

Mobile Application as a legal and informative support tool for the active population of Ecuador

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Abstract—The purpose of this study was to design a mobile application as legal and informative resource aimed at an Active Population—employed and in search of employment—in Ecuador. A quantitative research method was used with the Feasible Project, which complement with the “Development of Mobile Apps. First, the model was obtained through the National Statistics and Census Department (INEC, 2018) and by the Employment, Unemployment and Underemployment National Survey— (ENEMDU, 2019). Second, data was gathered through a documental technique—a method consisting of empirical levels. In addition, data sheets were used as tools, while the Content Analysis enabled data interpretation. The technical diagnosis revealed that the Active Population faces unemployment and underemployment serious issues affecting the country’s productive stability in addition to decreasing the likeliness of promotion in the latter of opportunities in society. A mobile app has been designed as a tool containing legal and informative content to enable access to rules and regulations governing labor and information of productive processes. In order to accomplish the making of this app, agile methods, SCRUM work frame and a CMMI model. Furthermore, analyses requirement, conceptualization and assessment prototypes were established.

Index Terms— Active population, rules and regulations, labor market, mobile app.

I. INTRODUCTION

ACCORDING to Banco Interamericano de Desarrollo, —The Inter American Development Bank IDB 2018—By the year 2018 a favorable economic growth scenario was forecast at a global level Inter-American Development Bank, BID [1]. Therefore, Latin America should have an economic growth at 2, 2%. However, real time figures are not encouraging because in recent years, unemployment has risen.

The IDB also points out that if compared Ecuador’s current condition to other countries in Latin America, agencies such as International Monetary Fund estimated a lower than estimated economic growth by 2018. Despite this estimate, Ecuador is not exempt from an economic and labor crisis that most countries in the region have to face and it is proven by their unemployed or underemployed population that in other words claims an improvement in labor conditions.

Labor stability in any country has become a vital aspect for its own development thus, having a positive impact on income inequality, betterment of social protection and the minimization of the impact on an informal economy. Likewise, a robust labor market boosts social advancement, poverty reduction in other words, this would be interpreted as quality of life for society.

Under this scope, finding attention mechanisms for the Active Population of Ecuador is an utmost priority involving those who are in a working age being able to reach a certain level of enjoyment when it comes to having a job. However, this mostly young segment of society still face problems related to employment rights or are job searching. Additionally, their demands are not being satisfied and as a result, the unemployment line keeps getting longer and eventually this young segment may become underemployed. This context certainly deserves the relevance of Employment rights, since it is necessary to create awareness of this issue in the Constitution of the Republic of Ecuador and in the Labor Code.

In this respect, the aim of this research work is to design the APPS Job- Ecuador with the purpose of bringing together the advantages of mobile applications backed by thorough legal knowledge of rules and regulations that have established employees’ labor rights and duties which in turn, enhance updated and useful information regarding job offers, market tendencies, hiring and training requirements among other processes.

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General Objective

The designing of a mobile application as a legal-informative resource aimed at the Active Population of Ecuador.

Specific Objectives

- Diagnosis of labor market actual conditions in Ecuador
- Interpret the legal contents that regulate work in Ecuador
- Applying the methodology that identifies the proper requirements that the mobile application should meet thus creating user interphase in paper.

TABLE 2. RESULTS NATIONAL EMPLOYMENT, UNEMPLOYMENT AND UNDEREMPLOYMENT SURVEY (ENEMDU, 2019)

GLOBAL PARTICIPATION RATE	Unemployment Rate	Suitable Employment Rate	Underemployment	Other Employment or unsuitable employment	Unpaid Employment
66,5%	4,6%	37,9%	18,7%	22,7%	11,0%

- Validating mobile application requirements with a low-fidelity prototype

Likewise, labor obligations dismissal by disobeying labor rules or misconduct or even unjustified dismissal laws are included. Dismissal by agreement is defined as: “the authorization granted by a Labor Inspector for such dismissed labor relationship which happens when one of the parties whether the grounds for dismissal are set out in Articles 172 y 173 under the Labor Code” Bustamante, [5] Unjustified dismissal is the legal way by which a labor relationship is finished and it’s provided by a judgement given through an administrative labor authority.

Another form of labor dismissal is unjustified layoff defined as: “The unilateral will of the employer which breaks an employment relationship, generally characterized by an unexpected or violent action.” [6]

It would sound relevant to point out that the employer who dismisses and employee in an unjustified way will be forced to compensate him in accordance with length of service and to a predetermined scale provided by the Labor Code. Compensation by dismissal –firing—may have a more positive outcome by mutual agreement between the parties, but not by a Labor Court.

Rights in Ecuador are progressive according to the Constitutional Mandate Article 11 numeral 8 “the content of citizens’ rights will be developed in a progressive way through the law, regulations and public” Constitution of Ecuador [7]

II. METHODOLOGY

The Feasible Project was used, since the design of a mobile resource is proposed, which was supported by documentary research (second-hand data), as data collection instrument content sheets and data analysis technique were used The Content Analysis was used.

The analysis core was composed by reports made by the National Statistics and Census Agency—INEC [8]—and by the National Employment, Unemployment and Underemployment Survey— ENEMDU [9].

Such procedures aggregate to the method for development of mobile applications which must comply with a mobile device particular capabilities such as: memory restrictions, processing and storage, the platform’s implementation in addition to deployment and maintenance processes.

Within framework and software creation methodologies multiple options, the so called “agile methods” stand out. Pressman [10]. In this context, the following framework are considered: SCRUM, Model CMMI *Capability Maturity Model* [11]. From these framework, the following phases for the mobile application design were determined: Requirement analysis phase, Conceptualization phase and Validation and Prototype phase.

Building phases and testing, Application’s Corrective and Preventative maintenance practices for the implementation phase are not part of the scope in this Project.

III. RESULTS

In order to watch Labor Market’s performance in Ecuador, the following figures provided by the National Statistics and Census Agency [8].

Source: INEC [8]

As it can be observed, by 2017, employed population reaches 7, 7 million figure considerable superior to unemployment rate.

TABLE 1. ECUADOR’S ESTIMATE LABOR MARKET 2017

EMPLOYMENT RATE	UNEMPLOYMENT RATE	SUITABLE EMPLOYMENT	NON CLASSIFIED EMPLOYMENT	UNSUITABLE EMPLOYMENT
7,7 MILLION	373.000 MILION	3,5 MILLION	13 MILLION	PART TIME EMPLOYMENT, OTHER 45,6% UNDEREMPLOYED 37.4% UNPAID WORK 17,0%

On the other hand, there are 3, 5 millions of people that enjoy of suitable employment which means that they have a 40hour full-time employment gaining minimum wage.

Unclassified employment is reported at a rate of 13.000 people at a national level (located in the Andean range and in the Coast). It is evident that unclassified employment represents a low participation in relation to the total of employment in the country.

Unsuitable employment is subdivided in: Part-time employment (45, 6%), underemployment (37,4%) and unpaid labor (17%). Under the unsuitable employment category belongs to the employment that does not reach 40 working weekly paying basic wage of \$375 or less. Figures for each of the subcategories that comprise unsuitable employment have gradually increased.

Figures show a complex general scope of the Ecuadorian Labor Market which needs to certainly improve labor relationships between employers and those who apply for paid labor. Similarly, economically active sectors that are often at disadvantage like the young, women and the informal sector deserve special attention.

The following results were taken from an ENENDU survey in 2019. This survey has covered the entire country of Ecuador, including rural and urban areas equally, as well as five self-represented cities of: Quito, Guayaquil, Cuenca, *Source*: ENEMDU [9].

Previous data dates to March 2019 which are an important reference to specify at a national level, economic activity indexes and source of income pertaining to the Ecuadorian population.

As to the global participation rate, is about the “resulting percentage from the ratio between the economically active population (PEA) and the working-age population (PET)” ENEMDU [9]. Totals reached a national level of 66, 5 % and it means that there is a 66,5% of young people that are over the age of 15 apt to start being economically productive.

As far as the unemployment rate denominated as “the resulting percentage from the ratio between the unemployed and (D) the economically active population (PEA)” ENEMDU [9] -another important point is that the active population reached 4, 6%, compared to figures from 2018. Then it is safe to say that these percentages did not experience significant statistical fluctuations.

Suitable employment rate belongs to the “resulting percentage from the ratio between total suitable employment or full-time (EA) and the economically active population (PEA)” ENEMDU [9]. Data shows that this indicator has reached 37, 9%. By comparing this figure to the one from the previous year, a significant decrease turns out to be evident and indicates a negative performance.

Underemployment is defined as “the resulting percentage from the ration between the total number of underemployed individuals (SUB_E) and the economically active population (PEA)” ENEMDU [9], as demonstrated by the figures, underemployment reached 18, 7. Additionally it did not show significant statistical fluctuations compared to previous data.

As far as Part-time employment rate, “the resulting percentage from the ratio between the total part-time employment and the economically active population” (PEA) ENEMDU [9], positioning itself at 11, 0%, representing an significant increase statistically speaking.

Finally, non-paid labor is defined as “the resulting percentage from the ratio between the number of non-paid Jobs and the economically active population (ENR) and “PEA” ENEMDU [9]. This category has reached 11, 0% at national levels. Furthermore, this indicator did experience fluctuations statistically powerful in relation to 2018 and these changes represent evidence of an increase in non-paid labor.

By taking a closer global look, these figures may highlight that the working population in Ecuador it not at is prime, although global employment has proved a relative stability as well as the unemployment rate. It is clear that suitable employment has decreased from 2014, while underemployment has risen from 2012, Olmedo [12]. Although urban areas seem to have the most employability capacity, they may create underemployment conditions. On the other hand, the rural population for the most part generates non-paid labor compared to urban populations.

It is imperative for those responsible for unemployment to pay close attention to this trend and also pay attention to additional employment categories since the purpose of the labor market should not only be to “reach a natural unemployment rate” Olmedo [12] but also to achieve more favorable working conditions for the general population by taking care of underemployment and other types of employment that aren’t necessarily satisfactory. Undoubtedly, the need for the implementation of market sustainable policies is essential for the strengthening of their structural bases.

The previous discussing helps to comprehend the transcendence that the intervening variables in labor markets and its own incidence in populations quality of life. Having labor stability is vital. As a result, technology has become an absolutely crucial information tool for the active population in aspects like legal instruments that can guarantee employees’ rights and obligations, job offers, market tendencies, statistical data and the most valuable professions among other services.

IV. PROPOSAL MOBILE APP DESIGN

a. Data gathering and requirements definition:

By exploring employability figures in Ecuador, certain characteristics related to the need for understanding rules and regulations governing labor aspects where found. Additionally, the urgency to access effectively enterprises with good economic prospects, better job offers and the most valuable profession among others. Having easy access to centralized permanent available data would be extremely useful to the general population.

Findings:

Employed population that also demands better employment choices. Active population should have access to legal information regarding their labor rights and proper procedures given situations that attempt to disturb job stability, or compensation once the employer has stable employment. In the same way, those in search of employment should be familiarized with pertaining legal aspects as well as elements surrounding job offers, enterprises such as:

- Regulations: Labor Code Republic of Ecuador Constitution

Practical Purposes. In this case, the active population demands information regarding labor markets, offers and employment agencies that enable individuals to find work, apart from finding institutions that promote skills training and professionalism.

Intermediary companies between job seekers and the economically active population, particularly Web portals and pages.

Enterprises and Institutions that bid on the development of skills training.

A basic control for statistical aims suggests obtaining data from users for an application required such as:

- Email address, age, gender, professional experience, education, expected salary and the like.
- b. Functional and non-functional requirements for the mobile app:
- c. Based on data gathering and the proposal made, the mobile application must meet following functional and non-functional requirements.

Functional requirements (RF):

TABLE 3.
MAIN HIGH-LEVEL FUNCTIONAL REQUIREMENTS

ID.	NAME	REQUIREMENTDESCRIPTION
RF1	USER RECORD	The application will record data user: personal email address and password.
RF2	SURVEY FILL-IN	As a user logs in for the first time, the app will ask the user to fill in a survey
RF3	OPTIONMENU DISPLAY	The application will provide a hamburger-type menu. It will show the different information categories in a list so that it is easy to access.
RF4	INFORMATION DISPLAY	Through the option menu, the application will allow selecting available options, opting to download them in the local memory such as documents, requirement list, audios and videos and general information.
RF5	GLOSSARY	The application must have a glossary easily accessed by menu or search.
RF6	SEARCH BOX	In the app displaythe user may have access to a text box for the search of resources and information.
RF7	FREE NAVIGATION	Every section will be linked for free navigation provided the user wants to.

ID.	NAME	REQUIREMENTDESCRIPTION
RF8	ACCESS TO SOCIAL NETWORKS	The app will allow access to official accounts among those involved in every type of process pertaining to the labor market.
RF9	WEB RESOURCES	The app will have links to complementary resources in the Web, official web pages including those in the economic sector.
RF10	TERMS OF USE	The app will provide the user privacy politics, terms and conditions including an option to accept them or not. The use of this app requires user acceptance.

SOURCE: THE AUTHORS

Non-functional requirements (RnF):

TABLE 4.
NON-FUNCTIONAL MAIN REQUIREMENTS

ID.	NAME	DESCRIPTION
RNF1	NAME	THE APP WILL BE NAMED "JOB- ECUADOR"
RNF 2	HARDWARE	HARDWARE REQUIREMENTS SHOULD BE EASILY ACCESSED EITHER FROM A COMMON MOBILE DEVICE OR FROM A SMART MOBILE WITH A COMMON OPERATIVE SYSTEM.
RNF 3	CONNECTION	THE APP MAY BE ACCESSED FROM ANY WHERE WITH WIFI CONNECTION.
RNF 4	AVAILABILITY	THE APP WILL BE AVAILABLE 24-7
RNF 5	PLATFORM	THE APP SHOULD WORK WITH ANDROID OPERATING SYSTEM DEVICES
RNF6	LICENSING	ALL RESOURCES SHOULD COMPLY WITH COPYLEFT LICENSING (FREE DISTRIBUTION) GUARANTEEING THE NO VIOLATION OF COPYRIGHTS.
RNF 7	USERHELP	THE APP WILL HAVE BASIC HELP INTEGRATED FOR ALL FUNCTIONALITIES AND A CONTACT FOR PRODUCT OR SERVICE ENHANCEMENT REQUEST.
RNF 8	CONTROL CHANGE	ELEMENTS INFORMATION CONTROL ARE BASED ON SETTINGS MANAGEMENT, PARTICULARLY WHEN IT COMES TO FILE NAMES, VERSION AND FEATURES, GIVEN THAT RESOURCES MAY BE PERIODICALLY UPDATED..
RNF 9	QUALITY	APPLICATION MAXIMUM RESPONSE TIMEWILL BE AT ONE SECOND IN 95% OF THE OPERATIONS.
RNF10	FAILURE CAPTURE	THE APP WILL BE ABLE TO CAPTURE AS MANY POSSIBLE FAILURES AND TREAT THEM ACCORDINGLY.
RNF11	LANGUAGES	THE APP WILL SUPPORT ENGLISH AND SPANISH LANGUAGES.
RNF12	DATA PROTECTION	FOR DATA STORAGE PURPOSES, THE CORRESPONDING REGULATION MUST BE TAKEN INTO ACCOUNT, IN ADDITION TO "PERSONAL DATA PROTECTION" AS WELL AS TELECOMMUNICATION SECTOR REGULATIONS.
RNF13	SECURITY	DATA EXCHANGE BETWEEN APP AND SERVER DATA BASE WON'T USE AN ENCRYPTION METHOD.

SOURCE: THE AUTHORS

d. Actors definition:

The application *Job-Ecuador* interacts with two types of actors:

- Active population. Referring to working age population (employed or in search of employment).

- Administrator: Responsible(s) individual for the app which main responsibility is to update information and improve operational malfunctions.

The three general processes user type “Active Population” may do with the *Job-Ecuador* app are the following:

- Mobile App Installation
- Application Navigation (optional menu system)
- Uninstalling the mobile app

e. Information Categories definition:

According to data gathered, *Job-Ecuador* app will display the following information categories:

Information regarding legal resources and procedures, entities that provide the employee information and labor resources, surveys, companies offering Jobs and labor resources, general information regarding the application, assistance and contact data as well as social networks official accounts.

f. Use of mobile app cases

Given that the interaction between user and app is shaped for the most part regarding consulting of information, using basic navigation supported by usability criteria and accessibility to every screen, no use-case were designed.

g. Low-fidelity prototy pedesign

For prototype design at low fidelity levels, the BalsamiqMockupstool (version 3.5.17 / <https://balsamiq.com/>) was used. This app enables designing interface models fast and efficiently, allowing the user to navigate through the prototype, experiment and validate functional requirements, [13].

h. Resource Format Specification

Built-in application resources keep the following conventions needed for their names and format type. Such definition corresponds to a non-functional requirement. A through specification is part of the building process for the *Job-Ecuador* app, which has not approached in this study.

Name format for resources: **ir_mnemonic_vr<nn>.ext**, where:

- go: identifier for the type of resource possibly having the following values:
 - vi: video (Accepted format: mp4)
 - au: audio (Accepted format: mp3)
 - dc: document (Accepted format: pdf, xls, pps, jpg)
- mnemonic: Used to describe resource content
- vr: constant followed by resource version
- nn: resource number version (01, 02, 03, no period)
- ext: file extension (pdf, mp3, xls, pps, jpg, swf, mp4)

i. Social Networks selection and official accounts:

Job-Ecuador enables official accounts social networks particularly in the economically active population interest and to the general public. Having such accounts, users have access to the most updated information by each agency, entity as the case may be.

5. CONCLUSION

The current labor market in Ecuador has similar difficulties to other countries in South America, according to the National Statistics and Census Institute INEC [8] and [9] In Ecuador global employment keeps certain stability, as a result suitable employment has decreased and unemployment has increased. Generally, urban areas show the most employability capacity, although there is a great deal of underemployment. This numbers discourage major efforts made to combat unemployment related issues. There is an immediate call for attending to the young population labor needs, as well as to reconcile strengthening policies for the structure of the domestic system of production.

Methodology used for the mobile app design was SCRUM and CMMI model which offered support for the three phases: Requirement analysis, conceptualization and prototype requirement analyses resulting in a complete and thorough application design. Job Ecuador has informative resource content regarding general aspects known as labor markets and legal content—the Constitution and Labor Code—and regulation for employment accessibility in Ecuador.

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