

# Design of an Enquiry System for Nigeria National Youth Service Corps (NYSC) Scheme Deployment Using WAP



Alese B.K\* Ogundele O.S Thompson A.F Obembe O.M.

© Institute of Management Studies, Noida  
Online access at [www.publishingindia.com](http://www.publishingindia.com)

## Abstract

The NYSC Scheme in Nigeria has been greeted with a lot of administrative issues like deployment, placement and location concerns over the last twenty (20) years, this resulting from the increasing number of graduates who have to participate in the scheme. However, the growth of Information and Communications Technology (ICT) means these issues can be resolved seamlessly with available technologies which can break the barrier of distance and communication. This paper intends to solve the problems experienced by prospective NYSC scheme participants in Nigeria, who want to know the state of the Federation where the scheme organizers have deployed them to, how to reach the orientation camp and give the weather and environmental condition of the orientation camp. The design explored the capabilities of Mobile Internet made possible by the Wireless Application Protocol (WAP) in solving these problems by designing a Deployment Enquiry System for all prospective NYSC scheme participants. The design system was tested using a mobile device simulator in the Windows operating system environment. The system when deploy will effectively service all prospective corps members irrespective of their location – whether in the city, town or village.

**Keywords :** National Youth Service Corps (NYSC), Wireless Application Protocol, Mobile Phone, Mobile Web Application

## 1. Introduction

The world in which we live is an increasingly wireless one. If the human eye were able to see the full electromagnetic spectrum, we would be faced with the sight of a mind-blowing quantity of information being exchanged. However, mobile devices do not have enormous processing power, run a range of diverse, proprietary operating systems, and are constrained by the low speeds at which they can receive and transmit data, WAP, the wireless Application Protocol, has emerged as an important technology in this area.

Mobile Internet is internet access from mobile devices. What makes things even more favourable for the mobile internet is that it already has a lot of internet-based content from which to draw. This can be adapted for display on mobiles in a number of ways. A WAP enabled website can be viewed using a phone that is WAP-enabled. WAP allows carriers to strengthen their service offerings by providing subscribers with the information they want and need while on the move. A good example is the **AEGEE-Eindhoven** - A Europe-wide students' association whose goal is to allow all students to integrate and learn about each others' cultures.

Nigerian graduates hoping to participate in the NYSC programme are faced with the problem of knowing their states

---

\*Department of Computer Science, Federal University of Technology, P.M.B. 704, Akure, Nigeria

of deployment before hand. In the past, they only get to know in not more than one week to the orientation programme. Knowing the state of deployment in time help aspiring Corp members to adequately prepare on how to live and cope with their new location. In 2004 City Express Bank partnered with the organizers of the programme to help solve this problem by introducing NYSC Postfinder a web base database where aspiring Corp members can check their states of deployment. Subsequently, SMS NYSC Postfinder – a Mobile Phone Short Message Service (SMS) version of NYSC Postfinder was introduced. It works by sending a specified format text to subscriber Mobile Phone number and reply with a text message containing their NYSC deployment status. In 2008, the internet-based NYSC scheme was launched and provided intending corp members to check their camp states before going for their call-up letters, fortunately, this method helped to solve the congestion and mishap that might have occurred due to the Batch-splitting into A & B for a particular set say “February Batch”.

While many of the intending corp members have bits of computer experience to check the internet-based application, the availability and reliability of the Internet in Nigeria brings a downside to this system and while NYSC wants to rely on these scheme, the last two years has seen the birth and re-birth of a growing Internet-Based NYSC placement system. Additionally, the SMS NYSC PostFinder system met with a lot of issues like long delays, no response and missing numbers and has since been fashioned out of the system. The physical dispatch in tertiary system is still an issue and registration at camp sites still has problems that have to be solved.

The use of Mobile Communications in Nigeria has come of age and latest statistics record up to 60 million subscribers shared amidst eight (8) mobile operators (African Network Projects, 2007). Also, observation analysis reports that over 85% of students in tertiary University have mobile phones with over 45% of this figure capable of using the GPRS/EDGE/3G Technology. Thus, considering the limitations affecting the NYSC scheme, the need to have a system to support the Internet-based system is of high priority because with the mobile, information is on the go. The objective of the Mobile NYSC Deployment Enquiry System (MNDES) is to design a system whereby prospective NYSC scheme participants would be able to access information needed concerning their NYSC posting via a WAP enabled mobile. The components of the designed system will include a deployment enquiry system for all prospective NYSC participant that will effectively and efficiently serve as information source to the scheme participants irrespective of their .

## 2. Methodology

WAP is an open specification that defines a set of protocols in application, session, transaction, security, and transport layers (Prasad et al 2002, WAP wp ). To leverage existing programming and development skills, it is based on existing standards and protocols such as XML, HTTP, UDP, HTML, and JavaScript. Figure 1 shows the WAP protocol Stack.

(Mahmood, 2000) described the key elements of the WAP specification as :

- A well-known applications development framework. The WAP transport model is analogous to the Internet model, except for the gateway that is inserted between the Web server and the client. This familiar model leverages the existing development skills of WWW programming.
- WML (Wireless Markup Language) as the standard markup language.
- A browser inside WAP devices that parses WML and WMLScript.
- A framework to support advanced telephony services, like WWW to mobile messaging, call forwarding, mobile to telefax access, and address book access.

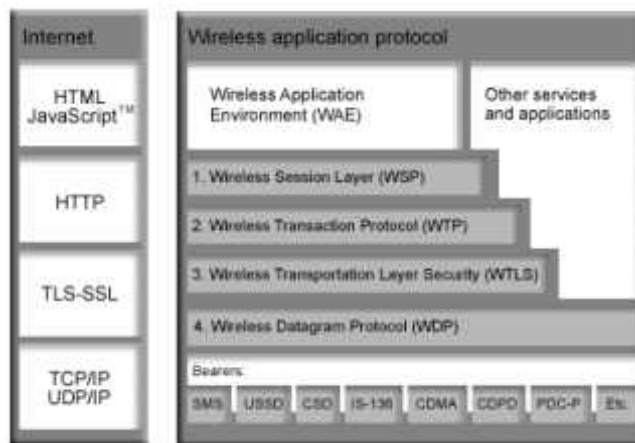


Figure 1 : The WAP Protocol Stack

The Mobile NYSC Deployment Enquiry System was designed to handle the problems listed above. It will allow prospective corps members to check their NYSC deployment status from any location in Nigeria at anytime using their GSM mobile phones and it will also enable the users to know the climatic conditions of their state of deployment. This was achieved by designing a website for mobile devices (WAP enabled website). This website was developed using the Wireless Markup Language (WML) and allow WAP enabled mobile devices view the WML cards using the WAP protocol.

PHP was used as the application platform to help realize a dynamic server-side scripting application, with Apache functioning as the web server and MYSQL serving as the back-end database. The applications developed will run on a simulator. If implemented and connected to a WAP gateway, the applications can be accessed by any WAP enable mobile phone from any location, at any time, allowing prospective corps members login to the WAP enabled website by entering a valid scratch card PIN and serial number after which they can view all the required information when they enter a valid institution and matriculation number.

## 3.0 System Analysis

The system analysis phase involves two stages which are listed below

- The preliminary investigation of existing systems
- The establishment of a technical feasibility of the proposed system

### 3.1 Preliminary Investigation

Observatory investigation reveals that prospective NYSC scheme participant are scatter all over Nigeria Cities, Towns and Villages and they want to get the following information from their locations:

- Call-up Number
- State of Deployment
- Address of Orientation Camp, if possible a navigating Map.
- Date of Camp Resumption, and a
- Weather history of the Orientation State (Camp).

Investigation also reveals that the internet and SMS versions of NYSC Postfinder displays only the first four information leaving prospective scheme participants to ponder on the weather and environmental conditions of the orientation camp. Having this information can eventually mean the difference between life and death especially for participant with serious health problems and knowing all the listed information before hand would help participants locate and reach the orientation camp on time, avoiding miss-direction and even death. The internet version of NYSC Postfinder requires the use of a computer, reliable internet service and scratch card to access the Postfinder's database. However, these system is still far from perfect due to unreliable internet service in the country, inadequate development of the PostFinder system (ability to handle access loads), non-fault tolerant systems and less-redundant systems which fails from time to time.

### 3.2 Establishing Technical Feasibility

Due to the recent trend in the use of mobile devices for communication and the consequent evolution of the wireless application protocol, which enables wireless devices to be hooked up to cyberspace via a WAP gateway, coupled with the fact that an emulator or mobile phone simulator can be used instead of the real mobile phone to test the applications. This ensures that the application will be able to run on a variety of mobile phones, since it can be tested with several existing emulators without necessarily having to purchase them. The estimates of the cost of developing the system, which includes the cost of consulting WAP experts for technical supervision among other cost estimates, are made. A schedule of the time it will take to design the project was estimated so that the project can be completed at the time stipulated by the department for submission of the project.

In the second stage of the analysis of the system, the user requirements were identified, and the methods and procedures for the new system were established. This involved collection of facts on how to make relevant information available to the prospective corps members in the most convenient way which were obtained through different methods. These include:

- Conducting interviews with serving corps members on problems they encountered while trying to know which state they had been deployed to as well as conducting interviews with prospective corps members to ascertain their quest for a system that meet their need for information about their state of deployment and orientation camp.
- Gathering information from the National Headquarters of

the Youth Service Corps on deployment of Corps members.

- Consulting WAP experts on the design and implementation of the proposed system.

## 4. The System Design

The database approach to data management has evolved in recent past with the intention of marking the beginning of a new era of a controlled and centralized application development. The DBMS provides the mechanism for data integration, concurrency control and independence by a community of database users (Silberchatz, 2004). In this section, the design of the relational database for the Mobile NYSC Deployment Enquiry System (MNDES) is presented. The database is viewed in terms of the interconnected relations, database transactions and processing.

The relational database model has been widely discussed in (Codd 1970, Date 1981, Paolo et al 1999). The general form of a relational schema is denoted by

$R [A_1, A_2, A_3, \dots, A_{n-1}, A_n]$  and

defined as a name (of the relation)  $R$  with a set of attributes  $A_1, A_2, A_3, \dots, A_{n-1}, A_n$  where  $n$  represents the attributes of the relation  $R$ . The relations described below are the key relations needed to get the MNDES working at the best minimal implementation.

**Nysc\_Data** [*corp-id*, last-name, first-name, age, date-of-birth, gender, state-of-origin, *matric-no*, institution, course-of-study, call-up-no, state-deployed, camp-id, site-condition, batch, resumption-date]

**Scratch-Card** [card-id, card-number, expiry-date]

**Camp-Site** [camp-id, camp-name, camp-state, camp-population, camp-director]

The data flow diagram of the system is shown in Figure 2 and it describes the various modules of the program that needs to be developed with respect to the various levels of enquiries that the user may want to make with the system. The data flow diagram also shows how different modules relate with one another.

## 5. System Implementation

The implementation of the MNDES will require high capacity hardware servers and reliable software systems. Recommendations for hardware include the HP-ML server series with configurations like:

- Dual Core Processors
- 1024MB RAM and above
- Over 300 GB Drives And other supportive systems like
- Battery back-up systems (BBS) and
- Cu-BAND VSAT for High Speed internet Connection.

The software applications that are necessary for the installation of the Mobile NYSC Deployment Enquiry System are:

- A reliable network Operating System like UNIX, LINUX or Window Server 8.

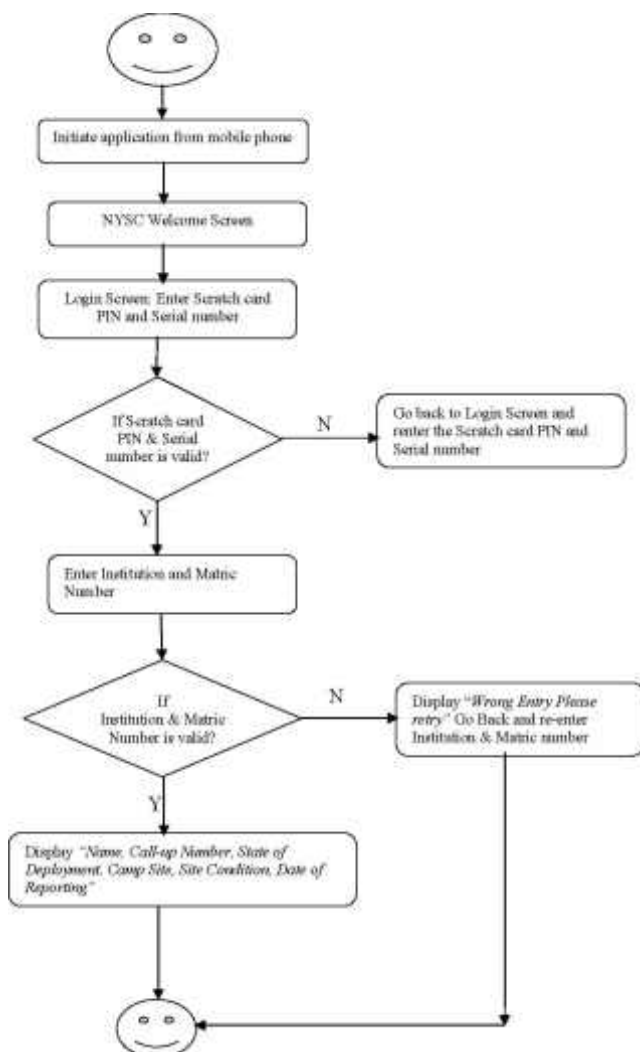


Figure 2 : Activities Diagram for DEMPU

- ii. A stable Web server like IIS, Apache 2.0 and above
- iii. PHP 5.0 and above, and
- iv. A DBMS like MySQL or compatible DBMS.

### 5.1 The Program Modules

The modular design, which is a prominent feature of a modern system of programming was highly and intensively utilized. Each subsystem was designed as a deck of cards and users can easily navigate through just like going from one web page to the other.

Since the application is to be run on wireless phones, the screen display is made as brief as possible to accommodate the screen once at a time. Where this is impossible, the user can scroll the device display up or down to read the content. This is the first screen that will be displayed by the application after the user has successfully established a connection between the server and the mobile phone by typing in the URL of the home page. Once this is displayed the user can press 'click' and this gives him/her another screen shown below.



Figure 3 : The MNDES Welcome Screen

This screen allows the user to key in the Scratch card serial no and the scratch card pin number. The serial number and the scratch card pin number must tally with the one in the database if not the user will not be able to access the next NYSC site to get details about his/her state of deployment.



Figure 4 : The MNDES Login Display

This screen allows the user to enter the following fields so as to be able to know detailed information about his/her state of deployment. Failure to key in the correct information like institution and the matric number, it prompts the user wrong entry and should retry.



Figure 4 : The Prospective Corps Member Expected Information Screen

The below screen gives the result of the two parameters defined above



Figure 5 : The Prospective Corps Member Deployment Details Screen

## 5.2 Operating Procedures

To start the "NYSC deployment for mobile phone users", you are required to perform the following tasks :

- Make sure that the Apache web server is running.
- Load the WAP Emulator program
- Type in the URL of the Home page of the application. i.e. <http://wap.nysc.com/index.php>
- The home page which is the welcome screen will be displayed on the device i.e. the emulator.

While navigating through the application, the user friendly display is enough for the user to move back and forth without much assistance. Some keys on the device are activated so the user can be able to navigate through. Where the information required cannot be displayed on the mobile screen at once, the user can easily use the scroll key on his/her mobile device to move up or down.

## 6. Conclusion

WAP provides a markup language and a transport protocol that opens the possibilities of the wireless environment and give players from all levels of the industry the opportunity to access an untapped market that is growing rapidly. The bearer-independent nature of WAP has proved to be a long-awaited breath of fresh air for an industry riddled with multiple proprietary standards that have suffocated the advent of a new wave of mobile-internet communication. The Technology of WAP enabled application has been brought o the table in this paper and has been used to design a Mobile NYSC Deployment Enquiry System which will serve as an associative technology to the present Internet-based Deployment Scheme. The opportunities presented by this system bring high-level redundancy to the NYSC deployment scheme making orientation camp administration easier and achievable with less stress and ambiguity. It is however expected that with the growing mobile technology in 3G and 4G and the increasing penetration of mobile communications in Nigeria, this system will develop into one that will play a key role in major NYSC administration and management.

## 7. References

- African Network Project* (2007), a presentation by Ericsson Nigeria and Frost and Sullivan.
- Codd, E. F. (1967) .A Relational Model of Data for Large Shared Data Banks., *Comm.ACM*, Vol. 13, No. 6, pp. 377.387.
- Date, C.J (1981) 'An Introduction to database systems, Vol 1, Addison-Wesley Publication Co.
- Mahmood Ahmed (2000), The Basics of WAP Technology, Article retrieved from [http://articles.techrepublic.com.com/5100-10878\\_11-1031976.html](http://articles.techrepublic.com.com/5100-10878_11-1031976.html) on August 19, 2009.
- Montgomery, Tim (1999), WAP: A Beginner's Guide, published by McGraw Hill Professional, (pg. 10–32).
- Paolo Atzeni, Stefano Ceri, Stefano Paraboschi and Riccardo Torlone (1999), *Database Systems, Concepts, Languages and Architectures*, McGraw-Hill, 1999
- Prasad V.K.K, Gupta V, Dass A, Jain D (2002), WAP, Bluetooth, and 3G Programming: Cracking the Code, published by Hungry Minds, Inc. New York, NY, ISBN: 0-7645-4905-7
- Silberschatz-Korth-Sudarshan (2004), *Database System Concepts, Fourth Edition*
- Taylor M and Marcel van der Heijden, (2002), *Understanding WAP: Wireless Applications, Devices, and Services*, published by McGraw Hill , pg. 60
- Wireless Application Protocol*, a white paper retrieved from [www.wapforum.org](http://www.wapforum.org) on August 19th, 2008.