Research Article

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Mobile Recruitment System for Nigerian Civil Service Commission via Cloud Computing

Fagbolu Olutola Olaide* and Atoloye Afeez Oluwatobi

Department of Computer Science, School of Computing and Information Technology, Kampala International University, Kampala, Uganda

***Corresponding author**
Fagbolu Olutola Olaide, Department of Computer Science, School of Computing and Information Technology, Kampala International University, Kampala, Uganda, E-mail:folutola@kiu.ac.ug

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Abstract

Traditional recruitment procedures are replaced in order to overcome most of its attendant challenges such as time-consuming and tiresome nature of recruiting a larger number of applicants into Civil Service from different parts of Nigeria considering multifaceted nature of the nation. This research work obliterate favouritism, nepotism and other corrupt means that were the usual practice in shortlisting prospective candidate for job, electronic recruitment system are enhanced with the availability of mobile platform that improve accessibility with emerging computing paradigm over the internet.

Finite State Transducer (FST) in Machine Learning is used to learn from the pool of candidates for employment, GIATI(Grammar Inference and Alignment for Transducers Inference) are efficiently applied that is prospective candidates are offered job on a deductive rule-based Machine Learning. It is implemented with Android Studio and WAMP server. Its performance was tested using Ogun State as a pilot in the Federation and User Satisfaction were evaluated.

Keywords: Recruitment, E-recruitment, Mobile Recruitment, Finite State Transducer, GIATI

Introduction

E-recruitment is done on web and other media, it is a practice in which technology are deployed to attract, find, evaluate and hire people. Suitable candidate are searched for, assess, interview and hire personnel based on the vacancies but the accessibility of mobile phones, PDA, tablets and other portable gadgets will encourage, invigorate and support the Mobile Recruitment (m-Recruitment). Mobile gadgets are commonly used and readily available for easier use than other electronic gadgets because of its portability and availability, the growing use of mobile technologies couple with the evolution of technologies has opened up novel opportunities, contributed to the way of life of people and how endeavors are better tackled which invariably bring about the need to develop m-recruitment system for Nigerian Civil Service. Considering the mobile deployment in business and banking (m-business and m-banking) and its ease of use coupled with the wider acceptability then this concept can be used in government agencies and parastatals to recruit qualified candidates to various vacancies [1]. The remarkable use of mobile technologies has brought great changes, not only to individuals but also to several companies including their service, hence mobile technologies is stretching into shortlisting and recruiting prospective jobs seeker into Nigerian public sector on cloud. M-Recruitment on cloud will avail diverse resources to both applicant and the government which include software, hardware, data storage and power consumption and so on. In this system, computing needs are accessed, stored and occur over the internet. Hardware resources such as processing power, memory are replicable so as to efficiently utilize these hardware resources that is, memory and processing power can be multiplied and moved from server to server at any time. The storage of data is done online (cloud storage) which means as data are stored, it will be accessed from different distributed terminals. Power consumption could be saved by moving and processing recruitment process in Nigerian Civil Service into the cloud and consequently saved electricity. Although there are many ways by which the Nigerian Civil Service recruit talents for their organization which can be internal (it is vacancies for staff that were on previous appointment with a particular government agency but desire upward movement which can be promotion, transfer, employment exchanges, employee recommendation and others) and external vacancies (it is done for fresh applicant that were not on previous employment of government parastatals) [2]. Recruitment is an essential part of any organization as it includes the way of drawing or harnessing critical assets for example, human capacity and skills into an organization and Government as well as individuals are aware that lack of employee may impede their growth and compromise their success[3]. In 2014, 3.6 billion people had a mobile subscription, accounting for 50 percent of the world population. In that same year, 2.6 billion people had a smartphone, a penetration rate just under 40 percent [4].

The Nigerian Civil Service has been undergoing gradual restructuring and systematic reforms since May 29, 1999 after decades of military era [5]. Government have made effort to transient from archaic and traditional ways of handling their activities to better, sophisticated and electronic approach but recruitment processes is still adjudged to be grossly unfair, ethical, costly and time-consuming hence need for m-Recruitment will proffer solutions to problems such as filling of forms, time consuming manual screening and reviewing of resumes which is often fuelled by sectionalism, nepotism and favouritism. These issues has become very critical and spread from the Federal Civil Service to the State Civil Service Commissions[6]. Recruitment process in Nigeria has become nightmare as indicated by 2014 report of Nigeria Immigration Service where 15 unemployed youth died in a stampede, 200 injured including pregnant women. The country experienced a terrible situation in which 6.5 million people applied for 4000 vacancy positions [7]. Although government has introduced e-recruitment as the recruitment strategy in some ministries, departments and agencies but still with some flaws while the m-recruitment is proposed and developed to cater for these inadequacies.

Why do we need to go mobile?

The total number of mobile subscribers has increased rapidly over the past decade; at the end of 2005 there were 19,519,154 subscribers, but by the end of 2015 there were 151,017,244 subscribers which is equivalent to an increase of 13,149,809 subscribers every year. However, this increased population of subscribers will help recruiters (Government or Individual) in employing best fit and most suitable candidates in terms of quality and quantity through mobile technologies.

Statistical Framework for m-Recruitment System

Finite State Transducers have proved to be useful in Machine Learning, Stochastic Finite State Transducer (SFST) is used to automatically learn from the database or pool of prospective candidates for employment by using efficient algorithms called GIATI (Grammar Inference Alignments for Transducer Inference). The candidates are offered job on a rule-based Machine Learning which is deductive and involve knowledge domain of the employer. GIATI models the shortlisting once the basic requirement such as WAEC (West African Examination Council) or Bachelor Degree/ Higher National Diploma is met.

GIATI Algorithm provides a probabilistic finite state transducer that performs the following:

1. Given a list of prospective applicant, find the status of the applicant by assigning an output sequence to their basic requirement.
2. Deduce probabilistic finite state automation from the database by promoting the use of k-testable in the strict sense (k-TSS) model instead of n-gram models, since k-TSS model keep the rules of shortlisting any qualified applicant
3. Split the status of the applicant such as Offered employment, Denied employment or Indifferent

Once we have the transducer and prospective applicant submit their application as input $r \epsilon \Sigma^+$, the recruitment process implies searching the applicant details which will include Academic, Personal and Medical to determine the status of their job requirement s where d (r, s) represents a path in SFST which is compatible with the applicant requirement, status and joint probability is

$$s = \arg\max_{s} (P(r, s) \approx \arg\max_{s} \max_{d(r,s)} P(d(r, s))$$

This research work handles an efficient e-recruitment framework to deal with all phase of the e- recruitment process such as multi-job posting, organization channel administration and candidate filtering to distinguish the most qualified candidates. The system is developed using macromedia dream weaver (a professional HTML editor for designing, coding, and developing websites, web pages, and web applications), SWISHmax (for creating graphics and animations), Structured Query Language (SQL) database creation for the website, creation of different tables and the storage of data sent from the website.

Existing system

The existing system for recruitment in Ogun State Civil Service has been traditional mode of recruitment since the creation of the state in 1976. Traditional civil service recruitment is centralized but rely on formal examinations and leaves government officials with low discretion and little or no flexibility. Increasingly, this method of recruitment is however with its own attendant flaws which are challenged by faster and more flexible private sector practices to avail prospective job seekers with more effective, high discretion and greater flexibility. The traditional process of recruitment includes submission of job request and its approval, recognition of recruitment needs, application or resumption of screening, job posting, pre-employment screening, interviewing and employment contract and job offers[8].

Implementation

Recruitment system via cloud computing was developed with Android Studio Development Platform, for execution and debugging Android Emulator with SDK and Nexus 5_API_21 on Android 4.4 and a 4-inch screen HDPI was used. The mobile recruitment system was designed to be user friendly, easy to navigate and all what the prospective user needs to apply for job is to download the application from the publisher store. This is achieved by offering data privacy, index privacy, keyword privacy and many others, the cloud enable search service which is of utmost paramountcy to mobile recruitment system and eliminate local storage management, storing data into the cloud does not serve a purpose unless they can be searched and utilized easily, conveniently and efficiently. By considering the larger population of Nigeria, search service will eliminate unnecessary network traffic by sending back only most relevant data that are desirable in the pay-as-you-use cloud paradigm. The various modules were integrated together in different interfaces, the modules were packaged and install on the testing machine, each module having some specific requirements but certain minimum specifications were met.

Mobile Recruitment System for Nigerian Civil Service Commission was configured and implemented. The configuration of the application was done in the Android Studio using Java Programming Language, PHP (Hypertext processor) was used to connect Android Studio Platform of Mobile Recruitment Application to a database and validate the table designed in the WAMP. MySQL connector was used to link Android Studio and WAMP server at the backend.

Figure 1: Mobile app for prospective job seekers

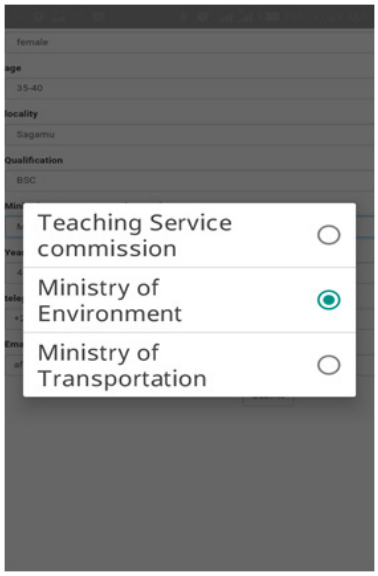

Figure 2: Mobile app with a typical drop-down menu

Result and Discussion

By experimenting with the system, it afforded us to determine whether the system is capable of accepting applicant data for job processing. Conclusive validation was done to test, evaluate and measure the usability of the developed mobile application.The first stage of the evaluation was the self-evaluation and technical testing which was carried out without the help of external users, and this part included validating and dry running the java code, xml code, testing the system with different kinds of inputs, debugging, and other design issues. After that, the system was tested using android virtual device (emulator). At this stage the system was said to be valid.

At the second stage of evaluation, a survey was conducted using questionnaire with prospective applicants; Twenty-eight (28) was used to pick sample size from population of Thirty (30) in sample size determinant table in Abeokuta, Ogun State of Nigeria.Table 1, shows the responses for the multiple choice questions, along with each question, the percentage of user satisfaction of the system is 60% positive feedback for that question according to our success criteria[9-17].

Table 1: Results from questionnaire that show evaluation of the user satisfaction of the developed application.

Responses	Number of Applicant	Count	Percentage
Very Satisfied	28	5	17.9
Satisfied	28	17	60.7
Not Satisfied	28	6	21.4

It is shown from Table 1 that user satisfaction for prospective job seekers randomly selected is 78.6% while only 21.4% were not satisfied with the mobile app.

Table 2: Results from questionnaire that show evaluation of the user interaction of the developed application.

Responses	Number of Applicant	Count	Percentage
Excellent	28	16	57.1
Good	28	6	21.4
Bad	28	6	21.4

Table 2 shows that interactivity of the mobile application is satisfactorily okay with 78.5% and 21.4% is the percentage of dissatisfaction with the developed mobile application and from this result, it was deduced that the developed mobile recruitment system attain satisfactory level when compare with the existing system in terms of satisfaction and interaction.

Conclusion

This research work introduced a new mobile application for recruitment that can facilitate many recruitment in 24 hours in a week without any limitations and make larger storage capacity available in cloud hence irrespective of the population of any nation, this recruitment system can be employed. Shortcomings of other online job portals were enhanced after thorough analysis of their limitations.

At the end, the use of a mobile recruitment application will greatly enhance Civil Service Commission responsibilities by improving flexibility, enhancing transparency, promoting equity among different applicants and upsurge accessibility, portability and availability to applicants and Nigerian government. Cloud services will ensure that mechanism for accountability, tracking and transparency are obtainable while valuable information can therefore be centralized, stored and redistributed so as to avoid data redundancy and unnecessary duplication and the recruitment processing time will consequently be reduced [18-20].

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