ESTUDIO DEL FRAMEWORK IONIC 2 PARA EL DESARROLLO DE APLICACIONES MÓVILES HIBRIDAS

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Summary. *Ionic 2 is a powerful framework for developing hybrid mobile applications, this allows us to develop applications in a short time because it is possible to compile these on different platforms (Android, IOS, Windows Phone) using the same source code.*

Destino Pimampiro is a mobile application that provides the local tourist, national, foreign and general public information on the tourism of the Canton Pimampiro in which we find tourist places, services, map, events and a section of interest.

It is a project in which the one that applies the research carried out, with the elaboration of a mobile application in which the characteristics of the studied framework are exploited.

Key words

Ionic 2, Pimampiro, Tourism, Mobile applications.

1. Introduction

From a few years ago, we have developed mobile applications with different and new Framework´s with different programming languages, with the aim of accelerating the development process and stop resorting to unnecessary costs, encouraging the reuse of existing code and promoting good development practices.

One of the reasons for the great reception of Ionic 2 among the developers of mobile applications is that in its internal structure it implements angular which is a powerful framework developed by Google for the construction of Web applications. Another reason for the great reception of Ionic is that it also implements Cordova formerly known as Apache Cordova as a link between Ionic 2 and the Api That provide the Android, IOS and Windows platforms Phone.

Based on these platforms the development team decided to build their own framework that focused on performance and to be built with modern web standards, and after launching a first version in May 2015 and the hand of the second version of Angular Denomi Nothing Angular 2, is launched in October 2016 the second version of the framework called Ionic 2.

Currently there is a lot of ignorance and scarce information about the framework Ionic2 in its version 2.0 so it is necessary to analyze each and every one of its functions, in order to explore new technologies oriented to the development of mobile applications Hybrid.

This research will achieve a consolidated, clear and structured documentation that helps people in general who want to educate themselves and/or need a solid foundation when developing mobile applications with the framework Ionic 2.

1.1 General Objective

Conduct a study of the Ionic 2 framework for the development of hybrid mobile applications through an application to disseminate tourist attractions.

1.2 Specific objectives

Develop technical documentation that will serve as a guide for people interested in the framework Ionic 2.

Implement the SCRUM methodology in the development process.

Develop a Mobile application for the promotion of tourist attractions in the decentralized autonomous government of the Cantón Pimampiro.

1.3 Reach

The purpose of this qualification work is the analysis of features and functionalities of the framework Ionic 2 whose focus is the realization of mobile multiplatform applications.

A study was conducted, and solid documentation was developed that will serve as a basis for people interested in this technology

A mobile application was developed for the autonomous government of the Cantón Pimampiro, which will make known the tourist attractions, cultural attractions, events to be held in this canton which was named Pimampiro destination. This application will be developed in the framework to be studied through the consumption of RESTful Web services.

1.4 Functionality

The features of Pimampiro destination developed for the benefit of Gobierno Autónomo Descentralizado del Cantón Pimampiro are:

The application is based on three important aspects of the tourist heritage, services, events and interest

Within the tourist heritage module, we find the different sections Pimampiro Cultural, Productivo, Extremo, Natural and Festivo same that are in the official tourist guide of the canton.

Within services in which we find transportation, food, health, fun, security among others.

Within interest we find the tourist agenda with the events to be held within the Cantón Pimampiro, the official tourist guide of the canton and the points Wi-Fi.

It also has a search section of tourist sites and services

Modules of the Content Management Web Application

The structure Of Content Management Application It will contain the following registry and process modules:

User management: In this module, the system allows to manage the creation, editing and assignment of roles to users. In addition, in this module it is possible to manage operations, tasks and Roles that the system is registering as drivers and views are created. All these operations can only be performed by an administrator-type user of users.

 Support: This module is responsible for making a backup of the database at your time allows us to manage them is to delete, list and download them in order not to lose the information stored.

Api: This Module is responsible for providing the same RESTful Web services that will be consumed by the mobile application. This makes use of independent models and controllers.

Catalogues of locations: This module is intended for the administration of the catalogues stored in the database that are constant data of the system and only in special cases can be modified and these are the political distribution of the country such as provinces, cantons and parishes.

Tourist attractions: This is one of the most important modules because in this you will have to create the menu and submenu and details of the application.

The menu should be created in descending way in the side menu in the Tourist attractions option you must create the main menu itself that we can see in the following image

Figure 1Main Menu Pimampiro Destination

Then you will have to create a category of tourist places in which you must enter the tourist attraction that belongs to the category created, once createdA will immediately be displayed in the application in the following way

Figure 2 Category of tourist places

Tourist places: This option of the Content Manager will allow to create the tourist sites, in this we must enter coordinates (routes), web site, telephones, etc.

This information will be presented to the end user of the mobile application in the following format

Figure 3 Tourist Place Detail

Events: The Content Management Web Application we can add upcoming events to be developed in the canton, additional this will allow us to realize sub-events.

Visits: In the left side menu we find the option with this name that allows us to view the number of visits that each tourist place has received.

Audit: Each one of the views has a detail of tourist places in which it is indicated that user created or modified in its defect like the time and date of creation or modification.

Reports: Relevant general views contain a data export button, these do not allow generate a file in Excel and PDF format

1.5 Justification

Research

The research project was carried out in view of the lack of the necessary information from the Ionic 2 framework, which results in a total ignorance of this new technology for mobile application developers.

Application

The direct beneficiaries with the development of this application are and will be the citizens both local, national and foreign. This project will be very useful for the people, as they will have real and updated information of tourist attractions of the Pimampiro canton.

After completing the project, this will be a great help for students and people in general who want to develop mobile applications using the Ionic framework.

2. Methodology

The Web System Content Management it is developed under PHP language, using the YII framework 2 that includes JavaScript libraries JQuery) and CSS (Bootstrap).

The mobile application is developed under the framework Ionic 2 which makes use of the angular framework 2, Google libraries Maps and RESTful Web Services

All languages and technologies are open source making it possible to make future improvements and constant maintenance of the free Form web and mobile application.

For the development of the project we used the methodology agile SCRUM.

The product is a Web System of Content Management; Therefore, it requires resources to access the Internet such as hosting and availability (Web server).

A mobile app that requires an Internet connection, being an application available for Android phones needs accommodation and availability in this case Google Play Store.

Architecture Model Controller View for the Content Manager Web Application

It is a software design pattern that is based on separating the programming code in three different layers (models, views and controllers) in order to create more robust software, allowing the reuse of code and ease of maintenance. 1]

Control Flow:

1. The user makes a request in the View that is presented.
2. The controller receives the Action you want to perform and it treats the entry event.
3. The controller Send To the model the action of the user, and it returns the required information.
4. The driver generates a new view or same page that makes use of the data provided by the Model.
5. Finally, the view expects another request from the user to repeat the process.

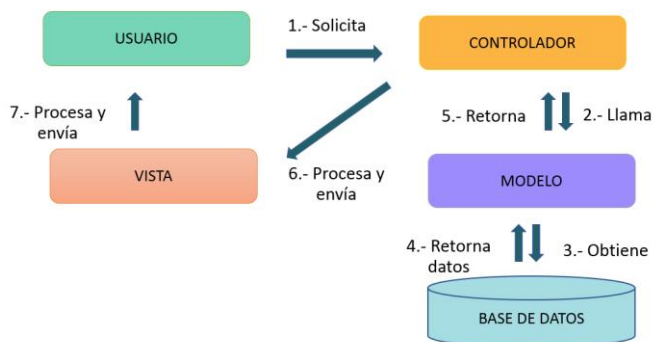A diagram of the MVC architecture information flow:

Figure 4 MVC Architecture

2.1 Planning Phase

Customer requirements are grouped in iterations Or Sprints According to the SCRUM methodology, which are:

Iteration	Description
Sprint 1	Design and implementation of the database, as well as the configuration of the application and the upload to the version Manager
Sprint 2	Creation of CRUD´s (provinces, cantons and parishes) and add additional views.
Sprint 3	CRUD´s (Touristic places, events), uploading images and adding the additional views as well as the performance tests. Additional the module for REST Web Services was created.
Sprint 4	Configuring the Ionic 2 working environment, a prototype of the application and the creation of REST Web services
Sprint 5	Presentation of the prototype and corrections of Product Owner as well as new requirements were accepted
Sprint 6	Is conducted the testing period and the Feedback testing of the application
Sprint 7	Spelling check and go up to production.

Table 1 Sprint Planning

2.2 Design phase

This phase details the processes of obtaining information or damages of the Application Mobile to System Content Management Using diagrams of the general architecture of the agricultural mechanization system.

Additional, describes the activities performed by people who interact with the mobile application and content management.

Actors in the process

Client: We define the customer as the user of the final product in this case that makes use of the mobile application. This user has the ability to freely navigate By applying search and knowing the content presented in the application. It is not indispensable for the customer to have knowledge of the content presented, the application will provide the necessary facilities to guide the user.

Administrator: The administrator is the maximum role of the web system, is in charge of the administration, audit logs, and perform records deletion tasks from different catalogs. Additional access to the backup module in which you will be responsible for backing up and maintaining the data base in time periods determined by an estimate of time to consider.

Editor: Users who have this role assigned will be responsible for content management. This is the most important role because all the changes you make to the content will be immediately reflected in the mobile application.

Auditor: is the lowest role within the system and will have permissions only to display information and Details of this information is to say data from Create and modify records with the ability to export the desired reports.

Architecture of Content Manager Web Application

Figure 5 Web System Content Management Architecture

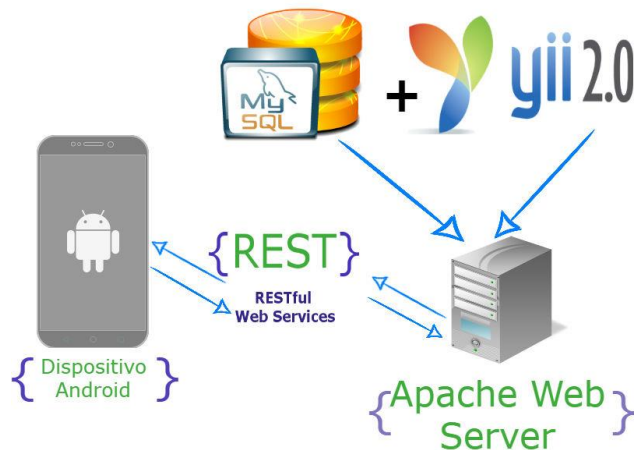Architecture of the Mobile application

Figure 6 Architecture of the Mobile application

2.3   Development and implementation phase

Within the development phase in accordance with Agile SCRUM methodology, presents the Result obtained within the sprints.

Implementation process Content Management System

Description: Once developed and performed the necessary tests for the implementation of the Content Management Web system

Execution conditions: Required A hosting that supports PHP language and a MySQL database hosting the GAD Pimampiro It was commissioned to acquire it.

Implementation process Mobile application

Description: Once developed and carried out the necessary tests for the implementation of the target application Pimampiro requires its availability in the Google Play Store.

Execution conditions: Required A license of Google Play Console In order to publish the application y Have your availability in the store.

3.   Results

Developing applications with the Ionic 2 framework It presents a number of advantages to application developers as it allows us to optimize resources, save

development costs and work hours. The following considerations are presented:

Savings in licenses because it is a free development tool.

Creation of applications for different platforms from a single source code.

It offers a wide variety of documentation provided by the framework such as demos, videos, manuals, blogs, etc. As well as great experience in the community that often share their experiences and knowledge.

Allows you to create native applications with which you Can interact with different components Of the device as the GPS, Google Maps, Bluetooth, fingerprint, etc.

As are presented in many Development framework Shows Certain Disadvantages for its use, such as:

Because of Apple policies it is necessary to work on a computer with MAC operating system to be able to compile for App Store.

You should have considerations on many components to be able to use on different platforms.

4. Conclusions

New technologies, new programming languages and development trends such as Ionic 2 help programmers and product owners to save costs and time significantly in this case generate applications for different platforms Starting from a single development project that is based on a single programming language.

The study of a tool should be as thorough as possible because it provides information and helps to maximize the benefits of a framework or programming language, even gives us a brief overview of whether the framework has future stability.

Software development methodologies such as Scrum aim to expedite the generation of products because it is a fast development methodology and guarantees to have a product as the development project is carried out.

New technologies give us new methods of connectivity between applications, this is RESTful services, they are full, lightweight and easy to deploy web services because they use JSON which makes data multidimensional and easy to manipulate.

Acknowledgements

Bibliographical references

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About the author

Luis YAGUAPAZ Born in Ibarra city began his studies in the Private school "La Dolorosa" In the Pimampiro city, his secondary studies were carried out in the educational unit "Teodoro Gómez de la Torre" Of the City of Ibarra, he continued with his university studies in the Computational Systems Engineering degree at the Technical University of the North.