TECHNICAL UNIVERSITY OF THE NORTH

FACULTY OF ENGINEERING IN APPLIED SCIENCES

CAREER OF ENGINEERING IN COMPUTATIONAL SYSTEMS

TOPIC:

"Web system with software free for the Control of Assistance of Personnel of the Province Direction of Imbabura Environment, by means of a biometric collector of data."

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Web system with software free for the Control of Assistance of Personnel of the Province Direction of Imbabura Environment, by means of a biometric collector of information.

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Ibarra – Ecuador

Summary.

The present system was realized to satisfy the requirements of the control of assistance of personnel by means of the information that there gathers the biometric collector who possesses the institution, the tools for your development are of free license. In addition there has been in use methodology RUP for your planning and design

Introduction.

Previously, the control of the assistance was doing it to him manually by means of signatures in printed documents.

It, is like that, that 18 months ago the Direction of Imbabura Environment, did the acquisition of a biometric clock of fingerprint and the System for the control of the assistance of your personnel, but could not adjust to the needs of the institution.

The accomplishment of this project focuses in generating reports that solve the insufficiencies of the current system with regard to the control of the assistance of the personnel, administered and visualized Web route, this will solve in efficient form the current situation of assistance of the personnel.

Objectives.

General Objective:

To optimize the Control of Assistance of Personnel of the Province Direction of Imbabura Environment, by means of Web System represented with a biometric collector of information.

Specifics Objectives:

- To determine the requirements and needs of the Institution with regard to the control of the assistance of personnel.

- To design the architecture of the processes and functions of the Web System for control of assistance of personnel.

- To develop and to implement the Web System for control of assistance of personnel, using free tools.

- To realize tests and to implant the Web System for control of assistance of personnel in Imbabura Environmental Direction.

Scope.

In this project one is going to develop 5 Modules:
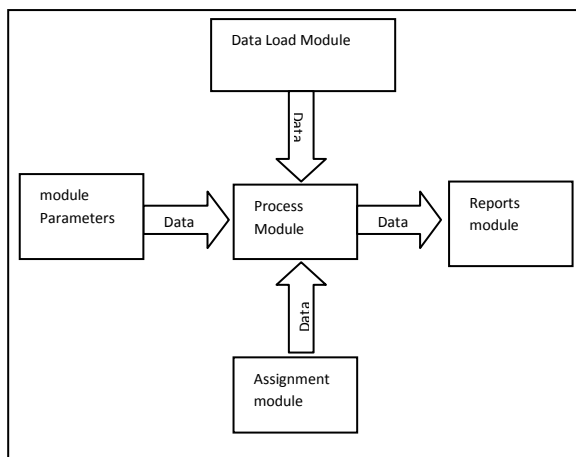
Source: Own

Figure: Project modules

- **Module Parameters.**

To create, to modify, Users eliminate.

To create, to modify, to eliminate parameters of the Shift.

To create, to modify, to eliminate Charges.

To create, to modify, to eliminate Departments.

To create, to modify, to eliminate Sections.

- **Module Assignment.**

To create, to modify, Employees eliminate.

To assign Permissions to Employees.

To assign Vacations to Employees.

To assign Mobilizations to Employees.

- **Module of Load of information.**
Transmission of Information by means of file of text generated by Biometric clock.

- **Process module.**
Re calculation of Hours E/S.
Re calculation of Lags.
Re calculation of Overtime.
Re calculation of Worn out Hours.

- **Module Bring(Report).**

  Personal report (Vacation, Permissions, Mobilization).

  Report (Income and Exits, Overtime, Lags, Worn out Hours).

Development Tools.

The implementation of the Web system of the institution was carried out by the tools:

	Tools	why?
Database:	MySQL	Scalability and flexibility, High performance, High availability. Robust transactional support. Strengths in Web. Strong protection of information
Platform	PHP	The Community PHP, performance, portability, etc.
IDE	NetBeans 6.9	Environment of modular, compatible total development with PHP.
Servant Application	Apache	Is robust and compatible with PHP and NetBeans.
Framework:	Symfony	Symfony is mature(ripe), stable, professional and is very well documented. Compatible with NetBeans 6.9.

Source: Own

Figure: Development tools to use and justification

CHAPTER I

Vision.

The specific needs to satisfying are:

- One must integrate the information contained in the biometric clocks of Ibarra and Cotacachi in the database of the System.

- The unload of the information will be realized by means of cable by connectors rs232, from the secretaries of every canton.

- The administration of the System it will realize Web route.

- Is necessary to give average safety to this information (Users).

- The system will realize the reports as reminded with the authorities of the institution.

- The reports will be able to export to files with extensión.pdf (Acrobat).

- The reports on screen will have to have a statistical graph for your visualization.

- The employees will be able to consult your income and exits.

Global Product Description.

Project Overview.

The project of development must generate a facility in the interface for revenue of specific parameters, besides realizing the load of the information of the biometric clock to the database of a simple form without many processes and presenting the reports of a concrete and graphical form that is what needs the Institution.

- Will Show a simple interface for revenue of information by means of tools that help to this labor.

- Will Show the way of managing the safety of the users who could accede to this system.

- Will Show a way of loading the information very simple, by means of tools that help to this process.

- Will Show specific reports and of graphical form of the assistance of the personnel of the institution.

Security.

Restrictions in the administration of the system with regard to the information, in addition only the authorities and employees will be able to accede to this information.

Levels of access to the application:

1. Administrator: Total Access to administration of parameters (To create, To edit, To erase), loads and calculation of information, generation of reports.

2. Employee: I access to Consultation of Income and exits, lags, worn out hours, permissions, vacations and mobilizations.

3.   Administrator Cotacachi: loads of information of Cotacachi biometric clock to the System.

Software Development Plan.

The Web system will be developed using the methodology RUP, the same one that will allow to use your procedure to define the project, this helps to organize of better way both for development and for documentation. Report of the documentation is the present document.

key Points.

Of the interviews key points of helping were generated:

Fundamental points:

-    Security in the presentation of the information.

-    Adaptability of the user and the facility of use.

-    Facility to load the information of the biometric clock on the system.

-    Incorporation of the system for 2 states (Ibarra-Cotacachi).

Plan of the phases.

The development will be carried out on the basis of phases by one or more iterations in each of them. The following table shows the distribution of times and the number of iterations of every phase (for the phases of construction and transition it is only a very preliminary approximation).

| Phase	Nro. Iterations	Duration
Phase of Beginning	1	6 weeks.
Phase of Elaboration.	1	10 weeks.
Phase of Construction	5	24 weeks.
Phase of Transition.	1	4 weeks.

Source: Own

Table: Phase plan

Requirements capture.

To describe there are realized graphs of case of use and graphs that they describe in clear form and need the functioning and structure. In addition defines the technological resources of hardware, software and telecommunications for the accomplishment of the present project.

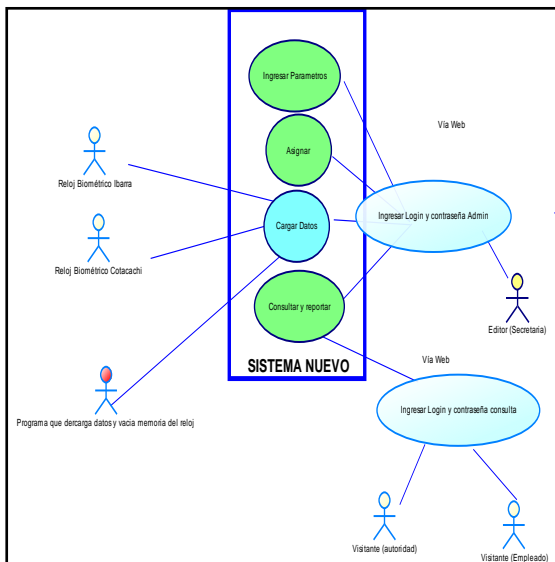**Identification of Cases of Use of the Current System.**
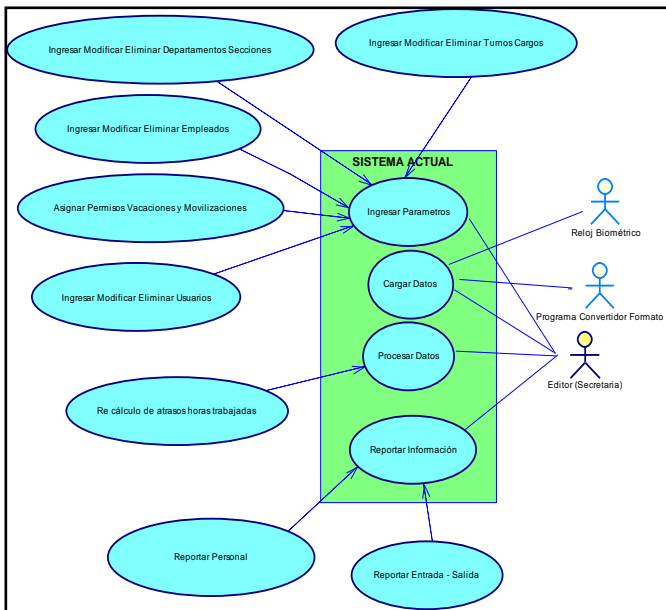
Source: Own

Figure: Graph Cases of Use of the Current System

Model of cases of use with new requirements.

Source: Own
Figure: Cases of use of new requirements

Graphs elaborated after the analysis of the new requirements.

Realized the identification of the cases of use of the system could elaborate the graphs of:

- Architecture of the Proposed System.
- Specification of the individual cases of use
- Shape Entity - relation.
- Requirements of Hardware and Software
- Requirements of Telecommunications.

CHAPTER II

In this stage the software is explained to using and justification of using them, the processes and the prototype of the interface of the system.

Tools to using:

Database (MySQL):

· Scalability and flexibility.

· High performance

· High availability.

· Robust transactional support.

· Strengths in Web.

· Strong protection of information.

Platform (Language PHP):

· The Community PHP,

· Performance

· Portability

IDE (NetBeans 6.9):

· Environment of modular development.

· Compatible total with PHP.

Servant Application (Apache):

· Is robust

· Compatible with PHP

· Compatible with NetBeans.

Framework: Symfony

· Is mature

· Stable

· Professional

· Is very well documented. Compatible with NetBeans 6.9.

There is realized a Graph of Classes that helps with the actions that one needs in every Module and process of the system.

The most important actions are:

· To create

· To modify

· To eliminate

· To list

And the special ones are:

· Loads

· Loads Beginning

· Loads Information

· Loads Record

· Loads Worn out Hours

· Report

· Graph

· Report Entries and Exits

· Report Mobilizations, Permissions.

Prototype of user's Interface.

The generated prototypes are:

· Form of Security

· Form for Users

· Form for Administrators

Relational Model.

There is generated a royal model of the system by means of which it will be implemented in the system.

Later it is indispensable to analyze the load of the system and times of response that is given in the following table:

	Number of employees	Number of monthly Records generated by every employee	Number of records that are generated in the database for month	Time of ideal delay
Current system	24	4 you stamp X 20 days. Aprox. 80 c/u.	1920 records	10 to 20 minutes
Proposed system	24	4 you stamp X 20 days. Aprox. 80 c/u.	1920 records	<10 minutes

Source: Own**.**
Table: Load and times of response of the system.

Model of Implementation.

The schemes to see the details of the objects and classes for the execution of the implementation they are represented by the graphs of sequence, later the realized ones be listed:

· Graphs of sequence for registered User.

· Graphs of sequence for Administration of the system.

Implementation Techniques.

This system realized in Symfony is based on a classic boss of the web design known as architecture MVC, who is formed by three levels:

· The **M**odel represents the information with which the application works, that is to say, your logic of business.

· The **V**iew the model transforms in a web page that allows to the user to interact with her.

· The **C**ontroller takes charge processing the interactions of the user and realizes the changes adapted in the model or in the sight.
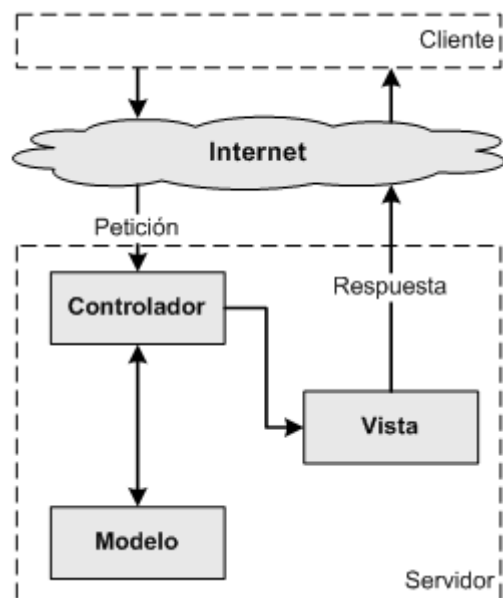
Source: Web Image [1]
Figure. Sequence diagram for system administration (source).

[1]Quick note on MVC:
http://lobotuerto.com/blog/2008/04/07/una-nota-rapida-sobre-mvc/

CHAPTER III

Final design of the system.

To give a clearer idea of the contents of the system later a table is detailed representing the map of the site and the accesses that are going to have for the users represented in the following table:

PARAMETERS	ASSIGNMENT	LOAD	CONSULTATIONS AND REPORTS	HELPS	To export to pdf
Department	Employees	Load	Load Income and exits (Statistical	user's Manual	Entry / exit and Permissions Mobilization Vacations
Section	Permissions	To calculate			
Turn					
Post					
Users					

Source: Own**.**
Table: Representation of the map of the site.

To understand better the design of the system in the managing of flow and contents, administration and other sections one comes to the **Graphs of Activities**, since for example in the following graph it is possible to observe the activities that must follow for the Users' revenue, later:
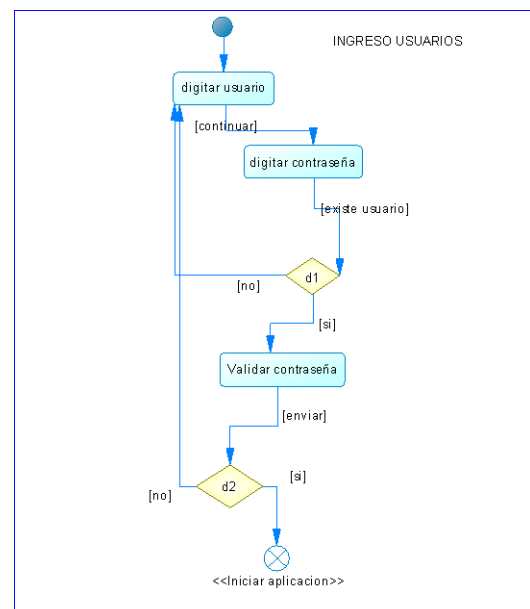
Source: Own**.**
Figure: Graph of activities of parameters modification.

Then each of the processes is detailed by your detailed explanation, later there are named the names of the files that are going to contain the system for the different activities to develop and that are identified in the code.

Finally there are detailed the screens of the system that contain the parameters of entry and exits of information, to see figure.

Source: Own**.**
Figure: Description E/S Screen I Enter.

List.

In this part there is detailed the code generated by the framework and the developer.

Chain of Execution.

The route is defined to accede directly to every module, for example to agree to deposit a new department in parameters, is obtained: www.asistenciamai.com/Departamento/new.php

Results of the tests.

One indicates generally the processes and results obtained in the phases of functioning of the modules, your

appearance and in the integration of the System.

There is elaborated the Manual of operator and of the system.

CHAPTER IV

There are specified the cases of test of the system with the different dates and version in that the changes have been realized. Describing in addition the entered information, the realized processes and your results.

There is detailed the **report of installation** of the System**. And the letter of acceptance of the authorities** on the part of the Institution of the Government, with the signatures and the content of the commitments of the entities recipients of this project.

Maintenance.

There is described finally in tables the list of faults detected in the different modules, a list of improvements on the part of the users and the trace details of the realized changes.

CONCLUSIONS:

With the web system there has been solved in efficient form the consultation and report of the assistance of the personnel of the institution, since it(he,she) is very easy to handle, rapidly in the consultations and reports, and in proportion to the requirements of the institution.

The framewok Symfony helped to organize files of the classes, actions(shares), insoles(staff), etc., used in the project, as well as plugins, styles, configurations, etc., In addition I use the IDE NetBeans to be able to visualize them create them and modify them.

The system can be understood and modified easily since there was in use standards of programming and an architecture of software MVC, which organizes the code to be illustrated by clarity.

The present project has a lot of future, since, the government is going to control his(her,your) employees in all the public institutions and it would be a great opportunity to be able to implant(implement) it in other institutions.

RECOMMENDATIONS:

Before beginning a project it is necessary to to analyze the user's requirements thoroughly and if another system has analyze it and that it(he,she) uses as base and guide for the project, but first of all, it is necessary to take many emphasis in purifying the database that is the vertebral column of the project.

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