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SCIENTIFIC ARTICLE

TOPIC:

"STUDY OF CODEIGNITER TECHNOLOGY APPLIED TO DEVELOPMENT

OF WEB PORTALS WITH MVC ARCHITECTURE"

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Study of the Codeigniter Technology Applied to Development of Web Portals with MVC Architecture

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Abstract. The current article has as objective to investigate the CodeIgniter technology applied to the development of web portals with architecture pattern MVC (Model-View-Controller)

To show an introduction of the antecedents of the project, the objectives that were presented about the realization of the investigation, the justification and the reaches of this project. It is developed a theoretical foundation of the CodeIgniter tool, It is making an introduction and revise the main characteristics of the tool and the architecture MVC in which is made, it revise the development tools that are coupled with the framework.

To show the development and implementation of the web Portal application of the company "MEGASYSTEM", it is carried out the analysis of requirements, the design of the application, where are used tools such as: cases of use; it registers the development and the implementation of the portal. The Conclusions and Recommendations of the investigation.

Key words

Framework, Libraries, Helpers, Flow Chart.

1. Introduction

The main objective of this project is to study the Codeigniter technology and its integration of the agent's database MySQL. The second objective is making a Web Portal applying the Codeigniter technology and the Mysql database to the Megasystem Company is provided the necessary information about the products to the customers.

To make this application was used the programming language PHP, with the Codeigniter framework and the MySQL database, for the programming was used the development tool Netbeans.

To develop the methodology was used RUP (Rational Unified Process) with the devices such as:

- Document of Vision
- Work Flow
- Diagrams of Use Case
- Class Diagram
- Sequence Diagram
- States Diagram
- Collaboration Diagram
- Distribution Diagram

2. Background

Company Name: MEGASYSTEM

Owner: Mr. Léning Moran

Ruc: 0401168513001

Address: Víctor Gómez Jurado 3-44 Street and DR. Luis Fernando Aguinaga St.

Phonenumber: 062630894

City: Ibarra, Ecuador

Economic activities:

- Wholesale and retail distribution of computers and parts.
- Sale retailer of materials and office equipment.
- Maintenance and repairment of computer science machinery

2.1. Problem Statement

People that work in the software development and especially in portals and web pages, generally use technologies like php, jsp or .net for the development of their applications, also they usually use development frameworks such as Symfony, Zendframework, Ruby on Rails or content management systems as Drupal, Joomla among others. The frameworks that are regularly used for the fast development of web applications , have very potent characteristics, however these possess a very high learning curve, since much time should be invested in their study before being able to use them, that retards the development and the culmination of the project.

It may also be that the tools are not used in current capacity or in the worst cases the projects are given up because they can not be coupled with the framework.

Consequently the frameworks help the fast development but most have a high learning curve generating additional investment time to the planned one that may cause the delay or abandonment of the project.

2.2. General Objective

To study the CodeIgniter technology applied to the development of web portals with MVC architecture.

2.3. Specific Objectives

- To study the operation of CodeIgniter framework and technology MVC (Model-View-Controller).
- To implement the web portal of information about prices and stock for Megasystem company.
- To document the operation of the portal with RUP tools.
- To test the correct operation of the portal.

2.4. Justification

The study of the CodeIgniter framework will directly benefit the students of the School of Systems Engineering and the Faculty of Engineering in Applied Sciences FICA because it will have a means of support for the development of web applications and integration into the database manager MySql using this tool, they will also know a little exploited tool despite its good features because it has a very low learning curve which will allow them to develop complete web applications very quickly. The faculty teachers will also benefit because they will know another tool to teach in class.

Indirectly it will benefit to Megasystem Company and users requiring computing products because a web tool will be created to allow the diffusion of products and services through the Internet.

2.5. Scope

2.5.1. Technology Tools

The CodeIgniter tool will be studied with their architecture MVC in all that requires being with the realization of a web portal and its integration with the database manager MySql

The web portal of information on prices and stock contains the following modules: Customer Module, Products Module, Information Module, Services Module, Reports Module, Surveys Module, Security Module and Administration Module.

2.5.2. Architecture of Web Portal
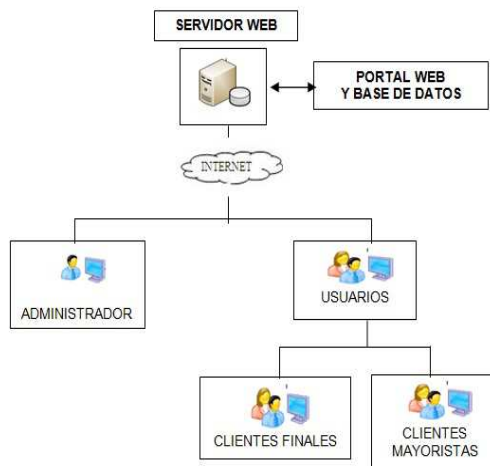
Figure 1: Architecture of Web Portal for Megasystem Company

2.5.3. Restrictions

Communication will only be done with customers to provide products information, prices, stock and quotations on line, financial transactions will not be made, billing or sales on the Web Portal.

3. Study of CodeIgniter Framework and MVC architecture (Model View Controller)

In principle it should be noted that PHP is a high-level language that runs on the server where the pages are hosted, different from other languages that are executed in their own browser, this is the main advantage, when

running the code on the server, all pages will be viewed on any computer, regardless of the browser it have.

CodeIgniter is a framework, a program or web application developed in PHP for creating any type of web application under PHP. It contains a number of libraries that are used for web application development and marks a specific way to code web pages and classifying different scripts, it serves for the code to be organized and can be easier to create and maintain. It Implements the development process called Model View Controller (MVC), which is a standard of applications programming, used to create both web sites as traditional programs. It differs from other frameworks in which it is created to be easy to install on any server and start to use.

A Web Portal is a web page or a set of web pages, designed to achieve the participation the final user, in order to get something from him. A portal is usually developed in a more powerful and complex language than HTML, can be PHP or Java, and it is usually associated with a database that stores as much the information to be presented as the information obtained from the Portal User. Such information should be able to be managed from an area designed for a common user within the company, it can update,

modify, add new content without the necessity of experts.

3.1. Flowchart of an Application with Codeigniter

CodeIgniter manages the flow of data through the implementation of several procedures that are performed internally, to assist the request of the client's page and to present the information on screen, use modules created by the developer as controllers and views and also modules built-in the framework as libraries and helpers among others, the flow of data is managed as shown in the following graph:
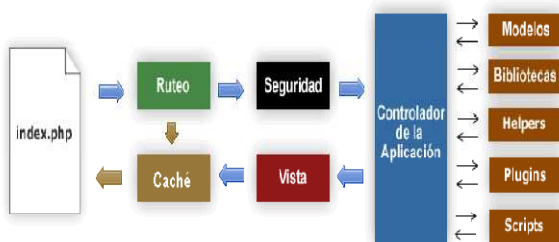
Figure. 2. Flow chart of a Codeigniter application.

3.2. Architecture MVC (Model-View-Controller) of Codeigniter
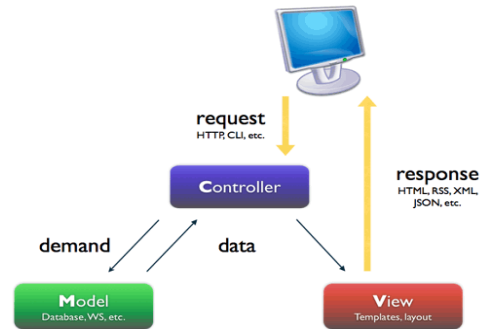
Figure. 3. Diagram of Architecture MVC.

The Model represents the data structures, in other words all code that has to be with access to the database. The model classes contain functions that help to receive, Insert, update or delete information from the tables. One of the most important advantages of using models is that all the code that manages the database is centralized in one class and can be used for different functions of various controllers.

The View is the information presented to the user; a view will normally be a web page, a page fragment like a header or footer, or any other type of page. In the view all HTML code is placed, CSS, Java Script, etc. which helps to generate the page.

The Controller is the most important part of the framework since it serves as an intermediary between the Model, the View, and any other resource necessary to process the HTTP request and generate a web page, the logic of the pages are kept in the controller.

3.3. Objectives of Design and Architecture of CodeIgniter

It can be said that CodeIgniter is a system, dynamically instantiated, coupled slightly and with high uniqueness of components. All these features make that Codeigniter has a high performance when putting in production a website.

3.4. Development Tools of CodeIgniter

NetBeans IDE NetBeans IDE is defined as: a development environment, a tool to write, compile, debug and run programs. It is written in Java, but can be used in any other programming language like PHP. There are also an important number of modules to extend the NetBeans IDE. NetBeans IDE is a free product and of unrestricted use.

MySQL The database manager is defined as a relational database management system, licensed under GNU GPL. Its multithreaded design allows supporting a very efficiently heavy load. This database manager is probably the most used in the world of free software because of its great speed and easiness of use. This great success is due, in part, because there are plenty of libraries and other tools used by lots of programming languages, in addition to its easy installation and configuration.

Grocery CRUD[1] is a useful open source (MIT License GPL v3), with this library and the power of Codeigniter framework in just a few minutes it is possible create interfaces to carry out the basic functions in database (Create / Read / Update / Delete CRUD). Once integrated in the Codeigniter installation, through a few lines of code it will have access to stable and appropriate interfaces for managing data. This library contains all the necessary things to add, display and edit data. It also includes data validation as in the server as in the client.

4. Design and Implementation of Web Portal

Below is described a RUP configuration for this project. Due to the characteristics of the project, roles and activities of the

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[1] CRUD (Create/Read/Update/Delete-Crear/Leer/Modificar/Borrar) en la base de datos.

methodology artifacts are included, maintaining the most essentials ones.

Participants in the Project

To be a dissertation Project all roles necessary for the development of this project correspond to Wilson Javier Cevallos Avilés, but the control and monitoring that it is the responsibility of the Project Manager, in this case Ing. Marco Pusdá.

Requirements Specification

The application is mainly focused on the presentation of information about the products of Megasystem Company through the web portal. The Web application is focused on automation of various processes such as: management of the content and the portal, presentation about information of the products. The Web site has 2 modules: Module that manages the entire Web site (Backend), client Module (frontend).

Diagrams of Use Case

The diagrams of use cases serve for specify the communication and the behavior of a system by means of their interaction with the users and other systems. The following diagram of use case, clearly describes the

operation of the Web Portal, the actors are the Site Administrator and the contents, the users who are registered and unregistered guest.
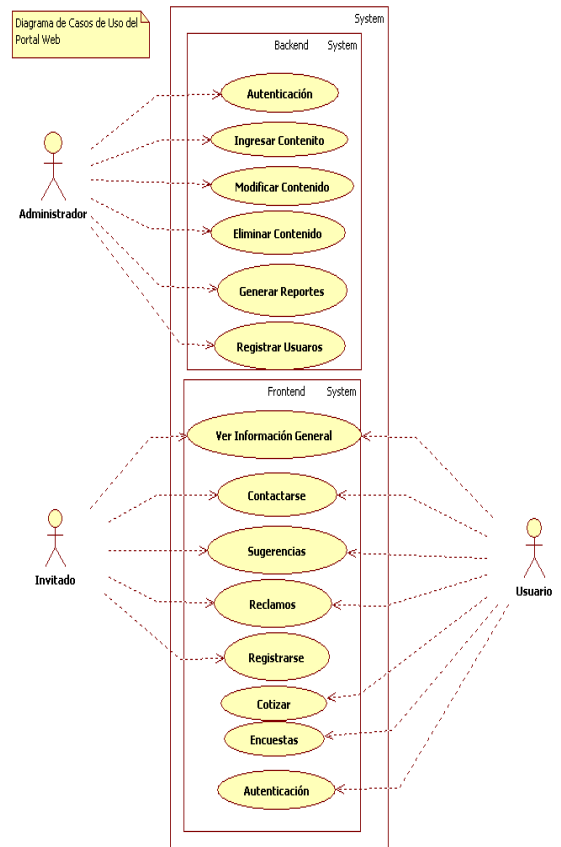

Figure. 4. Diagram of Use Case of the Portal Web

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Development and Implementation

The implementation of the application was made with Netbeans 6.9.1 tool with support for the PHP programming language, using the programming language PHP 5.1.6, the CodeIgniter Framework and database manager MySql.4.1, free tools to develop the website applicative of the Megasystem Company.

5. Conclusions

- The CodeIgniter framework has a very low curve of learning, what makes a simple learning and using tool, with a short time used to its study, it will be in the capacity to carry out complete web applications using the architecture of Model-view-controller software which separates the code of the logic, the data and the presentation, with this it gets clearer and easier programs of maintaining, besides the quantity of libraries and helpers generate bigger speed of development of the projects

- The implementation of the web portal of prices and stock in the Megasystem Company has not had bigger difficulties considering that most of web servers can host applications carried out in PHP that is the language that Codeigniter manages and the mentor of MySQL data base.

- Using the RUP methodology helped to define and to understand the necessities of the users and to define the requirements of the portal, when using the devices of RUP like use cases, diagrams of classes, diagrams of sequences among others, improved the understanding of the analysis and the design of the portal, so that, it allowed

us to build a more efficient system, more secure and with less programming errors.

- The validation and tests carried out to the modules of the web portal allowed to determine that the portal is adjusted to the requirements outlined initially, that all the modules work according to what is expected and that it fulfills the expectations of different users.

- In general the use of the portal by the customers of the company will allow them to be better informed about what the Megasystem company can offer, creating greater linkages between them.

6. Recommendations

- It is recommended to make a study of other libraries made by members of the community which are not integrated into Codeigniter as groceryCRUD that makes the backend of the application, dompdf to convert the HTML pages into .pdf format, redux_auth for users' authentication, among many other libraries that can be helpful in the different cases that may be required.

- For future versions of the portal, a module that integrates facebook can be created and with that to let the

company know the very famous and used social networks using codeigniter.

- Before carrying out changes or improvements in the portal, it is important that the documents that were obtained using RUP artifacts will be revised; with this how the system works can be understood better and it will be easier for the developer to make the improvements.

- The portal has a module of surveys and another of suggestions, it is advisable that the administrator makes questions about the operation of the portal or the design and it is indicated to the users to make periodic suggestions about the operation, this way the portal will be in a constant cycle of tests.

- The students of the Career of Systems Engineering should take advantage of this tool for the development of their applications; the web developers will have many benefits since they can provide the web pages to their clients in shorter times.

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