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TEMA:

SISTEMA DE ENTORNO VIRTUAL DE ENSEÑANZA APRENDIZAJE DE LA UNIVERSIDAD TÉCNICA DEL NORTE CON LOS MÓDULOS DE CURSOS, USUARIOS, RECURSOS Y TAREAS.

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Virtual Learning System for the Universidad Técnica Del Norte, with modules: Users, Courses, Resources and Tasks.

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Abstract. *One of the main objectives at the Universidad Técnica Del Norte is to have excellent professionals. To support this, there is a program to improve the quality of education. The Direction of Technological Development and Computer of UTN has tried to optimize the academic processes making them more efficient. To help achieve this, the informatics system has been working on a system to allow virtual learning.*

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 uno de sus objetivos, formar excelentes profesionales, por lo que se ha trabajado en mejorar cada día más la calidad de la educación. La Dirección de Desarrollo Tecnológico e Informática de la UTN ha tratado de optimizar los procesos académicos haciéndolos más eficientes. Se ha desarrollado un sistema informático que permite facilitar el aprendizaje virtual.*

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

The Universidad Técnica Del Norte does not have a system for Virtual Teaching and Learning Environment adapted to the needs of the institution, it does not integrate with other systems, since the information is not shared and difficult to monitor and evaluate the students as Teachers. Although there are other systems, these cannot be managed properly because they are not compatible with the tools used in the systems of the Universidad Técnica Del Norte, in addition to many of these would have a high cost, so they are not accessible.

Virtual education is a great alternative for professional development outside classrooms; so much emphasis should be given to the use of software for online learning. Teachers have to prepare content for online courses, but in the syllabus for each subject, and content making it unnecessary re-create them are included. Another problem is that the storage of the activities of the students is not registered in the database as evidence of learning for each user.

At the Technical University North has been working with the Moodle virtual learning platform, since 2006 with version 1.9, but unfortunately was not able to regulate or socialize using this tool. The teaching-learning tools virtual, they support for classes, optimizing

time and space, so that virtual education is increasingly used.

Teachers are becoming increasingly required to use computer tools, so they should take advantage of that fact and make applications that are functional and user friendly. The fact that users cannot restore the restore does not complete courses and, therefore, changing Moodle valuable information will be lost, so that design and implement a system-Virtual Learning Environment learning with the UTN modules: Courses, Users, Resources and Tasks; focusing on the following main objectives:

- ✓ Integrate with the Academic System modules having the UTN today.
- ✓ Implement a Web system for the students and teachers have access to it through the Internet.
- ✓ Using BDD and software tools that are accessible and with the UTN works.
- ✓ Train users for the appropriate system operation.

2. Materials and Methods

Three main methodologies for virtual education are known:

Synchronous: When the moderator (in this case the teachers) and students will communicate at the same time for a message to be transmitted must be connected the two. This method allows you to work together. Some features of virtual classroom with this method are: chat, voice chat, video conferencing with whiteboard, audio or images and virtual groups.

Asynchronous: This method allows you to send messages without the user receiving the message logging for this, a storage server stores messages required. Some features are: Email, discussion forums, web domains, texts, animated graphics, audio, interactive presentations, video.

b-learning: It is the combination of the characteristics of the asynchronous method to synchronous, accompanied by classroom education. With this mode, the Teacher is no longer the traditional leader academic training and becomes a moderator of the course, where

students have more freedom to participate and learn. This method is very useful, flexible and is chosen for this Project.

The Virtual Learning System, also known as distance learning platform (e-learning), is a web system that allows Teachers and Students of the Universidad Técnica Del Norte, share knowledge and ideas through documents, books , multimedia, digital files, as well as the evaluation of them, as part of the qualifications of the existing academic system.

This system consists of the following modules:
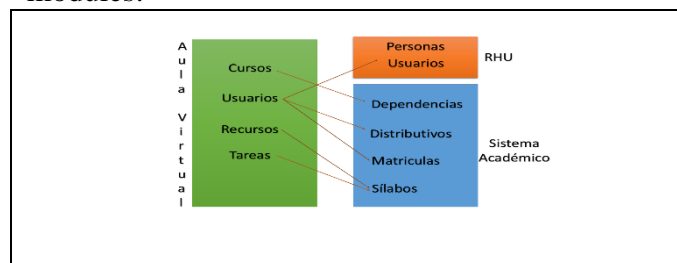
Source: Own

Figure 1 Integration Modules

Course Management Module: Manages virtual courses to be opened in each period or academic year, courses will be administered according to the materials from each school in addition to open courses requiring students to acquire knowledge enabled virtually:

- ✓ The courses will be created from subjects created in each academic year.
- ✓ Open courses will be enabled as required in the different academic units.
- ✓ The course content will be imported from the syllabus that teachers up to the current system.
- ✓ The courses are organized by content themes each with a series of activities planned Teachers.

User Management Module: Manages users who are enabled for each course, with its own moderator, users can enter the system with your unique password that will be used to enter all the systems that currently exist:

- ✓ Control Users and Roles (Students, Teachers and Administrators) will take.
- ✓ Users will be the same as those used in the computer systems of the university.
- ✓ There will need to enable virtual users per year, but these will be automatically enrolled once they enroll in the subject.
- ✓ Users can access the course only the academic period for which it was created, with modifications that will prevent outside time limits for each course are made.

Module Resources: Responsible for files that can be loaded and unloaded in each course to supplement classroom learning:

- ✓ Teachers can upload different types of files (documents, slides, videos, links, and publications) and online course material as necessary to Students.
- ✓ It can display files in a preview and / or you can download them.
- ✓ The files are placed according to the schedule contained in the syllabus, planning to have them.

Module Tasks: These are tasks that are planned, the students will have to make and upload the files of evidence:

- ✓ Teachers can plan percentages of grades task, and other academic activities.
- ✓ It may rise up and tasks in addition to their respective rating.
- ✓ Students can view a schedule of tasks or pending events.
- ✓ Notes will be available for the tasks performed.
- ✓ The score of the tasks will be part of the note that is set in the current school system.
- ✓ The scores for the tasks will have a comment on that warrant Teachers note just making the observations.

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*".
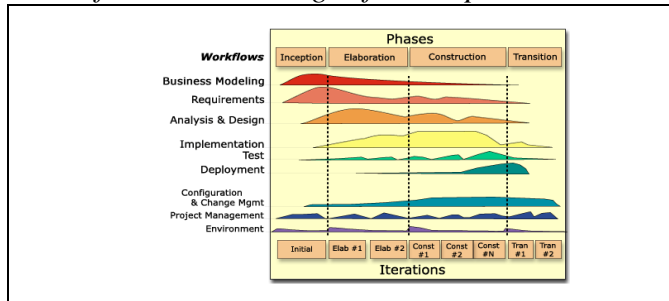
Source: IBM

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.

2.1 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 / SQLalso 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.
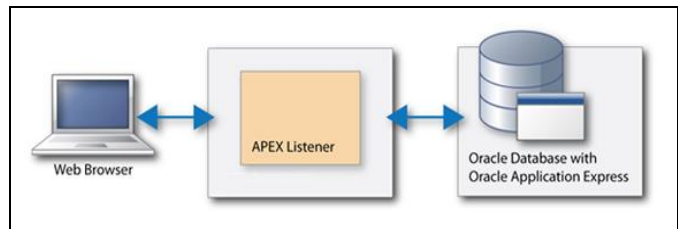
Source: Oracle

Figure 3 Architecture Oracle Application Express Listener

3. 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

3.1 Conceptual Model
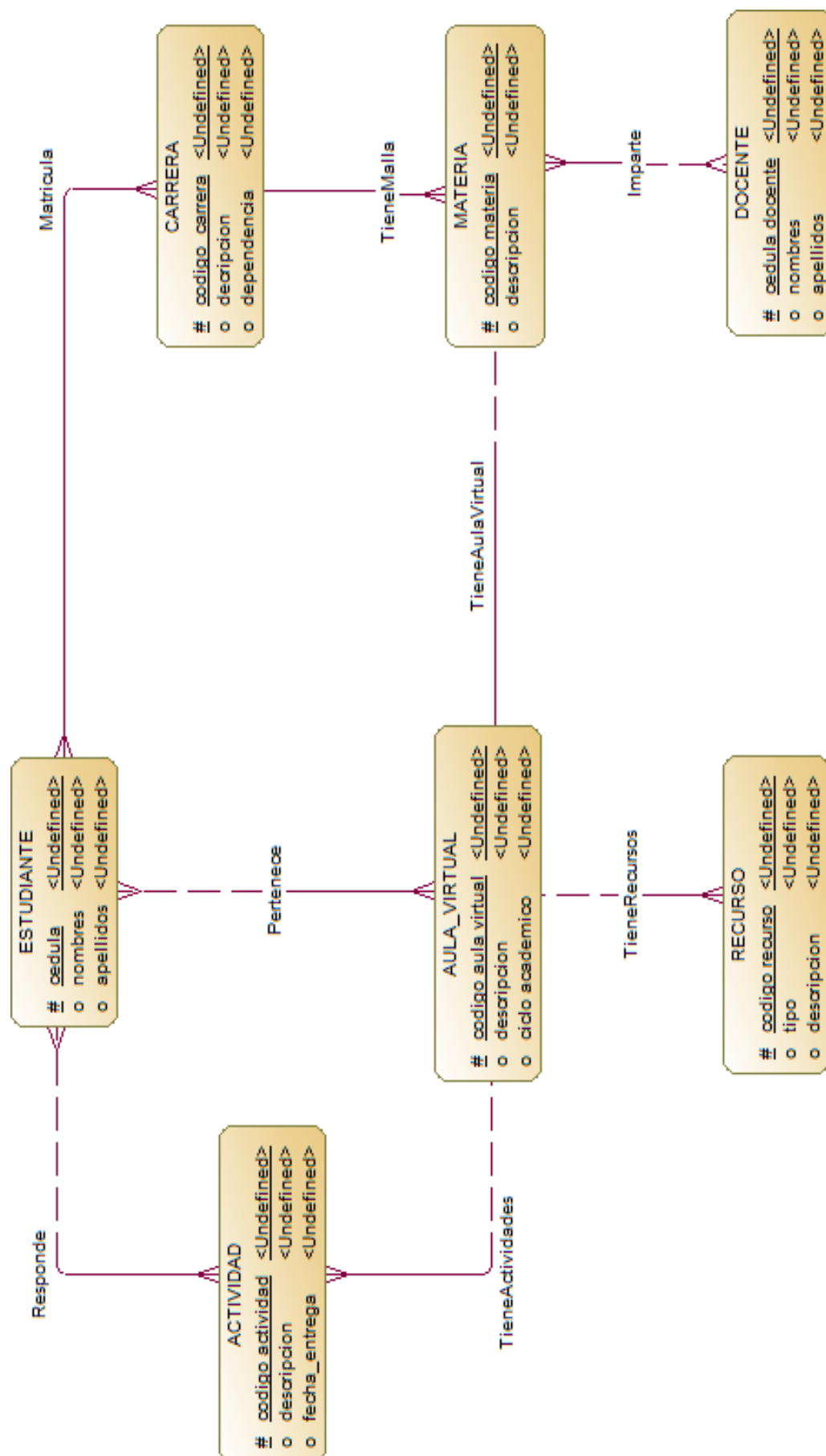
3.2 Physical Model
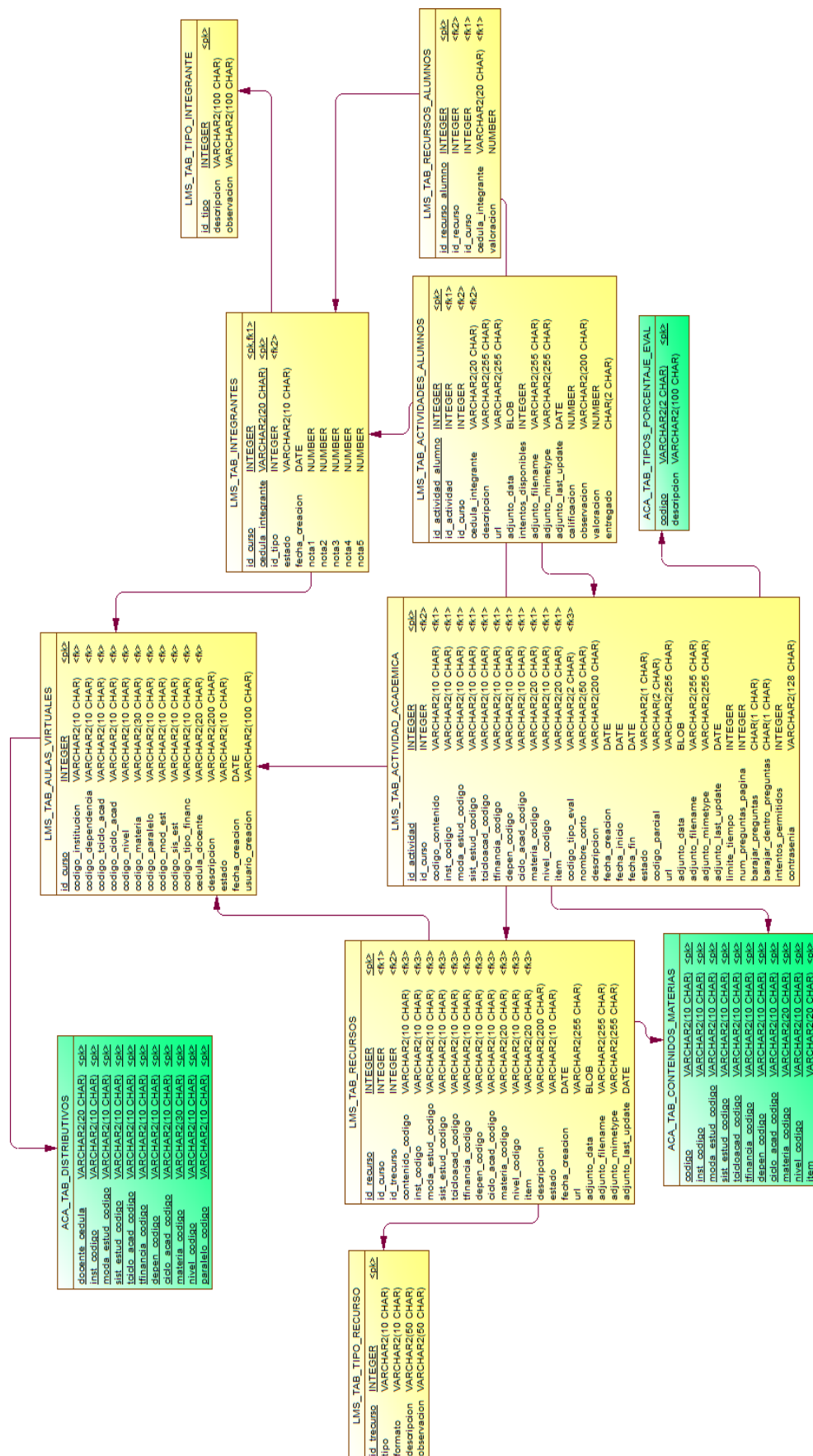
4. Conclusions

Has been analyzed the tools with which it works the UTN. Has seen fit to implement the web system in Oracle Application Express, for ease of development and application management.

The application is deployed with Oracle and related tools; in which modules of the Universidad Técnica Del Norte integrated system are implemented.

The user training has been performed with good results, as it has implemented an easy to use graphical interface.

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5. Recommendations

For proper operation of the system must successfully complete the process of making distributional Teachers, Student enrollment and registration syllabus subjects.

The UTN has licensing of software tools that could be very useful in the system so they could investigate these to couple it to the system, such as plagiarism prevention system with URKUND, video calls or other.

It is necessary to promote the use of IT, in conjunction with computer systems for the UTN for a culture of use of new technologies.

Could standardize web platform systems, allowing users to handle a single type of interface and facilitating the entry of information.

Should assess the capacity of the hardware infrastructure to be alert to the IT needs of the UTN.

Observations made by users they must be analyzed by a group of trained personnel together with the authorities to regulate and standardize processes relevant to the system.

With the upcoming features that the system will be necessary to to train users to manage the system properly.

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