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**"IMPLEMENTATION OF AN APPLICATION RESPONSIVE FOR DENTAL CLINICAL
MONITORING IN THE CEMOC DENTAL INSTITUTION PROVINCE OF PICHINCHA
CANTÓN CAYAMBE."**

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IMPLEMENTATION OF A RESPONSIVE APPLICATION FOR CLINICAL DENTAL MONITORING IN THE DENTAL INSTITUTION CEMOC PROVINCE OF PICHINCHA CANTÓN CAYAMBE

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Abstract. *This article presents the results of process automation: patient management, specialist management and clinical history management, which allows to carry information from a database manager helping to reduce the time of access to patient information, Control of how the patient has evolved both in his oral health and in his different medical visits. The dental clinic CEMOC of the parish of "Cayambe" located in the Cayambe canton of Pichincha province worked for many years only with papers and typical information carried in archivists which can be exposed to confusions, lost of folders or the creation of medical records Repeated for lack of control, this affects the patient and the employee working in this area for the time needed to invest in this activity, so in order to avoid data redundancy and streamline the process, the system was developed Vaccination so that the information collected in this area of medicine is available and classified. In particular, the document describes that the development of computer systems is much more efficient and manageable when it has an established procedure, which allows to recognize the practice of methodologies of software development.*

Keywords

Stories, Evolved, XP Methodology, Postgres, Bootstrap 3.0

1. Introduction

The majority of dentistry clinics currently offer the service of dentistry for children and adults, which allow

adequate control of the history of vaccines, for this it is necessary to take a stored documentation either in files or some type of collector of information, contributing to the Decrease of time invested in the accomplishment of this activity, according to indicators about organizations that manage a computer system of dental histories and facilitates the collection of all the documentation that is generated in this process is the clinic CEMOC - Cayambe that has been in the vanguard Of the latest changes in the cards handled and disseminated by the World Health Organization which helps us to have a guide point to follow. (Andalusia J., 2009)

The purpose of the creation of this system was mainly the need to show real information to doctors, family and health ministry when required on the dental medical consultations. The collection of pertinent information helps in the availability of information of patients and allows to have raised processes according to a methodology of development.

The main activity to be carried out is the collection of information on the entire dental clinic process, design and analysis of user requirements, development of each requirement compiled and finally the relevant tests of all activities, proving that time has reduced as well Also the information is stored safely and reliably, which helps the staff have confidence and want to get more involved in the process; As well as giving the correct monitoring to each of the functional operations of the system constantly verifying that the performance is the same. (ITMORELIA-CA-PG-002, 2012), (López, 2008), (Sánchez, 2011)

2. Materials and Methods

2.1 Lifting procedures

In the initial analysis of the information, data were collected through user stories that were signed by the person in charge of the reception area according to each meeting and observation of an established requirement, the design of the home page which characterizes the system and shows each operation and function of all methods that allow its correct operation, lifting of the appropriate processes as well as its documentation, design and structure.

It was possible to analyze and identify the patient management process, management of specialists and management of medical histories.

2.2 XP Methodology

The procedures correctly developed help to develop software development in a more orderly and efficient manner following a particular development methodology, in these cases it is advisable to use an agile methodology which allows us to carry a correct documentation and development process suitable for projects of This nature.

The stages that are followed in the development of this computer system are those of the programming xtreme (XP) methodology which helps us to follow a proper order for the development of all kinds of business processes, these begin with research and analysis Of the business, that is to familiarize itself with the ones to be developed, the second is the documentation and survey of processes, third we have the stage of design and development and as last phase we have the implantation and tests of the elaborated system. (Artega, 2012).

2.2 Development tools

For the execution of the system will be uploaded to the apache web application server Tomcat 7.0 which will allow us to host our web system and publish it to the user, for mapping tables to objects in the eclipse IDE, it is done through java persistence API (JPA), using the java data base connection (JDBC). (Andalucía J. d., 2009).

The application server that adapts more to this project is apache Tomcat, which more than an application server is a web container that allows us to publish our pages to the user and this in turn have communication with our database server. (Alvarez A., 2012). (Eloy, 2013).

The database that is handled in this system is postgresql, currently one of the most used managers of the market in terms of free software, is a manager that allows many customers and offers the service ACID (Atomicity, Concurrency, Integrity and Availability) of data, this allows users to have orderly, relevant, secure and reliable information at all times. (Martinez, 2010), (Camps, 2007),

The intermediate classes called JavaBeans, which allow the manipulation of entities from the view of the programmer, this helps to take a proper management of the properties and methods that you have in our business layer and view.

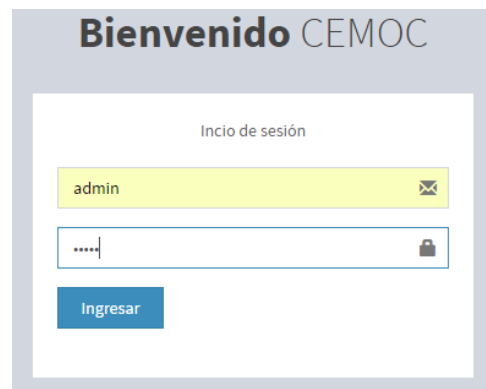
2.3 Description of the computer system

The dental clinic monitoring system called SISCEMOC helps to have more control with missing, pending or new client announcements, scheduling the next medical appointment date, creating patients, basic and necessary inventory control, keeping daily records of medical appointments, Ease of creation to enter a patient, patient search more easily and quickly, appointment of medical appointments, see list of patients.

For the reports we have statistical tables in which allows us to see the growth or decrease of cost treatment client.

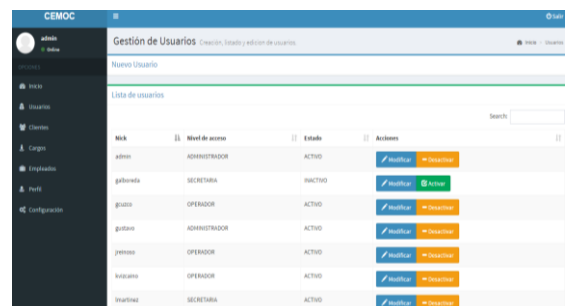
For the technical part, the dental computer monitoring system allows complete control of the system, through the administrator who can enter from any medical branch selected and make changes, this allows to have the most available and timely information..

3. Resultados



Graph 1.- Login of the computer system of dental clinical follow-up.

The front of the computer system for clinical dental monitoring is presented as shown in figure 1.



Graph 2.- Registration of users accessing the system of the CEMOC clinic.

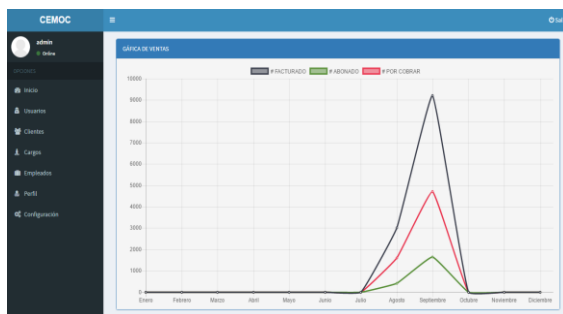
It allows the registration of users to the system and depending on the role assigned by the administrator, can view the part that belongs to him.

Graph 3.- Assigning the role to the user.

In the form of graph 3, it shows the way of assigning roles to a given user, which may have permissions to specific functions depending on the role.

Graph 4.- Record of dental clinical history.

The registry allows the collection of additional patient information for future functions, such as treatments, consultation or application of medicines per campaign, in this section shows the option of creating clinical dental histories when saving a patient.



Graph 5.- Control of growth in cost treatment per month.

The results of the blue curve must be analyzed, depending on the curve color in which it is found.

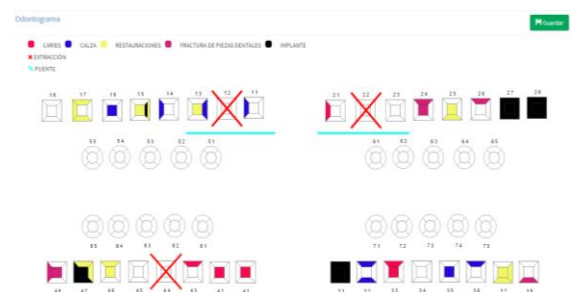
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Graph 6.- Patient search and options that can be performed

The form in graph 6, allows us to search for a particular patient in different ways, either by history number, by cédula or by surnames and names; Also once selected we can see all patients or only those who have a card and register an appointment or proceed to vaccinate the selected patient.

Graph 7.- Patient Registration

In the registry allows to collect additional information of the patient for future functions, such as medical consultations, consultation odontograma medicine application, in this section shows the option to create a new and save a patient.



Graph 8.- Odontogram per patient.

This is where it is carried out for dental clinical follow-up, in the CEMOC clinic.

4. Conclusions

The management of documentation is known since the necessary information was gathered from the entire process of patient management, specialist management and clinical history management of the canton "Cayambe", for the development of the Computer System called SISCEMOC (Computer Medical Clinic System And Cayambe dental).

The development of computer systems is much more efficient and manageable when you have a well-established procedure of the entity for which the software is being made.

Knowing how to perform all the processes and documents that are carried in dental clinical histories, allowed to better couple the computer system to the reality of these processes.

By conducting the study in the vaccine administration process, the system allows us to more easily examine the missing, administered and unapplied vaccines of patients who are enrolled in the system, this helps to better control the fulfillment of the history Thus avoiding diseases that can be prevented through responsible management.

The management of the methodology XP (Extreme programming), allowed the user to review the advances according to the development time.

The PostgreSQL database manager makes it possible to carry the information generated daily in the health center more easily and safely, and through the different reports we can see the progress of the records.

The use of JSF framework (javaServer Faces) helps a lot, since it is destined to facilitate the development and development of interfaces for applications based on the web environment.

Version 3.0 of Bootstrap offers several development components for the programmer and a much more user-friendly and intuitive interface responsive to the user.

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7. Sobre los Autores

Author - Gustavo Cuzco

She was a student at the Technical University of North, Faculty of Applied Sciences, of the School of Computer Systems Engineering, which during her student life was conducting research in dental medicine and its procedures, and was very interested in researching new Software development, and the need for an important area of medicine "Dentistry".

One of the fundamental reasons for this is to see the need to take adequate control of the information generated in several processes not only in dentistry but also in other points relevant to this work of all citizens.

The development of the thesis with its scientific article helped me to train as a professional and person, knowing in depth one of the most important areas: technology and dental medicine, two worlds that can not be separated.

Coauthor - Diego Trejo

Lecturer in the Faculty of Engineering in computer systems of the faculty of applied sciences of the Technical University of the North.

It is an ethical person, more than professional a human being that is framed in constant research with all the technological advances that arises today.

He is a professional with multidisciplinary criteria, since he works with groups of professionals of many areas, which helped with primordial ideas in the elaboration, design and functionality of the SISCEMOC computer system.