
Source: Own elaboration

Results

In Figure 5 we can see how information is provided on how many teacher evaluations have been received by the students during the teacher evaluation period information is provided on how many teacher evaluations have been received by students during the teacher evaluation period; this information was not previously available. Students had to be asked if they had already completed the corresponding questionnaires. Now with the support of this system all the information is obtained in real time, showing not only how many have been completed or were completed, but also how many are still pending and those that have not yet been completed.

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Figure 5 Number of teaching evaluations performed by students
Source: Own elaboration

The report in Figure 6 shows one of the different results reports (reports) that can be obtained once the teaching evaluation season has ended. Among which we can find: Teaching Evaluation Scores (PED) by degree, PED by teacher, general PED.

So now the system provides a solution and reports on the individual performance of teachers in their respective subjects and degrees in which they are teaching.

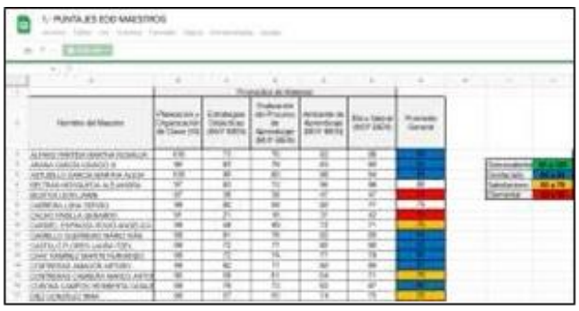

Figure 6 Spreadsheet report generated by the system with the PEDs by teacher
Source: Own elaboration

Figure 7 shows a table where the personal access links of each student (organized by group and degree) were previously stored. As a result of this process, a spreadsheet file with 25 different tables was generated, the problem of working under this format lies in the difficulty of guaranteeing that each student accesses only the link assigned to him/her, that there are no duplicate accesses, etc.

LICENCIATURA EN EDUCACIÓN PREESCOLAR		
1°U		
No.	Docente	Liga de evaluación
1	Moreno Madrigal José Luis	https://forms.gle/qwMssRgscieTKAm6
2	Castillo Flores Laura Itzel	https://forms.gle/qgDJumVmi6w45qHA
3	Contreras Amador Arturo	https://forms.gle/tTBQJhtC8HJfP7R49
4	Pérez Becerril Berenice Guadalupe	https://forms.gle/t7vWqwP614ECeRL8
5	Diez González Irma	https://forms.gle/eL8gHq42J2rvJVpB7
6	Beltrán Mosqueda Alejandra	https://forms.gle/5WD8fgNftHye5fvv9
7	Ramírez Espinosa Yared Holanda	https://forms.gle/fcJDcHM453dZW5CK9
8	Oliva Maciel Judith	https://forms.gle/mmRsJMUcxH3wPSgm7
9	Chay Ramírez Martín Fernando	https://forms.gle/Emrzgama5uk8Yss59
10	Parra Sánchez Salvador	https://forms.gle/j2gxFiM13i59VG3r5
11	Mateos Guerrero Alberto	https://forms.gle/YevZCH4qD3NER3NT8
12	Gallardo Portillo Amanda	https://forms.gle/s7mrDp7mDosByRWm8

Figure 7 Table of links to previously used teaching evaluations
Source: Own elaboration

This is solved and automated with the implementation of the following section of the teaching evaluation system, in which after the student logs in, he/she will be presented with his/her pending evaluations, the form used to capture the student's answers is shown in Figure 8.

Figure 8. Form displayed by the student to carry out the teaching evaluation
Source: Own elaboration

Conclusions

By establishing the use of new technologies allows us to transfer and develop a rp system, a strategy to obtain analytical results and dynamic graphic presentation to manage data and consolidate them in a manner consistent with a graphical presentation and to observe the weaknesses and opportunities that the teacher can bring to the student and strengthen their meaningful learning, without forgetting that the teacher must be prepared to meet the new demands in information techniques, as a student.

In this project the teacher is a fundamental part for the realization of a successful methodology, due to the incentive and innovation of processes so that the students learn and can develop projects by themselves, and thus create their own knowledge, to develop in the work and personal environment. Without forgetting that the student is motivated when there is a teacher with the vision of teaching, with the pillars of education "learning to learn, learning to do and learning to live", therefore, the teaching practice is one of the aspects that must be taken as a priority for the development of a society.

References

Foundation, O. (2021). Jquery.Com. https://jquery.com/

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GoDaddy, E. e. (2019, Octubre 04). godaddy.com.mx. godaddy.com.mx. https://mx.godaddy.com/blog/que-es-un-sitio-web/#:~:text=Un%20sitio%20web%20es%20un,de%20inicio%20o%20Home%20page.

Ionos.mx. ionos.mx. https://www.ionos.mx/digitalguide/servidores/know-how/que-es-un-servidor-un-concepto-dos-definiciones/

Lerdorf, R. (2021). Php.Net. https://www.php.net/

Mdn,. (2022, 09 1). Mdn Web Docs. https://developer.mozilla.org/es/docs/Web/JavaScript

Mdn Web Doc, N. MD. (2005). developer.mozilla.org. Retrieved Marzo 21, 2021, from https://developer.mozilla.org/es/docs/Web/API/Service_Worker_API

Pérez Porto, J. &GA. (2019). My Sql. https://definicion.de/mysql/

Pérez, J. & Gardey, A. (2014). Reincidencia. Unknown.

Pressman, R. (2003). Ingeniería del Software, un enfoque práctico. McGraw-Hill.

Pressman, R. S. (2010). Ingenieria de software, un enfoque práctico. McGrawHill.

Vaca, C. (2011). Paradigmas de Programación. Universidad de Valladolid.

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