

Data-Driven Appointment and Recruitment System

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ABSTRACT

Web-based recruitment (e-recruitment) system is used to facilitate and improve human resource management. It addresses the needs of employers and job-seekers via internet which increase the speed of employment, and improves the quality of recruitment services. Such system becomes vital assistance to human discrimination to put right people in right places. Similarly, online appointment system provides a reliable appointment schedules for appointees. It tremendously helps to reduce long waiting time and reduce queues in offices. Due to the rapid changes in jobs' demands and the required specialization and experience, it becomes more and more difficult for recruiters to find employees that are right for their business. The data-driven appointment and recruitment system (DARS) was developed in such a way that, the appointment module handles the appointment program, such that, booking of appointment by appointees is determined by matching the appointee option with the staff's stored appointment data. Also, the recruitment module takes care of the recruitment process in which a matching is design between the employer's demands and jobseeker's qualifications to make the right recommendation. This research work made use of data collected from the case study (Adekunle Ajasin University, Akungba-Akoko, Ondo State, Nigeria), as well as materials and journals from various authors/sites. The application was developed using a scripting language, PHP, and MySQL database as backend to effectively achieve the aims of this project.

Keywords: data-driven, appointment, recruitment system, scheduling, Internet

1.0 Introduction

In general definition, appointment or in other words, scheduling tasks and problems are defined as a matter of assigning limited available resources and time points regarding to a given task systematically and well planned. Basically, scheduling an appointment do exists thousands years ago, and now it is

increasingly getting more attention in many real world domain especially in reservation environment. For example, appointments exist to meet for job interview, the doctors, lecturers, managers, and equipment. Appointment is needed when dealing with limited available resources when the demands get high. Systematic appointments scheduling will

results in benefitting such customer's welfare, save time, and reduce operation cost.

The internet has been extremely popular as a basic infrastructure for providing world-wide distributed service to end customers. The internet's economics are sustainable, improve, and will become the benchmark by which users will measure other communication alternatives (McInerney, 1997). WWW (World Wide Web) has become the richest resource pool of services and information (Chang, 2005). The web services paradigm provides organizations with an environment to enhance communications. It is becoming increasingly important for integrating systems and services.

Organizations have been moving to develop the efficiencies offered by information technology. Most organizations today have some form of management information system and computerized business records. But many organizations still lack a central applicant online record system that includes comprehensive, up to minute appointment information on admitted applicants. Instead, applicant data is scattered across multiple records and is accessible only within each institution or practice.

An appointment system is considered as a tool to control applicants flow in order to optimize organization's operation. Since applicant throughput can be greatly affected by altering schedule and admission rules, a web based model appointment scheduling module will help to minimize waiting times. Complaints about long waiting times on the phone or in the applicant organizations have caused a need for the use of online notification system. Many organization and institution increase their investment in web-technology and online system. The scope of web-based application has grown enormously and has moved to become a platform that can support all facets of organizational work (Isakowitz et al., 1998).

A good, well thought-out, Data-Driven system is "normalized" and "modular". It consists of separate sub-systems that allow the designer to break down the basic elements of an application into logical sub-systems that can then be easily hooked together via menus, controls, push-buttons, validation systems etc.

Recruitment is important for organizations since it performs the essential function of drawing an important resource into the organization. It has a strategic aim as it focuses on the need to attract high-quality people in order to gain a competitive advantage (Parry & Tyson, 2008; Malinowski et al, 2005). A new improvement in this domain is the use of the internet to attract potential employees to an organization, and is referred to as e-recruitment.

The buzzword and the latest trends in recruitment is the "E-Recruitment". Also known as "Online Recruitment", it is the use of technology or the web based tools to assist the recruitment process. Many big and small organizations are using the internet as a source of recruitment. It is a kind of system in which job seekers can register themselves online and apply for job and attend for exam/interview. It plays a role in simplifying the recruitment process. Such websites have facilities where prospective candidates can supply their data and upload their CV's and apply for jobs suited for them.

In other words, online recruitment is the process of matching people to appropriate jobs, using the Internet. The most common form of online recruitment is the advertisement of job openings on job sites and corporate sites. This may generate a lot of responses, but simply attracting large numbers of potential candidates is only part of the online recruitment process. Recruiting people with the right abilities reinforces the organizational goals (Boxall & Purcell, 2003). Online recruiting and recruitment system, with its emphasis on a

more strategic decision making process is fast gaining ground as a popular outsourced function. According to Dafoulas (2002), the internet has emerged as a practical and reliable tool for recruiting.

Database of information is vital in today's organization/business transaction with respect to scheduling appointment for job interview and result processing. This has become a very vital issue as applicants spend so much time trying to know the time scheduled by a particular organization for their interview. This problem has lead to time wasting, inaccuracy of results and even open to fraud. Cases of missing credentials of applicants have been recorded thereby making appointment more difficult and untimely.

Conventional recruitment has always been a time consuming and paper intensive process. They also stress out monitory resources. Accessibility problems appear when the queue is crowded with applicants and that will force them to wait for a long time until the organization can select qualified applicant that will be subjected to further screening by the management and later to be selected for a job. More so, applicants spend long time and effort before knowing whether they are qualified for a particular job or not.

This research work is therefore moved to :

1. provide a reliable solution to appointment scheduling that is corruption free.
2. ensure that normal number of applicants for a particular task in line with the organization is maintained.
3. design a conceptual model for the appointment and recruitment system.
4. provide an easy to use interface for applicants, personnel specialist, and managers, recruiters to update job requirement information/data from time to time.

2.0 Related Literature

The Internet has revolutionized the computer and communications world like nothing before. The intervention of the telegraph, telephone, radio, and computer set the stage for this unprecedented integration of capabilities (Baran P., 1964). The internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regards for geographic location (Barry M., et al 1997).

The internet today is a widespread information infrastructure, the initial prototype of what is often called the National (Global or Galactic) Information Infrastructure. Its history is complex and involves many aspects technological, organizational, and community. And its influence reaches not only to the technical fields of computer communications but throughout society as we move toward increasing use of online tools to accomplish electronic commerce, information acquisition and community operations (Mitchell L., et al, 2002).

“Web application” a term first coined by Bruce Tognazzi (Norman, 2002) is defined as serious software being delivered as a service over the Web (Nail, 1998). The term “serious” is applied because web applications do not include “trivial applets or simple forms” that do not accomplish much beyond collecting information (Berst, 1997).

Web application is an application that is accessed via the web over a network such as the internet or intranet. The ability to update and maintain web applications without distributing and installing software on potentially thousands of client computers is a key reason for their popularity. The web applications become the most important tools that used to reduce the time and the effort for the user to do their job. The internet is the technical

infrastructure on top which the web is built.

French (1992), in his book titled "Computer Science" fourth edition, relates the relevance of computer to management and stated that "a company needs information in which to base decisions concerning the current operations and future plans. It requires the information to be timely and accurate". He then cited the example of the use of computer in the area of management control to production and stated: "production must be able to respond quickly to changes in demand and other circumstances. To do so require the provision of up to date information that is accurate and timely".

Aluko (1991), stated that "in virtually any job whether clerical, technical, business, or professional; whether it is a banking, medicine, education etc. Computers are useful tools" and that "computers are tools with which we calculate, measure, assess, store, retrieve, regulate and monitor information". Hence, the blood and life – wire of any system is information. A typical system (Education, Management, Personnel etc.) cannot survive without good management information system (MIS).

Appointment is time reserved for something such as business deal, scheduling time for job interview, and much like a reservation. The pen-and-paper method is the old way of scheduling appointments for a workgroup, in which all scheduling is funneled through an appointments secretary with a central calendar. In this model, the people whose time is being booked must check in regularly to find out what their schedule is, and the secretary let them know what times are unavailable. With large workgroups or very busy schedules, this system can rapidly become untenable.

Traditional appointment systems in the private practice sector have been

shown to be underprovided in matching supply and demand for urgent or same-day appointments. Traditional appointment systems have been shown to contribute to slow rates for appointments scheduled into the future as well as decreasing patient satisfaction (Belardi, Weir & Craig, 2004).

In addition, it involves operations performed by a clerk assisted if desired by specific aids such as a pocket calculator or adding machine etc. This method of processing is only suitable in cases where the volume of applicant records to be processed is small and there is not too much emphasis on the specific period of time the work must be completed. The processing is simple and in most cases, the employment of more hands will solve the problem of time constraint. Example is the updating of handwritten applicants' records. In particular, and especially among diminished capacity, there is a clear need for analytical tools that can be provide better services with dynamics of patient (applicants) flows in the clinics (organisations). Variability in both supply and demand, when left unmanaged, necessarily produce crowding, staff overloads, unmet patient needs and general frustration (McManus et al, 2003).

Computerization is a social process for providing access to and support for computer equipment to be used in activities such as teaching, accounting, writing, designing, circuits, file processing etc. Computerization entails social choices about the levels of appropriate investment and control over equipment and expertise, as well as choices of equipment. Computerized scheduling systems are a method of using scheduling algorithms and rules to help multiple people manage appointments and meetings. Computerized scheduling allows users to publicly share free time on their calendars, while keeping specific appointments private. They tend to be more efficient than manual scheduling, but a good appointments

secretary can more effectively handle some situations.

Kling, (1994) illustrates that systems being computerized offers exciting possibilities of manipulating large amount of information rapidly with little effort to enhance control, to create insights, to search for information, and to facilitate cooperative work between people. A great number of articles claim that an effective appointment system can reduce waiting time significantly (Harper and Gamlin 2003, Wijewickrama and Takakuwa, 2006). The online appointment system also provides more flexibility to the administrative staff. They can work from almost any location whether they use the system from multiple offices or work from home. Because the system is internet based, it allows administrators who do not have time to finish paperwork during the day to take work home, which was previously not possible. In addition, staff members who may have needed to go into the office on weekends in the past are now able to work from home, at their convenience. Better communication and shared knowledge between the front office and the back office staff has been another benefit for the practice (Nelson and Lang, 2002).

Recruitment is one of the Human Resource Management (HRM) practices, and can be defined as those practices and activities carried out by an organisation with the primary purpose of identifying and attracting potential employees (Breaugh and Stark, 2000). Recruitment is important for organisations since it performs the essential function of drawing an important resource, human capital, into the organization (Boxall & Purcell, 2003; Galanaki, 2002; Malinowski et al, 2005; Parry, 2006; Parry & Tyson, 2008; Singh & Finn, 2003). In order to create competitive advantage and subsequently higher organizational performance, the process starts with recruiting applicants who possess the necessary knowledge and

skills (also called abilities) to actually do the job.

There are three contemporary developments that influence recruitment practices. The first of these developments is tight labour markets (Lievens et al, 2002; Parry & Tyson, 2008). Scarcity in the labour market makes it more difficult to recruit the right people. Secondly, existing recruitment difficulties also have an effect (Parry & Tyson, 2006). The Chartered Institute of Personnel and Development (CIPD, 2007) mentioned that 84% of the organizations experienced recruitment difficulties related to consequences of tight labour market conditions, and the need to choose appropriate ways to access the labour market. These former two developments result in a more competitive recruitment market (Parry & Tyson, 2008). A third development concerns the increase in world population working with the internet (Bartram, 2000; Hayes et al, 2005; Lievens et al, 2002; Parry & Tyson, 2008).

As consequence, organizations need to respond to this development. Applicants by mail become rare, and organizations may profit by using this development in their own favour as well (Bartram, 2000).

Different authors define e-recruitment differently, yet the essence is similar. For example, Galanaki (2002) defines that online recruitment refers to posting vacancies on the corporate web sites or an online recruitment vendor's website, and allowing applicants to send their resumes electronically via e-mail or in some electronic format. To these definitions different dimensions can be added in which e-recruitment is performed. The scope of e-recruitment can also involve the possibility to conduct remote interviews and assessments, like psychometric or aptitude test online, and using banner advertisements and smart agents to search the web. In addition, interactive tools can be used to link the corporate database with the web site, like search engines, interactive application

forms, e-mail auto respondents and electronic mailing lists (Dysart 199; Taylor, 2001).

Munger (2002) stated that with the presence of online hiring (e-recruitment) in the internet through powerful search engines, the labour market has become a true market, uncontrolled by individual companies, and unconstrained geographically with thousands of resume being posted daily by job seekers to online hiring sites. Therefore, many companies have the ability to hire locally as well as

reach globally in the search for talented knowledge applicants. E-Recruitment though at nascent stage, is becoming a part of corporate strategy with increasing numbers of companies setting aside budgets for online recruitment. E-Recruitment practices- using the internet to find candidates for job openings- have established some roots in the business world. The table below presents steps taken during a recruiting process, and presents the methods used for the e-recruitment as well for the traditional process.

Recruitment Process	Traditional Recruitment	E-recruitment
Attracting candidates	Using sources that are not technological, like advertisement, flyers, spokespersons, to draw as many applicants as possible to contact the organization.	Using the organization's reputation, product image, online technology and other methods to draw as many potential applicants as possible to the organization's website. There organizations can present themselves.
Sorting applicants	Using a paper-based test for applicants to create a manageable applicant pool.	Employing sophisticated, standardized online tests to screen candidates, and to winnow the applicant pool to a manageable number
Making contact	Contacting the sorted applicants by phone or mail and having face to face conversations	Using automated hiring management systems to contact the most desirable candidates very quickly, before they are snapped up by another company
Closing the deal	Making the phone call, setting up the meeting and shaking hands	Making the phone call, setting up the meeting and shaking hands

Table : The recruitment process set out in traditional and 'e' way of recruiting
 Source: Cappelli, 2001

3.0 Methodology

Gathering empirical data through exploring and unfolding the phenomenon of data-driven appointment and recruitment system (DARS) at Adekunle Ajasin University, Akungba-Akoko, Ondo State, Nigeria (AAUA), was made possible by several research techniques, In order to

gather details about the current recruitment and appointment mode at AAUA, in-depth study was carried out.

3.1 Recruitment System in AAUA

Presently recruitment is done manually at AAUA. That is, if employees are needed they make an announcement through

newspaper. Interested candidates from different part of the country, collects the application forms from the Institution's Headquarter office, Akungba-Akoko or at the various liaison offices across the nation. Completed application forms are submitted by post or hand to the collection centre. Admission requirement is stated in the recruitment handbook, which is normally made know to applicants through the adverts.

From these applications they are called for interviews or tests. After written and oral tests, the personnel department of AAUA has to do short listing manually. From these shortlisted candidates, they are called for interviews. After interview, short listed candidates are employed. The flow diagram below depicts this present system.

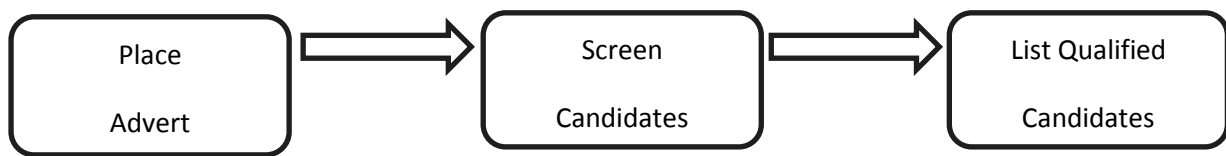


Fig. 1 Data Modelling for recruitment system in AAUA
 Source: Author

3.2 Appointment System in AAUA

Appointments have to be booked with the receptionist/secretary within a specified period of time in the day. Then the person booking appointment will have to wait in

the queue or told to come back at a later time. There are some principles for waiting in the queue; their appointment time, arrival time and type of person booking appointment

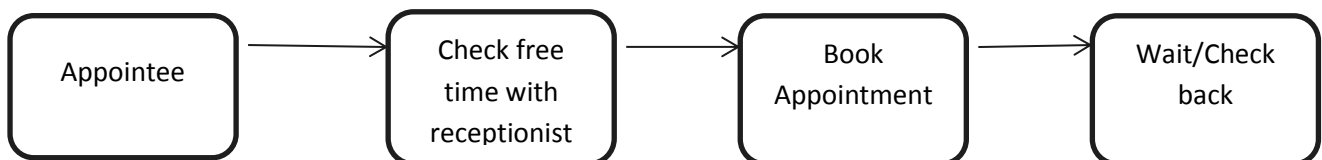


Fig. 2 Data Modeling for Appointment system in AAUA.
 Source: Author

3.3 Feasibility Studies

To achieve the goal of this research work, we make use of the internationally accepted software engineering model, Structured System Analysis and Design Methodology (SSADM). Structured System Analysis and Design Methodology (SSADM) is a system approach for the analysis and design of information systems. SSADM method involves the application of a sequence of analysis, documentation and design tasks concerned

with analysis of the current system, logical data design, logical process design etc.

A thorough investigation of the current system was made in order to obtain detailed fact about the application area to be re-designed. Investigation also covered looking at the functional requirement of the present system and finding out whether the requirements and objective of the present system are being achieved. In the investigation proper, several methods of data collection were employed which

includes interviewing of office representatives, evaluation/inspection of forms and direct observation. These methods were adopted to ensure the validity of data collected and relevance of the result after processing the data.

4.0 Design of the Proposed System

Systems design is concerned with how to provide an efficient (economical) and effective (relevant and useful) system. It is an integral part of software development process which is embarked upon after a detail analysis of the system has been done, and the project feasibility study undertaken.

The system would be implemented through prototype development approach to arrive at a near-to-completion developed working system. The system would be implemented by using PHP and MySQL as the database for the proposed system. The new system will be database driven. The database will be hosted locally. In other words, the system that hosts the site will be a local server. The database is designed in such a way that form data are bounded to the database for the purpose of form submission. The user may only access the database when they submit forms but cannot retrieve information from the database.

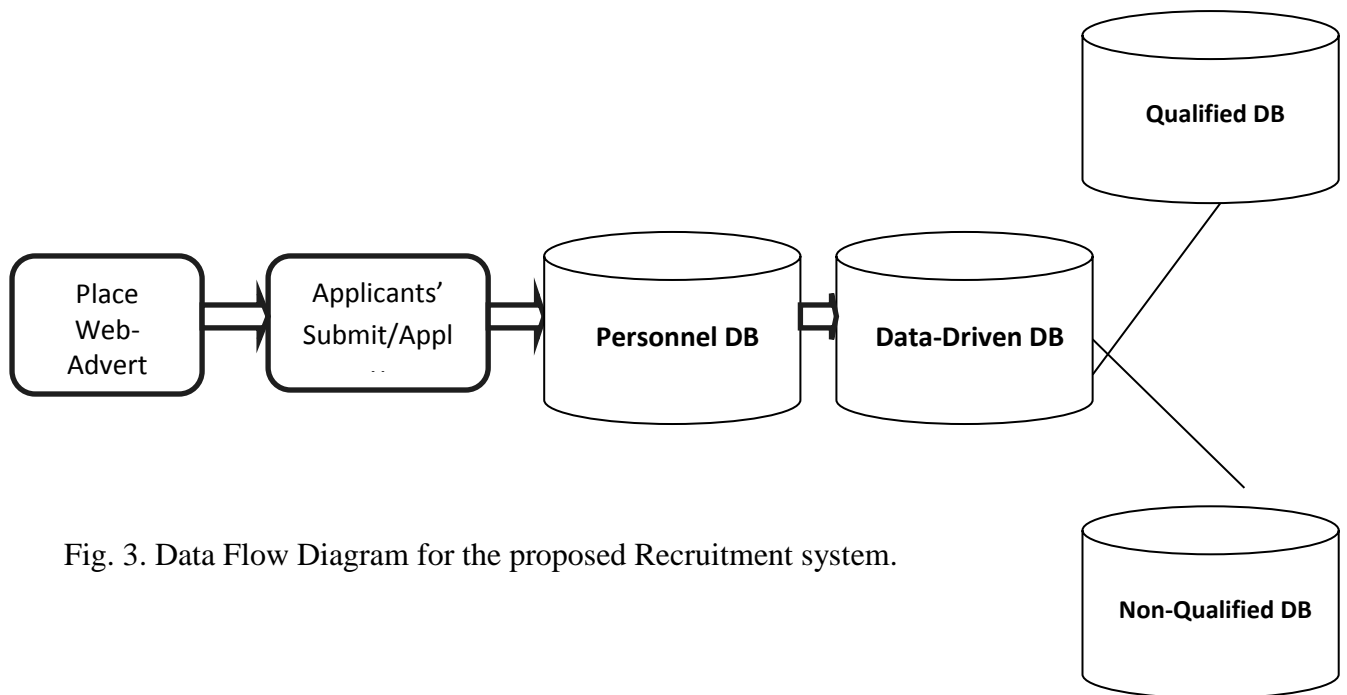


Fig. 3. Data Flow Diagram for the proposed Recruitment system.

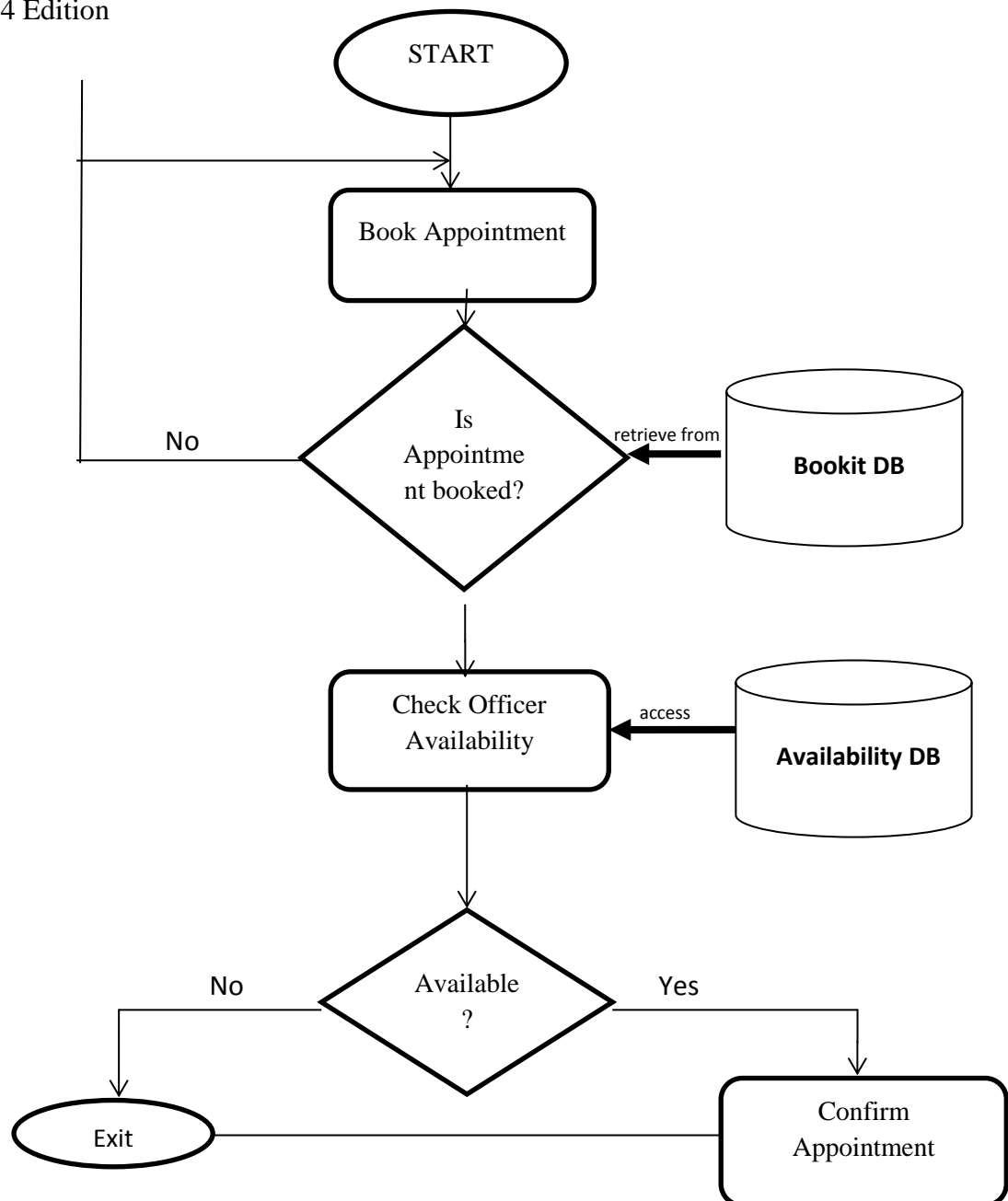
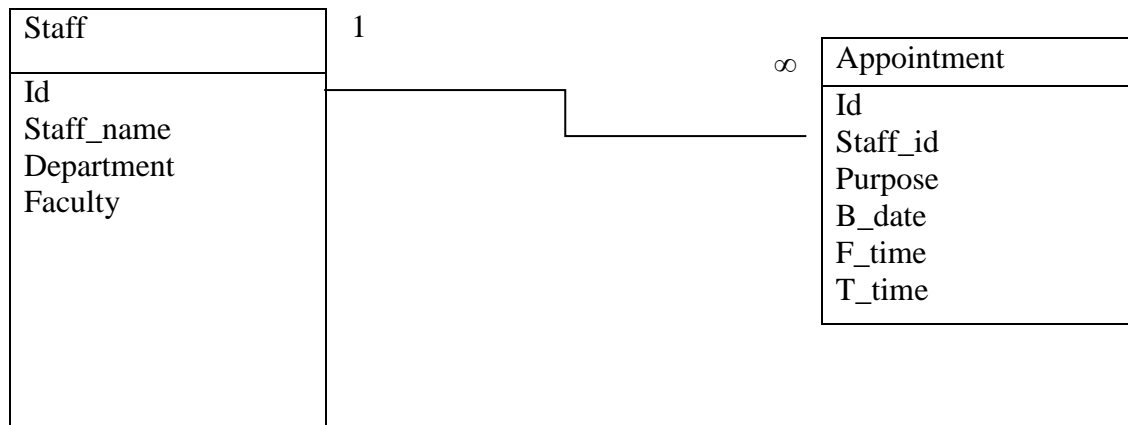


Fig. 4 Flow Diagram for the proposed appointment system.

Relationship Model



5.0 Conclusion

As organization increasingly adopt information technology into their operations, it has become important for them to move their operations and services to a new paradigm by wholly embracing the use of e-recruitment system for handling recruitment process and also use online appointment system to reduce waiting time and manage appointments.

Web portals are essential aspects of the internet that provide temporal link to vital information resources. This research work has been able to implement one for job recruitment exercises and appointment process that is data-driven. The broader world of information and communications technologies (ICT) has exciting prospects in the Nigerian market, and will attain greater heights even quicker if all technological tools are properly harnessed.

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