Proposal for a Web System for Tracking Graduates of the National Technological Institute of Mexico Campus Olmec Zone

Cipatly David Rodríguez Isidro, Clemente Hernández Arias, Víctor Manuel Arias Peregrino,
Dulce María León de la O, Hugo del Ángel Delgado

National Technological Institute of Mexico Campus Villahermosa.

Abstract

National Technological Institute of Mexico Campus Olmec Zone was founded in 1982 and became part of the National Technological Institute of Mexico in 2014. The department of Technological Management and Linkage is in charge of establishing, coordinating and maintaining the relationship with the productive, public and private sectors to support the fulfillment of linkage programs. This department carries out the alumni follow-up process whose purpose is to add improvements in the educational process, mainly in the study plans and programs, which increases the effectiveness of the institution, through the collection and information analysis provided by the institution's graduates. The development of the proposed project seeks to obtain reliable and timely information on the labor market insertion process in order to assess the degree of impact of the educational institution in the productive and social sector, providing a tool that facilitates this process for the TecNM Campus Olmeca area and complements the progress of its quality indicators, allowing to provide the graduate with a platform that allows them to obtain opportunities in the labor area and that companies have a catalog of professionals with the necessary skills for their jobs.

Resumen

El Tecnológico Nacional de México Campus Zona olmeca fundado en el año 1982, forma parte del Tecnológico Nacional de México a partir del año 2014, dentro del tecnológico se encuentra el departamento de Gestión Tecnológica y Vinculación, encargada de establecer, coordinar y mantener la relación con el sector productivo, público y privado para el apoyo del cumplimiento de programas de vinculación. Este departamento lleva a cabo el proceso de seguimiento de egresados el cual tiene como propósito agregar mejoras en el proceso educativo, principalmente en los planes y programas de estudio, que incrementa la efectividad de la institución, por medio de la recopilación y análisis de información brindada por los egresados de la institución. Con el desarrollo del proyecto propuesto se busca obtener información confiable y oportuna sobre el proceso de inserción laboral con el fin de valorar el grado de impacto de la institución educativa en el sector productivo y social, proporcionando una herramienta que facilite dicho proceso para el TecNM Campus zona Olmeca y complemente el progreso de sus indicadores de calidad, permitiendo brindar al egresado una plataforma que les permita obtener oportunidades en el área laboral y que las empresas cuenten con un catálogo de profesionistas con las competencias necesarias para sus puestos de trabajo.

1. INTRODUCTION

Graduates follow-up of, allows institutions to measure the efficiency of their study plans according to the capacity of their graduates in the labor field, that is why it's very important that this process is done in an efficient and reliable way, the graduate follow-up system will provide a tool to carry out this process according to the needs of the institution, starting from the data of their alumni, the feedback will be execute through a survey that must be carried out periodically, As well as facilitating access to the labor exchange that will be fed by the companies with which the TecNM campus Zona Olmeca has established agreements, allowing access to a catalog of trained

professionals who meet the optimal characteristics for jobs, the institution can efficiently nourish its Annual Work Plan indicators that pertain to the follow-up of graduates.

2. BACKGROUND

National Technological Institute of Mexico Campus Olmec Zone, founded in 1982, was born as an Agronomic Technological Institute No. 28, in 2005 it becomes National Technological Institute of the Olmec Zone, belonging to the General Direction of Technological Higher Education and in 2014, it becomes part of the National Technological Institute of Mexico. Among its educational offer are the careers of Agronomic Engineering, Forestry Engineering, Community Development Engineering and Computer Systems Engineering, accredited by the Mexican Committee for Accreditation of Agronomic Education, A.C. (COMEEA) in 2019, currently with 220 students. Thus, being a reference of Agricultural Education in the State of Tabasco.

It's the most important institution of higher agricultural education in the region, and its mission is to train professionals within the context of the quality institution that the country demands, through the generation and transfer of knowledge for the rational use and management of natural resources, with the consequent productive, social, economic, comprehensive and sustainable development.

General Information about the Company

National Technological Institute of Mexico Campus Olmec Zone it's located in Prolongación Ignacio Zaragoza S/N Villa Ocuiltzapotlán, Centro, Tabasco.

It is a quality institution that the country demands, through the generation and transfer of knowledge for the rational use and management of natural resources, with the consequent productive, social, economic, comprehensive and sustainable development.

Mission

To offer quality educational services that contribute to the integral formation of competent professionals, based on responsibility, teamwork, leadership and equity, that promote the development of society.

Vision

To be an educational institution of excellence that generates, applies and transfers knowledge in the Mexican Southeast.

Values

- Responsibility and accountability
- Quality
- Teamwork
- Leadership
- Fairness

3.   CONTEXT OF THE PROBLEM

The problem to be mentioned deals mainly with the follow-up of graduates of National Technological Institute of Mexico Campus Olmec Zone, in the area of Technological Management and Linkage, this is due to the fact that we do not have the current data of the graduates and there are even cases in which we do not have any information, data on graduates are obtained through surveys which are sent by e-mail or applied in writing to professionals when they are invited to an event at the institution, as well as to companies that have an agreement with the institution, the corresponding survey is sent by e-mail and when they participate in events at the institution, the questionnaire is applied in writing, Consequently, it is not possible to provide a job bank that allows professionals to have contact with potential employers and the institution to have the necessary information to obtain the results of the quality indicators corresponding to the follow-up of graduates, thus reducing the results and making it difficult for the institution to make decisions regarding its curricula and the quality of its professionals. In conclusion, there is no adequate follow-up of students after the graduation process.

4.   PROBLEM STATEMENT

National Technological Institute of Mexico Campus Olmec Zone it's located in Prolongación Ignacio Zaragoza S/N Villa Ocuiltzapotlán, Centro, Tabasco, has the department of Management and Linkage, that is responsible for establishing, coordinating and maintaining the relationship with the productive sector,it's in charge of establishing, coordinating and maintaining relationships with the productive, public and private sectors to contribute to the fulfillment of linkage programs, thus allowing the planning, coordination, control and evaluation of activities related to the provision of social service and community development, visits to companies, internships and professional residencies, as well as the follow-up of the Institute's graduates.

According to the aforementioned, it was detected approximately two and a half years ago that this process is affected due to the fact that we do not have all the necessary information of the graduates, such as their contact information and updated resumes. These methods are not efficient to obtain the information from the surveys in an easy and effective way because it is not possible to contact all the graduates via e-mail or that all of them attend the events, in the same way, the survey of employers is applied to the companies with which the institution has contact by e-mail or at the time of their attendance to events at the institution, likewise the companies send their information and their job offers to the institution, which then sends this information to its graduates, all of the aforementioned causes that the link between companies and graduates is not carried out in the best way, that is why there is no information on the entire population of interest.

It is also important to mention that, since we do not have all the data from the surveys for analysis and processing, the results obtained do not reflect the reality of the professionals who graduated from the institution, internally these data are linked to the indicators related to quality follow-up, that is, if the data obtained from the follow-up of graduates is not shown in its entirety, the progress of the quality indicators is diminished, affecting the institution's decision making process.

5.   JUSTIFICATION

The Secretary of Public Education (SEP), through the Undersecretary of Higher Education through the document Technical and Administrative Provisions for the Follow-up of Graduates mentions:

"The purpose of graduate follow-up is, to incorporate improvements in the Educational Process, especially in the study plans and programs, which increases institutional effectiveness, through the collection and analysis of information on the professional and personal performance of graduates, as well as the requirements of the employer sectors. (Tecnologica(SEP), 2018) "

The graduate follow-up system seeks to: obtain reliable and timely information on the process of labor market insertion, both their performance in employment and their professional career, in order to assess the degree of impact of the university on the productive and social sector.

To provide a tool that facilitates the graduate follow-up process for the National Technological Institute of Mexico Campus Olmec Zone and complements the progress of its quality indicators, to provide graduates with an easily accessible platform that allows them to obtain opportunities in the labor field and that companies have a catalog of professionals with the necessary skills for their jobs.

6.   GENERAL OBJECTIVE

To develop and implement a web system for the follow-up of graduates of the National Technological Institute of Mexico Campus Olmec Zone.

7.   SPECIFIC OBJECTIVES

- To analyze the system requirements.
- Model the database.
- Design the system interface.
- Develop the system modules:
- Users Module.
- Professionals Module.
- Careers Module.
- Companies Module.
- Job Board Module.
- Surveys Module.
- Implement the web system in the server.

8.   YII2 FRAMEWORK

Yii is a framework based on object-oriented programming and PHP, is free license and allows the development of large-scale web applications, allowing rapid development, which is currently in its version 2 and version 3 is

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being developed with compatibility with PHP version 8, the name yii (pronounced /i:/) is for easy (in English easy), efficient (in English efficient) and extensible (in English extensible) (Xue, 2008).

Some characteristics of yii.

➢ Model View Controller (mvc) design pattern.
➢ Database Access Objects(DAO), query builder, Active Record and database migration.
➢ Integration with jQuery.
➢ Form inputs and validation.
➢ Ajax widgets, such as autocomplete text fields and more.
➢ Built-in authentication support. In addition, it supports authorization via hierarchical Role-Based Access Control (RBAC).
➢ Customization of skins and themes.
➢ Complex WSDL generation, specification and management of Web Service requests.

9. PHP

PHP (recursive acronym for PHP: Hypertext Preprocessor) is a very popular open source language especially suitable for web development and can be embedded in HTML.

This hypertext processor allows us to improve the efficiency of coding for the appearance and functioning of the web environment, allowing us to develop more complex operations and applications efficiently. (R., 1995)

10. MariaDB

MariaDB Server is one of the most popular database servers in the world. It is made by the original developers of MySQL and is guaranteed to remain open source. notable users include Wikipedia, WordPress.com and Google.

MariaDB converts data into structured information in a wide range of applications, from banking to websites. Originally designed as an enhanced direct replacement for MySQL, MariaDB is used because it is fast, scalable and robust, with a rich ecosystem of storage engines, plugins and many other tools that make it very versatile for a wide variety of use cases.

MariaDB is developed as open source software and as a relational database it provides a SQL interface for accessing data. The latest versions of MariaDB also include GIS and JSON functions. (Ulf, 2009)

11. PROPOSAL

According to the points mentioned above, it is proposed to develop a system for traking graduates to meet the needs described in the problem, using technological tools to provide robustness, security and reliability to the system, taking into account the following points:

Cope

- It will allow registered users to create their CV, answer the corresponding surveys to alumni and companies, as well as access to the job bank.
- Business users will be able to access to a job bank and create profiles for job vacancies.
- Administrators will be able to report on alumni indicators and generate documents in pdf format (*.pdf).
- A web version will be finalized, stored at the National Technological Institute of Mexico Campus Olmeca Zone Olmeca, within its local server.

SWOT

The SWOT of the proposal will allow us to identify the areas of opportunity that the system will have as well as its strengths.

Table 1. Swot analysis.

	Strengths	Weaknesses	Opportunities	Threats
WEB SYSTEM FOR TRACKING GRADUATES OF THE NATIONAL TECHNOLOGICAL INSTITUTE OF MEXICO CAMPUS OLMEC ZONE	Allows access from any device connected to a network. Allows users to manage their information. Allows the management of the labor exchange. Provides a digital catalog of professionals. It allows the institution to evaluate the indicators of the graduate area.	It is a system under development. No tests have been conducted to assess its effectiveness. Access is limited to users with enrollment assigned by the TecNM campus Olmec Zone.	The integration of a job banks as a tool in the labor area for graduates of the Institute. Periodic digital surveys to graduates and companies. Contribution to the evaluation of indicators pertaining to the institution's graduate process.	The change of the parameters of the graduate follow-up. User acceptance of the system.

For the development of the project, we seek to implement a development methodology, in this case the SCRUM methodology is proposed to guide the process from beginning to end.

SCRUM

SCRUM is an agile development methodology used in software development based on an iterative and incremental process. SCRUM is an adaptable, fast, flexible and efficient agile framework that is designed to deliver value to the customer throughout the development of the project.

Software development is carried out through interactions called Sprints, with an approximate duration of 30 days. The result of each Sprint is the conclusive result of the executable to be shown to the client (CHANCUSI, 2012).

This methodology creates a great relationship with the client and the final product, facilitating to the developers the progressive delivery of results and decreasing the risk of possible changes in the final stretch of the project, being this one of the main reasons to be proposed for the development of computer systems.

12.   CLASS DIAGRAM.

Based on the analysis of the document Disposiciones Técnicas y Administrativas para el Seguimiento de Egresados in its version 2.0 in force since 2018 (Josefina Vázquez Mota, 2018), this class diagram proposal is made to which the functionalities of a job bank and other criteria are added according to the aforementioned proposal as a start for the development of the system.
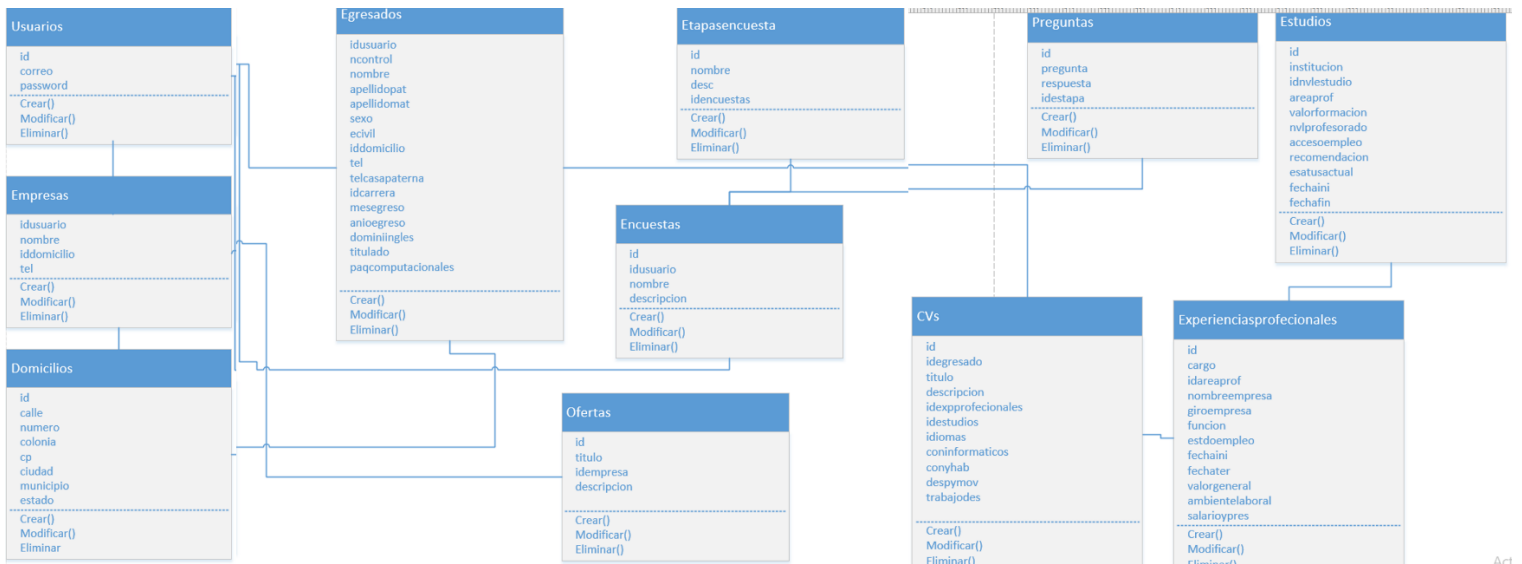

Figure 1. Proposed Class Diagram for the SSEITZO.

The following class diagram is proposed, derived from the analysis carried out in this first stage of the project development, which implies that there is the possibility of an improvement for the structure of this diagram.

13.   CONCLUSION

In conclusion, we propose a web system for the follow-up of graduates of the Technological Institute of Mexico Campus Olmec Zone with the following main points:

Functionality

- It will allow users to create their account being validated by the control number provided by the institution.
- It will allow the management of the labor exchange so that companies can post their job vacancies.
- It will allow graduates to create their CV and apply for job vacancies in the labor exchange.

- It will allow users to answer the survey of graduates and companies digitally, possibly twice a year, in a period of approximately 6 months.
- It will allow the administrator to generate the survey results report.
- It will allow the administrator to visualize the results using graphs.

Security

The system will have a section of roles and permissions which will allow the correct management of users within the system.

Portability

The system can be deployed in different devices with internet access.

This is the initial proposal for the project, which is currently under development in its early stages, with the purpose of covering the needs of the problems described in this document and open to changes for the continuous improvement of the system in question.

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Author's mail: *M21301110@villahermosa.tecnm.mx*

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