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Presentatiton of Content

In this Volume 4 Issue 6, As First Article we present, *Finding the use given by computer students to social networks (Case: DAIS-UJAT)*, by JERONIMO-YEDRA, Rubén, ALMEIDA-AGUILAR, María Alejandrina, RAMOS-MÉNDEZ, Eric and GÓMEZ-RAMOS, José Luis, with secondment at the Universidad Juárez Autónoma de Tabasco, as a second article we present, *Design and development of integration activities at preschool level using technology*, by APAN-ARAUJO, Karla Cecilia, MARTÍNEZ-TÉLLEZ, Rubelia Isaura and SORIANO -PORRAS, Dulce Maria, with affiliation at the Universidad Politécnica de Amozoc, as the third article we present, *Development of a Website through XP Xtreme Programming, for the Integration of Academic Production in the research area*, by JUAREZ-SANTIAGO, Brenda, ROJAS-HERNÁNDEZ , Sergio Alejandro, SILVA-RIVERA, Manuel Eduardo and LANDAVERDE-NERI, Juan Pablo, with adscription at the Universidad Tecnológica de San Juan del Río, as fourth article we present, *Methodology for the UPFIM own software development*, by REYNA-ANGELES, Omar, HERNÁNDEZ-TAPIA, Zaila, SOTO-FERNÁNDEZ, Susana Leticia and GÓMEZ-RAMOS, Marcos Yamir, with affiliation in the Universidad Politenica de Francisco I Madero.

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Finding the use given by computer students to social networks (Case: DAIS-UJAT)**Descubriendo el uso que le dan los estudiantes de informática a las redes sociales (Caso: DAIS-UJAT)**

JERONIMO-YEDRA, Rubén †, ALMEIDA-AGUILAR, María Alejandrina, RAMOS-MÉNDEZ, Eric and GÓMEZ-RAMOS, José Luis

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Abstract

Social networks are part of our daily lives and the importance they have today is evident and indisputable, which have changed the way we communicate with friends, colleagues or even with teachers and classmates. Social networks are powerful tools that allow individuals to interact, but also develop skills and abilities such as socialization, teamwork or the importance of sharing, developing communication skills. In view of this situation, this quantitative study was carried out, with a descriptive exploratory approach, whose objective is to know the use given to social networks by students in the computer science area of the Universidad Juárez Autónoma of Tabasco. To this end, a questionnaire was used as a data collection instrument that was applied to the target population. Observing in the results, which networks have been used more frequently by students, as well as among the reasons for their use, it can be seen that they are already used in the educational field and for what purposes the teacher uses them.

Social networks, Computing, UJAT

Resumen

Las redes sociales forman parte de nuestra vida cotidiana y la importancia que tienen en la actualidad, es evidente e indiscutible, las cuales han cambiado la forma que tenemos de comunicarnos con amigos, compañeros de trabajo o, incluso, con profesores y compañeros de clase. Las redes sociales son poderosas herramientas, que permiten a los individuos interactuar, pero también desarrollar habilidades y aptitudes tales como la socialización, el trabajo en equipo o la importancia de compartir, desarrollando habilidades comunicativas. Ante tal situación se realizó este estudio de tipo cuantitativo, con un enfoque exploratorio descriptivo, que tiene como objetivo saber el uso que le dan a las redes sociales los estudiantes de área de informática de la Universidad Juárez Autónoma de Tabasco. Para ello se utilizó como instrumento de recolección de datos un cuestionario que fue aplicado a la población objetivo. Observándose en los resultados, cuáles redes han usado más frecuentemente los estudiantes, así también entre los motivos de su uso, se puede observar que ya se emplean en el ámbito educativo y con que fines las utiliza el profesor.

Redes sociales, Informática, UJAT

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† Researcher contributing first author.

Introduction

Information and communication technologies (ICT) have changed the ways of communication, fun and work, especially in children, adolescents and young people called millennials. Society evolves and thanks to ICT, today we can say that our children and young people have access to a world of options and unlimited offers of communication.

If something characterizes the human being by nature is its social nature, for its need to have interpersonal relationships based on the act of communication and transmission of information between individuals. This aspect of human beings together with the rise of information and communication technologies, especially with the generalization of the use of the Internet, has meant a transcendental change in today's society as far as the cultural, communication and productive sphere is concerned. (Santiago, 2012).

The widespread use of new technologies, the Internet boom and the recent impact of Social Networks have led to profound changes in the way we relate, communicate and express ourselves, especially in the group of adolescents (Rodríguez, 2017).

Regarding the role of the student in social networks, and being the one who represents the central axis of the teaching-learning process, it is necessary to develop knowledge linked to the possibility of accessing the sources of information supported by technologies and, in addition, show technological competences that allow you to consume, use and produce more information.

Students in the context of social networks need to develop skills such as finding, assimilating, interpreting and reproducing information (Torres y Carranza, 2011).

The present work is the result of applying a pilot test of an instrument, which is currently being used in a wider investigation, involving both student and teachers.

In the aforementioned research, the aim is to investigate the use of computer science students, specifically those studying Computer Systems Engineering (ISC) of the Academic Division of Information Technology and Systems (DAIS), of the Universidad Juárez Autónoma de Tabasco (UJAT), they give to social networks.

Theoretical aspects of research

It is important to review the theoretical concepts involved in this work, taken as an initial reference the concept of the Internet to understand how social networks are important today in educational processes.

a) Internet concept

The Internet has now become a very important tool in education. The positive aspects that already involved the use of the computer in the classroom have been added to the fact of sharing knowledge in a more global way. Internet is also used within education as an administrative tool, continuing education, distance education, etc. (Puiggalí, 2004)

Conceptually, the Internet is a large network of networks that covers practically the entire planet and makes it possible for users from all over the world to connect. In its origins the American government, and more specifically the Department of Defense, built an initial network, known as ARPANet. This network was extended throughout the country and began to be used by North American universities, to use it mainly for the scientific and informative interest that the network had (UNSL, 2008)

b) From the Web to the Web 2.0

The World Wide Web ("web of worldwide scope") or simply the Web, had its origins in 1989 in Geneva, Switzerland, in circumstances in which the British researcher Tim Berners-Lee was dedicated to find an effective solution to the problem of proliferation and the heterogeneity of information available on the Web. Integrating existing services on the Internet (such as the widely used Gopher at that time) Berners-Lee developed the basic architecture of what is currently the Web (Valzacchi, 2003)

Until 1990, the Internet was a set of unconnected computers and you could not navigate from one direction to another by clicking on a link. Neither the search engines existed, nor could images be integrated on the screen since graphic interfaces for the World Wide Web had not been developed.

The WWW is defined as a set of hypertext documents and / or hypermedia linked and accessible through the Internet. The WWW is a distributed system that allows us to navigate easily through huge amounts of information. With a Web browser, a user views pages that can contain text, images, videos or other multimedia content, and navigates through them using hyperlinks.

It was created by Tim Berners Lee and Robert Caillau in 1992, within the framework of the research carried out at CERN with the aim of integrating information accessible through a single computer network (Abuín and Vinader, 2011).

This World Wide Web or simply the Web, which has a basic form with text-only browsers quite fast, based on hypertext, which allows to classify information of various types and which is known as the great world spider web, is also called Web 1.0 . Which works as mentioned before, by hypertext and graphics and includes multimedia effects. It is considered as the most simple and comprehensible access to the universe of information available on the Internet, since it links pages or documents located in the network, regardless of their physical or geographical location (Lozada, 2009).

Much is heard today about Web 2.0. The term, coined for the first time in 2004, is now a recurring theme in corridor conversations, news, strategic communication campaigns and the like. However, before taking an active part in this new stage, it is necessary to understand exactly what it is about, how it changes us and what it is useful for us.

Web 2.0 must be seen not only as a social phenomenon, but also as the transition that gave the Internet with the aim of becoming closer to those who were on the other side of the screen. Its main objective was to focus production according to the end user, even counting on their active participation in the process. We talk about thinking content, developments and applications that meet the needs of the population (Cadena, 2010).

Web 2.0 is nothing more than the evolution of the Web in which users stop being passive users to become active users, who participate and contribute to the content of the network, being able to create, support and be part of a network society and / or communities both locally and globally; who are informed, generating knowledge and content.

Web 2.0 facilitates the interaction of users who participate by generating content and valuing applications and services, mainly in organizations that have large amounts of information, and provide knowledge that can be a very useful tool to innovate all types of products and services. It also allows to create content (texts, photos, audio, video) without having programming knowledge (Perera, 2017).

c.-) Social networks and their importance

Through the history of humanity, human beings have used different ways to communicate, from communication with signs, to communication at a distance by means of advanced technological devices.

The emergence of social networks dates back to 1995, when Randy Conrads created the classmates.com website, so that people could recover or maintain contact with former colleagues at school, university, etc. (Deloitte, 2014).

The history of social networks, in the format we know them today, dates back to 1997, with the sixdegrees.com network that allowed users to create their profile and have a list of friends, and from 1998, navigate through it. Since then the growth in users and networks has been vertiginous. Facebook is an example of this; was born in 2004, until 2006 it was not allowed the registration of people who did not have a mail account of a North American university and in 2008 it only took five weeks to go from 150 million users to 175 and growing at a rate of 600,000 users per day (Celaya, 2008 cited in Pérez - Wiesner et al., 2014).

The human being is a social being. Therefore, social networks exist since human beings coexist in society. However, at the dawn of the 21st century, a new form of network socialization has emerged, combining social and technological elements. Linked to the emergence and development of the Internet, social networks have become one of the phenomena most studied in recent years, due to its enormous penetration in society, and therefore its impact at the global level (Vinuesa, 2015).

Social networks are currently everyday forms of social interaction, defined as a dynamic exchange between people, groups and institutions of high complexity that involves groups that identify with the same needs and problems.

Currently the trend of social networks is focused on the consumer market of society, such as fashions to dress, eat or even talk. More and more companies and institutions are striving to occupy that interactive medium to make a presence and gain market, becoming involved with the dynamics or generating diverse needs for expression, entertainment, etc. among users (Miranda et al., 2011).

Social networks are part of what is known as web 2.0 technologies, and that is why they have a great potential in education, since they promote students active and involved in their learning.

In the current statistics, both globally, and in our country, it is well known that their use is growing significantly, which is why it is convenient to consider them as feasible spaces to provide educational information to students who, once connected, they can take advantage of their time to consult educational content and interact with teachers and other students (Valenzuela, 2013).

Social networks are an excellent opportunity to enhance learning, given that they have the undeniable value of bringing informal and formal learning closer together. They allow the student to express themselves, to establish relationships with others, as well as to meet the demands of their education (Naso et al., 2012).

The incorporation of Web 2.0 applications in training processes implies adding new communication styles, roles, intervention forms, scenarios and a wide range of activities, which, in turn, require fulfilling a series of educational challenges; therefore, it is necessary for universities to assume the challenges that these tools represent within integrative approaches, which seek to create better educational spaces for exchange and training activity, and take advantage of the network potential (García, 2009 cited in Islas y Carranza, 2011).

Web 2.0 tools can be exploited with a competitive advantage to work collaboratively, as they are free and accessible platforms, which favor the motivation and interest of students when looking for strategies that benefit their learning (Islas and Carranza, 2011).

In this sense, this research was carried out with the intention of discovering the use given to social networks by students in the computer science area, specifically those studying Computer Systems Engineering (ISC), in the Academic Division of Computing and Systems (DAIS) of the Universidad Juárez Autónoma de Tabasco (UJAT).

Nowadays many people have become very dependent on mobile devices and pending what happens on social networks. Many see it as a way of being in communication with different people, who are divided by the geographical barrier of distance, but who are close to technology.

But as many people use it to socialize with other people, many others see it as a means where they can learn by reviewing educational materials that can range from handicrafts, recipes, decoration, nutrition or diets, to more specialized ones such as marketing or microelectronics to mention some of the many courses that circulate on social networks.

That is why the main objective of this work is to conduct a survey to discover the use that computer students give to social networks and determine if they use them to support their academic activities, within their school subjects. Worldwide, universities are becoming aware of this new world of opportunities offered by the Internet, where the teacher also acquires a very participatory role from the moment he himself provides teaching materials and even carries out virtual tutorials. The university is in a deep process of reorganization, which tries to keep pace with the changes that are taking place in today's society. Undoubtedly, we are facing new training spaces, which can complete face-to-face teaching that we have always known.

Social networks are precisely one of the ways that the Internet gives us to communicate with people. As mentioned in previous paragraphs, they are framed in the Web 2.0 denomination and they suppose a form of social interaction that is based on the interactive and dynamic exchange of different information between different people, groups or institutions. Social networks have especially favored group work and collaboration between peers. It is an ideal space to share knowledge that is attractive and motivating for students (Muñoz et al., 2013).

Methodology

The present investigation is based on the qualitative approach where an objective reality is analyzed from numerical measurements and statistical analysis to determine predictions or behavior patterns of the phenomenon or problem posed, where at the end of the investigation a generalization of results must be achieved, predictions, control of phenomena and the possibility of making replicas with said research (Sampieri, 2014).

This research will be exploratory and descriptive since it is intended to give a general view, regarding the reality of ISC students of the DAIS-UJAT in the use of social networks, describing the reality of the groups that served as a sample.

For the data collection the survey was used as instruments, to obtain information from the students of Computer Systems Engineering.

The population that was used for this work was composed of the students of the Computer Systems Engineering (ISC) career, in the Computer and Systems Academic Division (DAIS) of the Universidad Juárez Autónoma de Tabasco (UJAT).

As mentioned at the beginning this work arises from a pilot test, where the sample that was used was obtained under a census type sample, formed all the groups that were studying the subject of Programming of the first semester of the ISC of the DAIS-UJAT, of which turned out to be only 3, same that were conformed with a total of 46 students, to as shown in Table 1.

The decision was made to work with first semester students, as they are the groups with the largest population within the academic division, since in the most advanced semester groups, this is quite scarce, where large groups can be represented by a plus 5 or 6 student.

It should be noted that this work comes from doing a pilot test, on an instrument that is currently being applied, in a larger project, where students and teachers will be involved..

Group	Number of students
A	15
B	18
C	13

Table 1 Universe of data
Source: Own Elaboration

The methodology that was used to conduct this work was its own elaboration, which is composed of the following stages: a) Gather information, b) Design the instrument, c) Apply questionnaire and d) analyze the data.

Data collection instrument

The data collection instrument that was used to investigate the use that computer students give to social networks was composed of 25 questions, divided into two blocks of questions:

- **Block 1:** The most used social network and with what purpose

This block tried to obtain information from the social networks that the boy uses most and with what purpose.

- **Block 2:** Social networks and academic work

This block was intended to know that they have both used social networks as a means of academic communication and complement their subjects.

Below are some of the most significant (Table 2):

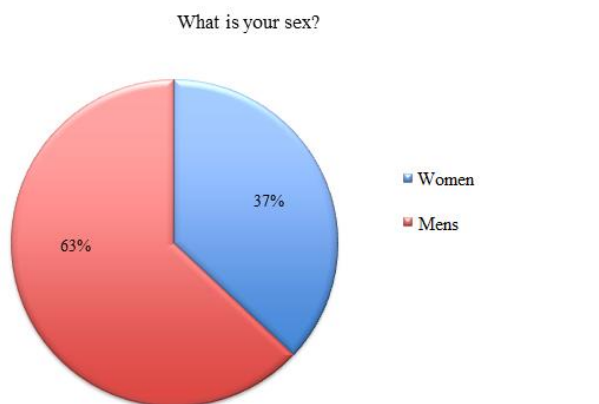
Student questionnaire	
Question	Answer
How much have you used social networks?	a) Much b) Sometimes c) Hardly ever d) I do not use them
Mark which social networks you have used	- Facebook - Whatsapp - Wechat - Instagram - LinkedIn - Snapchat - Youtube - Other
Of the following social networks, which one do you use the most?	- Facebook - WhatsApp - Wechat - Instagram - LinkedIn - Snapchat - YouTube - Other
With what intention have you used social networks? (You can choose more than one option):	- To make friends - For academic activity - To sell products - To look for a job - Other activity
Have you used any of the social networks as a complement to your classes that your teachers give you?	a) Forever b) Sometimes c) Rarely d) Never
Choose from the following list, what type of use you have given to social networks, when your teacher uses them as a complement to their classes (you can select more than one option)	- Send tasks - To receive course notes - For online advice - To receive tasks - To receive multimedia material (Videos or audios) - To receive notices related to the subject
Do you think it is good to use social networks as a complement to your teacher's classes ?, (choose an option)	- Totally agree - In agreement - In disagreement - Totally disagree

Table 2 Sample instrument questions
Source: Own Elaboration

Results

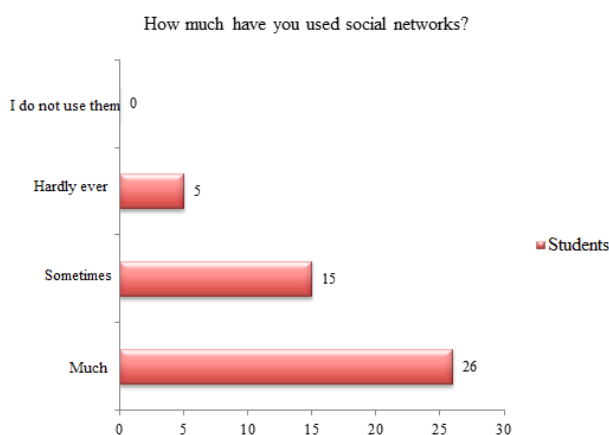
Below are some of the most significant results of Block 1: The most used social network and for what purpose.

The students were asked: What is your gender?, resulting that 63% of the respondents are men and the rest are women.



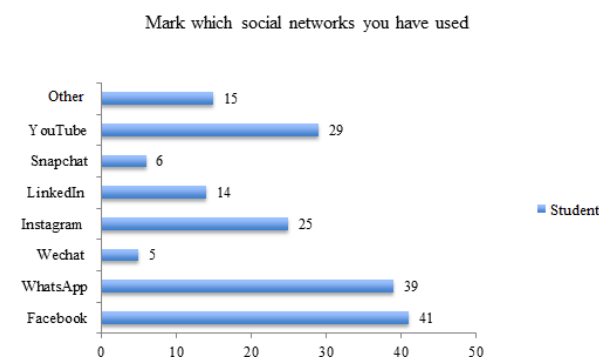
Graphic 1 Gender of the surveyed students
Source: Prepared by the authors

To the question, how much have you used social networks ?, 26 (57%) of the students answered that "Much", while the option "I do not use them", got 0%.



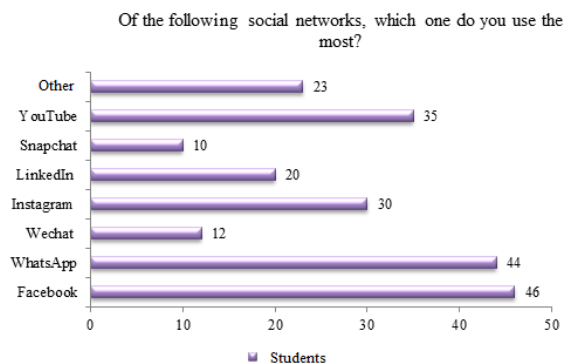
Graphic 2 Times the student has used the networks sociales
Source: Own Elaboration

The students surveyed were asked to mark which social networks they had used, where it was noted that Facebook and WhatsApp were the most chosen, with 41 and 39 responses respectively, while WeChat only received 5 responses.



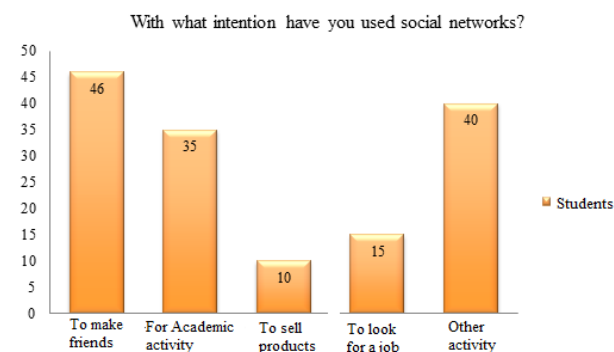
Graphic 3 The social networks that the student has used
Source: Own Elaboration

One of the questions was shown a list of social networks, where they were asked to mark only 3 of the most used, having as answers that Facebook and WhatsApp were the most chosen, with 46 and 44 responses respectively, while SnapChat he only got 10 answers.



Graphic 4 The social networks that the student uses the most
Source: Own Elaboration

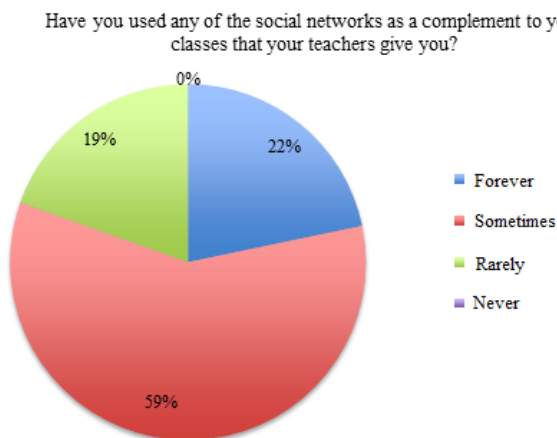
Students were also asked, with what intention have you used social networks? Giving them the option to choose more than one option, resulting in 46 of them choosing "To make friends", while only 10 of them said that "To sell products".



Graphic 5 Intention to use social networks
Source: Own Elaboration

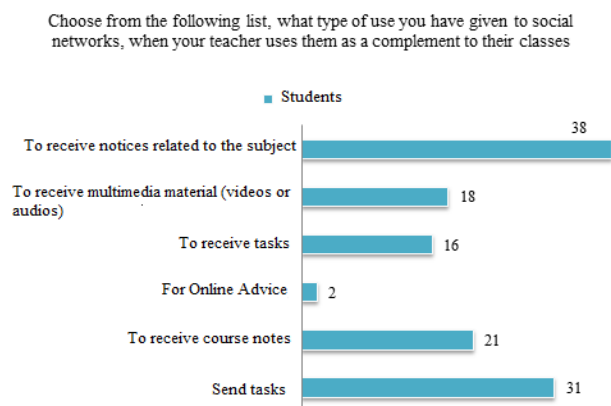
Below are some of the most significant results of Block 2: Social networks and academic work.

To the question, have you used any of the social networks as a complement to your classes that your teachers give you?, 59% (27) of the students answered "Sometimes", 22% said "Always", 19% selected " Rarely "and the option" Never "had 0%.



Graphic 6 Use of social networks as a complement to classes
Source: Own Elaboration

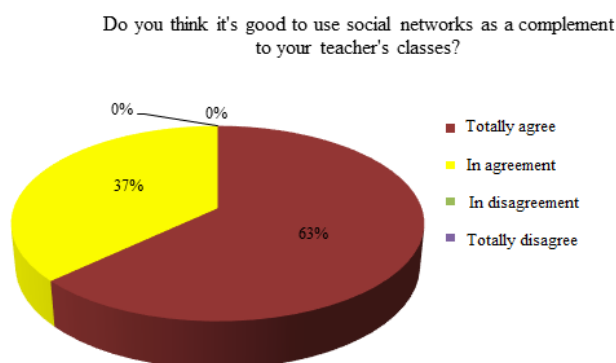
Students were asked to choose from a list of options, what type of use you have given to social networks, when their teacher uses them as a complement to their classes, where "To receive notices related to the subject", he got 38 answers and "Send homework" got 31, while "Online counseling" only had 2 answers.



Graphic 7 Use of social networks as a complement to classes

Source: Own Elaboration

A very important question asked to the students was, Do you think it is good to use social networks as a complement to your teacher's classes?, where 29 (63%) of the respondents mentioned that they were "Strongly Agree", while 37 % (17 students) selected "Agree" and with 0% the answers "Disagree" and "Strongly disagree" were found.



Graphic 8 Opinion to use social networks as a complement to the classes

Source: Own Elaboration

Conclusions

As mentioned at the beginning of this document, this work was born out of the concern of doing a pilot test of an instrument, which is currently being used in a wider investigation, involving both students and teachers.

This work allowed us to corroborate what many authors and organizations mention, that the social network Facebook, is the one most used by young Mexicans nowadays and those of the computer science area, specifically those who are studying Computer Systems Engineering (ISC), in the Academic Division of Information Technology and Systems (DAIS) of the Universidad Juárez Autónoma de Tabasco (UJAT), followed that same trend.

You can also see that students, being immersed in social networks, their main purpose is to make friends, although it is noted that 76 percent of them have used it for academic activities.

It can also be observed that 59 percent of the students answered that they have sometimes used some of the social networks as a complement to their classes given by their teachers, but also 19 percent answered that rarely and this is where you have that work in the promotion of the same with the teachers, so that they begin to involve them in their academic activities.

It was also possible to observe the positioning of the surveyed boys, since 63 percent of them mentioned that they think it is good to use social networks as a complement to their teacher's classes.

For all the above is that this work gave guidelines for a larger project, to investigate how the use of social networks have an impact on the teaching and learning process.

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Design and development of integration activities at preschool level using technology

Diseño y desarrollo de actividades de integración a nivel preescolar utilizando la tecnología

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Abstract

The present investigation shows the way of designing educational activities according to the Preschool Program supported with the use of technology. In such a way, that with the strategies, the specific objectives, the competences; which are indicated in said Program and together with the collaborative work and the technology; strengthen meaningful learning in a group of first grade of preschool. To enhance the skills, attitudes and skills of the students, a work plan was designed in which the way to use technology with the use of the Robot NAO from the Universidad Politécnica de Amozoc, Puebla is described and thus design and develop planned activities as established by the Preschool Program; which start from a methodology using a technological strategy. The general objective is to carry out the design to develop integration activities at the preschool level using technology. The results obtained were the improvement of skills, attitudes and aptitudes among the children, the educator, the rules established in the classroom, their empathy among peers and sometimes in the subsequent tasks they perform at home.

Educational activities, Preschool Program, Technology

Resumen

La presente investigación muestra la manera de diseñar actividades educativas conforme al Programa de Preescolar apoyadas con el uso de la tecnología. De tal forma, que con las estrategias, los objetivos específicos, las competencias; los cuales están señaladas en dicho Programa y junto con el trabajo colaborativo y la tecnología; fortalecen los aprendizajes significativos en un grupo de primer grado de preescolar. Para potenciar las habilidades, actitudes y aptitudes de los alumnos, se diseñó un plan de trabajo en el cual se describe la manera de utilizar la tecnología con el uso del Robot NAO de la Universidad Politécnica de Amozoc, Puebla y así diseñar y desarrollar actividades planificadas como lo establece el Programa de Preescolar; las cuales parten de una metodología utilizando una estrategia tecnológica. El objetivo general es realizar el diseño para desarrollar actividades de integración a nivel preescolar utilizando la tecnología. Los resultados que se obtuvieron fue la mejora de habilidades, actitudes y aptitudes entre los niños, la educadora, las reglas establecidas dentro del aula, su empatía entre pares y en ocasiones en las tareas posteriores que realizan en casa.

Actividades educativas, Programa de Preescolar, Tecnología

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Introduction

Currently, the use and incorporation of technology within basic education schools in Mexico has been increasing and gaining day by day greater relevance and attention for most teachers as well as students. We must not forget that school education begins in preschool and it is important to take into account that young children often tend to use from a cell phone to a tablet and that sometimes they only use them for entertainment or play at home.

Hence, that the integration of these technologies within the teaching-learning process has become part of the classroom planning by the teacher. In the teaching area, it is also necessary to take into account the contents established in the Early Childhood Education Program 2011 where the teacher must use each of its tools and strategies, such as the set of methods, techniques and resources used by the teacher to assess the student's learning and thus achieve the objectives established in it.

Another point that should not be forgotten is the socialization at the preschool level, since it allows children to choose their friends with judgment, create healthy friendships, overcome shyness, share with others, work as a team, etc. The human being is born to be sociable, since we are in the womb of our mother until the last day of our life we have to develop socially relevant experiences, hence the importance of teaching preschool children behavioral patterns to maintain good relations with others, which are the basis of good emotional intelligence.

With all the above, if we add the use of technology and socialization to encourage, develop and strengthen these skills and attitudes in preschool children we will have better results. For this reason, the use of the NAO Robot of the Polytechnic University of Amozoc was integrated into this technology to design and develop integration activities based on socialization and thus demonstrate how technology strengthens along with the teacher's act the integration of children from a group of first grade of preschool of the Municipality of Chignahuapan, Puebla.

This research aims to incorporate technology using the NAO Robot as the design and development of social integration activities at the initiative of the teacher and thus generate new teaching-learning practices, creating dynamic environments in which students develop new skills.

Theoretical framework

Below are brief descriptions of some articles where robots have been used to improve social integration using technology.

Use of educational robotics as a didactic strategy in the classroom. This article deals with qualitative research, action research in the classroom, which proposes recreational activities with educational robots as a pillar of technology education, and which aims to motivate students and educators to formulate and apply strategies innovative educational systems that use as a didactic tool robotic platforms and technological devices that have completed their useful life, in such a way that the same robot becomes a strategy within the classrooms.

In this way it seeks to provoke in the students of preschool education, enthusiasm for developing skills that allow them to build knowledge, to give a well-founded, responsible and critical use of technology. Additionally, the didactic proposal involves students in playful activities with educational robots to develop conceptualizations that allow them to address everyday problems related to the appropriate use of technology. (Barrera, 2014).

What Makes Robots Social?: A User's Perspective on Characteristics for Social Human-Robot Interaction. In this longitudinal study, he mentions how the field of robotics has advanced rapidly. There are different types of robots that are increasingly being built and programmed to perform more and more difficult tasks to such an extent that they can become our assistants or guides and that in the not too distant future in our colleagues.

The robot used was Karotz, in such a way that its interaction within the home influenced and improved the social behaviors among its members. It has the shape of a rabbit which is connected to the internet with 30 cm of height. The relationship occurs through the verbal, the LED light in his belly, the movable ears, and by detecting the presence of other nearby objects. As the Karotz is permanently connected to the internet, it is able to react and transmit all kinds of content available on its network, for example, news, messages, music, texts, alerts and radio. The built-in webcam allows users to communicate with family members at home for surveillance purposes when they are away. (Graaf, 2015).

Educational robotics, a tool for the teaching-learning of science and technology. In this article, educational robotics is presented and analyzed as a support tool for the teaching-learning process, at a pre-media level, mainly oriented to complex subjects such as mathematics, physics and computer science, among others. The study is limited to secondary schools in the Province of Chiriqui, Republic of Panama; a sample of six schools in the province was taken and for each school both students and teachers participated.

The main objective of the project was to demonstrate how robotics applied to education facilitates and motivates the teaching-learning of sciences and technologies. The results showed that robotics can become an excellent tool to understand abstract and complex concepts in subjects in the area of science and technology; as well as it allows to develop basic skills such as working as a team. (Moreno, 2012).

Robotics as a resource to facilitate learning and development of general skills. The article mentions the growing importance of technology in the world today and its continuous development, makes technology, in itself, becomes an integral part of the training process in childhood and youth. For this reason, it is important to develop proposals in which children and young people are offered the possibility of coming into contact with new technologies; This is possible through the use of software and hardware tools, such as robotic prototypes and specialized programs for pedagogical purposes. At the same time it shows the importance of the use of robotics as a learning tool and presents the typical stages that must be faced when implementing educational robotics projects in the classroom. (Bravo, 2012).

Advantages of NAO in any educational environment. In this article he mentions that since 2009, there are more than 8,000 NAO robots in the educational area and 80% of them are aimed at schools. This reflects the high level of implementation that the use of robots in general and the NAO in particular is having at the elementary levels of education. On the other hand, motivates curiosity and stimulates the interest of children in the classroom regardless of the subject taught. NAO, with its 25 degrees of freedom of movement and its multiple sensors, can interact with children naturally and encourage them to work in groups through specific programs such as NER (NAO Entertainment Robot) V1.1. In this way, students are not only interested in robotics and learn how it works, but also attend classes taught by the robot.

In the case of students, NAO motivates the learning process through its multiple sensors and its ability to communicate and interact with students. It becomes a nexus between theory and practice since the robot explains the theory while executing it and shows itself as a practical example, and students also program the robot themselves while witnessing the results. (Alive Robots, 2015)

Methodology

In this section are the educational activities through a work plan based on the 2011 Preschool Education Program, which describes how to use technology with the use of the NAO Robot of the Polytechnic University of Amozoc; divided into two sessions which start from a methodology using a technological strategy to enhance skills, attitudes and aptitudes of students in a first grade of preschool. The objective is to develop social integration activities at the preschool level by incorporating technology using the NAO Robot to generate new teaching-learning practices, creating dynamic environments in which students develop new skills.

The general contents are the design of activities with the NAO Robot, the educator and the software programs, which are described below in two sessions that include different activities.

Session 1. The activities that were carried out between the educator and the NAO Robot were designed, based on the favoring of social relations, considering two interventions on different dates. On the first day, an activation routine was conducted by the Robot; the following participation was based on a sequence of activities where said Robot collaborated.

First intervention of the NAO Robot. The training field is called Physical Development and Health. The competition is to maintain control of movements involving strength, speed and flexibility in games and physical exercise activities. The expected learning is to participate in games that make you identify and move different parts of your body.

The didactic sequence was the presentation of a visitor to our room and knowing their name, age, origin and the purpose of their visit.



Figure 1 Presentation of the NAO Robot in the lounge
Source. Own Elaboration

In such a way, that the development of the activity was the following: The visitor and new friend invites to initiate the activation routine with the sequence of movements such as moving the head for both sides, raising and lowering the shoulders, bringing the arms to the sides, arms up and down, waist movement to the sides and in circles, alternate leg movement, kicking with alternating legs, clown jumps and finally breathing. It was finalized by giving the new friend a present to each of the 23 students.



Figure 2 Physical activation routine directed by the NAO Robot
Source. Own Elaboration

Second intervention of the NAO Robot. The training field is called Personal and Social Development. The aspect that is favored are interpersonal relationships. The competition is to establish positive relationships with others, based on understanding, acceptance and empathy.

And the expected learning is to gradually accept the norms of relationship and behavior based on equity and respect, and put them into practice.

The didactic sequence was divided into three moments. In the first, the following activities were carried out: Greeting by the NAO, activation routine directed by the NAO, as well as helping to remember the classroom regulations, asking the students to brainstorm with the teacher's support write the comments of the students on the board.

The second moment was where NAO mentioned the importance of following the rules of the room and showed and mentioned the images that represent the action of each rule in the classroom and so the group was divided according to the number of rules, forming teams. To each student, NAO assigned one of the slogans to monitor compliance with them, also provided material to each child to make badges according to the rule that each one touched.



Figure 3 Importance of the classroom regulations by the NAO Robot
Source. Own Elaboration

The last moment corresponded to the closing where the evaluation and dismissal by the Robot was included. Inside a magic box NAO took out different elements classifying them into two groups, one of them was for girls and the other for children, each group mentioned the elements that NAO assigned for each of them, in turn asked for groups to be refers to each element and how it can help them be better companions and friends. In the evaluation NAO developed a plenary with the students and the teacher reinforced what they learned on that day, giving recommendations to follow the rules. Regarding the farewell NAO sang a farewell song with the students.



Figure 4 Farewell by the NAO Robot
Source. Own Elaboration

Session 2. It was designed with students of the Polytechnic University of Amozoc that belong to Software Engineering a computer program for the NAO Robot, with the purpose of developing activities that would be carried out with the preschool group, to investigate needs and applications in matter of interpersonal relationships, considering the two interventions. In addition, tests were carried out prior to the application of activities with the NAO Robot at the Polytechnic University of Amozoc. In this section the main activity was the application of activities designed with the NAO Robot and the educator (1st and 2nd intervention).

It should be noted that in the programming tests for the second intervention, more movements were added to the Robot for physical activation, in addition to a greater dialogue with the aim of giving children more attention to the activities and an additional story on the part of the Robot so that there was more interaction with children.



Figure 5 Software design and testing with the NAO Robot
Source. Own Elaboration

There were also tests where the Robot mentioned the rules of the room and at the end asked for a drawing to the children.

The evidence was that the Robot had to identify a logo which was on the edge of a sheet that was later to be given to each child in his room and so he could congratulate the activity done by each child at its end. These tests were conducted in three sessions to be successfully identified by the Robot.

Results

To obtain quantitative results with respect to the integration activities, two evaluations were carried out prior to the visit of the NAO Robot and a second after the intervention with the same. Hence, the design of these activities to develop them with NAO were divided into two participations based on the same elements of the current Preschool Program; The first intervention consists of a greeting and presentation, activation routine and incentives provided by NAO, in order to know the impact and reactions to the students. The second NAO intervention consists of a greeting, activation routine, presentation of school rules, collaboration dynamics between boys and girls, a plenary of what has been learned, farewell and gifts. In each evaluation the children were asked different activities as programmed by the Robot previously done, as well as the collaborative work by the educator. The results of these activities during the first intervention that were applied to 23 children are shown in Table 1, where it can be seen that the children's social integration improved.

1st intervention				
	He/she does it	He/she does it with help	He/she presents difficulty	He/she does not perform it.
Accept his/her colleagues as they are and understand that they have the same rights, as well as responsibilities.	20%	40%	20%	20%
Understand that people have different needs, points of view, culture and that they should be treated with respect.	50%	20%	15%	15%
Learn about the importance of friendship and understand the value of trust, honesty and mutual support.	50%	15%	20%	15%
Internalize the rules of relationship and behavior based on equity and respect.	40%	30%	15%	15%
Become aware of others and establish communication relationships and group integration.	30%	50%	15%	5%
Establish attitudes and relationships of respect and collaboration.	45%	25%	20%	10%

Table 1 Activities during the 1st. intervention
Source. Own Elaboration

The results of these activities during the second intervention are shown in Table 2, where it can be seen that social integration was even more remarkable in the group but also impacted attitudes and aptitudes not only individually but also at the group level.

2nd intervention				
	He/she does it	He/she does it with help	He/she presents difficulty	He/she does not perform it.
Accept his/her colleagues as they are and understand that they have the same rights, as well as responsibilities.	70%	25%	2.5%	2.5%
Understand that people have different needs, points of view, culture and that they should be treated with respect.	80%	20%	0%	0%
Learn about the importance of friendship and understand the value of trust, honesty and mutual support.	95%	5%	0%	0%
Internalize the rules of relationship and behavior based on equity and respect.	90%	10%	0%	0%
Become aware of others and establish communication relationships and group integration.	80%	20%	0%	0%
Establish attitudes and relationships of respect and collaboration.	90%	10%	0%	0%

Table 2 Activities during the 2nd. intervention.

Source. Own Elaboration

Conclusion

This research provides a tool for teachers to make use of technology in their educational planning and applications, as in the generation of new meaningful learning for students to strengthen them. In this case, with the help of the intervention of the NAO Robot, these educational activities were adapted according to the Preschool Program, which generated other ways of planning, organizing and even changing attitudes and aptitudes not so favorable within the classroom and which impacted the the students.

In addition, the attitudes and behaviors of the students were observed after the first intervention of educational activities, identifying gradual changes in the children that make up the group; at the beginning of the final intervention they were attentive, following directions, listening, recording these changes or results, with the development of the session with the NAO Robot, they reaffirmed and learned how to use the school rules and its usefulness, together to this the development of empathy and the use of values were gradually cemented.

The following day the attitudes of the students were different because they remembered the recommendations of the NAO Robot, besides having advances in their language development, oral, plastic productions referring to drawing, listening skills, respect of turns, among others; in reference to various training fields, such as exploration and knowledge of the world and physical development and health.

Next, there is evidence of the work done which was used to strengthen what was learned in the children, through the implementation of the use of the NAO Robot to generate and potentiate the interpersonal relationships in the first grade of preschool students.



Figure 6 Selección de materiales.

Source. Own Elaboration



Figure 7 Construction of buildings with the help of my friends.

Source. Own Elaboration

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Development of a Website through XP Xtreme Programming, for the Integration of Academic Production in the research area

Desarrollo de un Sitio Web mediante XP Xtreme Programming, para la integración de Producción Académica en área de investigación

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Abstract

The present work describes the process of a Web site for the administration of the information, of a Superior institution, the objective is that the research area has a website that allows to have the management of its CA Academic Bodies, in the scientific production conducted by the professors of each CA of the institution, classifying, articles, papers, books and reports of scientific research projects, made by teachers-researchers with a profile of the Program for Professional Development Teacher (PRODEP). The methodology used is the XP methodology (Xtreme Programming) is an agile methodology that allows to have the desired results, showing the functionality of the product in each phase of the development, it is carried out in four stages: Planning, Design, Coding and Testing. Software prototypes must be based on user stories, in this case teachers and public with Internet access, these stories are established from the beginning of the project. The development of this website will allow the university community to provide a support tool for the research of scientific articles of interest in institutional web pages, as well as to control and store all the scientific products that the institution has.

Academic Groups, Methodology XP, Web Site

Resumen

El presente trabajo describe el proceso de un Sitio Web para la administración de la información, de una institución Superior, el objetivo es que el área de investigación cuente con un sitio web que permita tener la gestión de sus Cuerpos Académicos CA, en la producción científica realizada por los profesores de cada CA de la institución, clasificando, artículos, ponencias, libros e informes de proyectos de investigación científicos, realizados por docentes-investigadores con un perfil del Programa para el Desarrollo Profesional Docente (PRODEP). La metodología utilizada es la metodología XP (Xtreme Programming) es una metodología ágil que permite tener los resultados que se desean obtener, mostrando así la funcionalidad del producto en cada fase del desarrollo, se realiza en cuatro etapas: Planificación, Diseño, Codificación y Pruebas. Los prototipos de software deben estar en función de las historias de usuario, en este caso docentes y público con acceso a Internet, estas historias son establecidas desde el inicio del proyecto. El desarrollo de este sitio web permitirá proveer a la comunidad universitaria una herramienta de apoyo para la investigación de artículos científicos de interés en páginas web institucionales, además permite controlar y almacenar todos los productos científicos con los que cuenta la institución.

Cuerpos Académicos, Metodología XP, Sitio Web

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Introduction

The technology within the education centers has advanced in such a way that it has allowed anyone to have intelligent devices with Internet access, capable of performing various tasks of daily use, optimizing most of the activities and with them the time that it takes to perform them. However, to date there are scenarios in which it has not been possible to take advantage of the potential of these devices. The biggest problem at present, is that the contents of the Internet pages contain false or incomplete information, causing a great unknown in question to the truthful and uncertain. Articles generated in universities in Mexico, whose bibliography is extensive and the information generated totally reliable, have been lost due to the lack of a public platform that allows the dissemination of research done by teachers with a profile in the Teacher Professional Development Program. for the Superior Type. (PROMEP, 2015).

The interest to investigate this problem is to develop a Website that allows to manage the information produced by a higher level institution, in this way the administrators will be able to control the scientific production made by each member of the Academic Body (CA). In this context, the information and communication technologies (ICT) applied to the generation of this web platform have allowed the development of a feasible development process for the project with the help of the Xtreme Programming methodology.

Therefore, the problem that seeks to solve this project is defined as presenting an accessible web platform, facilitating the scenario of the publication of scientific products, which is useful to establish a channel of communication between users and any research that teachers have done and published. However, the cost and availability of a server in the university, lead us to stop the project and resort to implementation alternatives that are available to the institution.

The rest of the article is organized as follows; In the section of the Approach of the problem a review of the background is made in an institution for the analysis of the magnitude of the problem and the current situation of higher level institutions, while in the Design and Codification sections the procedures are described carried out in the development of the website for Academic Bodies and Research Direction, in the Tests section, the scopes obtained with the development and implementation of the project are presented, while in the Conclusions section the aspects of interest for research works are mentioned. future.

Theoretical framework

In Mexico, one of the most recent policies aimed at promoting new ways of stimulating the generation and application of knowledge has been the impulse to the creation of academic bodies (CA) in public institutions of higher education, this with the purpose of strengthening dynamics Academics sustained in collaborative work, manifested in the structuring of disciplinary teams.

For some authors it is more appropriate to handle the concept of "epistemic communities", referring to groups of experts whose mission is to solve a series of problems through the application of scientific knowledge (Maldonado, 2005).

The idea of "epistemic communities" constitutes a new approach to public policies, the author considers them as "entities composed of professionals who share the commitment to a common causal model and a series of common political values. They are united by the conviction in the truth of their model and the commitment to translate this truth into public policies "(Parsons, 2007), also refers to the epistemic communities taking the form of "invisible universities "or" networks of people "with similar ideas.

The concept of invisible universities had already been worked on, as Crane called "invisible colleges" (Campanario, 2002, page 175) a small community of scientists who exchange information with each other and increase their position of power within a given field or discipline. Members of the "invisible college" know each other, and probably read and share the work of the other members.

In this respect Olivé (2008) points out that:

"The objective of scientific communities is to generate authentic knowledge in their field, an objective knowledge of reality that is the result of rational processes ... scientific communities are characterized by a constellation of shared elements; among them, the previous knowledge that accumulated in their field, but, above all, a set of values and common interests within each specialty " (pag.33).

For Tierney (2001) the main element in a scientific community is the production of knowledge through joint work: "The community of scientists within a specific field works together, so that a person learns a fact and another builds on this fact to discover another, and so on" (pag.165).

According to the previous opinions, the academic body should be understood as a small scientific community that produces and applies knowledge through the development of one or several lines of research, and the work in them works as the unifying element of said team.

What, added to all the above, the fact of sharing information between researchers and / or scientists is advancing with the development of new technologies that can facilitate the transfer or an own inquiry.

The importance of the visualization of a web page for the development and advance in education is very important and more to impart knowledge among the student society (Mendoza, 2018).

The use of a web page may seem like a good idea for some people. The problem is that by not being aligned in the lack of knowledge of the education provided, a poor communication solution is being offered. (Jiménez, 2014).

A web content manager or content management system CMS (Content Management System) will be an important part that facilitates the editing and publication of content on the web directly from the server. (Innovate your Web, 2009).

Methodology

The problem addressed by this work is to develop a website for the research department and Academic Bodies of the Institution, with the implementation of the XP methodology, in planning, designing, programming and testing, based on the team's ability to communicate with each other and the desire to learn from inherent mistakes in a programmer.

The advantage of XP is its ability to respond to unforeseen events, which includes the following phases: Planning, Design, Coding, Testing. These phases will be implemented in the development of the project. See figure 1.

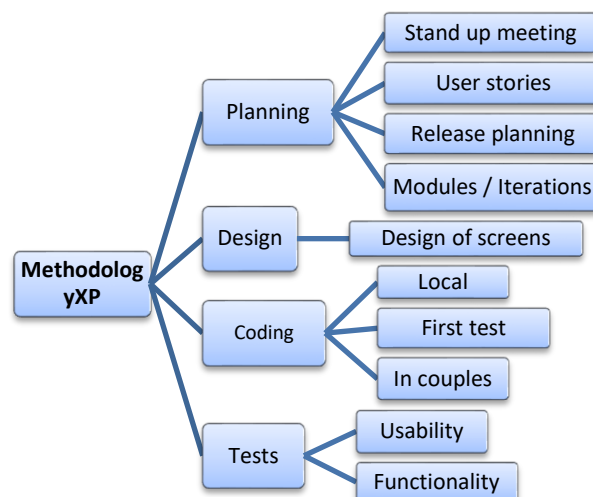


Figure 1 Phases based on the XP Methodology of the Website

Source: Self Made

Project development

Planning phase

Work meetings are held with the research area director, to define the requirements through user stories. The results of this phase are: Stand-up meeting, User stories that identify the requirements. The goal to fully develop the project is approximately 4 months.

Stand-up meeting

These meetings are held at the beginning of every day during the project period, the entire development team meets to present the problems and ideas that are being presented, in order that the team as a whole build a better solution. (Department of Computer Systems and Computing, 2018).

For the project, the interaction with the research director (User) was required, in table 1, the planned meetings are detailed.

No. Meeting	Activity
1	Define the modules and the list of users.
2	Delivery advance main screen and prototype members of the academic body.
3	Delivery of the first iteration
4	Delivery of the second module
5	Review of the site mounted on a free server.
6	Delivery of the third iteration

Table 1 Delivery meeting plan and progress

Source: Self Made

The iterations used for the creation of the website served to improve the requirements and requests of the user, 4 were used to define the objectives and improve the user's stories. See tables 2-5.

In the planning phase the analysis of the website was carried out, the modules and the actions to be carried out were defined, as well as the deliverables and functions of each one of the team members, including the client as a fundamental part.

User History	
Number: 01	Name: Registration Module
User: Administrator	
Priority: High	Assigned Iteration: 1
Functionality: Enter the basic personal data of the teacher or member of the academic body	
Description: Contains a section to register the user who wants to access the system.	
Functionality Tests: Insert the data and perform the corresponding validations for each required field, in the case of email, it is necessary to validate that the format is correct.	

Table 2 User history - Registration module
Source: Self Made

User History	
Number: 02	Name: Password Recovery Module
User: Teacher	
Priority: High	Assigned Iteration: 2
Functionality: Recovery and / or password change due to forgetting	
Description: It contains a section where the user, not remembering his password, can restore it by means of his email address and thus he can log in without problems.	
Functionality Tests: Insert the data and perform the corresponding validations for each required field, in the case of email, it is necessary to validate that the format is correct.	

Table 3 User history - Password Recovery Module
Source: Self Made

User History	
Number: 03	Name: Module of Members of the Academic Bodies
User: Coordinator	
Priority: High	Assigned Iteration: 3
Functionality: Register, edit and eliminate teachers	
Description: Coordinator options for registration and modification of new teachers	
Functionality Tests: Insert user and verify that belongs to the academic body, besides editing personal information and eliminate teachers who no longer belong to these	

Table 4 User history - Module of Members of the Academic Bodies
Source: Self Made

User History	
Number: 04	Name: Academic Bodies Module
User: Teacher (Administration), Normal User (Navigation)	
Priority: High	Assigned Iteration: 4
Functionality: Browse the different academic bodies and information management of teachers or members of academic bodies.	
Description: Academic Bodies. It contains a sub-module where you can access the different academic bodies that the web system has registered.	
Teachers It allows the registration, modification, elimination of the different research articles that the teacher has registered, as well as updating their profile.	
User interface tests: navigation through the elements that are being tested reflect the client's functions and requirements, including window management, fields and access methods; The objects of the windows and features, such as menus, size, position, status, work according to the standards.	
Functionality Tests: Insert the data and perform the corresponding validations for each required field, in the case of email, it is necessary to validate that the format is correct.	

Table 5 User history - Academic Bodies Module
Source: Self Made

User stories

The user stories have the same purpose as the use cases, the client describes their needs based on the requirements of the website, a documentary research was conducted, from which the way of collecting the background of the products made by teachers was obtained researchers of the institution.

Release planning

The developers and clients established the ideal implementation times of the user stories and the priority with which each phase was implemented.

Iterations

– **Registration Module**

Section where the user will access the system and verify the level of access to control the information pertaining to each teacher or academic body.

– **Password Recovery Module**

In this section you can recover / modify the password of users who have had problems accessing your account, until you forget your password, for security and for trust a verification email will be sent to the corresponding user.

– Module of Members of the Academic Bodies

In this section the users and their information will be created and managed, the administrator will be able to edit the system in its entirety, up to the profile of the teachers. The coordinators of the academic bodies, will have privileges of access only to the CA of their area, with the accesses of edition in the members of CA, to register, modify and eliminate academic products while the members of CA will be users who will be able to edit only its profile and its products, with limitation to modify the one of other members.

– Module of Products of the Academic Bodies

Section where teachers can upload and control their products, from publications to articles developed by them. Products can be added, edited and deleted according to the user.

Project speed

What XP says

Number of user stories or programming tasks performed per iteration.

It helps to estimate the amount of user stories to be implemented in a given iteration.

Experience in current project

The number of user stories performed per iteration was not a good measure of the speed of the project because not all had the same level of difficulty and therefore the same requirement of development hours.

In the second iteration, fewer weekly hours were worked in comparison with the other iterations. The reason for this result was that the level of difficulty was of less complexity, therefore, the number of hours required for the user stories of the second iteration was the lowest of the entire project.

Everyday meetings

To follow up on the project, several meetings were held and topics were discussed where the following weekly activities were agreed, problems and solutions according to the needs of the project, sometimes the client was requested to request information and new agreements.

Design phase

Site screens on a local server

Homepage

For the access of the main page, tests were carried out locally in a desktop computer in order to visualize the interface of each of the windows of the web page, this was done with the aim of designing each of the sections You have the web page and see its structure before you can mount it on a server. See Figure 2.



Figure 2 Index of the main page

Source: Self Made

Academic Bodies

The carousel in the browser or gallery of academic bodies; in this part we have the options of the academic bodies, within this dynamic menu we have 2 buttons on the sides to go through the options and choose one, each academic body has a description and a "See more" button in this option will redirect us to the selected academic body and see more detailed information of each one of the CA. See figure 3.



Figure 3 Carousel of the academic bodies

Source: Self Made

Members of the academic body

In the button of figure 2 "See more" in the Career gallery of the main page, it will redirect to the menu of the academic bodies. In Figure 3, shows the members of the academic body that perform in the institution within which it has been selected, you can see all members of it: name, the general objective of each of the members and a respective photo of each one of them. See figure 4.





Name	Objective	Photo
Brenda Juárez Santiago	Investigate and manage information technology and communication projects, to encourage higher education research skills, through the implementation of new technologies, solving real problems in the industry and education.	
Normal Alejandra Ledesma Uribe	General Objective	
Gregorio Rodríguez Miranda.	General Objective	
René Santos Osorio	General Objective	

Figure 4 Members of the academic body
Source: Self Made

Enter

To be able to log in you must locate the menu that is at the top of the page below the banner in figure 4. Since it is possible to locate the menu, the access option is searched in the upper right and clicked to see the options that each of them has. See figure 5.

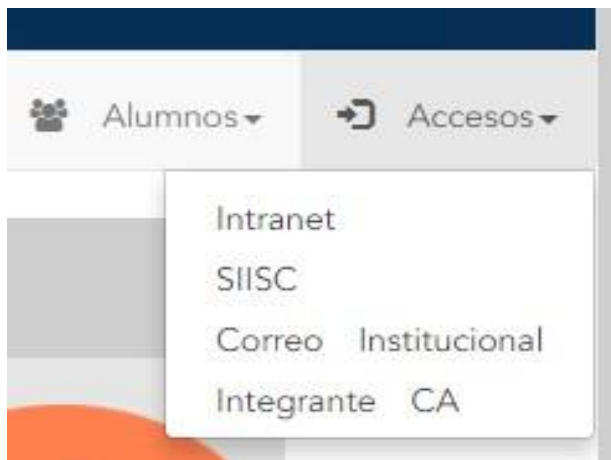


Figure 5 Menu for user login
Source: Self Made

Within Access options you have to enter Integrante CA.

To be able to enter, you must put the user or email in the Username part and the password in the password of each of the members of the CA. See figure 6.

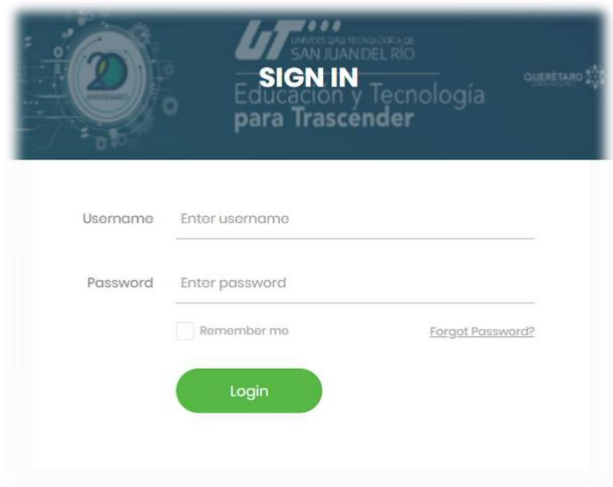


Figure 6 Teacher profile login
Source: Self Made

**Modification of the Academic Bodies
Add teacher**

To be able to add a member you must be the coordinator of said CA.

On the CA screen locate the objective part.

Click on add teacher and a window will be displayed to register another member of the CA that belongs to it. See figure 7.



Figure 7 Add teachers
Source: Self Made

Fill in the fields that appear with their respective values and personal information of new member and click on add. See figure 8.

Name

Last Name

Position

Figure 8 Registration of academic body
Source: Self Made

Delete Teacher

To be able to eliminate the Teacher one must find in the screen of Academic Body and locate the table with the list of the teachers who belong to this academic body from which it is desired to eliminate. Click on the delete button and click on accept to confirm that you wish to delete your information from the website. See figure 9 and 10.



Figure 9 Location of the delete button
Source: Self Made

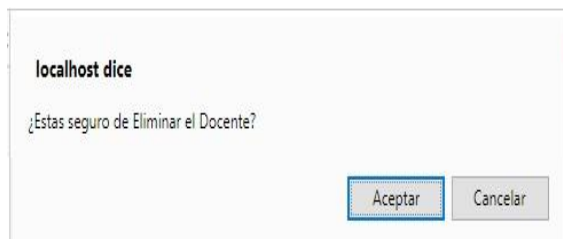


Figure 10 Delete button
Source: Self Made

Teacher Edit

To be able to edit a teacher must have a position of Administrator, Coordinator or own the profile.

Locate the edit button inside the box with the main data in the profile that is in each of the profiles of the members of the CA where they are required to make the changes. Click to display the menu with the options to edit. See figure 11.



Figure 11 Modification of a teacher
Source: Self Made

After modifying the information of the fields that were selected, click on the update button in the bottom of the menu. Changes will be made automatically with the new information that has been registered in the modification. See figure 12.

 A screenshot of a form for editing teacher information. At the top is a photo of the teacher. Below it are several input fields: 'IMAGEN' with a file selection button, 'Nombre' (Brenda), 'Apellido' (Juárez Santiago), 'Cargo' (MGTI), 'Objetivo' (a text area with a scroll bar containing text about research and technology), 'Email' (brenda@gmail.com), and 'password' (masked with asterisks). A green 'Actualizar' button is at the bottom.

Figure 12 Teacher information form
Source: Self Made

Projects Add project

To be able to add a project, you must be in the session and profile of each of the members of the corresponding CA. Search the projects section on the teacher's page.

Identify the option to add in the project and click, fill in the information with the requested fields: title, description, representative image of the project, type of project and at the end click to add the project with the others. See figure 13.

Form to add a project. Fields include: titulo, Descripción, Imagen (with 'Seleccionar archivo' button), Link/Url, and Tipo de Proyecto (dropdown menu with 'Reporte' selected). A green 'Actualizar' button is at the bottom.

Figure 13 Add a project
Source: Self Made

Edit project

To edit a project you must be in the "MY PROJECTS" section and select the article you want to Modify. Within the project section locate the edit button and click to display the menu. See figure 14.



Figure 14 Section of my projects to modify
Source: Self Made

After finalizing the changes, click on the button. See figure 15.

Form to modify project details. Fields are filled with: IMAGEN (Seleccionar archivo), titulo (El Portafolio Electrónico-Online, Herramienta para el Desarrollo de Com), Descripción (Portafolio de desarrollo), Imagen (portafolio), Link/Url (https://drive.google.com/file/d/0BwMxlvwpJ8nfmRObVdPRnZ5aWc/view?usp=shar), and Tipo de Proyecto (Reporte). A green 'Actualizar' button is at the bottom.

Figure 15 Form to modify project
Source: Self Made

Delete project

Within the selection of "MY PROJECTS" identify the options and click on the delete button. A warning will appear. When you click on the accept button, the project information is deleted, otherwise no action will be taken. See figure 16 and 17.

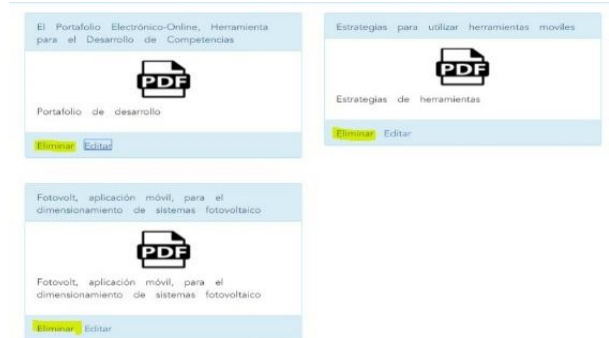


Figure 16 Section of my projects to eliminate
Source: Self Made



Figure 17 Removing a project
Source: Self Made

Phase coding

Local Coding

Coding is a process that is done in parallel with the design and which is subject to several observations by XP considered controversial by some experts such as the rotation of programmers or programming in pairs. In addition to the aforementioned topics, the reader will find below a description of the following topics: customer always present, coding the test first, sequential integration and frequent integrations.

Client always present

One of the requirements of XP is that the client is always available. Not only to solve the doubts of the development group, should be part of it. In this sense it becomes a great help to solve all the doubts that may arise, especially face to face, to ensure that the implemented covers the needs raised in the user stories.

Code the test first

One of the advantages of creating a test before the code is that it allows identifying the requirements of said code. In other words, when writing the tests first, all the special cases that the code to implement should be considered in a simpler and clearer way.

In this way, the developer will know with complete certainty when it has finished, since all the tests will have passed.

Programming in pairs

All the code must be created by pairs of programmers seated both in front of a single computer which in principle represents a 50% reduction in productivity, however, according to XP there is no such loss. It is understood that there is not much difference, as far as the quantity is concerned, between the code produced by a couple under these conditions that the one created by the same members working separately, with the exception that one or both programmers are very expert in the tool in question.

When you work in pairs, you get a better quality design and a more organized code with fewer errors than if you worked alone, in addition to the advantage of having a partner to help solve problems in coding time, which they present very frequently.

It is recommended that while one member of the couple is concerned with the method being written, the other is concerned with how it fits into the rest of the class. (Lete, 2009).

Sequential integration

One of the biggest drawbacks presented in software projects has to do with integration, especially if all programmers own the entire code. To solve this problem, many mechanisms have emerged, such as giving ownership of certain classes to some developers, who are responsible for keeping them updated and consistent. However, added to the fact that this goes against the collective ownership of the code is not solved the problems presented by communication between classes.

Test Case	
Case Testing Author: María Ortiz García	Code Test Case: PB-01
Test Environment: Web	Code User Story: 001
Descriptions and / or Actions for the Tests	
Name: Login Test - Administrator and Teacher	
Description: Tests will be carried out on the access of the administrator of the website and of the professors who enter their corresponding profiles.	
Terms:	
<ul style="list-style-type: none"> - The test will be done in several Web Browsers, such as: Google Chrome, Mozilla Firefox, Microsoft Edge, Opera, etc. - Users already registered and not registered will be used. - Passwords valid (8 characters) and not valid (less than 8 characters). 	
Entry / Execution Steps:	
<ol style="list-style-type: none"> 1. It will open one of the possible web browsers with the tab in the direction of the research website. 2. In the address bar, where the URL is located, the word "Admin" will be placed after the diagonal "/" (example.com/Admin). 3. Once the Login or Access page is displayed, the user will be entered in the corresponding text entry. 4. The user is validated with "ENTER" with the keyboard, once this is done, the password or password entry will be activated. 5. Enter the password or Password (valid) in the text entry (once activated). 	
Expected Output:	
<ul style="list-style-type: none"> - In valid user access and password, the profile page corresponding to the user will be displayed. 	

Table 6 Example of test cases developed for the test stage
Source: Self Made

Test phase

Local Tests

Usability and functionality tests

This technique was focused on evaluating the almost finalized project, where the user was kind enough to be guided by the tester to execute and review the website, software compliance was validated.

Implementation

Technical manual

A guide was made to identify more easily the aspects and characteristics that are part of the website. It was directed to the IT department so that they can provide maintenance in case the Website requires it. The following most important elements of said manual stand out:

- Business rules
- Responsible
- Requirements and user platform
- Application areas and scope
- Logical view
- Diagram of use cases
- Entity-Relationship Model
- Data Dictionary
- Deployment diagram
- Site map
- Description of fields
- Description of algorithms

User manual

A manual was designed to give assistance to the people who use the website, in this way it solves the simple problems that could arise during the operation, by means of screenshots the user was informed about the total functioning of the system and everything that involves the handling. This manual contains:

- Minimum system requirements
- Description of the web page
- Guide to use the website
- Glossary of terms

Development of the page in WIX

In the following section we show the example of the figures where the website was developed in the WIX hosting, See figure 18



Figure 18 Main page index in WIX
Source <https://uniticsparatodos.wixsite.com/c-academy>

Section of the academic bodies that make up WIX

A carousel style is shown horizontally showing a representative image of each one of the members that make it up and the name of each of them, as well as an about above of these in which the objective of the academic bodies is explained they reside in the university. See figure 19.

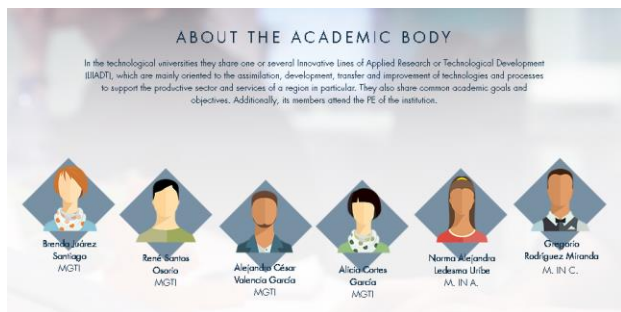


Figure 19 Section of the members of an academic body
Source <https://uniticsparatodos.wixsite.com/c-academy>

Profile of the researcher in WIX

Section where you can see an image of the academic member, as well as the name and work and academic experience, achievements and sections where their projects are displayed: books, articles, reports of stay and collaborations that have developed. See figure 20 and 21.



Figure 20 Carousel of work and academic experience
Source <https://uniticsparatodos.wixsite.com/c-academy>



Figure 21 Products of the academic members
Source <https://uniticsparatodos.wixsite.com/c-academy>

Contact with the teacher in WIX

In this section the people who see in each of the profiles of the academic members will have the possibility of contacting the teacher in an electronic mail for academic purposes and being able to make collaborations according to the convenience of the person who contacts him / her. See figure 22



Figure 22 Academic member contact
Source <https://uniticsparatodos.wixsite.com/c-academy>

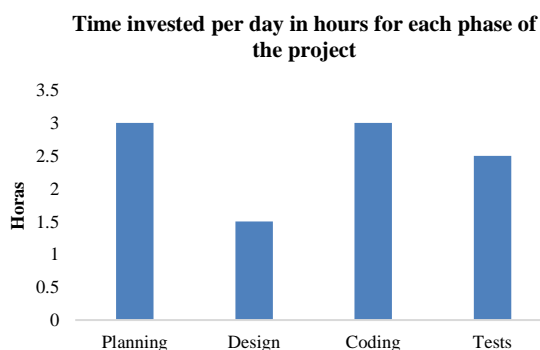
Results

The tests and development concluded successfully in 3 months with good integration and with a web page using a free web server hosting such as WIX to finish the development of this project, the XP methodology allowed us to identify the time spent in This project was estimated to have all the stages in a period no longer than 4 months.

One of the most important results we had was that thanks to the deliverables and the meetings made during the whole monitoring of the project was that the product was delivered on the stipulated dates, we minimized the risks that this entails, likewise the delivery times were minimized It was done at a faster time than with another methodology.

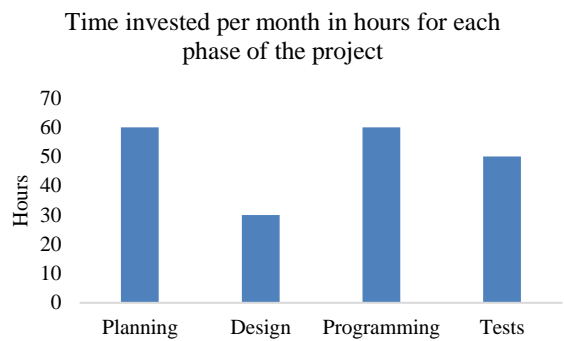
The final results were as expected, the tests and the development concluded satisfactorily with good teamwork and integration by developing the website in a free web server such as WIX to complete the development of this project, the problems that delay and I annul a good result was the lack of budget to rent a Host to store the project in addition to missing the SSL certificate and administration of emails for the operation of sessions I have proper integration of security, effectiveness and control of the page, however the procedure to obtain the resource by the university is being done to store the page on a server and its own hosting, however the option of managing WIX in the same way provides a service and hosting of acceptable information for the requirements that the University, provides the fastest options to make the page and meets the expectations tativas, that is why the coding of the page locally is useful so that in the not too distant future it is uploaded to the server that the university will have.

Figure 1 shows the time that was invested per day in hours in each of the phases of the XP methodology applied to the project.



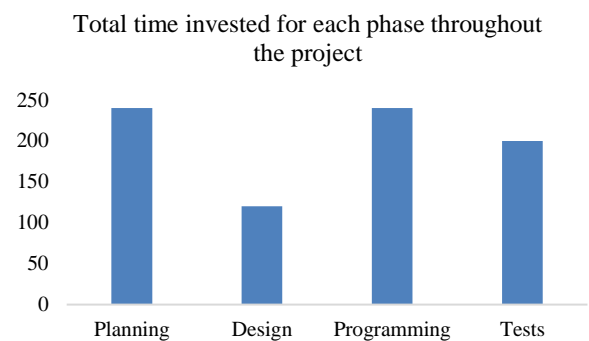
Graphic 1 Results of the time invested per hour per day per stage of the project
Source: self made

Graph 2 shows the time that was invested per month in hours in each of the phases of the XP methodology applied to the project.



Graphic 2 Results of the time invested per month in hours for each phase in the project
Source: Self Made

Graph 3 shows the total time invested in hours in each of the phases of the XP methodology applied to the project.



Graphic 3 Results of the total time invested in hours for each phase throughout the project
Source: Self Made

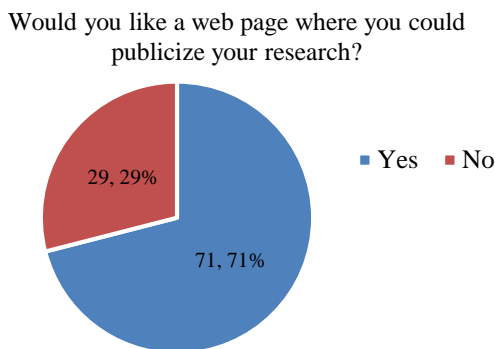
Conclusions

The website that has been implemented, has contributed in an important way to identify the CAs and their scientific products of the institution. It leaves us many types of learning, issues to reflect and situations to reinforce that can help us to perform a better job in the professional field. It is more than proven that the incorporation of a website in an institution, where you can view the different research articles that have been developed by the different academic bodies is positively related to the success of the same and the increase of visits to their research, so its relevance is maximum today. Hence the importance of having the implementation of a web system that stores the different articles and publications of their research of teachers, this system has a database that allows the efficient organization of data and information of all teachers that make up the academic bodies.

The benefits provided by the website for academic bodies is the ease with which other users or researchers can see and / or rely on their publications, research and products that are registered within the web system.

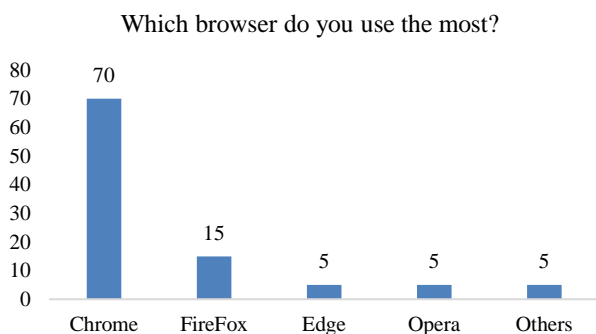
Annexes

The first question was asked to know how many teachers would like a web page as a means to publicize and deliver their research to their superiors. See graphic 4



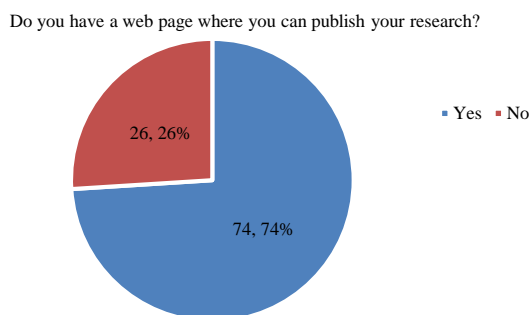
Graphic 4 Number of teachers who would like a web page
Source: Self Made

After the first question we emphasized to know what kind of browsers they use where they could edit and correct the page for a good visualization of it. See graphic 5



Graphic 5 Browsers most used by students
Source: Self Made

The third question was to count the teachers who already have the help of a web page to publicize their research. See graphic 6



Graphic 6 Teachers of the academic bodies that have a web page
Source: Self Made

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Methodology for the UPFIM own software development

Metodología para Desarrollo de Software Propio de la UPFIM

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Abstract

In the Computer System Engineering (CSE) of the Universidad Politécnica de Francisco I. Madero (UPFIM), it is necessary to define a methodology for its own software development that allows to manage the progress in an appropriate way, to have the control over the future maintenance and creation of different versions of it; Teachers of the CSE Full Time Teacher category (FTT) and some Professors by Subject (PS) work on software development projects useful for some areas and departments of the UPFIM, because there is not enough budget to hire external the development of software or acquire it, however the automation of several processes is necessary. The methodology created has 4 stages: conception, production, growth and delivery. Each one of them has defined activities that can be carried out in parallel, the other is necessary to work them linearly, it can be considered semi-incremental since some activities and / or stages can be worked like this.

Methodology for software Development, Agile methodology, Own software

Resumen

En la Ingeniería en Sistemas Computacionales (ISC) de la Universidad Politécnica de Francisco I. Madero (UPFIM) es necesario definir una metodología para el desarrollo de software propio que permita administrar los desarrollos de manera adecuada, tener un control sobre el futuro mantenimiento y creación de distintas versiones del mismo; los docentes de la ISC categoría Profesor Tiempo Completo (PTC) y algunos Profesores por Asignatura (PA) trabajan en proyectos de desarrollo de software útil para algunas áreas y departamentos de la UPFIM, esto debido a que no se cuenta con presupuesto suficiente para poder contratar de manera externa el desarrollo de software o adquirirlo, sin embargo la automatización de varios procesos es necesaria. La metodología creada cuenta con 4 etapas: concepción, producción, maduración y entrega. Cada una de ellas tienen definidas actividades que se pueden realizar en paralelo, otras es necesario trabajarlas linealmente, se puede considerar semi-incremental ya que algunas actividades y/o etapas se pueden trabajar así.

Metodologías de desarrollo, Metodología ágil, Software propio

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† Researcher contributing first author.

Introduction

UPFIM has the Subdirección de Sistemas Informáticos (SSI), which is in charge of the administration of ICTs in the institution, one of the responsibilities of this area is the development of software and the maintenance of computer systems, due to the fact that the area is very limited by the number of personnel it has, practically only they administer and maintain the integral system of academic control (SICA), one person is in charge of the system code and another of the database. However, the university has many needs for process automation that can help the different areas to provide a better service to the almost 2500 students enrolled in the 8 educational programs it has.

One of the strategies that has been thought is that the teachers of the ISC's educational program can participate in their own software development projects for the different areas, this is due to the lack of budgetary sufficiency to acquire applications that resolve the lack of automation or hire a company for development. Currently the area does not have a development methodology because, as mentioned before, it only maintains the SICA.

The foregoing makes it essential to have a methodology for the development of software projects that considers stages, activities, steps to be followed, responsibilities, documentation to generate and nomenclature of documents.

Failure to do so would not have procedures to follow in the development of the systems and their documentation, if the developers have experience they could achieve functional applications but poorly documented, which would cause great uncertainty in the future, since at some point the applications will require maintenance or updating, that is, once the system is put into operation the modification of a functional requirement, a non-functional requirement or the implementation of new requirements, it will become a problem since it will not be possible to implement a progress control of versions, nor of specifications.

We propose a current and innovative methodology appropriate to the organizational and functional needs of two areas (SSI and ISC) that would now work together in the development of applications: the sub-direction of computer systems and the direction of the educational program of Computer Systems Engineering UPFIM.

The methodology will allow to standardize the development of systems and optimize development times since the processes will be well defined with the appropriate controls for monitoring and compliance with the activities of the development team.

The methodology will be based on ideas and foundations of other existing ones, specifically RUP and the main agile methodologies such as, Extreme Programming, Scrum, Crystal and DSDM. Having this methodology will allow the generation of a correct and complete technical documentation to achieve an appropriate and integrated software change control.

The article is organized as follows: Section 2 presents the state of the art. Section 3 contains the general elements of the proposed methodology. In section 4 each of the stages of the methodology are defined and finally in section 5 the results are established on time and the future work.

State of the Art

The revision of different current methodologies has led to the definition of the state of the art, first the RUP (Rational Unified Process) was revised, understanding it as a robust and traditional methodology, after which the four most used agile methodologies were analyzed and from which more information is available: XP (Extreme Programming), Scrum, Crystal Clear, and DSDM (Dynamic Systems Development Method).

This work at the end of accounts is about proposing a hybrid methodology based on RUP and lightweight methodologies also called agile. Therefore, the in-depth knowledge of the two approaches, their applications, characteristics and methods is important.

Table 1 shows the main differences of the agile methodologies with respect to the traditional ones. These differences affect not only the process itself, but also the context of the development team as well as its organization.

Metodologías Tradicionales y RUP	Metodologías Ágiles
Basadas en normas provenientes de estándares seguidos por el entorno de desarrollo	Basadas en heurísticas provenientes de prácticas de producción de código
Cierta resistencia a los cambios	Especialmente preparados para cambios durante el proyecto
Impuestas externamente	Impuestas internamente (por el equipo de desarrollo)
Proceso mucho más controlado, con numerosas políticas/normas	Proceso menos controlado, con pocos principios
Requiere extensa documentación para controlar todo el flujo del desarrollo	Poca documentación, el control es mínimo pues se basan en la disciplina y capacidad de los desarrolladores.
Documenta todo para tener un buen control de versiones y cambios una vez ya liberado el sistema.	No se generan documentos a menos que sean muy importantes, para esta filosofía la documentación no es esencial.
Existe un contrato prefijado	No existe contrato tradicional o al menos es bastante flexible
El cliente interactúa con el equipo de desarrollo mediante reuniones	El cliente es parte del equipo de desarrollo
Grupos grandes y posiblemente distribuidos	Grupos pequeños (<10 integrantes) y trabajando en el mismo sitio
Más artefactos	Pocos artefactos
Más roles	Pocos roles
La arquitectura del software es esencial y se expresa mediante modelos	Menos énfasis en la arquitectura del software

Table 1 Differences between traditional methodologies and RUP vs Agile Methodologies

Source: Self Made

According to the analysis made of the existing methodologies, no one can apply for the SSI of the UPFIM, since none is completely adapted to the needs, limitations, resources and structure of the organization.

On the one hand, traditional methodologies and RUPs are impossible to implement as they require relatively large development teams with too many well-defined roles, and this organizational structure does not exist in SSI, mainly because these methodologies are more focused on software development companies than they provide outsourcing service to different clients.

The disadvantage of agile methodologies to fully consider them is that they do not consider documentation as important, and this is the problem that is intended to be solved with the proposal.

Therefore, both philosophies should take the characteristics that are adaptable to the SSI and generate a current and innovative methodology that meets the needs.

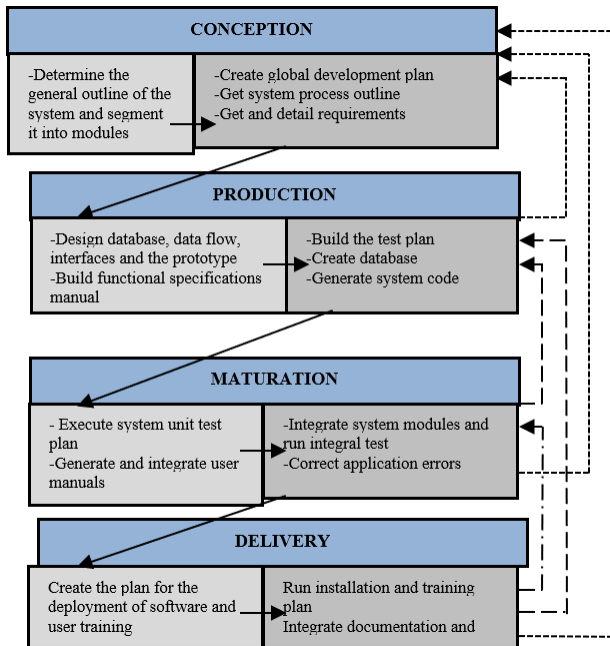
General elements of the methodology

The proposed methodology that from now on we will call Agile Methodology in Own Software Development (MADSP) is of the incremental type in the middle of its stages since with that it allows a flexibility in when to the changes during the development, there are functional products of It is possible to work in a modular way if necessary, to finally integrate everything in a single system. It is considered hybrid because elements of traditional, RUP and agile methodologies are taken into account, Following are the characteristics that were taken from each philosophy:

Agile Type

- a. Prepared for changes during the project
- b. There is no traditional contract with the client, because it is not necessary
- c. Few roles
- d. Small groups working in the same place
- e. Good communication between the development group
- f. Great capacity and experience in the development group
- g. The client is part of the development group and is in the workplace
- h. Based on the production of functional applications as soon as possible, considering only the essential documentation for control of changes in future versions
- i. Little control, since it is based on the discipline of the development group.
- j. RUP
- k. The artifacts to be used as inputs and outputs of the stages are some of those used in this methodology.
- l. The controls that will be carried out although they are minimum are based on those proposed by RUP.

As for the working group, it is recommended that they be in the same physical space to achieve better communication and work in pairs as recommended by agile methodologies in small groups for development. The roles of leader, developer, client and consultant should be considered, all of them are part of the UPFIM, the leader and developers should be elements of the SSI or the ISC, the client is from the area requesting the application and the consultant is someone also from UPFIM that is aware of the regulations, regulations or laws that must be considered in the processes to be automated. The MADSP consists of four stages (conception, production, maturation and delivery) in figure 1 the diagram of the stages of the MADSP is shown.



If during the Production, Maturation or Delivery a change occurs in the requirements of the client, in the design, or in the integration of modules the modification can be integrated but that will alter the initial development plan, and is justifiable only if the person responsible for the change is the client due to a change in some regulations that affect the process to be automated.

The software modules in the Production stage can be worked in series or in parallel, just like in Maturation; the decision will depend on the number of developers available. Each increment is given by the completion of the production and after maturity of each module.

Necessary flow

- Flow in case of changes in Concepción
- Flow in case of changes in Production
- Flow in case of changes in Maturation

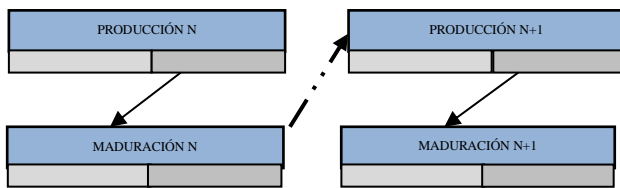
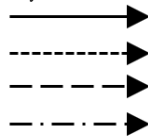


Figure 1 Diagram of the stages of MADSP
Source: Self Made

The Conception and Delivery do not work in increments, that is to say those stages are not finished until they are Completed, on the other hand the phases that if handled incrementally are Production and Maturation since they work by modules according to how many parts and small teams divided the development, this allows that at some point a team is working the production of a certain module and another team is in the maturation of another part of the software, or that all the equipment is in production or in maturation of different modules.

The methodology considers the possibility of changes in any of the stages, although this would affect the development plan and for that reason, as far as possible, they should be avoided, especially if the change is responsible for the change.

Figure 1 contains different types of lines that indicate the flow to follow in the process, only the continuous lines are the ones to follow during the development, the others will depend on a change in a previous stage or the number of developers available to participate in the creation of software Each stage is divided into two parts and each one of them indicates the work to be done. From one part to the other the workflow is serialized as indicated by the arrow, and within each of them the activities are worked in parallel.

Description of the stages of the MADSP

Conception

This first phase is not incremental, is made up of two parts like all the others, in the first is to determine the general scheme of the system and are segmented into modules this task is carried out by the Leader of the development team together with the client and the consultant's support if necessary.

After the above, the activities of the second part can be carried out, which are carried out in parallel, creating the overall development plan carried out by the group leader based on the general outline, the available personnel and the time in which the client requires the software, the leader and the developers are responsible for the task of obtaining the system's process schema. The task of compiling and detailing requirements is executed by the developers supported by the client (s) and the consultant. When detailing the requirements, those obtained by the leader in the general scheme of the system are used, the objective is not to leave any important details outside the requirements and be sure that all the functions to be implemented in the system have been captured.

Production

This stage is worked incrementally, it is considered as an increase the work with a module, that is to say the production of a module; For example, if the system will contain four modules, then there will be four iterations in the production one per module, being able to work more than one module in parallel as long as you have the number of developers available, remember that the developers must work in pairs, then to have at the same time two modules in Production, you must have 4 developers.

The activities of this stage are eight divided into two parts, the first consists of four activities and can be carried out in parallel.

The developers are responsible for designing the system and here three activities are considered: the database, the data flow, the interfaces with the creation of a prototype; the fourth is carried out by the leader, build the specifications manual; the second part of the Production includes the other four activities that can be carried out in parallel, these are: build the test plan, develop database and generate complete code by system modules. In this stage is where you spend more time but having activities in parallel and work on modules helps streamline production.

The only activity where the client or the consultant participates here, is in the construction of the test plan as long as the leader considers it convenient.

The design of the database and the subsequent creation of it is done by a couple of developers only, while the design of the interface and the data flow, the construction of the test plan and the coding is divided into modules and into couples.

Maturation

Maturation is the third stage of the methodology and as the Production is worked incrementally and divided into two parts, with four activities being carried out in total, in the first part the unit testing plan is executed system and the user manuals are generated and integrated per module, in the second the integration of system modules is performed in parallel and run integral test, and the errors of the application that the test plan has thrown are corrected.

The execution of the test plan is carried out by modules, and it is carried out regularly by a expert expert in tests, here the client or the consultant can also participate if the leader considers it necessary at the suggestion of the expert in tests. The integration of the modules is done by a single team (couple) always having the necessary communication with the people who worked each module, in parallel the other pairs of developers generate the user manuals of the modules that corresponded to produce and mature. According to this methodology, you can have developers working on the production of a module, while others are already in the maturation of the module that corresponded to them. The integration of the modules will be given incrementally as the tests pass. The correction of errors will be made by the couple that was commissioned at the time to work on the module that has thrown the error.

Delivery

The delivery is the last stage and like the first one is not done incrementally, the activities are three, divided into two parts, in the first the leader creates the software installation plan and user training. In the second part in parallel, the installation and training plan of the system carried out by a couple of developers is executed, and another couple integrates the generated technical documentation and the release of the system is performed under a reception delivery with the client area.

Results and future work

So far we have worked on the tasks shown in Table 2, achieving the objectives of each activity.

Task	Objective
1. Carry out an analysis of the organization of the development team of UPFIM, to determine the requirements that the methodology to be proposed should cover.	Know the detail of the work area and obtain the profile of the human resources (developers of the SSI, developers of the ISC and the deputy director of computer systems)
2. Make an in-depth study of the software development methodologies Robust and Agile to determine the methods useful to the proposal that will be made.	Know and understand in depth the methodologies useful to the proposal that will be made. Determine that they will be taken from the known methodologies, to put together the proposal.
3. Define the generalities of methodology based on the principles, philosophies and phases of other existing methodologies, considering the context of the UPFIM development group and the needs of the SSI.	Generate the proposal of the MADSP to propose it to the SSI of the UPFIM in order to have a current and innovative methodology appropriate to their organizational and functional needs
4. Establish the stages of the methodology, the activities to be carried out in each of them, the work flow and communication between the activities of each stage and the sequence of the same.	

Table 2 Activities to define the development methodology of the SSI of UPFIM

Source: *Self Made*

Future work is defined in table 3 with the objective of each task

Future task	Objective
1. Define for each stage description and format of the artifacts (records) of each activity, these can be printed or electronic and can refer to documents or application code, as well as the person in charge of generating and safeguarding them	Have elements of control during the development and document the different activities and stages for future system maintenance and version control
2. Establish a nomenclature for each device	Identify in a standardized way each record of the activities, stages and systems for a better control of the documentation and support to the maintenance and control of the versions of the different applications developed
3. Develop application for the administration of academic, scientific and technological production of UPFIM teaching staff	Apply the methodology in a software development case to evaluate its effectiveness and analyze results obtained

Table 3 Future works

Source: Self Made

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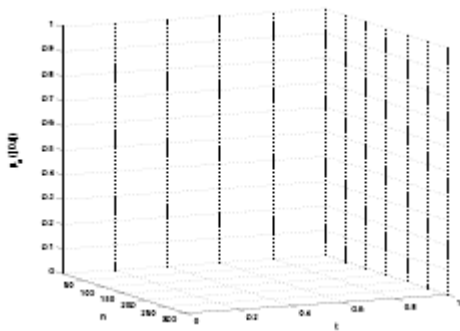
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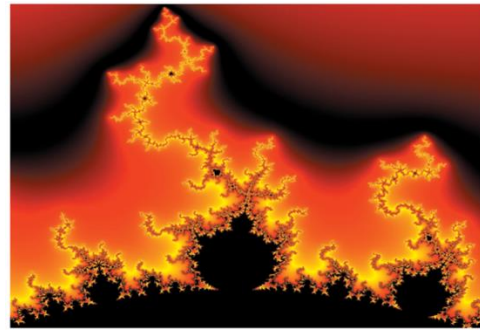


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JUAREZ-SANTIAGO, Brenda, ROJAS-HERNÁNDEZ, Sergio Alejandro, SILVA-RIVERA, Manuel Eduardo and LANDAVERDE-NERI, Juan Pablo

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“Methodology for the UPFIM own software development”

REYNA-ANGELES, Omar, HERNÁNDEZ-TAPIA, Zaila, SOTO-FERNÁNDEZ, Susana Leticia and GÓMEZ-RAMOS, Marcos Yamir

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