Study development multiplatform framework Titanium Appcelerator with prototype mobile application for control orders in restaurants

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Abstract. *This project stems from the need to know the use of new tools for cross-platform mobile application development.*

One of these tools is Appcelerator, which allows coding mobile applications in one programming language such as JavaScript and compile this encoding to native applications supported by the different types of mobile devices with IOS and Android platforms are the platforms most traded worldwide, resulting in a reduction of costs and time involved in developing a natural language application of each mobile platform.

The chapters have given this draft guideline are:

Chapter I. It includes an introduction to the current problems and the objectives, scope and rationale for the project is proposed.

Chapter II. Which provides the theoretical framework, presenting an overview of which is a mobile application development tools available for the mobile application, also explained about web coding languages and databases, and formats of communication between a mobile device and external database.

Chapter III. This chapter is devoted to explaining the use of Appcelerator tool, since its installation, to the generation of a mobile application, bumping aspects of development and development patterns, use of databases, use of social networks and services of geo localization.

Chapter IV. Here the Mobile-D methodology used in the project is described. Specifying in detail each of the stages in the development of an application is divided.

Chapter V. It includes the development of the application. Framed with the application of the methodology used, the entire application development process is described, since the lifting of requirements, configuration tools to use, development, testing and release.

Chapter VI. This chapter disclose findings and recommendations that the project has come once completed, also includes the bibliography and a glossary of terms shows.

Keywords

Resumen. *El presente proyecto nace de la necesidad de conocer el uso de nuevas herramientas multiplataforma para el desarrollo de aplicaciones móviles.*

Una de estas herramientas es Appcelerator, que permite codificar aplicaciones móviles en un solo lenguaje de programación como es JavaScript y compilar esta codificación a aplicaciones nativas soportadas por los diferentes tipos de equipos móviles con plataformas IOs y Android que son las plataformas más comercializadas a nivel mundial, lo que se traduce en una reducción de los costos y tiempo que conlleva desarrollar una aplicación en los lenguajes naturales de cada plataforma móvil.

Los capítulos que han dado lineamiento al presente proyecto son:

Capítulo I. Que incluye una introducción de la problemática actual y se plantea los objetivos, alcance y justificación del proyecto.

Capítulo II. Que contempla el marco teórico, dando a conocer información general acerca de que es una aplicación móvil, herramientas disponibles para el desarrollo de aplicaciones móviles, también se explica sobre lenguajes de codificación web y bases de datos, y los formatos de comunicación entre un equipo móvil y una base de datos externa.

Capítulo III. Este capítulo está dedicado a explicar el uso de la herramienta Appcelerator, desde su instalación, hasta la generación de una aplicación móvil, topando aspectos de desarrollo como patrones de desarrollo, uso de bases de datos, uso de redes sociales y servicios de geo localización.

Capítulo IV. Aquí se describe la metodología Mobile-D, utilizada en el desarrollo del proyecto. Especificando detalladamente cada una de las etapas en las que se divide el desarrollo de una aplicación.

Capítulo V. Contempla el desarrollo de la aplicación. Enmarcada con la aplicación de la metodología utilizada, se describe todo el proceso desarrollo del aplicativo, desde el levantamiento de requisitos, configuración de herramientas a utilizar, desarrollo, pruebas y lanzamiento.

Capítulo VI. En este capítulo se dan a conocer conclusiones y recomendaciones a las que se ha llegado una vez finalizado el proyecto, incluye además la bibliografía utilizada y muestra un glosario de términos

Palabras Claves

Multiplataforma, Android, IOs, JavaScript.

1. Introduction

In the current market it has mushroomed selling Smartphones and PDA (Personal Digital Assistant), which depending on the model have their own operating system; teams with Android operating system are the best sellers by 80% of the world market share, followed by IOs by 15%, leaving the rest for computers with operating systems such as BlackBerry, Symbian, Windows Phone and others.

Each of the operating systems for mobile devices has its own development environments and their own programming languages applications, hampering the work of programmers, who must know several programming languages for the development of these applications and these turn are available in all types of Smartphone and tablets.

For this reason it is necessary to minimize the difficulty in the process of programming and development of mobile applications, in addition to these applications are portable to most operating systems mentioned.

Current technology has made available to developers a number of development environments and multi-platform mobile web applications, to meet and meet in the shortest time possible customer needs. Many of these environments are little known in our midst; we do not know its advantages and disadvantages, and when to use them, leading to not use them.

Therefore research on the use of new tools for mobile application development is important for professionals, students and teachers as these programming tools are versatile and generate code for any operating system platform.

2. Materials and Methods

To study the Appcelerator tool has set the development of prototype mobile application for control orders in restaurants, with which it seeks to use various tool components and determine their behavior.

2.1. Development Methodology

The development of the application is the conducted based on the development methodology Mobile-D, which is a methodology for agile development of mobile applications and has been supported by many other well-known solutions and consolidated: eXtreme Programming (XP), Crystal Methodologies and Rational Unified Process (RUP). The principles of extreme programming have been reused in regard to development practices, the Crystal methodologies provided a valuable input in terms of scalability of the methods and RUP is the basis for the complete design lifecycle (white, Camarero, Fumero, Wertesky, & Rodriguez, 2013).

This methodology proposes 5 stages:

1. Exploration

This phase is where the planning and establishment of the project is done, the actors, the scope and tools to be used in the development are defined.

2. Initialization

The purpose of the initialization phase is to enable the success of the next phases of the project, through the preparation and verification of all critical development issues, so that all are in full readiness at the end of the implementation phase of the requirements selected by the customer.

3. Production

The purpose of the production phase is to implement the required functionality in the product cycle by applying iterative and incremental development.

4. Stabilization

The purpose of the stabilization phase is to ensure the quality of project implementation

5. Testing System

The purpose of system testing is to see if the system produced correctly implements the functionality defined by the customer, the project team to provide feedback on the functionality of systems and correct the defects found.

2.2. Evaluation Process

To determine the evaluation criteria of the Titanium Appecelerator tool has been used the criteria established in the ISO 9126 standard is an international standard for assessing software quality.

1. Functionality

It means functionality, functional acceptance have activities that are performed for the deployment of an application on a mobile device. The process is based on the start of a new project, conducting test, the compilation process and put into production in a mobile terminal.

1.1. Evaluation

How easy is to create a project in Appcelerator?

The first thing to do is to configure the settings for which you want to deploy applications, for which it is essential to have the SDK of each of the platforms, this process is similar to that would have to be if you want to make a project in native platforms; ie have Xcode installed to develop applications IOs or have installed the Android SDK to develop applications in Eclipse.

How is the process of testing and compiling a project do?

To carry out testing and compilation Appcelerator presents similar to those of many application development environments, facilitating purification processes with breakpoints functionalities.

How difficult it is to put the application on a mobile terminal?

As for the start of production on a mobile terminal, processes are set by the application distribution stores, then this process is similar to that must be followed if developed in native environments.

What degree of difficulty involved in Appcelerator code an application?

Coding Appcelerator is performed in JavaScript language, so a personal opinion, it is much easier to learn one programming language and apply Appcelerator for functional applications in IOs and Android, to have to learn a language for each type of application; Java for the case of Android and Objective-C for the case of IOs, if desired encoding in native application environments.

2. Reliability

Means reliability, the precision with which applications can be performed in an environment Titanium. That is, graphical interfaces that can be represented and which are not. If they work equally well in an environment or another.

2.1. Evaluation

How reliable are the results when generating applications with Appcelerator?

To answer this question an analysis of each of the graphic elements that has been used in the development of the proposed application and its behavior when run on mobile devices or emulators Android and IPhone is presented.

- ImageView

The view image used to represent an image or a set of them. Supports PNG and JPEG formats. Proper operation both IOs and Android.

- Label

Labels have completely the same operation and function properly, can also be applied in the aestheticism IOs or Android, such as adding borders, round them, etc.

- TextField

Textfiels are important elements when the user needs to enter some information, properly work on IOs and Android, also can apply attributes to customize its appearance, such as edges, keyboard type you want to use, or if it is a password text.

- Picker

The Picker item is a selection item in the proposed application would use when selecting the company to which a user belongs.

Its functional behavior is correct on all platforms; not its screen presentation, this varies from one platform to another, in IOs this control has the properties width and length with static values so it is necessary to establish a correct position within the screen that contains it to avoid overlap with other elements used in Android is much easier to use because you can assign the properties width and length, and the presentation of the options is performed in another separate from the main view.

- Button

The buttons also work properly on iOS and Android, just as their styles can be customized, if they are not set some properties these are inherited from styles platforms, so its graphic presentation can switch from one platform to another.

- TabGroup

This element is used to group tabs that the developer has created and allows the user to interact with these, proper operation on both platforms, although Android there are graphic properties such as background color, which can not be assigned as the inherited the platform itself.

- Tab

Each Tab element represents a tab and serves to set different display sections, each with its own functional characteristics. This element works well on Android and IOs.

- TableView

This is an element that serves as a container rows in a table, and working properly.

• TableViewRow

This element represents a row in a table and can be inserted into each of these elements of text, graphics and buttons, you must specify the dimensions of the controls built into each row to prevent overlap each other. properly operate both IOs and Android.

• View

The views are elements widely used in Appcelerator and serve as containers for other controls can be customized. They are working properly.

• Window

The Window component is essential for the development of applications in Titanium. Each tab has its own window where other types of items are added to present to the user. They work properly on iOS and Android.

In general the results obtained to build applications for Android and IOs with Appcelerator platform are quite functional, except for the use of certain specific controls that need to be used on different platforms specifications.

3. Usability

Means usability, ease of use development environment for creating applications. To this end, documentation and Appcelerator resources available to its developer community, just as it is usable be checked.

3.1. Evaluation

Is there a complete documentation available to the developer community Titanium?

The Appcelerator platform provides a lot of very well organized on its website https://docs.appcelerator.com/platform/latest/#!/guide/Titanium_Development and constantly updated when a developer documentation to find bugs when implementing solutions with this tool.

This documentation has a very intuitive navigation system and fairly complete. There is a search engine, a route package, a list of components, a list of compatibilities and the description and examples of the selected component.

Examples are simplistic, designer and are clearly to be used as a "copy and paste" indicating where developers should go the code to be adapted to specific needs.

The components to be consulting, unfold through a series of tabs, which saves considerable time when you need to consult more than one component in the documentation.

It is also available to the developer community through the documentation an intelligent search engine that works quite accurately.

This documentation is only in English language.

Google also exists in a fairly active community of developers in Spanish, where you can consult and share examples.

4. Efficiency

It means efficiency Titanium compile times and application loads developed on the platform.

4.1. Evaluation

This section does not have data to other tools or native tools that allow a comparison in terms of load and compile times, you can not give an exact criterion.

Appcelerator is noted that in the compilation process takes JavaScript coding and generates projects that can be opened in the native tools of each type of mobile application; that is, a IOs Xcode project and a project for eclipse in Android and then generates applications using the SDK's if each platform, so the times should be higher than those obtained in the native tools.

To this must be added the time it takes to open emulators used for testing on the application, that Android is much more time consuming than IOs.

5. Maintainability

Maintainability is defined as the process of updating and correction of errors of the platform.

5.1. Evaluation

The Appcelerator platform puts constantly updates available to users, these updates have improved the use of controls and tools, and going to the pair of new updates that appear in the SDK's of native platforms; ie generates an update to launch applications using the new SDK's of IOs and Android.

Some updates have also been somewhat problematic, especially when working on the Windows OS, because when you install updates are configured des routes SDK`s Android and errors at compile time are presented, so you must reconfigure these routes.

6. Portability

Portability means ease of installation of the tool on different operating systems and operation in each of them.

6.1. Evaluation

Appcelerator development framework can be installed on different operating systems such as Mac are OS, Windows and Linux, and projects generated are easily moved from one operating system to another. In each of these operating systems have also install the respective SDKs for different mobile platforms.

Now each operating system has certain limitations when generating applications, as in the case of applications for IOs that only can be generated from a Mac OS operating system and in case you want to generate an application to Windows Phone owes performed from Windows.

3. Results

Application development framework with Titanium has a number of advantages in different fields or areas, such as optimizing resources, saving financial costs and working hours. With it you get:

- Save directly on licenses because it is a free program.

- Create applications that reach the maximum number of potential users with the least effort.

- Save time and costs in creating, developing and maintaining different versions.

- Leverage a wide and varied documentation provided by the platform as manuals, videos, webinars, etc. As the experience of the user community, which constantly share tips and tricks, as well as collaborating in resolving errors.

- Create native applications that can interact with the various components of the device such as GPS, the camera, contact directory, etc.

- It offers the possibility of extensible applications, and applications to improve constantly.

Like any development framework Titanium shows some disadvantages for use as:

- Due to Apple's policies to generate applications for IOs, you need to work with Titanium from a computer with MAC OSX operating system.

- In Titanium it is not possible to make a layout as there is no initial HTML page where you add the controls, but you have to create the windows and controls directly from JavaScript.

- Having a multiplatform approach is necessary to know which components work or not on certain platforms.

- It has constant updates that sometimes generate errors when using them.

4. Conclusions

Taking into account the objectives and scope outlined in the development of this project has reached the following conclusions:

- The use of new development tools like Appcelerator mobile applications significantly reduces the time and cost of a project, since it generates compatible applications for different platforms from a single development project based on a single programming language.

- The detailed study of the development tools used in the design and implementation of new applications allows making the most of these advantages give us.
- Selecting a software development methodology as Mobile-D causes the generation of a product be speeded up as it was designed for mobile applications and projects is based on rapid development methodologies.

- The use of computer technology is becoming more immersed in all kinds of business day, and companies engaged in the sale of prepared foods are no exception, so the use of this application can improve the quality of service provided, reducing waiting times for a customer to be served.

- Using JSON as the format of communication between the mobile application and web server is the best option when working with Appcelerator Titanium as the two are closely related to the JavaScript language.

Once completed this project has reached the following recommendations:

- Deepen the study Appcelerator framework to exploit all the advantages of when developing a project of mobile applications.

- Using Appcelerator Titanium tool for developing mobile applications as it allows from a single development process, generate applications compatible with several mobile platforms.

- Use the Mobile-D methodology in new development projects as it is an agile development methodology that can generate scalable projects where errors promptly detect and learned.

5. Acknowledgements

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