

Mobile Application In Smart Cell Phones For The Payment Of Income Tax For Individuals Not Required To Keep Accounting Records 2014-2015

Author Marco Vinicio Ramón Jiménez

**Carrera de Ingeniería en Sistemas Computacionales,
Universidad Técnica del Norte, Ibarra, Imbabura**

marco.vinicio.ramon@gmail.com

Abstract. *This project focuses on an area of taxation called Payment of Income Tax, and it is specifically developed for individuals not required to keep accounting records, who are employees. Furthermore, it describes the development of the methodology employed.*

The objective of this project is to develop an application for mobile devices, which runs on android operating system platform, allowing for the creation of files for Tax 102A. In order to generate and send XML file to the portal of Servicio de Rentas Internas (SRI), it is imperative for each user to enter their deductible expenses invoices, income earned and personal data.

Key words

Android, Smartphone, Extreme Programming, SRI, Income Tax 102A

1.Introduction

Currently, many of the people who are employees must pay income tax, but not all of them know how to go about it. According to recent studies, this causes bottleneck in the process and can attract fines or the individual, in some cases, can contract a third party to carry out the process on their behalf. As a result of the growth of the market for smart phones market witnessed in the past few years as default device and easy access, they automatically become a candidate for the development of personal applications such as the payment of income tax. It is suffice to note that there is no application in the country, at present, that is portable, easy to install and provides instant access that aid this process.

Access to smart phones has made it possible for many more people to have access to the internet and with this comes

the necessity to have applications of all classes for the phones. With the implementation of an application that facilitates the payment of income tax, many people who do not know the process will benefit from it, thereby providing an alternative to traditional process. In the light of the foregoing, it becomes imperative to create a mobile application for smart phones for the payment of income tax for individuals not required to keep accounting records. Additionally, android is the most widespread operating system in our society for smart phones and it is the most used by manufacturers.

Thus, the principal aim is the development of an application for smart phones with android operating that facilitates the payment of income tax for individuals not required to keep accounting records. In this way, we can take full advantage of the devices within our reach and continue to increase the number of applications for them.

2. Development of the Application

The application will run natively for android platform with JAVA programming language. It will generate and send an XML file to an email address that the user entered for its subsequent upload to SRI's portal. Furthermore, it will verify user's Taxpayer

Registration Number (RUC) and the validity of expenses bills.

The application will generate a little database that functions through SQLite, a database engine that can be found embedded in all android operating systems.

This application was created in line with the Model View Controller (MVC) pattern. The layer model was developed with JAVA. This layer helps with the connection between the database and the application.

The control layer also was developed using JAVA. This allows us to know actions taken by users and it also interacts with the model layer for the extraction or entry of data.

The view layer was carried out with the markup language XML, which is a language used for the interface of native android applications. Below is an illustration of the operation of the MVC pattern.

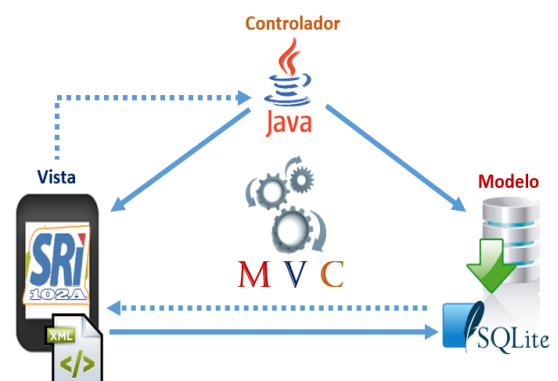


Image Model View Controller.

Source: Own

In order to create this application, the following tools were used:

| Tool | Description | Justification |
|---------|----------------------|---|
| Eclipse | Development IDE | Apart from being an open source which means it is free, eclipse is one of the most used Intra-trade Data Entry Software (IDES) due to its stability. In addition, it supports a large number of languages for the development of applications. |
| SQLite | Database | It is the database used in default android applications, which is embedded inside the operating system. It is free, just like the other tools and one of the most used databases, which can be found in various operating systems, web browsers and other applications. |
| JAVA | Programming Language | It is one of the most widely used |

| | | |
|---|---------------------------------|--|
| | | programming languages, not just for development of mobile applications but also for desktop and web applications. |
| ORMLite | ORM | This is a library that allows for interaction with the database through the use of objects. It supports a variety of databases such as MySQL, Postgres, Microsoft SQL Server, H2, Derby, HSQLDB and SQLite |
| Eclipse Android Emulator /Genymotion | Eclipse Android Emulator | Tests were carried out with an emulator for android applications embedded in Eclipse, but for being slow Genymotion was used for ease of use and speed. |

2.1 System Modules

The following are the modules to be developed:

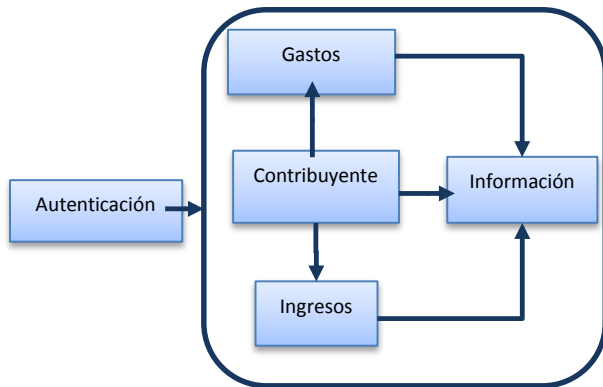


Figure 1. Mobile Application Modules
Source: Own

Authentication Module: Ascertains the identity of the user for the use of the application.

Expenditure Module: Manages expenses incurred during a financial year by taxpayer.

Income Module: Controls earnings received during a financial year by taxpayer.

Taxpayer Module: Allows taxpayers to enter or edit their data.

Information Module: Provides information about type of expenditure, income earned, income tax calculation table and expiration table.

3. The design of the Application

Just as there are traditional management methodologies for developmental projects, we can also find a different branch in project management, agile development methodologies.

The agile development of software is a project management methodology that allows us to carry out software developmental project that adapt to changes and evolve in conjunction with the software. For the development of this project, the XP methodology has been chosen.

Definition of the roles in XP:

Programmer: Writes the unit test and produces the system code. He is responsible for technical decisions and building of system.

Client: Writes the history of user and operational tests to validate system implementation. In addition to that, he prioritizes users' stories and decides which are implemented in each iteration, focusing on the equipment and support tools for testing.

Test Manager: helps client to write functional tests. He is responsible for executing tests, disseminating results in the group and support tools for the tests.

Monitoring Manager: Provides feedbacks to the team. He observes without disturbing. He verifies the level of accuracy between the estimates made and real time dedicated, without the view to improve future estimates. He monitors the progress of each iteration and keep historical records.

Coach: Responsible for the overall process. He provides leadership to the team to ensure that XP practices are implemented and the process is followed correctly. He is the leader of the team, takes important decisions and tends to remain in the background while the team matures.

Consultant: A member of the external team that possesses specific knowledge in some important topics for the project, wherein problems can emerge.

Manager: Provides the link between clients and programmers. He helps the team to work effectively and efficiently by creating adequate working conditions. His main task is coordination.

Artifacts: The following are the artifacts of XP: User history, engineering tasks and acceptance tests.

Once authenticated, the home screen of user interface (UI) for the mobile application shows the following:

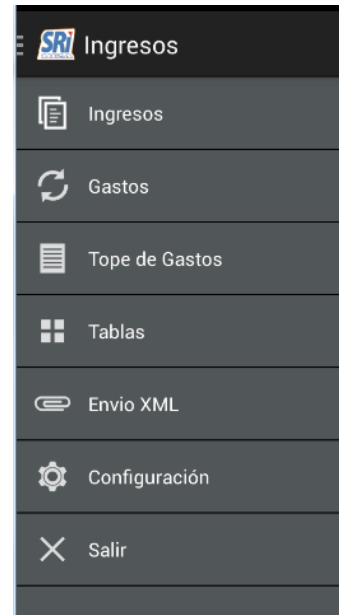


Figure. 2. Mobile Application Main Menu
Source: Own

4. Results

Studies have shown that the use of mobile technology for task resolution that are traditionally carried out manually or on the computer help us perform the same tasks in a immediately due to its portability and easy installation. The development of all types of mobile applications is made possible due to their increasing use and calculation potential.

Moreover, the creation of the application for android operating system is supported because it has a greater presence

in the smartphone market in low, medium and high ranges.

| Operative System | Market |
|------------------|--------|
| Android | 84.7% |
| iOS | 11.7% |
| Windows Phone | 2.5% |
| BlackBerry | 0.5% |
| Otros | 0.6% |

Table 1. Market share according to IDC Worldwide

Source:

<http://www.idc.com/getdoc.jsp?containerId=prUS25037214>

5. Conclusions

The agile development methodology XP facilitated the development of the thesis due to its short delivery cycles.

Current tools allow for the development of small applications for everyday tasks and repetitive processes in our smart phones, in a relatively easy and quick way.

The spread of an open mobile development platform is made possible, thanks to free tools and multiplatform.

Fragmentation in android operating system is the main problem facing the developer because not all features and library are supported in previous versions of the operating system.

You can harness the power of mobile devices calculation models to create new applications that were only available PC.

The chosen development tools (Eclipse, Android Emulator) were useful, but do not offer greater features as in Android Studio and Genymotion.

6. Recommendations

For the development of the android application with JAVA programming language, the use of Android Studio is highly recommended because it is distributed freely by Google and has features that are nonexistent in Eclipse.

The use of android 4 or higher versions for the development of applications is recommended because the quota of devices with these versions are currently very high.

It is possible to avoid the problems of library incompatibility and save development time by using android versions 4 or higher, because there are libraries developed by third parties that help the development of applications.

It is highly recommended to use previous knowledge in a programming language for the development of android applications. There are currently free and paid solutions for principal programming

languages, so do not waste time in learning a new programming language.

Although there are millions of developed applications on Google store, many more can still be developed if they are centered on a specific problem, in line with the reality in Ecuador.

Gratitudes

My profound gratitude goes to the Universidad Tecnica del Norte (UTN) and its staffs for their arduous task of instructing and capacitating students. In the same vein, I would like to thank Eng. Carpio Pineda for his wise guidance throughout the length of this project.

To the Internal Revenue Service (SRI) for publishing electronic manuals for processing income tax.

Bibliography

- [1] SRI, GUIA IMPUESTO A LA RENTA. [Online] Citado 2014-11-11. Disponible en: <http://www.sri.gob.ec/de/384>.
- [2] Sgoliver, Curso de Programación en Android. [Online] Citado 2014-06-20. Disponible en: http://www.sgoliver.net/blog/?page_id=3011
- [3] Canós, J. H., Letelier, P., & Penadés, M. C. (s.f.), Metodologías Ágiles en el desarrollo de software. Disponible en:

http://noqualityinside.com/nqi/nqifiles/XP_Agil.pdf

- [4] <http://www.idc.com/getdoc.jsp?containerId=prUS25037214>

About the Actor

Marco Ramón studied Computer Engineering at the Universidad Tecnica del Norte (UTN) in Ibarra, Ecuador.

His interests include development of mobile applications, development in JAVA, creation of web applications, among others. Contact : marco.ramon.jimenez@gmail.com.