

TECHNICAL UNIVERSITY OF NORTH



ENGINEERING SCHOOL OF APPLIED SCIENCE

SCHOOL OF ENGINEERING
COMPUTER SYSTEMS

TECHNICAL REPORT

TOPIC:

“VIRTUAL TOUR OF THE PHYSICAL INFRASTRUCTURE AND
TECHNOLOGY OF THE TECHNICAL UNIVERSITY OF NORTH.”

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Ibarra – Ecuador

2011

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1. OBJECTIVES

1.1. General purpose.

Create a three-dimensional modeling VRML world, the campus of the Northern Technical College located in the sector Olivo, the city of Ibarra, which can be displayed through the internet all the existing objects with a virtually real detail.

1.2. Specific objectives.

- ✓ Create a basic model and show the campus through the university web Uniportal.
- ✓ Create and model Internet Space Builder tool, each and every one of the real physical structures in detail, namely that you can browse each of its internal physical spaces. Integrate three-dimensional model with the database of the Integrated University, in order to display information from authorities and agencies of the Northern Technical College through the virtual tour of the UTN.
- ✓ Create a virtual campus model light enough, with the purpose to be explored through any Internet connection.
- ✓ Show through the virtual tour of the UTN, basic information technology equipment organized in the Computer Science Department and leave open the possibility to display information from all existing equipment within the university campus.
- ✓ Using the methodology RUP software development project for the construction of Virtual Visit to the physical and technological infrastructure of the Technical University of the North.

2. INTRODUCTION

Given the growth of technology and the need to be communicated globally as the world university and the community, is only feasible to have a web application that allows visitors to see virtually the campus in a real way and to acquire information available in the same manner as if he did personally.

The term "virtual tour" usually evokes the idea of a three-dimensional environment, which typically looks like the real world with real world rules such as gravity, topography, locomotion, real-time actions and communication. It is a kind of "alternative world " that was designed to provide a different form of communication and information services both online and offline college.

Today virtual worlds are equipped with features of social networking and online collaboration tools (integrating blogs, personal pages and some VoIP), which transformed them into valuable tools for e-learning and remote collaboration via the Web.

3. ANTECEDENTES

In North Technical University, we conducted a first study on the model of three-dimensional objects with VRML, where it was found feasible to create virtual spaces of any real scenario. In the thesis "Methodology for the development of virtual sets with VRML" by Bertha and Oscar Bautista Rojas, performed the first tests with VRML creating virtual environments using a small set of objects that can be solid form, located and oriented in a certain way or intangible elements that affect the scene as lights, sound and different points of view. To create these virtual reality worlds using text files, whose length will be provided. wrl, which can be developed using any editor or word processor.

At present there is a lot of tools to visually model the three-dimensional elements and other editors that support the programmer when writing VRML code, allowing to accelerate the construction of virtual projects. You can combine the development of virtual environments with other technologies with which they can take action outside the context of the virtual world, actions that enable a virtual model to obtain and display information from other data repositories such as databases data or simple text files

4. TOOLS

The implementation of the virtual tour of the institution is carried out with the tools:

- **Internet Space Builder v3.0:** Is a 3D editor for web designers, allows the creation of virtual worlds and online publishing. You can design and edit scenes and 3D objects using Boolean operations (addition and subtraction) on a range of primitive shapes like spheres, pyramids, cones and cylinders. You can also import and export scenes and objects in VRML 2.0 format. Creations can be seen in most of the VRML browser. Internet Space Builder has a great gallery of shapes, textures, paintings, objects and video. Allows you to create additional views (cameras) and has advanced features of texture mapping, color and transparency. You can also import and export VRML 2.0 worlds in compressed (GZIP) also rename and convert file formats other destination. Supports VRML 1.0, you can process files BMP, GIF, JPG and PNG image files and import 3DS, DXF and others, can import and export MUS objects in DXF format.
- **VrmlPad :** is a professional editor for VRML programming. Its main features save time and include powerful editorial abilities and visual support for the scene tree construction and operations of virtual items (Parallel Graphics)

- **Base de datos Oracle® Database 10g:** - Oracle® Database 10g is the new database based on Grid technology and designed to help companies optimize the performance of their technology tools, both hardware and software. Oracle® Database 10g is designed for companies to increase the profitability of their investments in technology.

This new database from Oracle® is designed to operate effectively in both small SMP servers and servers, to network environments and business tables. Oracle® Database 9i/10g incorporating features such as automating the setup and management, making it affordable and easy tool to use.

Among the new features of Oracle® Database 10g manageability highlights its detection, which eliminates some of the repetitive tasks that paralyze the day to day administration, such as performance diagnostics, the development of applications and management memory. It also includes a self-diagnostic engine that identifies any operational problems, performance, and recommends actions to resolve it. Oracle® Database 10g includes a new control system developed for web environments, called Database Control. This system creates a graphical diagnostic window into the database, while it works. This allows administrators to actively manage the database while receiving alerts and tips for getting the most out of software. ("Overview of Forms Server", 2009).

- **Netbeans 6.7 para la programación de JSP:** is a tool to help programmers develop applications. It is written in Java, but also supports other languages such as PHP, Ruby or C / C + +. Its popularity is due to be open source and free for both commercial and personal use under the GPL (GNU General Public License) and CDDL (Common Development and Distribution License).
- **Adobe CS3:** Creative Suite 3, is a set of tools that enable enterprise applications, illustrative and educational Adobe house.
- **Servidor Apache Tomcat:** It is the most widely used web server when working with Java web environments, Apache Tomcat is a fully functional implementation of the standard JSP and Servlets. It can also be specified as the handler of JSP and servlets requests received by popular web servers such as Apache HTTP Server Apache Software Foundation or Microsoft Internet Information Server (IIS). It is also integrated into the reference implementation of Java 2 Enterprise Edition (J2EE) from Sun Microsystems.

- **AutoCat 2007:** Design, visualize, and document your ideas clearly and effectively, from conceptual design through drafting and detailing, AutoCAD 2007 enables you to explore ideas like never before. Create, edit, and develop design alternatives using realistic solids and surfaces in an updated design environment. Communicate your ideas with powerful sketch, shadow, and rendering, including intuitive walk-through animations. After that, turn your concepts into a set of documents with the new section and flatten functionality. It should be noted that this tool will only be used to display the plans for the campus.
- **Rational Rose (UML):** Rational Rose CASE tool developers who sell UML and completely supports the UML specification. This tool proposes the use of four types of model for a system design using a static and a dynamic system models, a logical and a physical. Create and refine these views, thus creating a complete model representing the problem domain and software system.
- **CortonaVRML:** Cortona3D Viewer (formerly known as Cortona VRML Client) works as a VRML plug-in for popular Internet browsers (Internet Explorer, Netscape Navigator, Mozilla, Firefox, etc) and office applications (Microsoft PowerPoint, Microsoft Word, etc.)

5. BENEFITS

- Reduce information overload ("many things to learn and many places to go"), The Virtual Reality is extremely efficient in data transmission aspects of the network, since it is a different way of spreading knowledge and services real way, by combining information text, images, pictures and more.
- Dissemination, this project aims to disseminate services and physical and technological infrastructure of the campus of the Technical University of Northern truthfully improve community institutional marketing.
- Tool, allows the university to improve its efforts to publicize the infrastructure through the virtual reality display on the campus of Olive on the Internet.
- Improve, improve college gaining exposure in the field of education by using new information technologies, with an innovative project that has not been exploited..

6. IMPACTS

Social and technological Impact: As you can see this work, providing great benefits to society, and contribute to strengthening the presence in the National and International information technology being developed at the Technical University of the North.

The virtual tour of the UTN, can be accessed from anywhere in the world via the Internet however because there is still a large number of communities in our state who do not get these services, this model can be downloaded and explored locally by means of computer equipment that is found in schools, public libraries and community centers, this would help the dissemination of information through the Department for Liaison with the community.

Technologically, we mention that the project was supported by the Northern Technical College through the Department of Computer Science. A first model has already been submitted by more than a year in the university web Uniportal.

Education Impact, virtual reality can be used as a fundamental tool in the educational field, since, using virtual environments can create large three-dimensional information systems in the field of education (interactive museums, virtual classrooms, etc.) . The virtual tour of the Northern Technical College is a three-dimensional building modeled in VRML, which is made available to the students of the university and the general public, with the support of administrative and academic authorities of the same.

Ecological and Economic Impact, The Technical University of the North to have this tool as a fear of spreading improves environmental and economic impact, as in the ecological role should not be used to print a lot of propaganda flying and have a significant effect economic impact, because if not spent on impressions of leaves and leaflets, reduced advertising spending, and in this way would use the mass media such as television and radio university, generating effective use of university resources.

7. ALTERNATIVES AND COMPETITION

Acquiring a high cost system developed by a company dedicated to multimedia. It has licenses from Adobe, the same which is composed of tools and one of these is an Adobe Flash plug that lets you select a group of photos and put them together in a bidirectional way that gives a three dimensional effect, but it is not can navigate.

8. CARACTERÍSTICA GLOBAL DEL PRODUCTO

8.1. Ease of access and use

The system is developed under the same web technology that will be accessible via the Internet, the use of this software product is very easy as using the arrow keys or mouse movements, the navigator can manipulate the orientation of the avatar and visit all virtual spaces of the campus.

8.2. Incorporating visual information

This is the new way of presenting information, it incorporates a 100% visibility of the campus in a 360 ° panoramic view of the infrastructure of the University, presenting the same world images, textures, text and descriptive information.

8.3. Institutional marketing revolution

Using the virtual world of the campus, will be refined and given a large enough shift in the way of transmitting information and marketing of university services, improve the way it looks to UTN from the outside world, and that the information submitted is true and visible, visitors can enjoy walking around the campus and may be discovered without the need to be present at the facility.

9. SYSTEM REQUIREMENTS

To make the model of the campus will need to comply with the requirements of stakeholders which are detailed below.

Adaptable to the network.

Not require a high speed line (high band widths), detailing that better performance at higher speeds.

Platform.

You can see visually the physical structure and technology campus.

Easy to use.

That can display information from the agencies visited.

That can show some general information equipment.

9.1. Environmental Requirements

At this stage, interact with people involved with the virtual model, which as the project progress will be added requirements, which must be within the parameters of scope.

9.2. Documentation Requirements

- **User Manual:** This manual is on the CD.
- **Technical Manual:** the development of this application were generated diagrams and specific use cases, describing the same functionality of the project, this information is found in the chapters of the document III, IV, V, VI which is on the CD.
- Installation Guides, Configuration.

9.3. Quality Requirements

It is necessary to establish a quality standard for software product meets its goal, since its very structure and the submission of documentation for this will need to comply with the rules defining the methodology.

10. MODULES

The project was created for the purpose of meeting needs and requirements of the institution.

✓ Information Module.

- Se publicará manuales que permitirá al usuario adaptarse de una forma sencilla y fácil al mundo virtual de la universidad.

✓ Module physical infrastructure.

- 360 ° panoramic view of the entire physical infrastructure on the outside.
- 360 ° panoramic tour of all the interiors of each of the physical structures of the campus.
- Presentation of an overview of the place visited by signs and strategically placed sensors.

✓ Module technology infrastructure.

- 360 ° panoramic view of the entire technological infrastructure detailed in the document "Vision."
- Presentation of descriptive information technology equipment room grouped within the communication from the Department of Informatics at the university.

11. CONCLUSIONS AND RECOMMENDATIONS

11.1. CONCLUSIONS

- ✓ The application development possible to achieve the objectives.
- ✓ was created and published a basic model of the Virtual Visit to the physical and technological infrastructure of the UTN, through which he could show some basic elements of the campus and provide the basis on which to build the final product.
- ✓ It was found that the use of Internet Space Builder tool is indispensable in the creation of complex objects that are part of the final model of the campus, facilitating and accelerating the construction of the project.
- ✓ be successfully integrated three-dimensional model of the university with the database of the Integrated System of UTN with an application programmed in JAVA language, a set of files written in Java Script and sensors located inside the virtual elements of the virtual model thus achieving the objective of displaying information from the agencies and authorities, basic information on equipment and some officials of the Department of Computer Science.
- ✓ With the use of complex algorithms and VRML modeling techniques are able to reach a balance between file size and seaworthiness of the same, this being light enough to be downloaded and comfortable navigation.
- ✓ It was found that the use of RUP methodology significantly improves design and planning of the implementation of a virtual project.
- ✓ Implement the standard UML to develop virtual environments easier to perform the analysis and design of the system, using various tools to allow use abstract graphically represent the virtual environment through its various diagrams.
- ✓ The plug used for navigation of virtual environments, is essential for convenience, since it depends on the coupling with the virtual application, the improved navigation and ease of use.
- ✓ The seaworthiness of this draft is pretty intuitive for the user, and the selection of different views within the virtual scene.

11.2. RECOMMENDATIONS

- ✓ Within the academy recommends the establishment of a matter, to consider the field of virtual reality and three-dimensional models with the slogan that their students have a solid foundation for virtual modeling and to create more advanced models that can be improved applied in different fields of real life.
- ✓ It is important to take into account the processing power and memory of a computer to load an application time of three-dimensional, since it depends on how much to take in view and navigate the virtual world scenes.
- ✓ For the development of virtual environments are recommended, the use of VRML editors for building intuitive ways to accelerate the design of virtual worlds. It is necessary, before developing any application with VRML design and classify the objects used in all scenes.
- ✓ Use an appropriate way encoding of objects within the overall structure of the virtual application.
- ✓ Develop the application using sub divisions in VRML files, so you can adapt loading and rendering options that will improve the speed performance of the virtual view.
- ✓ Implement the reuse of objects, it is advisable not to declare the objects several times for reasons of speed and weight of VRML files, you have to watch the display quality and speed of execution of the virtual scenes that comprise the virtual world that aims to design.