

Deployment of Multicriteria Decision System for National Youth Service Corps (NYSC)

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ABSTRACT

National Youth Service Corps deployment programme is the process of deploying corps members to their places of primary assignment. This paper focused on the use of multicriteria decision system for deployment exercise of corps members to their places of primary assignment instead of manual method. The model was developed using corps members' disciplines, genders and tribes among others and requests from organisations. The Multicriteria decision system was implemented using Windows, Apache, MySQL and Hypertext Preprocessor (PHP) Apache as the web server, PHP as script language, MySQL as the relational database system with windows as operating system and it made use of a single client called the web browser. It is expected that the Multicriteria decision system will increase the efficiency, accuracy and timely posting of the Corps members and that the National youth service corps official should implement the use of the system for their deployment exercise.

Keywords – assignment, deployment, method, multicriteria, primary.

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1. Introduction

The National Youth Service Corps (NYSC) programme is a programme that involves Nigerian graduates in the development and integration of their country. The programme is meant for graduates from universities, polytechnics, and other degree awarding schools. Marenin, [1] states that one of the expectations of the programme is that corps members should be posted to cities and states far from their homes and states of origin. They are expected to mix with people of other tribes, social and family backgrounds, to learn the culture of the indigenes in the place they are posted to. It is a way to engender unity in Nigeria, to help youths appreciate other ethnic groupings in the country.

The problems associated with manual system of corps members' deployment give rise to the need for development of computerised model that can be used to carry out the deployment process with a view to: reducing the time it takes to process the deployment of corps members to their places of primary assignment; have fair and impartial deployment, placement and to minimize the incidence of rejection of corps members by organisations. The traditional recruiting process is typically a step-by-step sequential process whereby the subsequent phase starts the required tasks only after the previous phase completes its tasks [2]. Labour-intensive hiring tools like face-to-face interviews, paper and pencil tests, and job

previews are widely used in traditional recruiting. The traditional process has been fraught with task delays and miscommunications, which result in the long hiring process and high hiring cost.

The traditional recruiting process consists of the following iterative phases: identification of hiring needs; submission of job requisition and approval; job posting, submission of job applications; screening of résumé/application; interviewing; pre-employment screening; and job offer and employment contract. Both hiring managers and recruiters rely on hard-copy documents and conventional delivery mechanisms to complete the recruiting process.

Computers had been used in the traditional recruiting process even before the introduction of e-recruiting. However, computer applications were limited to the automation of internal processes rather than the rationalisation of the process. Software packages could not communicate with each other, and the quantity and quality of the job applications remained the same. Even with automation, most recruiting processes were still batch processes. The advent of e-recruiting moved the computer application of the recruiting process to a higher level. The e-recruiting system is a Web-enabled, "anytime-anyplace," ubiquitous system for both job seekers and recruiters [3].

The e-recruiting process consists of the following iterative steps: identification of hiring needs; submission of job requisition; approval of the job requisition via a job database; job posting on the Internet; online search of the

job database by job seekers, online pre-screening/online self-assessment; submission of applications by applicants directly into an applicant database; online search of the applicant database for candidate selection; online evaluation of résumé/application; interviewing by recruiters/hiring managers; online pre-employment screening; and job offer and employment contract.

While traditional recruiting is characterised as a sequential batch process, e-recruiting is characterized as a continuous and online process in which some of the recruiting activities may be performed concurrently. The benefits of e-recruiting are accomplished with the extensive use of a centralised job database and an array of Web-enabled integrated applications.

The submission of the retrieved job requisition to division managers is electronically processed. Once the job requisition is approved, the job requisition data are used for the job posting at the career Web site. The job requisition data are also used to search résumés based on specific criteria/keywords. The qualified candidates are further narrowed down with an additional screening process that utilizes various online and off-line interview and test tools, and then the company conducts an online pre-employment background check and makes a job offer to the best candidate. Major advantages cited for the successful adoption of e-recruiting methods include cost savings, efficiency, and convenience for both recruiters and job seekers [4], [5], [6]. In this paper, an attempt is made to develop and implement a multicriteria decision system that will deploy corps members to their place of primary assignments using NYSC corps members deployed to Kaduna State as a case study..

2. Related Works

The deployment process is different from the selection process. Selection is the method used to identify the best qualified applicant for the job in terms of an individual's knowledge, skills and abilities as matched against job requirement. The two concepts of recruitment and selection are closely related and it is difficult to differentiate when undertaking research as one process is dependent on, and influences the other [7]. Recruitment refers to the process of attracting, screening, and selecting a qualified person for a job [8]. E-recruitment, also known as online recruitment, Internet recruitment or cyber-recruitment refers to the practice of advertising job vacancies online, and the formal sourcing of information about jobs online [9]. E-recruiting can be defined as practices and activities carried on by the organisation that utilizes a variety of electronic means to fill open positions effectively and efficiently.

The rise in the amount of literature on e-recruitment was initially attributed to the sudden increase in the use of online recruitment by IT companies and universities [9] although as the technology field is constantly changing and progressing, much of what has been discussed in literature is now out of date [10]. According to Pallavi, [11], e-recruiting, also known as web-based recruiting, is the term that describes a method of recruiting employees, using web based resources, such as a company Internet site or its

corporate intranet. The author further emphasized that e-recruiting is used by more and more companies, who want to locate, screen, test and recruit candidates.

A research conducted by Verhoeven and Williams [12] reported on a study into internet recruitment and selection in the United Kingdom. The study discussed the advantages and disadvantages as identified in literature and considers those against the views of employers in UK. It draws its data from a survey through postal questionnaire followed by an administered questionnaire from 83 organizations. The authors found that quarter of UK employers agreed that internet recruitment can be effective, delivering suitable candidates. A survey conducted by Williams [13] on E-recruitment showed that dwindling recruitment spend was being focused on web-based recruitment at the expense of traditional methods. Veger[14] reviewed Internet recruitment methods and described how they can enhance recruitment performance. The author emphasized that the benefits of Internet recruiting may differ between organizations due to a variation in corporate strategy and overall recruitment objectives.

3. Materials and Methods

For the implementation of this multicriteria decision system, computer system that is fast and robust with the following configuration as the minimum configuration: Pentium IV processor, 128MB RAM, 40GB Hard Disk, CD-Writer, Internet and multimedia, Super Virtual Graphic Array(SVGA) Monitor, Uninterruptible Power Supply(UPS) and Stabilizer that serve as apache server is required. A simple local area network with a server and client machines is also required. Client side may use a system with lower configuration than this. However, a single computer system may also serve as server and a client. The basic software requirements for the system are Apache, My Structural Query Language (MySQL) and Hypertext Preprocessor(PHP), which are open source software running on window operating system (Windows XP), Internet Explorer version 6.0, Macromedia Dreamweaver8 for editing HTML(Hypertext Markup Language) pages.

This computer system is to house the MYSQL relational database codes for the NYSC database management system. Other low computer systems are needed at the client sides with a browser (Internet Explorer) that will enable users to make use of the NYSC database management system. Two categories of users can use the system being developed. One set of users can have full access to the system (the administration) while the other set of users (Corps members and organisations) can have partial access to the system.

The approach for the development of the system is based on WAMP (Windows as an operating system, Apache, MySQL and PHP). This is preferred because of its security and low cost of maintenance compare to other solutions and also PHP is faster with proper coding. Other solutions such as Microsoft's Internet information server (IIS) are popular, but they lack security and attract potential higher cost of hardware and maintenance, which keep them out of reach of many small organisations. Speed

is also another major factor to be considered. The system designed needs to respond quickly and remain snappy for the user's experience. With proper coding techniques, PHP is faster than Microsoft's Active Server Pages (ASP).

Applications developed with MySQL and PHP made use of a single client called the web browser. For any application to run on the web, there must be a web server which is an application that enables communication with browser, a relational database server, which stores all the information required by the web server, a programming language needed to broker request between the web server and database server and to perform programmatic tasks on the information that comes to and from the web server, and off course, an operating system that will interface between the server and programming language.

4. Discussion

Multicriteria decision system for deploying corps members to their places of primary assignments based on corps' course of study (discipline) with grade from the institutions of higher education such as University, Polytechnics, and other degree awarding institutions and other criteria such as gender, tribe/ language in accordance with the requests from the various organisations.

$$deploy[posting] \leftarrow \begin{cases} F(s_{ik} [c \cup grade \cup tribe \cup lang \cup gender] = [master[c_j] \cup r_{jk}] \cup [grade \cup tribe \cup lang \cup gender]) \\ F(s_{ik} [c \cap grade \cup tribe \cup lang \cup gender] = [master[c_j] \cup r_{jk}] \cap [grade \cup tribe \cup lang \cup gender]) \\ F(s_{ik} [c \cap grade \cap tribe \cup lang \cup gender] = [master[c_j] \cup r_{jk}] \cap [grade \cap tribe \cup lang \cup gender]) \\ F(s_{ik} [c \cap grade \cup tribe \cup lang \cap gender] = [master[c_j] \cup r_{jk}] \cap [grade \cup tribe \cup lang \cap gender]) \\ F(s_{ik} [c \cup grade \cap tribe \cup lang \cap gender] = [master[c_j] \cup r_{jk}] \cap [grade \cap tribe \cup lang \cap gender]) \end{cases} \quad (2)$$

posted[master, callupno, posted]←1

where F is a function that evaluates the request s_{ik} 's against the master corps members' database for a match. For each of the remaining non-special request from the various organisation ns_n , $n = 1,2,3,\dots$ (a request per organisation at a time)

deploying[posting] ← G(ns_n[c_j], master[c_j], callupno)
 $\leftarrow ns_n[c_j] = master[c_j] \cup r_{jk}$ (3)

posted[master, callupno, posted]←1

where G is the function that evaluates the non-special request ns_n against the master corps members database for a match.

For each of the corps members yet to be posted

Deploying[posting]←H(organisation,master[callupno]) (4)

posted[master, callupno, posted]←1

4.1 Multicriteria Decision Model

Let C_j represent course studied by corps member where $j=1, 2, 3, \dots, n$. Let r_{jk} represents related courses studied by corps member $j=1,2,3, \dots, n$ and $k=1,2,3, \dots, m$. Let basic degree represents the qualifications obtained from universities or polytechnics and other degree awarded

institutions (B.Sc, B.Tech, B.Ed, B.Engr, HND, LLB, DVM, MBBS, B. Pharm, B.Agric. among others). Let $grade_m$ represents the class of basic degree from universities or polytechnics and other degree awarding institutions (1,2¹, 2²,3, pass, distinction, upper credit, lower credit, pass), Let t_n represents the major tribes in Nigeria where $n=1,2,3$ major tribes/language are Hausa Ibo, Yoruba. Furthermore, let s_{ik} represent special requests (according to specific corps member, course/discipline, grade, tribe or gender) made by different organisations where $i, k = 1, 2, 3, \dots, n$ and ns_n represents the non-special request. Let P_n represent non-posted corps members.

For each of the organisations with particular corps member(s), $s_{ik}, i, k = 1, 2, 3, \dots$

deploy[posting] ← $s_{ik}[\text{callupno}] = \text{master}[\text{callupno}]$, (1)

posted[master, callupno, posted]←1

For each of the requests s_{ik} made by organizations with particular discipline, grade, tribe or gender specified: (a request per organisation at a time)

$H(s_{ik} [c \cup grade \cup tribe \cup lang \cup gender] = [master[c_j] \cup r_{jk}] \cup [grade \cup tribe \cup lang \cup gender])$

$H(s_{ik} [c \cap grade \cup tribe \cup lang \cup gender] = [master[c_j] \cup r_{jk}] \cap [grade \cup tribe \cup lang \cup gender])$

$H(s_{ik} [c \cap grade \cap tribe \cup lang \cup gender] = [master[c_j] \cup r_{jk}] \cap [grade \cap tribe \cup lang \cup gender])$

$H(s_{ik} [c \cup grade \cap tribe \cup lang \cap gender] = [master[c_j] \cup r_{jk}] \cap [grade \cap tribe \cup lang \cap gender])$

$H(s_{ik} [c \cap grade \cap tribe \cup lang \cap gender] = [master[c_j] \cup r_{jk}] \cap [grade \cap tribe \cup lang \cap gender])$

where H is a function that evaluates the organisation request against the master corps members' database for a match.

corps_member_table[corps_callupno, name, institution, discipline, grade, gender, tribe];

discipline_table[discipline_code, description];

related_table[discipline_code, related1, related2, related3];

organisation[org_code, organisation_name, address, phoneno, activities];

request[org_code, requestno, corpsmember_callupno, corpsmember_name, sex, discipline, tribe, grade,];

The internal working of the system is shown in Fig. 1. From evaluator 1, organisations request database which contains the collection of organisations corps members' requests. The request form specifies the number of corps members needed, their discipline, tribe and gender among others. Special request for a particular corps member is

collected from the request database and sent to the evaluator 1, and processed using equation (1). Special request stipulated corps members' course, grade, tribe or gender are processed as shown in equation (2) using evaluator 2. The organisation non-special requests are

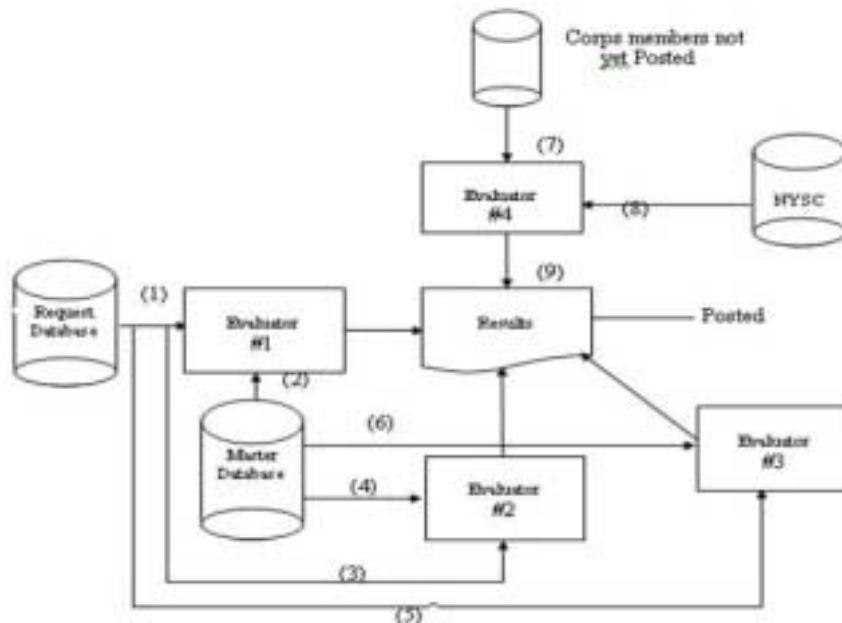


Fig. 1: Internal Working of the System

This modeled relation is represented in form of an entity relational diagram displayed in Fig. 2.



Fig. 2: Entity Relational Diagram

The implementation of the new system supports a user interface based on the interactive web browser known as Internet explorer and access is gain by supplying the username and password both of which aid the control of

access to the website. The selection of each main menu leads to the sub-menus, which calls on inference procedure associated with that menu. The inference procedure is interactive and it guides intelligently to supply appropriate

information. Finally, the administrator will post the corps members registered to different organisations. The Fig.3 gives the list of successfully posted corps and organisation posted to serve for the service year. This page is viewed by

the mobilisation officer only. It lists the corps that registers, also it shows whether the corps member is posted or not.

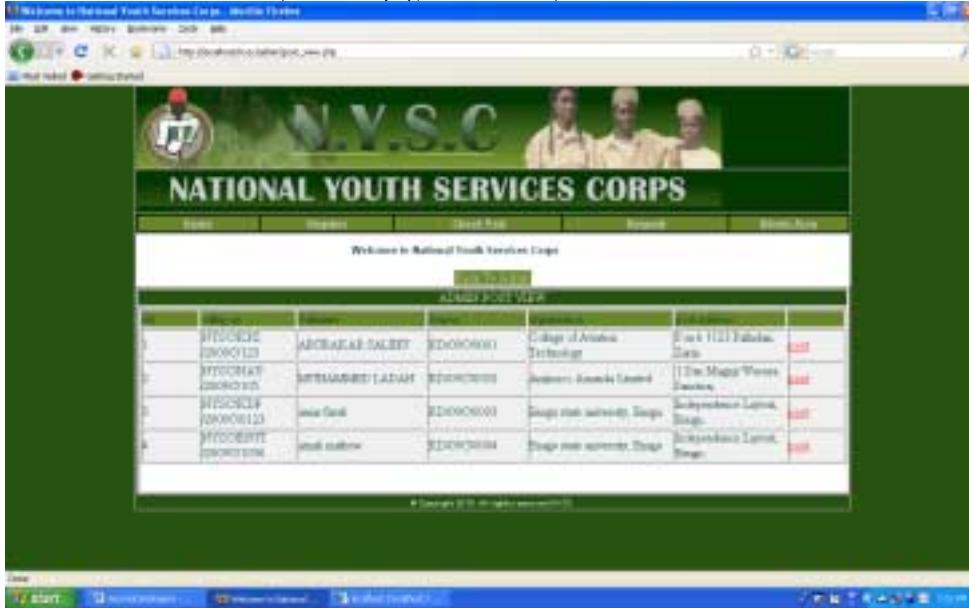


Fig. 3: Corps Members Posted Page

After the newly designed system has been implemented and tested, the sample result generated is displayed in Table 1.

Table 1: Sample Result of Deployed Corps Members

S/N	CALLUPNO	FULL NAME	REG. NO	ORGANISATION	POST ADDRESS	STATUS
1	NYSC/KPZ/2009 C/123	ABUBAKAR SALIHU	KD/09C/0001	FEDERAL COLLEGE OF EDUCATION, ZARIA	FCE, KONGO	POSTED
2	NYSC/NAU/2009 C/105	MUHAMMED LADAN	KD/09C/0002	COLLEGE OF AVIATION, ZARIA	COLLEGE OF AVIATION, PALLADAN, ZARIA	POSTED
3	NYSC/BUK/2009 B/115	ANI NNENNA	KD/09B/0003	ABU, ZARIA	ABU, SAMARU, ZARIA	POSTED
4	NYSC/UNILAG/2 009C/258	ADEYIMI OLOGBORU	KD/09C/0004	COLLEGE OF AVIATION, ZARIA	COLLEGE OF AVIATION, PALLADAN ZARIA	POSTED
5	NYSC/NAU/2009 C/1123	NGOZI OKEKE	KD/09C/0005	YOUNGSTER ACADEMY	OPPOSITE UNITY BANK, PZ, ZARIA	POSTED
6	NYSC/BUK/2009 C/1025	ABDULLAHI YAKUBU	KD/09C/0006	COLLEGE OF ARABIC & ISLAMIC STUDIES	TUDUN WADA, ZARIA	POSTED
7	NYSC/BUK/2009 C/1050	EMEKA OKAFOR	KD/09C/0007	GSS TAFIDA	G.S.S TAFIDA SOBA LGA	POSTED
8	NYSC/LASU/200 9C/2050	LILIAN OKOLI	KD/09C/0008	G.S.S MAKARFI	G. S S MARKARFI	POSTED

5. Conclusion

Advancement in technology has affected every areas of work especially in the areas of information and

communication. Considering the advantages of this technological advancement in solving problems associated with deploying of corps members is the major concern. The new system has replaced the traditional manual system by providing automated data retrieval in order to assist in

effective and timely posting. The administrator uses the information obtained from the applicant and organisation to design the system package.

6. Recommendation

Considering the advantages provided by this study, it is recommended that the NYSC officials should implement this system for their deployment exercise. The camp officials should be trained on how to use the new system by conducting workshops and seminars for them when implemented. The necessary facilities should also be provided for proper implementation of new system. Lastly, there should be technical and maintenance officer to ensure lasting of the new system. Further research could be carried out to accommodate other activities of the NYSC programme. Other aspect of the activities that could be addressed is the assessment of corps member redeployed to the state and assessment of corps data from NYSC head office at Abuja. A system can also be developed, such that relocated corps members are taken into consideration. This will help in knowing the total number of corps in the state.

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Dr. A.A. Obiniyi received his Ph.D degree in Computer Science from Ahmadu Bello University (ABU), Zaria in Kaduna State of Nigeria in 2009. He is a member of Nigeria Computer Society, Internet Society and a Chartered member of Computer Professionals (Registration Council of Nigeria). He lectures in the Department of Mathematics of ABU and has many publications to his credit.



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