

Virtual Learning System for the Universidad Técnica Del Norte, with modules: Questionnaires, Student-Teacher Interaction, Security and Auditing.

Author- Lenin Xavier CHÁVEZ GUAMIALAMÁ

Universidad Técnica Del Norte, Av. 17 de Julio, Ibarra, Imbabura
lxchavez@utn.edu.ec

Abstract. *Universidad Técnica del Norte has like institutional mission, to training excellent professionals which implies the continuous improvement of students' performances. Therefore it stipulates that degree work must be carried out at the end of the carrer in which the student demonstrates what has been learned, For this purpose, was carried out this degree work called "SISTEMA DE ENTORNO VIRTUAL ENSEÑANZA - APRENDIZAJE DE LA UNIVERSIDAD TÉCNICA DEL NORTE CON LA IMPLEMENTACIÓN DE LOS MÓDULOS DE CUESTIONARIOS, INTERACCIÓN ESTUDIANTE-MAESTRO, SEGURIDAD Y AUDITORIA." In order to provide a good tool that helps to improve the academic process of the institution.*

There is also a detail of the problems that UTN has faced in virtual learning and a description of the project that aims to solve such problems.

Keywords

Learning, Virtual, Software.

Resumen. *La Universidad Técnica del Norte tiene como misión institucional, formar excelentes profesionales, por lo que aplica la mejora continua. Por ello estipula que al finalizar la carrera se debe realizar un trabajo de grado donde el estudiante demuestre lo aprendido, para cumplir este fin se realizó el trabajo de grado denominado "SISTEMA DE ENTORNO VIRTUAL ENSEÑANZA - APRENDIZAJE DE LA*

UNIVERSIDAD TÉCNICA DEL NORTE CON LA IMPLEMENTACIÓN DE LOS MÓDULOS DE CUESTIONARIOS, INTERACCIÓN ESTUDIANTE-MAESTRO, SEGURIDAD Y AUDITORIA" para proporcionar una excelente herramienta que ayude a mejorar los procesos académicos de la institución. Así se desarrolló este proyecto de grado descrito en el siguiente artículo.

En este artículo se detalla los problemas que ha enfrentado la UTN con respecto al aprendizaje virtual, además de la descripción del proyecto con el que se dará una posible solución.

Palabras Claves

Aprendizaje, Virtual, Software.

1. Introduction

Universidad Técnica del Norte since 2011 implements the virtual environment through the Moodle tool in version 1.9 which offers many benefits and distance education.

Over time Moodle developers were improving and releasing new versions tool which was adopting the Technical University of North until today (April 2014) with the "Moodle 2.6" version

Over the Course of time comprised between 2006 and 2014 have identified a number of problems and inconsistencies regarding the management and use of virtual classroom Moodle.

In most due to the Institutional Integrated System integration.

Due to the lack of regulations requiring the use of this tool, the degree of difficulty having and poor training given, very few teachers who have been using this tool for teaching and learning.

The administration has been going to this tool is increasingly complicated considering that the number of students, careers and courses is quite large and in each academic year must manually create virtual classrooms throughout the university.

Problem

In the time between the years 2011 and 2014 have identified a number of problems to be solved regarding the management and use of virtual classroom Moodle. In most because it is a tool that works independently Institutional Integrated Information System. These problems are detailed below:

Difficult administration: the virtual classroom Moodle requires that courses are created manually for each academic year and considering the high number of students, careers, courses and parallel existing in our institution the task of creating the courses is very laborious and repetitive.

Difficult to use: the amount of options you have Moodle makes it robust but also causes its administration by the teacher is more complicated.

The content of this field is not linked to syllabus or prior planning: the UTN has a planning system in which the teacher plans the topics to be discussed during the course with times and qualifying ratios which should go linked to any activity and / or resource that teachers impart to the student.

Duplicate information: having to re-enter data both students, teachers, courses, etc. From the UTN Academic System to Moodle duplication and inconsistency of information is generated. Ideally have it only in the UTN Academic System.

Partial notes of the academic system does not have a detail: you do not have a register

detailing from which the partial marks, the list of activities annexed student work, the dates on which they were shipped and delivered all this respectively graded on a schedule. This occurs by having separate information Moodle with the UTN Integrated System.

You do not have evidence of learning: you need to keep learning evidence based planning.

General Purpose

Design and implement modules Questionnaires, Student-Faculty Interaction, Security and Auditing for the Virtual System Teaching-Learning Environment UTN

Scope

The system Virtual Environment Teaching-Learning is a tool that helps manage resources and academic activities and keep in constant communication to teachers and their students.

This system will focus on the following modules:

Questionnaires Module: This module allows the teacher to design and implement questionnaires to students.

You can raise assessments with different types of questions (multiple choice, true / false, short answer, etc.)

The questionnaires allow multiple attempts. Each trial is registered and qualified.

Teachers can define a database of questions that can be reused in different questionnaires

You can place limits access time to the tests.

This module includes self-rating, or also log note to the teacher if applicable.

As the rating of tasks, qualification questionnaires will be part of the note set in the current academic system.

Let's get reports of evaluations to students for each course.

Forums: This module will be a powerful tool for communication and collaborative work

between the student and the teacher, using virtual workspaces and dialogue provide the possibility of participation in a thoughtful way.

Provide different types of forums available: exclusive for teachers, course news, and open to all.

The teacher can force subscription for all to a forum or allow individuals to choose to subscribe forums.

Post ads between users of the same course.

Create forums.

Will allow teachers to qualify the student's performance within the forum if deemed necessary.

Polls: This module will enable students to conduct surveys.

You can generate reports from surveys, which include statistical graphs.

Each participating student is informed of the results of the survey in class.

Academic Calendar: In this application through a calendar organizer activities, scheduled by the teacher assessments will form.

You can also register with the date of completion of the activity or the delivery of tasks, etc.

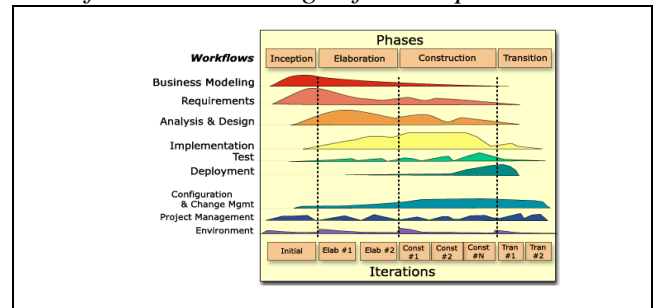
Provides friendlier interface and a more organized to present the events planned by teachers form.

Chat: This feature gives the possibility to communicate between the members of each virtual classroom.

Development methodology

For software development, RUP is used. Rational Unified Process is a methodology used in software engineering to standardize the process of project development. *“RUP, iterative development promotes and organizes the*

development of software into four phases, each consisting of one or more executable iterations of the software at this stage of development”.



Source: IBM

Figure 2 Description of Phases RUP

In the **Inception** phase will take place:

- ✓ **Software Development Plan:** The document in which a general approach to the whole project is provided.
- ✓ **Vision Document:** This document describes the main features that the project will be described.
- ✓ **Requirements:** A System Requirements document will be presented by the user, detailing the features that will.

In the **Elaboration** phase will take place:

- ✓ **Use Case Model:** Here you define which functions are allocated to each system user role. A diagram of use case specifications and use cases will be shown.
- ✓ **Document architecture:** the most important architecture diagrams that composed this system, as the architecture of the tool, the integration of the modules is displayed, the database diagrams and activity diagrams of the processes with the procedures manual respective.
- ✓ **Design:** prototypes of Web pages with their features and functionality will be modeled.

In the **Construction** phase, the implementation of the structural basis of

applications such as database schema and web pages with their validations are performed.

In the **Transition** phase, the system will be tested with real data and train users in their management of applications, and will be formally transferred to the documentation of the project, indicating the conclusions and recommendations.

Some **standards** organizations like IMS suggested for such tools should be used.

Flexible: The systems are constantly changing and being updated so it is necessary to make a system compatible with new technologies and modular, so adding or removing components.

Accessibility: The system must be available, meaning at any time and anywhere (obviously having internet access), to use the available resources.

Security: As with any system, you must have access permissions methods and authentication then discuss about the tools to use.

Tools to Create Courses: The teacher can generate, structure, update and publish the content of the courses. Provide mechanisms to automatically.

Course Management Tools: Creating, maintaining user accounts.

Educational materials: media shall be provided as document images, animations, video, audio, etc. The tasks must be programmed and automated mechanisms for controlling delivery dates will be made.

Tools

The Application Server that is used in this project is Oracle Weblogic 11g, with the development tool APLICATTION EXPRESS Oracle (Apex) in version 4.2.3. This tool is fully compatible with the Oracle database so it will be easy connections to it.

Apex is a tool for web applications very easily and quickly, which benefits the development of the applications and makes the time to optimize as long as the PL / SQL code are well designed. This tool is connected directly to the database, since it

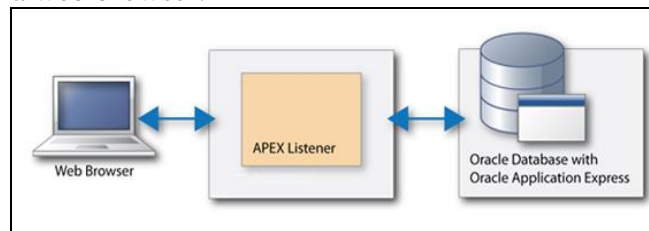
is a component that is installed in the Oracle database.

Making a web application in Apex has benefits as the usual dynamic action forms that avoid having to manually develop mechanisms using javascript or AJAX code own. You can include plug-ins that help place grouped dropdown lists, text fields with mask effects in and out of windows, or other elements.

Applications are made in Apex, you can export and import the database into a SQL script type, which facilitates portability and draw backs. Then APEX architecture shown.

Apex has the capability to integrate with SQL language, PL / SQL also with HTML so facilitating the integration of the database with web applications.

To access an application that Apex is needed on the server is installed and configured correctly so APEX_LISTENER access the application from a web browser.



Source: Oracle

Figure 3 Architecture Oracle Application Express Listener

Results

The design and implementation of the system has been performed based on the existing systems in making UTN has not made changes in the architecture of hardware or software, but have added components in the database that are related to the previously created.

The information presented in the Learning System UTN is loaded in the same database that have the rest of the modules of the integrated system. So you can say that it is a system with a centralized database, enabling the integration of academic and administrative modules.

With the creation of student and teaching portfolio has added a graphical interface for

virtual classroom and take advantage of these applications that are already created on the website UTN.

To access the system you only need a computer with internet access and a browser, revenue is not difficult installing more components.

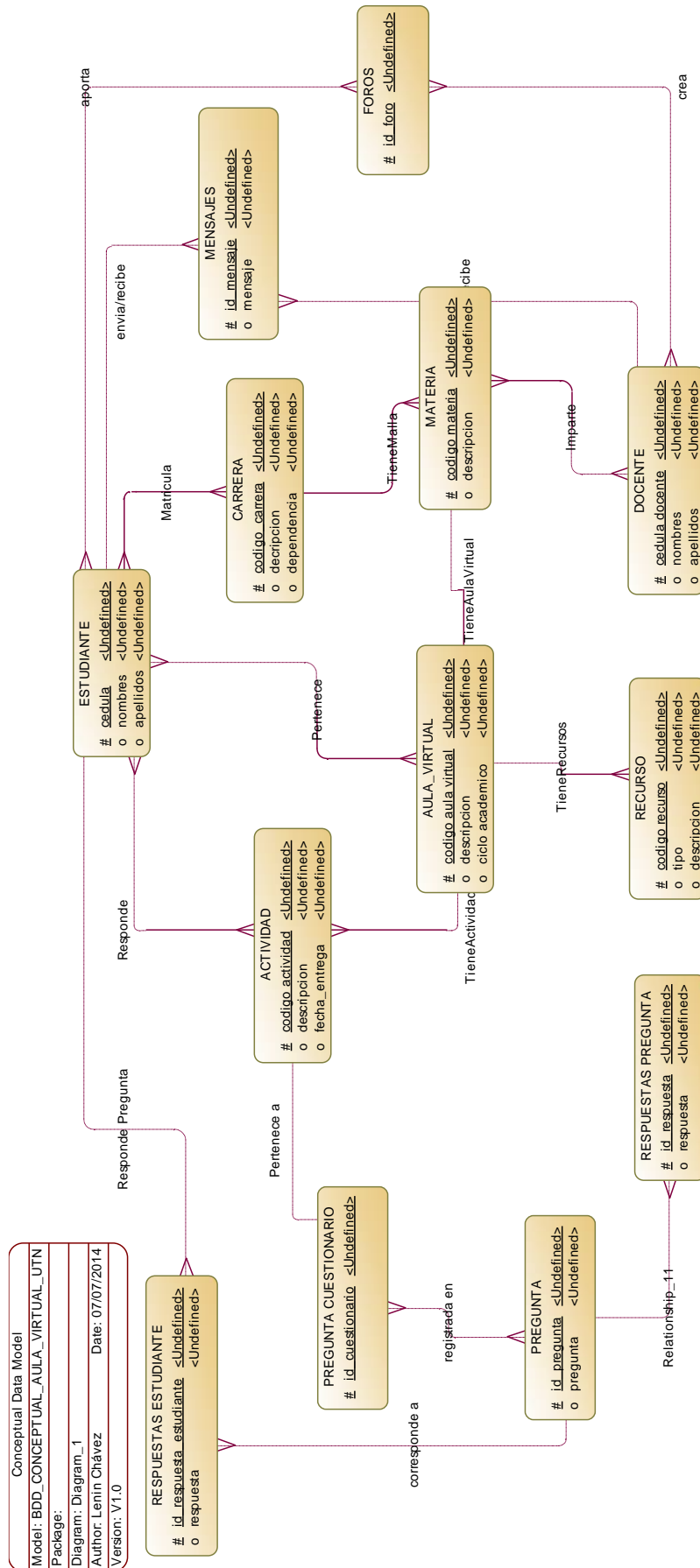
Described below are some benefits to that obtained with the system implementation:

IMPACT	BENEFITS
Economic	Process improvement, time savings and utilization of human talent. Savings in maintenance and reuse of hardware and software
Social	Increase the prestige of the Universidad Técnica de Norte.
Technological	Expansion and improvement of the quality of software UTN
Educational	Exploiting technological learning tools. Evaluation and control of academic management UTN.
Ecological	Reduction of impressions and / or use of paper.

Fuente: Own

Table Project Impacts and Benefits

Conceptual Model



Conclusions

Modules Quizzes, Interaction Student-Teacher, Security and Auditing for System Virtual Environment for Teaching and Learning at the Technical University of North smoothly developed and has been very beneficial and helps the academic process of the institution, it is made according requirements, standards, rules and tools used in the technological direction of the UTN and integrates with existing systems.

The design of the database is performed by integrating the structures associated with the project, thus avoiding duplication of information and ensuring the integrity of information and interaction with the various systems existing in the UTN.

RUP development methodology was applied, which allowed for an orderly work and especially as a result get quality software.

The use of Oracle Application Express has been very beneficial tool generates professional, dynamic, interactive applications and optimizes the time of application development.

Training the user has performed smoothly, the system was designed for intuitive and user-friendly manner.

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2. Recommendations

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Recommended

Should increase the bandwidth and server resources dedicated to Oracle APEX to improve the speed of system processes.

It is necessary to promote the use of virtual classroom UTN so there is a culture of using new technologies.

Should conduct a thorough investigation to automatically integrate institutional Academic Urkund system.

Should conduct regular trainings aimed at students and teachers of the UTN on the proper use of the Academic portfolios.

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About the Authors...

Author - Lenin CHÁVEZ Student of Computer Systems Engineering from the Universidad Técnica Del Norte, Ibarra City -Ecuador