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THEME:

"SISTEMA DE GESTIÓN DE INFORMACIÓN PARA EL HERBARIO NATURAL DE LA UNIVERSIDAD TÉCNICA DEL NORTE."

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SISTEMA DE GESTIÓN DE INFORMACIÓN PARA EL HERBARIO NATURAL DE LA UNIVERSIDAD TÉCNICA DEL NORTE

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Resumen. The management system information to the natural herbarium from Engineering Faculty in Agricultural and Environmental Sciences at Técnica del Norte University is the study, design and implementation of Taxonomic Register, Place, Taxonomic Identification levels. For the project development we realized the study of biological data definitions, and the collection of plants. For the development part we used Oracle Application Express (APEX) technology about a database Oracle 11g.

First, the processes that are used from the collection to the input of biological data to the system were determined. Then, the technology architecture will be designed. After that, the facilities and settings required will be developed for the project. Next, the SCRUM methodology will be used. Finally, rules and standards from DARWIN CORE biological data will be applied for best results.

From the collected samples some data will be entered for a continuous monitoring. This will help to the management system and also the natural herbarium. All this process will provide appropiate and adequate information. Furthermore, this will be used in the study and research of the different species in our natural environment.

Palabras Claves

APEX, DARWIN CORE, Datos biológicos, Oracle, SCRUM, Identificación taxonómica.

Abstract. The management system information to the natural herbarium from Engineering Faculty in Agricultural and Environmental Sciences at Técnica del Norte University is the study, design and implementation of Taxonomic Register, Place, Taxonomic Identification levels. For the project development we realized the study of biological data definitions, and the collection of plants. For the development part we used Oracle Application Express (APEX) technology about a database Oracle 11g.

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Keywords

APEX, DARWIN CORE, Biological Data, Oracle, SCRUM, Taxonomic Identification.

1. Introducción

Natural herbal Technical University of North is a laboratory where scientific evidence flora of our country are stored, is located on the second floor of the Faculty of Engineering in Agricultural and Environmental (FICAYA) Science, has become as a research center and botanical information to higher level education in the city of Ibarra. Serves students careers of Forestry and Renewable Natural Resources, as well as other races involved with the environment. The herbarium provides information services and training also contributes to the scientific and educational development of the north.

Currently the Herbarium has approximately 10,000 mounted and labeled specimens, of which 70% are with their respective taxonomic identification at the species level and are around 200 different locations. Make up the collection

species of vascular plants, mainly ferns, club mosses, selaginellas, gymnosperms and flowering plants (monocots and dicots), both herbaceous, shrubs and trees. Notably, the herbarium has the Technical University of the North is of great scientific and educational aid to the north, if a brief description of the publicity has had the herbarium to become known not only in the province but takes the country can demonstrate that neither the college students themselves know of its existence, notably affecting the management of the herbarium and its dissemination to the knowledge of not only the students of the UTN, but the entire province.

This year has been taken into account the issue of digital heritage, which is the preservation of digital documents, which have been called as digital heritage, in March 2003 UNESCO publish some of the conditions that should take just for the preservation of digital heritage, which were prepared and drafted by the National Library of Australia. The content of the publication makes a big the treasure of digital information produced in virtually all areas of human activity emphasis. Taking advantage of the innovations offered by new technologies, and if we speak of a digital heritage, herbal in digital format are an example of this, since it is a resource for managing the bilógicos data collections of plants with herbal, in turn allows people related to the topic of the environment to make a study of specimens with morphological characteristics and taxonomy of each species were collected from protected areas such as national parks, or collections of natural species points such Once a future due to climate change become extinct.

The information obtained from the plants is stored in Excel, in many cases they are not even stored which causes the loss of information. This generates the data does not have integrity reliability and availability necessary and required to make clear consultations and are able to meet the needs and requirements of stakeholders, so I set out to create a system for managing biological data to track of the input data, thus achieving a better management of information.

2. Materiales y Métodos

Currently the development of software applications is in conjunction with the use of development methodologies to achieve best results with quality product. There are several methodologies for development, these include traditional that its main objective is based on rigorous processes generating activities and artifacts. [1]

Then there is the agile development methodology that is focused on development cycles short time, for groups of small teams, is very interesting this methodology as they are based on human aspects associated with teamwork, where

they engage fully in customer throughout the process. In addition to the current environment is shifting to technology, this methodology adapts to the changes.

2.1 Metodología de Desarrollo

For the project development work under SCRUM, which is part of an agile development methodology it was taken; Scrum is a term used in the rugby game where players from both teams are grouped into a single formation where the goal is to get the ball that is in the middle.

At present, this framework has been taking a great impact on the development of software to obtain a quality product without comprehensive documentation, satisfied customers who are directly integrated with product development, and collaboration among members of the development team . Furthermore, it based primarily on the principles of the Agile Manifesto.

- Our highest priority is to satisfy the customer through early and continuous delivery of software with value.
- Accept the requirements change, even in late stages of development. Agile processes harness the change to provide customer competitive advantage.
- Deliver working software frequently, from two weeks to two months, preferably the shortest possible period of time.
- The business managers and developers work together on a daily basis throughout the project.
- Develop projects around motivated individuals. Give them the environment and support they need, and to entrust the execution of work.
- The most efficient and effective method of communicating information to the development team and its members is face to face conversation.
- The operating software is the primary measure of progress.
- Agile processes promote sustainable development. The promoters, developers and users should be able to maintain a constant pace indefinitely.
- The continuous attention to technical excellence and good design enhances agility.
- The simplicity, or the art of maximizing the amount of work not done, is essential.
- The best architectures, requirements and designs emerge from self-organizing teams.
- At regular intervals, the team reflects on how to be more effective then adjust and improve their behavior accordingly. [2]

Fue desarrollada por Ken Schwaber, Jeff Sutherland y Mike Beedle, donde se define un marco para la gestión de proyectos, que se ha utilizado con éxito durante los últimos 10 años. Está especialmente indicada para

proyectos con un rápido cambio de requisitos. Sus principales características se pueden resumir en dos.

- El desarrollo de software se realiza mediante iteraciones, denominadas sprints, con una duración de 30 días. El resultado de cada sprint es un incremento ejecutable que se muestra al cliente.
- La segunda característica importante son las reuniones a lo largo proyecto, entre ellas destaca la reunión diaria de 15 minutos del equipo de desarrollo para coordinación e integración. **[3]**

FASES DE SCRUM

Like any development methodology for compliance with its phases of the project objective.
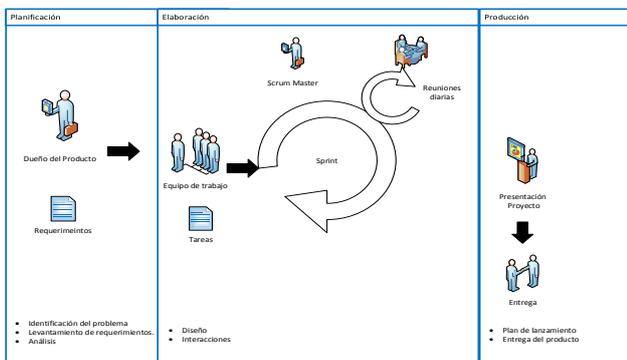

Figura. 1. Fases de SCRUM

- **Planning:**

The planning phase is the initial phase of the project where all the lifting of important information is made.

- **Follow up:**

The monitoring phase is the phase of iterations in this part of the project planning tasks performed, in addition to the design and acceptance tests.

- **Implementation:**

The production phase is the final stage of the project where the implementation plan is made, and the implementation of the project.

ROLES DE LA METODOLOGÍA SCRUM

Scrum is a reference model that defines a set of practices and roles, which can be taken as a starting point to define the development process that will be executed during the project. The team is comprised of the following roles: [4]

- **Product Owner** (Product Owner) that acts as a client.

- **Scrum Master** It is in charge of verifying that all necessary conditions have to work, leading in case of obstacles and to follow best practices for Scrum.
- **Team Members** (equipment) are in charge of design, coding and testing of the product to develop.

2.2 Standards publication of biological data.

For the publication of biological data are agencies like the TDWG (Biodiversity Information Standards, known as the Working Group of the taxonomic data bases) which is responsible for the regulation and standardization of biological information within the standards most commonly used for publishing biodiversity data this Darwin Core.

DARWIN CORE

Darwin Core is the body of rules. It includes a glossary of terms (in other contexts they might be called Properties, elements, fields, columns, attributes or concepts) to facilitate the exchange of information on biodiversity, providing reference definitions, examples and comments. Darwin Core is based primarily on taxa, observation in nature as documented through observations, samples. They include documents describing how biological terms are managed.**[5]**

2.3 Development Tool.

ORACLE DATABASE 11G

Each company or institution needs to store and manage the information they have a database engine is a system that stores and processes the information. The purpose of a database is to collect, store and retrieve related information for use by applications.**[6]**

ORACLE APPLICATION EXPRESS

Oracle Application Express (Oracle APEX), formerly HTML_DB, is a fully supported without cost of Oracle database option allows develop applications on most computers using just a web browser. Besides having a rapid application development (RAD) uses simple wizards and declarative programming to create powerful applications of information and data entry. **[7]**

ORACLE APPLICATION EXPRESS LISTENER

For architecture using Oracle Application Express it is necessary to use a web server for communication between the request made by the user via the web browser and the engine Oracle Application Express (APEX). Therefore the use of Oracle Application Express Listener to meet this need arises, which can be run on an application server and Oracle

Web Logic Server, Oracle GlassFish, Oracle Containers for J2EE, without the need to use a JDBC driver.

Oracle Application Express Listener is an alternative based on J2EE, provides more functionality, including a web-based configuration, enhanced security and file caching. In addition to providing greater flexibility to support deployments of servers used in applications where it is executed. **[8]**

PL/SQL

PL / SQL (Procedural Language Structured Query Language) is a language extension to SQL procedure for Oracle databases. It is a combination of SQL with the characteristic method of programming languages such as loop, selection, iteration, declaration of variables, structures, error handling and so on. You can use all SQL commands, functions, operators, data types that are available in SQL. Besides group sends several SQL statements to the base as a query therefore it accelerates applications and reduces network traffic. **[9]**

3.   Resultados

As a result of the study and implementation of the processes carried out by the Technical University Herbarium of the North, it has implemented a computer automated web solution that allows the user to maintain internal control over the information stored in the herbarium collections; and external users stay informed in the collections of existing plants.

Then the process of digitization of information is displayed samples.
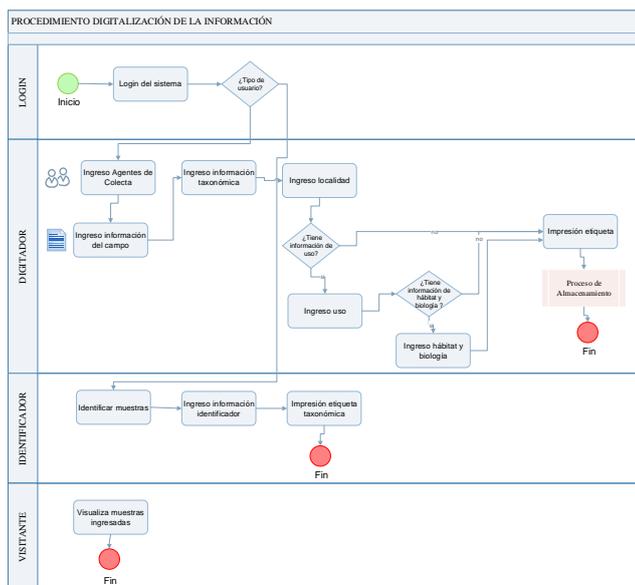
In addition to the processes for managing biological data of the herbarium at the Technical University of North the database model for storing and managing information it was designed.

Then the design image database system shown.

Figura. 2. Procedimiento digitalización de información.
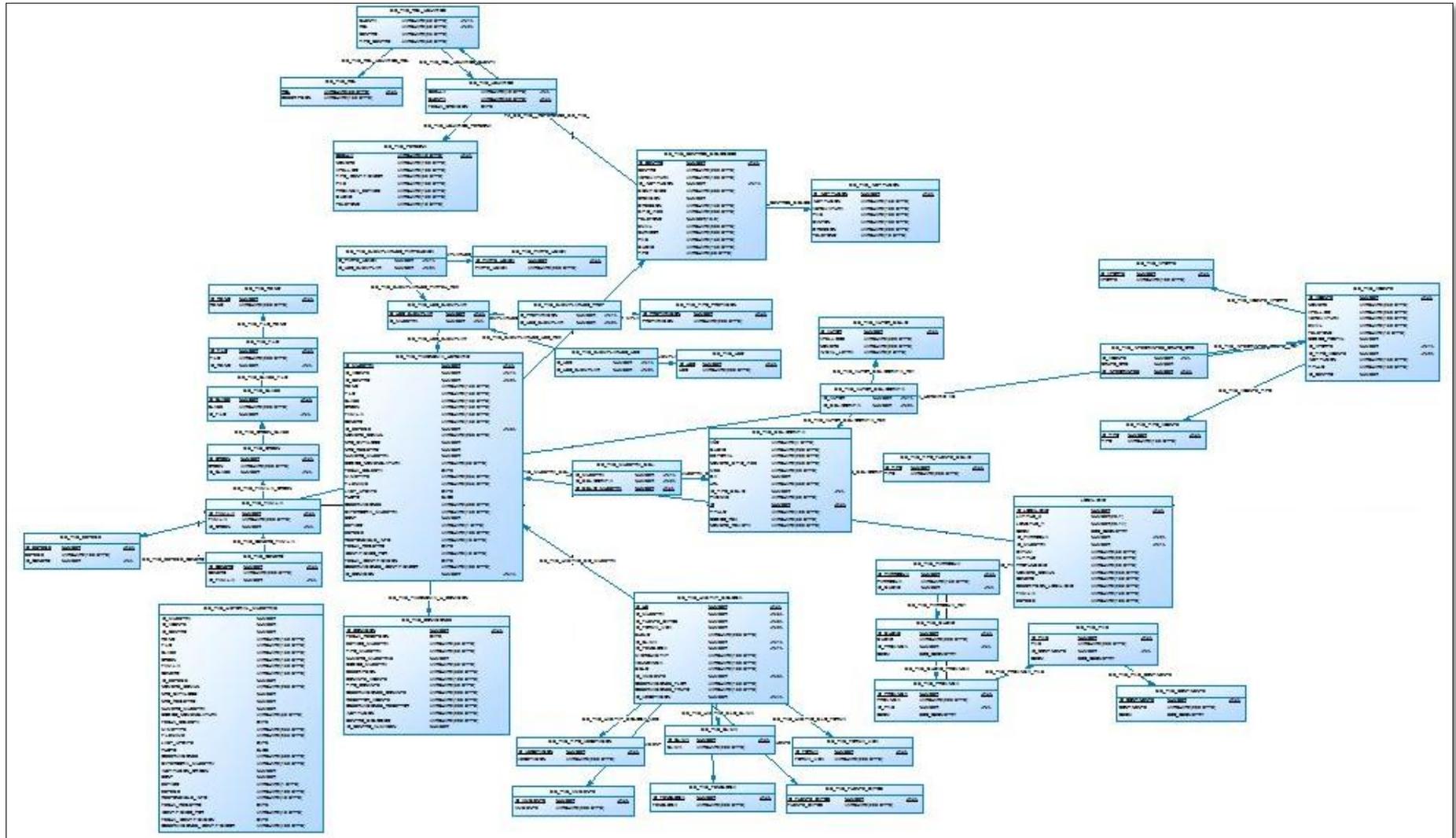
MODELO ENTIDAD - RELACIÓN

Figura. 3. Diagrama entidad - relación.

4. Conclusiones

With the implementation of the Information Management System for Natural Herbal Technical University North, the process of data agilitará intake, and thus meet the objective of the plan of Good Living, maintain a natural heritage.

The implementation of each module, optimizes and enter the information only shows that serve as scientific material.

Using the Oracle database was of great help to both the administration and for security and data integrity, that if at some point you want to integrate with the system of the UTN will be easier, since all applications the university handled this platform.

The development of the application made in Oracle APEX Aplication Express came as a result an application with a friendly user interface and easy to use as it is integrated into the Oracle database.

Using Scrum agile methodology in the project allowed us to offer a quality product and the customer as needed, because the client is completely linked to the implementation process, besides being a methodology that delivers results every certain fraction of time.

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Sobre el Autor.

Erika Abigail SANDOVAL CARRERA I was born on September 28, 1989 in the parish Jordan of Otavalo. My primary education in the school make Chavez Leopoldo N. Canton Otavalo, then enter the school Experimental Jacinto Collahuazo the same canton, where I obtained a bachelor's degree in Physics and Mathematics. Then enter the Engineering in Computer Systems Technical University of North for the title of Computer Systems Engineering.