

# APPLICATION DEVELOPMENT TO LEARN KICHWA LANGUAGE USING WEB 2.0 CONCEPTS AND FREE TOOLS

Wilson Fabián CHIZA MORÁN

Computer Systems Engineer Career, Tecnica del Norte University, 17 de Julio Avenue 5-21 Ibarra, Imbabura, Ecuador

wfchiza@utn.edu.ec

**Summary.** *The present graduation project is “Application development to learn Kichwa using Web 2.0 and free tools” guide in the agile development methodology Extreme Programming (XP) to finish the project. In the chapter I it explains the project objectives, it realices a short description of the Kichwa background and determine the module that will contain this program with its respective contents. In the chapter II, it describes some data related to Kichwa using the information of the INEC, also it describes the tools and technologies that will be used in this project. In the chapter III, it’ll try the phases that was used getting the defferent artifacts that appear in the use the agile development methodology XP. In the chapter IV, it realices a daitailed description of the operation program. Finally, in the chapter V, it presents the conclusions and recommendations that appeared in the project elaboration.*

## Keywords

Web 2.0, Kichwa, Open Tools, XP.

**Resumen.** *El presente proyecto de grado es el “Desarrollo de una aplicación para la enseñanza del idioma Kichwa utilizando conceptos Web 2.0 y herramientas libres” guiándose en la metodología de desarrollo ágil Extreme Programming (XP) para la culminación del proyecto. En el capítulo I, se declara los objetivos del proyecto, se realiza una corta descripción de antecedentes del Kichwa, y se define los módulos que abarcará el aplicativo con sus respectivos contenidos. En el capítulo II, se describe algunos datos relacionados al Kichwa utilizando la información de INEC también se describe las herramientas y tecnologías que se utilizarán en el presente proyecto. En el capítulo III, se documenta las fases que se realizaron obteniendo los diferentes artefactos que surgen al utilizar la metodología de desarrollo ágil XP. En el capítulo IV, se realiza una descripción más detallada del funcionamiento del aplicativo. Por último en el capítulo V, se presenta las conclusiones y recomendaciones que surgieron en la elaboración del proyecto.*

## Palabras Claves

Web 2.0, Kichwa, Herramientas Libres, XP.

## 1. Introduction

The Kichwa language in the country, through the past of the time it has suffered some distortion, it has suffered a decline due to the input of some words from the Spanish language; that’s why it has carried to kichwa speakers to forget of some kichwa words that apply in the communication, consequently, to the distortion and loss the language.

As an initiative to get better the use of the native language the National Assambly established in the Ecuador Constitution, section 2 says the following “Spanish is the official language in Ecuador, Spanish, Kichwa and Shuar are official languages of intercultural relation ...” [1].

With the purpose to contribute knowledge and materials to strengthen the kichwa language and with the increase of people which has access to internet I saw the need to create an application web 2.0 jointly to the Young Kichwa Association from Imbabura (YKAI) in order to the users can access to the application from any part of the world to improve their knowledge in kichwa.

## 2. Methods and Materials

The development of software methodologies help to create a quality software. There are many methodologies that is posible to apply in the development of a software, the most used are the traditional methodologies and agile methodologies.

At the same time, with the advance of technology there are many tools, language and programs to choose at the momento to develop a software taking into account the needs and habilities of the developer

## 2.1 Development Methodology

The chosen methodology to develop the project is XP (Extreme Programming), which is an agile development methodology in short time and the objective is to maintain a constant communication with the client generating only required artifacts.

Coming up next, it shows the roles and their activities of the methodology XP that participated in the present project [2].

### Programmer

- Basic piece in development XP
- More responsibility as in others development mode
- Responsible about the code
- Responsible about the design (refactoring, easiness)
- Responsible about the system trustworthiness (proof)
- Communication capacity
- Accepts criticism (collective code)

### Client

- Basic pieces in development XP
- Define specifications
- Influence without control
- Trust in the development group
- Define functional proof

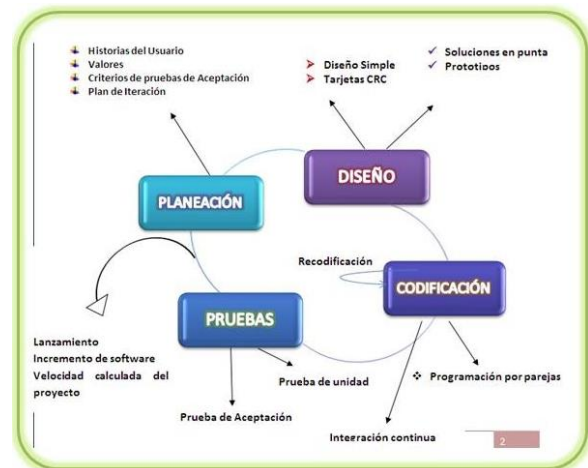
### Manager of Proof

- Help to the client in the preparation/realization of the functional proof
- Execute the functional proof and publish the results.

### Coach

- An expert in XP
- Responsible of the whole process
- Identify the deviations and claim attention about the same
- Guide the group the indirect form (without damage its security neither trust)
- Intervene directly if it is necessary
- Intercept rapidly the problem

## PHASES DE XP [3]



Picture 1. Phases of the Methodology

**Planning:** Realize a compilation of all requirements of the project, it should plan well among the other developers of the project, the purpose of the project then achieve the final objectives. It creates the user history (similar to use cases) that describes the necessary output, characteristic and functionality of the software which is going to be developed.

**Design:** This is the stage where user history is evaluated to divide in task, each task represents a different characteristic of the system and it is possible to design an unit proof which verify each task.

**Codification:** It is carried out the programming in pair, the unit proof and the code integration. During this stage I hope the availability of the client in order to it can solve any doubt that will appear during a working day.

**Proof:** Each task was identified with the user history, it represents a different characteristic of the system and it will realize an unit proof for each of them.

## 2.2 Development Tools

### PROGRAMMING LANGUAGE PHP

It is a programming language interpreted, designed originally to create the dynamic pages. It is used mainly to the interpretation the server side (server-side scripting) but, actually it can be used from an interface of command line or in the creation of other types of programs including applications with graph interface using the libraries Qt o GTK. [4]

### YII FRAMEWORK

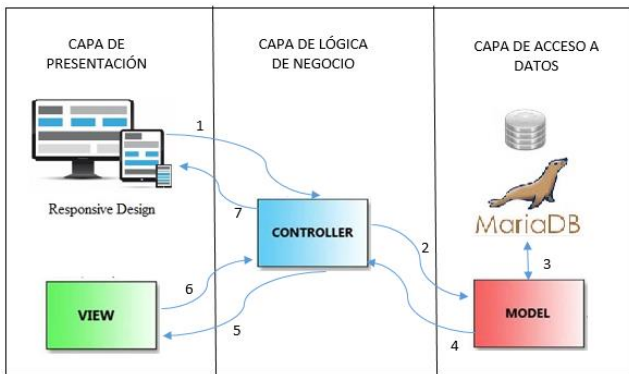
Yii is a framework php based in high performance components to develop applications web of large scale. It allows the máxima reuse in the programming web and it can speed up the development process. [5]

### MARIADB DATABASE

MariaDB is a system of management of data bases derived from MySQL with license GPL. MariaDB is developed by the whole community with Monty Program Ab as its principal in charge. [6]

### ARCHITECTURE MVC

MVC is an used technique in the software development. The main purpose is to create a distinction between the form that the software manages the data, and the form that interact with the user. This distinction means that the process can be handled, developed and proved separately. [7]



Picture 2. MVC Lifecycle

### 3. Results

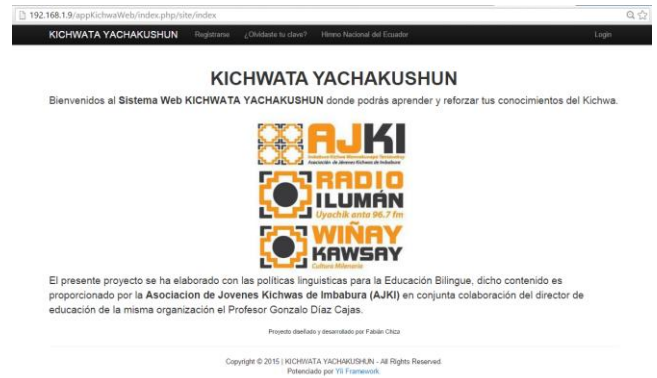
Once it has finished with all methodology phases and finished in the develop of the program, it continues to the functional proof and it obtained the following results.

| N | History Name                      | Acceptance Proof Name | Executed | Results            |
|---|-----------------------------------|-----------------------|----------|--------------------|
| 1 | Registration                      | Proof N° 01           | DONE     | Satisfactory Proof |
| 2 | Come in to the system             | Proof N° 02           | DONE     | Satisfactory Proof |
| 3 | Come in to the contents           | Proof N° 03           | DONE     | Satisfactory Proof |
| 4 | Visual Dictionary Module          | Proof N° 04           | DONE     | Satisfactory Proof |
| 5 | Upload Permission of the contents | Proof N° 05           | DONE     | Satisfactory Proof |
| 6 | Basic Kichwa Module               | Proof N° 06           | DONE     | Satisfactory Proof |

|   |                             |             |      |                    |
|---|-----------------------------|-------------|------|--------------------|
| 7 | Advanced Kichwa Module      | Proof N° 07 | DONE | Satisfactory Proof |
| 8 | Learning Verification proof | Proof N° 08 | DONE | Satisfactory Proof |

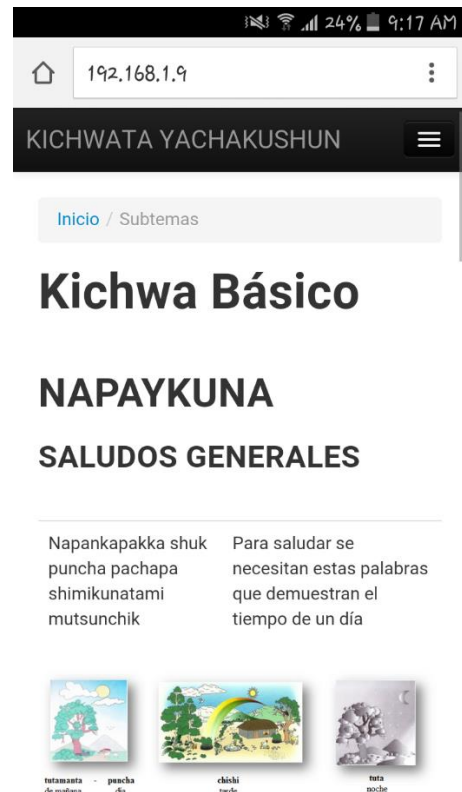
Table 1. Results Graph

Next, it shows the application main screen.



Picture 3. Main page of the web application

The application was designed if the user acceds from a mobile device, the view will be adaptable to the device screen, this concept is known as Responsive Design.



Picture 4. Access from a mobile device

## 4. Conclusions

The free tools are good alternatives to use in similar projects since the development cost will not be increased.

The use of frameworks, specially which was created using the architecture MVC, in every type of project it significantly helps in the advance and quick development of the programs.

The architecture MVC (Modelo Vista Controlador) in a option at the moment to develop the software and which help to have an ordered project for the next maintenances.

To use the agile development methodology XP in this type of project helps to realize and develop the project in short time applying all elements of XP.

To use frameworks to design the interface is a great help so that, it reduces the time and specially to dedicate to the development without worry about the necessary in the interfaces.

To follow a methodology step by step is complicated, but it should use the majority of the phases or advices that the same provides to the quality software development.

Make short tool search (hardware o software) helps to the programmer to have current knowledge and develop a potential search in order to do not have many problems in the workplace.

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## El Autor.

### Wilson CHIZA

I was born on June 2nd in 1992 in San Roque town, in Atuntaqui city. I studied in "Benito Juárez" bilingual intercultural school from Pucará de San Roque kichwa community which belongs to Antonio Ante, Imbabura province, then I entered to "Instituto Tecnológico Otavalo" high school in Otavalo city, where I got the bachelor degree in Físico Matemático. Finally, I entered to Computer Systems Engineer career at Técnica del Norte University to get the degree in Computer Systems Engineer.