Design and Implementation of an Automated Personnel Recruitment System

Kuyoro Shade O., Okolie Samuel O., and Abel Samuel B.
Department of Computer Science
Babcock University
Nigeria

Abstract— The traditional method of recruitment has been revolutionized by the emergence of the Internet. In the past few years, the Internet has dramatically changed the face of human resource recruitment and the ways organizations think about the recruiting function. Automated Personnel Recruitment System is one part of a whole system in the Human Resources Management that is basically in charge of recruiting personnel via the Internet. This work focuses on the design and implementation of an Online Technique for recruitment, using VTL Solutions as case study.

Keywords— online recruitment, human resources management, personnel administration, recruitment method

I. INTRODUCTION

Human Resource Management (HRM) is a term that has been in use for over two decades now. It was previously referred to as personnel administration. Personnel administration, which emerged as a clearly defined field in 1920s in the US, was largely concerned with the technical aspects of hiring, evaluating, training, and compensating employees in organizations. The field did not focus on the relationship of disparate employment practices, overall organizational performance or the systematic relationships among such practices, thus it lacked unifying paradigm.[1]

HRM came into existence in response to the substantial increase in competitive pressure that American business organizations experienced in late 1970s as a result of globalization, deregulation, and rapid technological change. These gave rise to an enhanced concern on the part of firms to engage in strategic planning--a process of anticipating future changes in the environment conditions and aligning the various components of the organization in such a way as to promote organizational effectiveness. Human resource management consists of all the activities undertaken by an enterprise to ensure the effective utilization of employees toward the attainment of individual, group, and organizational goals.[2] HRM function focuses on people management, especially on the growth and employee development. It also emphasizes developing individual potential and skills.[3,4] It involves practices that help organization deal effectively with its people during the various phases of the employment cycle [5] including pre-hire, staffing, and post-hire. The pre-hire phase involves planning practices. The organization must decide what types of job openings will exist in the upcoming period and determine the necessary qualifications for performing these jobs. During the hire phase, the organization selects its employees. Selection practices include recruiting applicants, assessing their qualifications, and ultimately selecting those who are deemed to be the most qualified.

In the post-hire phase, the organization develops HRM practices for effectively managing people once they have been employed. These practices are designed to maximize the performance and satisfaction levels of employees by providing them with the necessary knowledge and skills to perform their jobs and by creating conditions that will energize, direct, and facilitate employees' efforts toward meeting the organization's objectives. During the post-hire phase, the organization manages employee attendances, timesheets, benefits, discipline payroll, leave, performance and grievances.

Various components of HRM include but not limited to the following: Administration and organization structuring, recruitment and selection, personnel information management, employee self-service, timesheet management, leave management, performance management, payroll, benefits, report generation etc. This work focuses on staffing; thus more emphasis is placed on the recruitment and selection.

Recruitment and selection forms a core part of the central activities underlying human resource management: namely, the acquisition, development and reward of workers. It forms an important part of the work of human resource managers – or designated specialists within work organisations. It has an important role to play in ensuring worker performance and positive organisational outcomes. It is often claimed that selection of workers occurs not just to replace departing employees or add to a workforce but rather to put in place workers who can perform at a high level and demonstrate commitment. [6] The aim of every company is to employ the most suitable personnel in order to move the organization to the next level or to beat-up the ever increasing competition in the business world.

The problem is how to get the appropriate person for a particular post or job considering the large number of people that will apply for a particular job offer. How the most efficient or the most competent job seeker be reached to take-up the available job without spending more than expected. What means of advertisement will be deployed that is fast enough to reach out to those concerned. What criteria will be used for
to use OARS. Applicant uses Web browser that supports Web services; and out of OARS environment, its secured environment— in encryption, this prevents applicant personnel information from being read by others on the Internet while it is being transmitted between applicant web browser and OARS; and the notification—applicant can choose to receive email notifications of vacancies, OARS will notify applicant with an email message when that kind of job is open for application.

The weaknesses of OARS is that it is based in and mainly used in the United States of America.

B. Sarawak Information System (SAINS)

The Sarawak Information System e-recruitment is an online job application and processing system for employers to advertise their job openings and for candidates to submit their applications via the Internet.[8]

The strengths of SAINS include its simplicity—it is not complex and is designed for small businesses; its cost effectiveness in deployment and maintenance; its global usage—it is designed to be used anywhere; its systematic tracking—applicants can register and track their application status online; and its consistent and transparent screening—there is a set qualifying criteria with which the computer uses to perform the first level screening.

SAINS is not designed for integration into a HRMS or an ERP, thus there may be need for its replacement if the organization expands significantly.

C. Oracle Human Resource Management

Oracle Human Resource Management is an internet-based application that serves as a hub for all people-related activities including communication, development, measurement, compensation. Either in the private or public sector, oracle HR allows applicant to adopt structured approaches to attract, retain, develop and use critical skills and knowledge needed to optimize the human assets and workforce for business. Oracle Human Resources is part of the Oracle Human Resources family of application, and integrates seamlessly with Oracle E-Business suite and other Human Resources Application including advanced benefits, learning management, payroll, and compensation workbench.[9]

The strength of Oracle Human Resource Management include its leverage workflow and internet-based processes to speed and optimize recruitment, hiring, benefitting, compensation, termination, performance, skill, collective agreements and more; its ability to perform rules-based HR budget control; maintenance of global HR data in a single instance for better availability and accuracy of information, with a global single repository of employee data; managing total compensation, that is, attract and retain with the right combination of salary and benefits; deploying absence and termination policies, set limits and warnings, conduct competency profiling and management and managing recruitment, hiring and development on a global basis.

Oracle Human Resource Management software is very expensive to deploy and maintain; it is not designed for small businesses; and it contains a lot of interdependent modules which can reduce simplicity therefore leading to...

II. OVERVIEW OF THE EXISTING AND THE PROPOSED SYSTEM

THE EXISTING SYSTEMS

There are various literatures on online recruitment, some of which are mentioned here;

A. Online Automated Recruitment System (OARS)

The U.S. Geological Survey’s (USGS) Online Automated Recruitment System (OARS) is a computerized employment application processing system, which electronically prescreens candidates and ranks them according to specified criteria. OARS enable a person to search for available jobs in the USGS; create, edit, and archive applicant electronic resume; and apply for specific jobs online. [7]

The strengths of OARS include its ease of use in creating, editing, storing applicants’ resume and the ease of logging in and out of OARS environment; its secured environment—in order to use OARS applicant uses Web browser that supports...
underutilization which may affect efficient performance of the software in the long run.

III. THE PROPOSED SYSTEM

Based on the analysis of the existing system the proposed system require information such as job seeker registration form -When a job seeker wants to register, the system provides him/her a form to collect basic information such as names, username and password; Curriculum Vitae -when applying for a job, the application will require the applicant to upload a digital copy of his CV; the applicant profile -a unique applicant homepage where the administrators can communicate with the individual applicants about their interview eligibility, date etc. Thus, the features of the proposed system are job vacancy advertisement, secure applicant records, applicant profile, easy navigation and user friendly interface.

The advantages of this proposed system over the existing ones are:
1. Minimal personal data from the applicant, thus will not give out important personal data if attacked.
2. It minimizes the chance of biased selection.

IV. SYSTEM DESIGN

The design model used for the purpose of this work is the waterfall model. This is due to the fact that waterfall model prescribes a systematic approach to software development which starts with a well-defined, specification of requirements and move through a deployment in linear form. The waterfall lifecycle works by following a strict path through the development process not moving on to the next stage until the previous stage has been completed. Since the requirements do not change in the course of the work, this methodology suits the work. If the requirements are dynamic, a more agile methodology would have been chosen. The specification of requirements include form to collect relevant job seeker data, data warehouse where employee-related file and transactions are stored, appropriate viewer for job seekers to track available jobs and their applications, appropriate viewer for administrators to see applicant data, feedback from user to administrators and vice versa.

The design approach of this particular Automated Personnel Recruitment System (APRS) is a complete data-driven solution that resolves round the management of employee files/profile beginning from the recruitment stage.

In designing, various materials, features, constraints were considered and targets made. A proper feasibility study helps to support this design. The stages of the design are: collection various job advert placements on newspapers and billboards (or other media); taking note of the various job requirements in various areas specified; paying attention to deadlines and methods of replying to the job advert placement; collection of various format of job, application forms, interview rating forms and procedures and other forms necessary for successful design of the APRS; presentation of a map showing the procedures of the designs; implementation of the procedure of designs; identifying various programming tools and languages such as PHP, MySQL, Apache, HTML etc; designing of database tables; attributing the constraints to the database table fields; designing of front-end interface of the solution; scripting and linking the front-end to the back-end; testing solution; and finishing and compiling for distribution. Figure 1 shows the architecture for the system and figure 2 shows the flowchart.

V. IMPLEMENTATION

This Automated Personnel Recruitment System (APRS) has been designed to be user friendly and easy to navigate. If the viewer needs to communicate with the website, all he has to do is to click on any of the links and he can communicate with the site. The various modules are integrated together through as single web interface. The modules has been packaged and installed on the testing server, each module has some specific requirements but generally certain minimum specifications that are met. The modules has been packaged and installed on the testing server.

A. APRS MODULES

This section describes some major modules that were implemented in the application. Figure 1 to 10 in the appendix depicts the modules.

The Homepage: This page welcomes the user to the company’s site. It provides links to relevant information and interaction on the site. These links include home, register, login and view
vacancies. User will not be able to apply for any vacant post if he is not registered with the site.

Register: This module provides the applicants the opportunity to get a free account with the company’s website in order to have better access to job application information.

Login: This part of the application enables a registered user to access his/her page. In other word, the module is used to carry out access control and authentication against misuse and unauthorized access to the system.

Job description: This module describes the criteria that applicants must have to be eligible for a particular post.

Inbox: In order to notify applicants about the status of their application, each registered user maintains an inbox that presents messages received from the administrator. This message is sent to the user if and only if his/her application has been approved.

View Vacancies: This module allows the user to view available vacancies and apply. It displays a table showing a vacant position, its department, position and a link to view the description of the vacancy. Here, the user cannot apply to more than one department and the user cannot apply for the same position twice. Only registered users have access to this module while unregistered user can only view available vacancies.

Apply Page: Here, the applicant uploads a copy of his/her curriculum vitae. This module provides an input field that enables the user to upload the CV from a personal computer into the system in word document format. Also, the user is expected to have his/her application ID on his/her CV. This is very crucial as it shall be used to forward a message to the user in order to be able to notify him/her of the company’s acceptance.

Admin Login Page: This page authenticates the administrator before allowing him/her into the system. If wrong details are provided, the page rejects the user i.e. throws an error message. This module provides two input fields. The first one is reserved for the user’s username while the second input field is reserved for the password of the user. The passwords are encrypted for further security.

Upload Vacancies: This module enables the admin to declare a position as either opened or closed. This page displays a table showing vacancies and their respective departments followed by their descriptions. The table also provides links with which one can alter the status of the positions. If the administrator clicks close, the vacancy is closed and vice versa. Only the opened positions will be available to applicants. The closed positions are not displayed to the applicant. Whenever recruitment is over, the administrator can easily close a position until next time when such vacancy need arises.

Notify Users: This module is a message service used by the admin to send notifications to the applicants about their application status. This message is sent to only those who met the necessary requirements of the company. The interface provides three (3) input fields; the first for the applicants ID, the second is reserved for the subject of the message and the last is reserved for intended message that is to be sent by Admin. Also, as many id as possible can be added, but they must be separated with commas.

Users applied: This page displays the total number of applicant that has applied for a particular job at a given point in time. This page displays the department, post, CV, date, time, and applicant id, of applicant.

Short listed: This module shows the name, CV, post, department, interview date, AP id of applicant that has been short listed and invited for interview.

VI. CONCLUSION AND RECOMMENDATION FOR FURTHER WORK

The use of an effective online recruitment facility such as the one presented in this work provide efficient and accurate method of collecting and organizing relevant information and documents such as CV’s, resume’s, etc. about interested job seekers or applicants. The use of an online job recruitment facilities system will greatly enhance the organization(s) effectiveness, accuracy, speed, efficiency and convenience of its applicant and administrator. This software has attempted to solve the problem of traditional recruitment system and to a large extent it is successful. Regardless of the fact that the basic objectives of the work have been met, there is still room for further improvement better and easier recruitment. The solutions proffer by this application can be extended to other forms of human resource management. It is therefore recommended that further research be carried out on this work to improve it functionality and increase its features.
Figure 2 Flowchart of Automated Personnel Recruitment System (APRS)
REFERENCES