



A Web-Based Screening Model for Youth Empowerment and Career Development

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Abstract— Career development is the lifelong process of managing, learning, work, leisure and transition in order to move towards a personally determined and evolving preferred future for the youth. The increasing level of unemployment in developing countries is becoming a source of worry for government and societies at large. The inability of most graduates to secure a suitable job in their area study is a problem many have faced in recent time. In this project, we proposed an enhanced web based model for youth empowerment and career development which is an automated model that will automatically select qualified and certified candidates into the appropriate field of study. The Object Oriented and Design Methodology was used to analyse our findings because of its usability nature and to organize the interaction of the objects within the new system. The MinHash recommendation algorithm was applied to classify candidates using content based filtering approach with candidate's work experience, the behaviour-based approach was used to test candidates profile details to determine suitability to job allocation of a suitable position in candidate career prospect. Our results showed efficiency in Time Complexity especially in areas that involve speed in access validation of unemployed youths and speed in processing application of an unemployed youth, with values for the evaluated parameters to be 10 and 5 seconds respectively as compared to the Existing System values of 22 and 25 seconds respectively, which further implies that our proposed system outperforms the existing system. In addition, the new system automatically matches and provide screening model to job applications from qualified candidates and the results show that the rate of successful job testing and assignment can be significantly be improved with the most qualified and suitable candidate being assigned the appropriate job which matches his/her course of study, thus streamlining the random selection and producing higher quality output thereby reducing unemployment in the labour market. This work will be beneficial to young graduates, to Government, and any other organization that deals with youth empowerment.

Keywords— Career Development, Empowerment, Field, Job, Model

I. INTRODUCTION

Youth empowerment is an attitudinal, structural, and cultural process whereby young people gain the ability, authority, and agency to make decisions and implement change in their own lives and the lives of other people, including youth and adults. The aim of empowerment programmes is to provide education, employment assistance, health, housing referrals, and support services for citizens who are in disadvantaged positions due to incarceration, poverty, homelessness, HIV/AIDS infection, and/or involvement in the criminal justice system. Secondly, empowerment is based on the idea that giving employees skills, resources, authority, opportunity, motivation, as well holding them responsible and accountable for outcomes of their actions, will contribute to their competence and satisfaction [1]

Over the years, there are fewer concerns over the effectiveness of empowerment programmes in Nigeria. This is due to corruption, neglect of the programmes by government, and also the inability to manage large and voluminous datasets associated with the programme. This study focused on enhancing empowerment programmes through providing solutions to big data management issues. The inability to manage big data remains a major problem that affects empowerment programmes in Nigeria. According to Almeida *et al* [2] “big data is a disruptive force that will affect organizations across industries, sectors and economies”; Through better analysis of the large volume of data that are becoming available, there is the potential for making faster advances in many scientific domains and improving the profitability of many enterprises. However, there are challenges and issues that will have to be addressed to capture the full potential of big data. The term “big data” has recently grown in prominence as a way of describing the phenomenon of growth in data volume, complexity and disparity. The definition of big data is not totally consensual in literature and there may be some confusion around what it really means. Big data is not just an environment in which accumulated data has reached very large proportions.

Many citizens around the world regard this collection of information with deep suspicion, seeing the data flood as nothing more than an intrusion of their privacy. But there is strong evidence that big data can play a significant economic role to the benefit not only of private commerce but also of national economies and their citizens. In fact, the data can create significant value for the world economy, enhancing the productivity and competitiveness of companies and the public sector and creating substantial economic surplus for consumers. Digital data is currently in every economic sector, organization and user of digital technology.

The ability to store, aggregate, and combine data and then use the results to perform deep analysis has become ever more accessible as trends such as Moore’s Law in computing, its equivalent in digital storage, and cloud computing continue to lower costs and other technology barriers. Furthermore, the ability to generate, communicate, share, and access data has been revolutionized by the increasing number of people, devices, and sensors that are now connected by digital networks. More than 4 billion of people in 2010 were using mobile phones, and about 12 percent of those people had smartphones, whose penetration is growing at more than 20 percent a year. Youth empowerment is a process where children and young people are encouraged to take charge of their lives Hoang *et al* [3]

II. RELATED WORK

Evanthia *et al* [4] developed an integrated e-recruitment system for cv ranking based on AHP. They studied an integrated company-oriented e-recruitment system that automates the candidate evaluation. The approach they used differs from conventional e-recruitment systems in that they don’t accept CVs in a document format, but rather mandate that applicant’s fill-in predefined web forms. Additionally, it models the candidates’ CVs in HR-XML representation and subsequently provides a ranking of the applicants, scoring their qualifications for the given position requirements. The scoring and ranking process is based on Analytic Hierarchy Process, or AHP. However, their system is limited to automate CVs only.

Terzis and Economides [5] proposed a Job Site Evaluation Framework (JSEF), an easy to use and comprehensive evaluation framework for job sites. They evaluated the job sites across four categories: (a) job market, (b) technical, (c) usability, and (d) social. Each category has different weights. Each category is divided into sub categories.

Singh *et al* [6] proposed PROSPECT, a system for screening candidates for recruitment. They mine resumes to extract salient aspects of candidate profiles like skills, experience in each skill, education details and past experience, and mined details are presented in the form of facets. They also rank the candidates for a given job.

III. MATERIALS AND METHOD

A. Methodology

The Methodology for the Proposed System Design is Use-Case Methodology. A use case is a methodology used in system analysis to identify, clarify and organize system requirements. The use case is made up of a set of possible sequences of interactions between systems and users in a particular environment and related to a particular goal. The method creates a document that describes all the steps taken by a user to complete an activity. Use cases are typically written by business analysts and can be employed during several stages of software development, such as planning system requirements, validating design, testing software and creating an outline for online help and user manuals. A use case document can help the development team identify and understand where errors may occur during a transaction so they can resolve them.

Use cases describe the functional requirements of a system from the end user's perspective, creating a goal-focused sequence of events that is easy for users and developers to follow. A complete use case will include one main or basic flow and various alternate flows. The alternate flow, also known as an extending use case, describes normal variations to the basic flow as well as unusual situations. A business use case is a more abstract description that's written in a technology-agnostic way, referring only to the business process being described and the actors that are involved in the activity. A business use case identifies the sequence of actions that need to be performed by the business to provide a meaningful, observable result to the end user. On the other hand, a system use case is written with more detail than a business use case, referring to the specific processes that must happen in various parts of the system to reach the final user goal.

B. Analysis of the Existing System

The existing system is an online method of job application that takes record of unemployed youths by allowing them to apply for a particular job and submitting their credentials. It requires checking of curriculum Vitae of the applicant's one after the other in order to get the applicants that fits the job. The existing system of youth empowerment and career development system can help unemployed youth to view and apply for available job online. This system can also view the latest job available and the details concerning the job. Also, the existing system contains the detailed list of unemployed youth in different categories and session. In this system users can view available job in the system and apply. The user can also view his or her portfolio and also edit it for future reference.

The purpose of analysis is to learn why the system operates as it does and to prepare suggestion on how the study goals may best be achieved. Most specifically, we the researchers are interested in analyzing and documenting our findings in order to:

- Identify the weaknesses in the present systems so that they will not occur in the new system.
- Prepare a proper report for user and executives' approval.
- Clean up contradictions or inaccuracies that have developed up to this point of investigation.

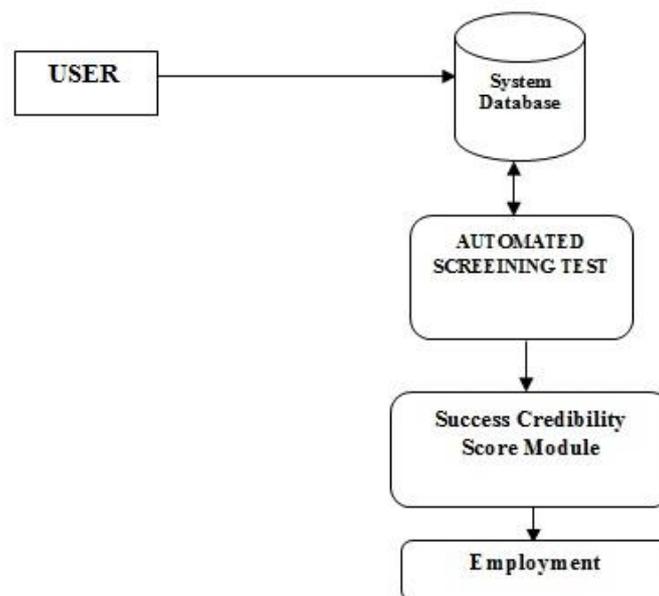


Fig. 1. Existing System Architecture
(Source: [7])

1) *Components of the Existing System*

Figure 1 analyzed the components of the existing system modules that made up the system.

- **User:** this module is for the applicants that will access the system for empowerment. It allows creating of account and allow login into the system.
- **System database:** the module uses a relational database that allows storage of applicants' profile, job categories, job requirements and also screening test questions and answers.
- **Automated Screening Test:** this module allows users to be examined after which their names will be enlisted for the employment based on their scores.
- **Success Credibility Module:** this module shows the result of each applicant's performance that will lead to employing the candidate.
- **Employment:** this module issues employment position to the successful candidates.

2) *Disadvantages of the Existing System*

The following disadvantages of the Existing System are:

- There is no automatic matching and screening of job opportunity.
- There is no identification method to ascertain original bearers of the job.
- Inability to interact with NYSC database, school database to identify the authenticity of the candidate's certificate.
- Inability to screen out who has been employed on the cause of the scheme.

C. *Analysis of the Proposed System*

The proposed system makes use of centralized database and automatic matching techniques to match users to his or her respective job opportunity categories. This proposed system is dynamically web based interactive interface design and it is accessible at any given time on web applications anywhere through the connection of internet access. It is an object-oriented analysis and design methodology that the researcher used in collecting and analyzing facts in respect to system operation of features on job opportunities and career development for effective input and output previews.

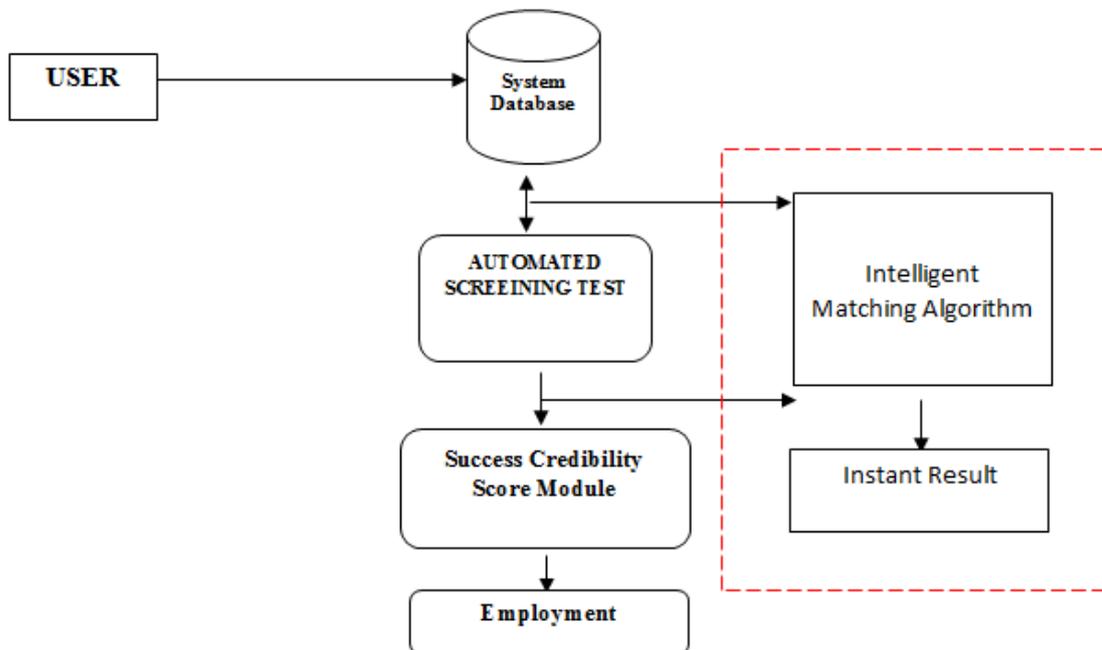


Fig. 2. Proposed System Architecture

1) Components of the Proposed System

Figure 2 analyzed the added components to the existing system that forms the new system.

- Intelligent Matching Algorithm: a matching algorithm was introduced into the existing system to eradicate any form of human interference.
- Instant Result: the system make selection based on the information received from the candidate and the candidates' scores in the screening test instantly and short list the highest performance.

2) Advantages of the Proposed System

The following advantages of the Proposed System are:

- Collecting data from candidates that enroll for empowerment and storing it in a relation database.
- Searching through the available data in the database to verify if the user already enjoying the scheme in order to obstruct double empowerment.
- Generating online quiz for the students.
- Scoring the quiz and bringing out those that passed.

D. Existing System Algorithm

```
STEP 1: START
STEP 2: ELSE{
STEP 3: M = (I + F)/2;
STEP 4: SX = CONTA_ZERI(V, I, M);
}
```

E. Proposed System Algorithm

```
STEP 1: SET M (M1, M2,...MI) = APPLICANTS(YOUTHS)
F (F1, F2,...,FI) = JOB REQUIREMENTS
C, CMF = 0
STEP 2: FOR EVERY M (M1.M2,...MI) INTERESTED IN F (F1.F2,..FI) APPLY
C, CMF = 0 WHERE NO APPLICATION IS MADE
C, CMF = 1 WHERE APPLICATION ONLY IS MADE
STEP 3: RECORD APPLICATION IN M X F MATRIX FOR ALL M'S (M1.M2,...,M1)
STEP 4: RECORD TOTAL APPLICATION DETAILS
STEP 5: MATCH ALL M'S WITH APPLICANTS PROFILE.
STEP 6: END MATCH.
```

IV. RESULTS AND DISCUSSION

A. Choice and Justification of Programming Language used

Hypertext Preprocessor (PHP) and MySQL were used in implementation as we shall briefly discuss them in order to shed more light on the discussed issue. PHP is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML.PHP code may be executed with a command line interface, embedded into HTML code, or it can be used in combination with various web template systems, web content management systems, and web frameworks. PHP code is usually processed by a PHP interpreter implemented as a module in a web server or as a Common Gateway Interface executable. The web server combines the results of the interpreted and executed PHP code, which may be any type of data, including images, with the generated web page. PHP can be used for many programming tasks outside of the web context, such as standalone graphical applications. MySQL is the world's most popular open source database. With its proven performance, reliability and ease-of-use, MySQL has become the leading database choice for web-based applications, used by high profile web properties including Facebook, Twitter, YouTube, Yahoo! and many more.

B. Discussion of Results

The new program contains several modules. The program modules are listed:

Figure 3 is the Homepage (index). This is the first page of the site. From the front page, the user can navigate to other modules of the web application. In the Administrator Module, it gives the system administrator access to manage user accounts, i.e. the administrator can create, and also modify or delete already existing account in the system. The administrator can also manage exams by adding new exams and modifying its details which includes exam questions and answers, exam lock or open status etc. The administrator will also be able to add job opportunities and their specifications. The administrator also integrate database from NYSC and Tertiary Institution for applicants' authenticity. In the User Module, it gives the users access to create account in the system. Users with already existing account can login into the system to make apply for available jobs. During the application, users' information will be checked for authenticity, he or she proceeds to screening test of which will be tested immediately after submission with his or her ref-no. User interface designs should be optimized so that the user can operate an application as quickly and easily as possible. The user interface is shown in figures as follows: Figure 3 identifies the Home Page of the system. It has links to other pages of the system. Figure 4 shows NYSC Input Specification. This module allows the candidate to fill in the details of his or her NYSC certificate for authentication. Figure 5 shows Tertiary Institution Input Specification. This module allows the candidate to fill in the details of his or her undergraduate certificate for authentication. Figure 6 identifies Exam Questions. Candidates are shortlisted based on the aptitude test performance. This module gives them access to take the screening test. Figure 7 shows the User account Input Specification. This module accepts user profile. Figure 8 shows User Application Details Input Specification. This form accepts user application details. Figure 9 shows user Job Opportunity Input Specification Figure 10 displays User's Profile Output Specification for decision purposes by the administrator. Figure 11 displays screening test Questions to the candidates. This module also allows updates in the administrator panel. Figure 12 shows the module for the candidates to take their exams based on the job category they registered for in the system. After taking the exam, the system shows results to the candidates as displayed in Figure 13. The performance evaluation is shown in form of chart as displayed in Figure 14.



Fig. 3. Home Page

Update NYSC

Corps Members Information

Select State ▼

State Code

Call-up No

Year Discharged (e.g 1900)

Corps Member Full Name

Add Member

Fig. 4. NYSC Input Specification

Update Universities

Student Information

Select University ▼

Select Department ▼

Student Registration No

Year Graduated (e.g 1900)

Student Full Name

Add Student

Fig. 5. Tertiary Institution Input Specification

Update Exam QUES001

QUES001

From what location are the 1st computer instructions available on boot up?

ROM BIOS

CPU

boot.ini

CONFIG.SYS

ROM BIOS

Fig. 6. Exam Questions Input Specification

Create Account and Login to Complete Application.

Apply only once. Be ready for Screening Test and have your documents with you for upload. Multiple Application result to disqualification.

Please fill in the form

Physical Science

LastName FirstName MiddleName

Email Phone No

Username Password Confirm Password

[I forgot my password](#)

Fig. 7. User Account Input Specification

The form is organized into three columns of input fields. The first column contains: 'ref-353395' (text), 'FullName' (text), 'Contact Address' (text), 'Select Gender' (dropdown), 'Select State of Origin' (dropdown), 'Select LGA' (dropdown), 'Select Qualification' (dropdown), 'yyyy-mm-dd' (text), 'Year Discharged' (text), 'Ready to Relocate' (checkbox), 'Choose File' (file upload), and another 'Choose File' (file upload). The second column contains: 'Email' (text), 'Home Address' (text), 'Select Marital Status' (dropdown), 'Select School Studied' (dropdown), 'Year Graduated' (text), 'Nysc Call-up No' (text), 'Disability' (checkbox), 'Choose File' (file upload), and another 'Choose File' (file upload). The third column contains: 'phone Number' (text), 'Select Nationality' (dropdown), 'Select Field of Study' (dropdown), 'Nysc State Code' (text), and 'Disability Details' (text). A blue 'Submit Application' button is located at the bottom right.

Fig. 8. User Application Details Input Specification

The form is titled 'Add Job Details' and features a section header 'Job Information' with a checkbox. Below this header are several input fields: 'Job Name' (text), 'Select Field of Study' (dropdown), 'Age Bracket' (text), 'Select Qualification' (dropdown), 'Year Graduated (e.g 1900)' (text), and 'Job Location' (text). An 'Add Job' button with a checkbox is positioned at the bottom right of the form.

Fig. 9. Job Opportunity Input Specification

The screenshot displays a 'User Profile' page. On the left, there is a profile card for 'Okeke Makua' with a profile picture, email 'makua@makua.com', gender 'Male', address '52 Awka Road Awka', and member since date '27/03/2017'. Below the card are buttons for 'Choose File' (No file chosen) and 'Update profile picture'. On the right, a 'User Information' section contains input fields for 'New Password' and 'Confirm New Password', and an 'Update Information' button.

Fig. 10. User Profile Output Specification

The screenshot shows an 'Examination Update' page with a table of 'Examination Questions'. The table has two columns: '#', 'Question', and 'Answer'. There are 10 rows of questions. Below the table is a pagination bar with buttons for pages 1 through 10.

#	Question	Answer
QUES001	From what location are the 1st computer instructions available on boot up?	
QUES002	What could cause a fixed disk error	
QUES003	Missing slot covers on a computer can cause?	
QUES004	When installing PCI NICS you can check the IRQ availability by looking at	
QUES005	With respect to a network interface card, the term 10/100 refers to	
QUES006	Which Motherboard form factor uses one 20 pin connector	
QUES007	A hard disk is divided into tracks which are further subdivided into	
QUES008	A wrist grounding strap contains which of the following	
QUES009	Which standard govern parallel communications?	
QUES010	In laser printer technology, what happens during the conditioning stage?	

Fig. 11. Job Question Output Specification

N-POWER NIGERIA
 npower@npower.com
 Block C 12 Awolowo Rd Abuja
 08010011100
Youth empowerment is our Priority



If you configure the TCP/IP address and other TCP/IP parameters manually, you can always verify the configuration through which of the following? Select the best answer.

- Network Properties dialog box
- Server Services dialog box
- DHCPINFO command-line utility
- Advanced Properties tab of TCP/ IP info

Sample-and-hold circuits in ADCs are designed to:

- sample and hold the output of the binary counter during the conversion process
- stabilize the ADCs threshold voltage during the conversion process
- stabilize the input analog signal during the conversion process
- sample and hold the ADC staircase waveform during the conversion process

What beep codes could indicate a system board or power supply failure?

- steady short beep
- no beep
- one long continuous beep tone
- All of the above

Fig. 12. Screening Exam Output Specification

Examination Results			
#	Question	Your answer	Correct answer
1	If you configure the TCP/IP address and other TCP/IP parameters manually, you can always verify the configuration through which of the following? Select the best answer.	Server Services dialog box	Network Properties dialog box
2	Sample-and-hold circuits in ADCs are designed to:	stabilize the ADCs threshold voltage during the conversion process	stabilize the input analog signal during the conversion process
3	What beep codes could indicate a system board or power supply failure?	steady short beep	All of the above
4	While working with MS-DOS, which command is used to restore files that were backed up using the BACKUP command?	DISKCOPY	RESTORE
5	While running DOS on a PC, which command would be used to duplicate the entire diskette?	CHKDSK	DISKCOPY
6	The probability that a single bit will be in error on a typical public telephone line using 3000 bps modem is 10 to the power -3. If no error detection mechanism is used, the residual error rate for a communication line using 9-bit frames is approximately equal to	0.009	0.009
7	Pick the correct choice for the 80386SX CPU	32 bit word size, 16 bit data path	32 bit word size, 16 bit data path
8	Four bits are used for packet sequence numbering in a sliding window protocol used in a computer network. What is the maximum window size?	16	15
9	A wrist grounding strap contains which of the following	Resistor	Resistor
10	A section of code to which control is transferred when a processor is interrupted is known as	MDR	M
11	In a computer with an elide adapter, where should you connect an ATA CD-ROM drive?	on the primary IDE	on the secondary IDE
12	Which values are held in CMOS for the hard drive	Free space	size (heads, cylinders, sectors)
13	The tracks on a disk which can be accessed without repositioning the R/W heads is	Cylinder	Cylinder
14	What voltage does a Pentium system use?	+ 5 volts	+3.3 volts
15	Which part interprets program instructions and initiate control operations.	Input	Control unit
16	Which of the following communications service provides message preparation and transmission facilities?	Teletext	Telex
17	When installing PCI NICs you can check the IRQ availability by looking at	CONFIG SYS	motherboard BIOS
18	Resistance is measured in ?	Ohms	Ohms
19	What is the default subnet mask for a class C network?	255.255.255.0	255.255.255.0
20	An anti static strap uses a small _____ to make sure you do not become the least path of resistance to the ground?	transistor	resistor

You have failed the exam with a score of 30%, Instructor must re-activate for you to repeat the exam
 Your record have been saved in database

Fig. 13. Screen Exam Result Output Specification

TABLE I
PERFORMANCE EVALUATION OF THE EXISTING AND PROPOSED SYSTEMS

SN	EXISTING SYSTEM	Time in Seconds	Time in Seconds	PROPOSED SYSTEM
1.	Speed in Access Validation of Unemployed Youths	22	10	Speed in Access Validation of Unemployed Youths
2.	Speed in Processing the Application of an Unemployed Youth	25	5	Speed in Processing the Application of an Unemployed Youth

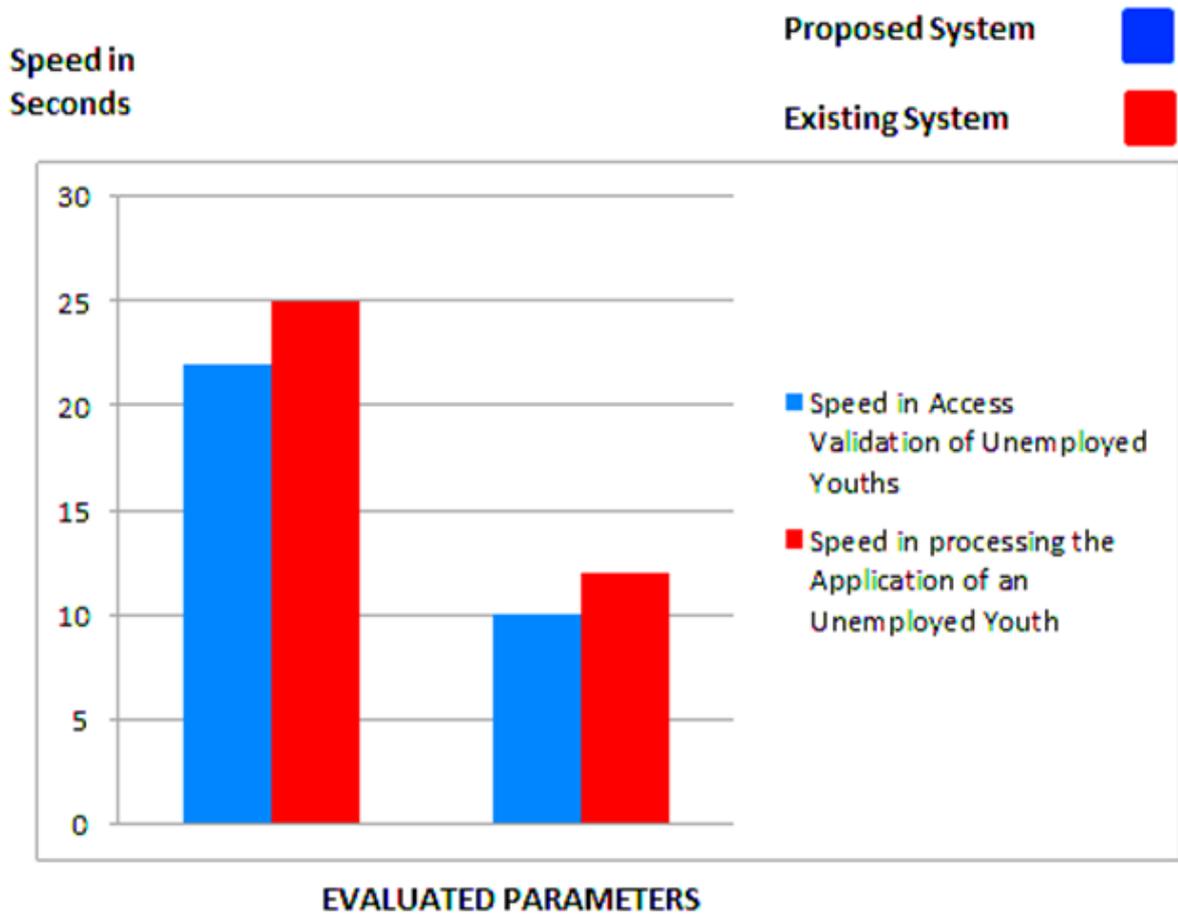


Fig. 14. Performance Evaluation Chart

V. CONCLUSION

In this study, we have developed a Web-based Screening Model for Youth Empowerment and Career Development. It is a system that will help unemployed graduates to view and check for the newest available job opportunity. This study tries to review the impact of applying a screening and matching technology that will automatically check to select the most qualified candidate available for a particular job opportunity. The study discussed the algorithm, technology and application of Web-based model for graduate employment and career development system. Finally, based on the finding of the research, the implementation of the design of Web-based model for youth employment and career development system will be a great relief for the country, unemployed graduate, graduate and under-graduate in general. Seriously with the study and implementation of this system, a major factor in youth alienation and violence will stop.

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