

AUTOMATION OF A SECURED NUC LECTURERS' INFORMATION SYSTEM FOR RESTRICTION OF UNDULY LECTURERS' MIGRATION DURING UNIVERSITY ACCREDITATIONS

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ABSTRACT - Lecturers' migration during accreditation in Nigerian University and other African Universities has becomes an issue that needed due attention and a means to save our educational standard in the country and beyond. Accreditation is a critical process of setting standard and quality Education in universities; and application of information technology to its processes is a great milestone towards realizing its goal and objectives. This does not only give good result during the accreditation exercise but also help to restrict unduly lecturers' migration before or during the university accreditation process as well as reduction in time consumed. It also reduces the tediousness and financial implication that come up with the process.

Key Words - Portal, Accreditation, NUC, Lecturer, Database, Security, Migration

1. INTRODUCTION

This paper presents a secured NUC lecturers information system for restriction of unduly lecturer migration during accreditation in Nigeria and other African Universities in order to enhance the manual capturing of lecturers information by individual Universities and results of academic staffs accreditation. Task of carrying out accreditation excises such as Students-to-lecturer ratio, Numbers of Professors, Reader, Senior Lecturers, Lecturer I, Lecturer II, Assistance Lecturer and Graduate Assistant (academic staff mix by Rank) in the University and department is been automated.

All the Lecturer in the Nigeria Universities will sign-up on the secured system with their details and are assigned a unique NUC-ID after successful sign-up. It deals with all kinds of lecturer details and academics related report. It tracks all the lecturers' details from day one of appointment to current date. This details include biological info, Professional qualification (NCE, ICAN, CSN etc.), Education qualification (Dip, BSc, MSc, PhD), professional experience, Rank, Administrating responsibility, publication (journals, conference/seminar, thesis) etc. The system is web-based and allows all tasks to be carried out using the personal computer and the Internet.

The legal basis for accreditation of academic programmes in the universities is derived from decree NO.16 1985. Section 10 of the decree as amended and incorporated in section 4(m) of Nigeria university commission Amendment Decree NO.49 of the 1988 empowers the commission: "To lay down minimum standards for all universities in the federation and to accredit the degrees and other academics awards after obtaining prior approval" (Okojie, 2008).

THE MOTIVATION FOR THE RESEARCH IS:

- i. Lack of Secured accurate information capturing system for Nigeria Lecturer's
- ii. Unduly Lecturers Migration during university programs Accreditation
- iii. Lecturers'-to-Student Ratio and the Minimum Benchmark for Academic Staff Mix by Rank are not maintained in our Universities.

The specific objectives of the research is to achieve the following; to automate the manual method of capturing Lecturers' information and accreditation of lecturers/academic programmes in Nigeria and other African Universities, to minimized the rate of lecturers' migration from one university to another during accreditation by providing a database that will capture all lecturers' details in Nigeria.

Register and assign NUC-ID numbers to all lecturers in Nigeria Universities, allow NUC to easily access every lecturer details and calculate the minimum benchmark for academics standard using computerized approach (i.e. student-to-lecturer ratio and academic staff mix by rank).

The implementation of the secured computer base system was carried out using HTML5, Bootstrap CSS, JavaScript, PHP and MySQL database. The result that was obtained was a web base portal that help to enhance lecturers' accreditation by NUC so as to ensure accuracy and transparency.

2. REVIEW OF RELATED LITERATURE

Higher education in Nigeria can be traced to 1932 when Yaba Higher College was established for the purpose of producing assistants who would relieve the then colonial administrators of menial tasks. The Ashby Commission in 1960 recommended the establishment of regional Universities in the then three regions of Nigeria [1]. Three Universities were established: the University of Nigeria, Nsukka (1960) in the Eastern region; the University of Ife, now Obafemi Awolowo University (1961) in the Western region and Ahmadu Bello University, Zaria (1962) in the Northern region, while the existing University College, Ibadan was granted full-fledged University status in 1962. Also, the University of Lagos, Akoka came into existence in 1962 and as a city University, it provided courses in law, social sciences, medicine, humanities, engineering and part-time programmes for working students. Lastly, the University of Benin was established in 1970, making the sixth of the Universities that have come to be known as Nigeria's first generation Universities [2].

Today the higher education system in Nigeria is composed of Universities, polytechnics, institutions of technology, colleges of education that form part of, or are affiliated to, Universities, and professional, specialized institutions. They can be further categorized as private, state or federal owned institutions. Federal Universities categorized as first, second, or third generation Universities. The first generation Universities are the six Universities established in the 1960s and early 1970's; second generation Universities are seven Universities established in the mid 1970's; while third generation Universities refer to the eleven institutions, including the Universities of technology, established in the 1980's and 1990's [3].

All these higher institutions obtaining prior approval from the federal government through the National University commission and operate within clearly laid down rules and regulations determined by the National Universities Commission [4].

The National Universities Commission (NUC) was established in 1962 and attached to the office of the Prime Minister; in 1974, it became a parastatal in the Federal Ministry of Education and a statutory commission charged with the responsibility of regulating the academic, administrative, and the financial activities of Nigerian Universities [5]. The Commission is, therefore, absolutely relevant to the running of all Universities in the country.

Accreditation may be used to signify the official approval granted by an accrediting agency to an accredited institution at the end of a successful assessment exercise [6]. It could also mean the process by which the quality and standard of educational institutions are assessed. The assessment is usually conducted by accrediting agencies set up by the Government through the Ministry of Education or by professional organisations.

In Nigeria, this quality assurance function is conducted by the National Universities Commission (NUC) for Federal, State and Private Universities. The same function is carried out by the National Board for Technical Education for Polytechnics and Monotechnics (NABTE) and the National Commission for Colleges of Education (NCCE) for this category of educational institutions [7].

According to [8]. Accreditation is essentially, about Quality and Standard. Also in a study conducted by [9] shows that the two concepts of Quality and Standard are not easy to define. Our review of the related literature shows that "standard" is an integral part of "quality" and also that many scholars have alluded to how challenging it is to define this concept: Despite these challenges, however, there seems to be a consensus among a good number of scholars that quality refers to [12].

2.2 Mathematical Model for Nigerian University Academic Staff Mix by Rank

According to [10], the Benchmark for minimum academic standard as at the year 2007 by National Universities Commission of Nigeria (NUC) can be model thus:

Table 2.1: Mathematical Model for Nigerian University Academic Staff Mix by Rank

Faculty	Lecturer/ Students Ratio	Percentage of professor/ Reader	Percentage of Senior Lecturer	Percentage of Lecturer I and Below
Q	R	P	S	L

Notes that from table 1 above the Lecturer/Students ratio and academic staff mix by rank given can be represented as Q, R, P, S, L as shown in table 2 above:

Also $Q, R, P, S, L > 0$

Furthermore, let

N = the total number of students in a given degree programmes under faculty Q .

x_0 = the number of Professors/Readers available for a degree programmes under faculty Q .

x = the number of Professors/Readers required for a degree programmes in addition to x_0 under faculty Q .

y_0 = the number of senior lecturers available for a degree programmes under Faculty Q .

y = the number of senior lecturers required for a degree programmes in addition to y_0 under faculty Q .

Z_0 = the number of lecturer I and below available for a degree programmes under Faculty Q .

Z = the number of lecturer I and below required for a degree programmes in addition to Z_0 under faculty Q .

From table 2, and the definitions given in the BMAS (2007), we have

$$\frac{x_0 + x}{(x_0 + y_0 + z_0) + (x + y + z)} \times 100 = P$$

i.e. $100(x_0 + x) = P(x_0 + y_0 + z_0 + x + y + z)$ and

$$100x_0 + 100x = P(x_0 + y_0 + z_0 + x + y + z) \quad (i)$$

$$\frac{y_0 + y}{(x_0 + y_0 + z_0) + (x + y + z)} \times 100 = S$$

i.e. $100(y_0 + y) = S(x_0 + y_0 + z_0 + x + y + z)$ and

$$100y_0 + 100y = S(x_0 + y_0 + z_0 + x + y + z) \quad (ii)$$

$$\frac{z_0 + z}{(x_0 + y_0 + z_0) + (x + y + z)} \times 100 = L$$

i.e. $100(z_0 + z) = L(x_0 + y_0 + z_0 + x + y + z)$ and

$$100z_0 + 100z = L(x_0 + y_0 + z_0 + x + y + z) \quad (iii)$$

$$\frac{N}{x_0 + y_0 + z_0} = \frac{R}{1}$$

i.e. $N = R(x_0 + y_0 + z_0) + (x + y + z)$ and

$$(iv)$$

$$\frac{N}{R} = x_0 + y_0 + z_0 + (x + y + z)$$

Now substituting (iv) in (i) we have

$$100x_0 + 100x = P \times \frac{N}{R} = \frac{PN}{R}. \text{ i.e } 100x = \frac{PN}{R} - 100x_0.$$

$$\text{Therefore } x = \frac{PN}{100R} - x_0$$

Similarly, substituting (iv) in (ii) we have

$$100y_0 + 100y = S \times \frac{N}{R} = \frac{SN}{R}. \text{ i.e } 100y = \frac{SN}{R} - 100y_0$$

$$\text{Therefore } y = \frac{SN}{100R} - y_0$$

Furthermore substituting (iv) in (iii) we have

$$100z_0 + 100z = L \times \frac{N}{R} = \frac{LN}{R}. \text{ i.e } 100z = \frac{LN}{R} - 100z_0.$$

$$\text{Therefore } z = \frac{LN}{100R} - z_0$$

Table 2.2 Result of the mathematical model

S/N	P	S	L	R	X	Y	z
1	20	35	45	20	$\frac{N}{100} - x_0$	$\frac{7N}{400} - y_0$	$\frac{9N}{400} - z_0$
2	20	35	45	30	$\frac{N}{150} - x_0$	$\frac{7N}{600} - y_0$	$\frac{9N}{600} - z_0$
3	20	35	45	15	$\frac{N}{75} - x_0$	$\frac{7N}{300} - y_0$	$\frac{9N}{300} - z_0$
4	20	35	45	10	$\frac{N}{50} - x_0$	$\frac{7N}{200} - y_0$	$\frac{9N}{200} - z_0$
5	25	30	45	10	$\frac{N}{40} - x_0$	$\frac{7N}{100} - y_0$	$\frac{9N}{200} - z_0$
6	25	35	40	15	$\frac{N}{60} - x_0$	$\frac{7N}{300} - y_0$	$\frac{2N}{75} - z_0$

Notes that if the value of x, y or z , is a mixed fraction of the form $m \frac{a}{b}$ where $\frac{a}{b}$ is proper with $b \geq 0$, then the following remark holds for the fraction $m \frac{a}{b}$

- (i) For $m \geq 0$ and $\frac{a}{b} > \frac{1}{2}$, we have $m \frac{a}{b} = m + 1$
- (ii) For $m < 0$ and $\frac{a}{b} > \frac{1}{2}$, we have $m \frac{a}{b} = m - 1$
- (iii) For $m \geq 0$ and $\frac{a}{b} \leq \frac{1}{2}$, we have $m \frac{a}{b} = m + \frac{1}{2}$
- (iv) For $m < 0$ and $\frac{a}{b} \leq \frac{1}{2}$, we have $m \frac{a}{b} = m - \frac{1}{2}$

The conditional approximation above is from the fact that two visiting lecturers are assessed as equivalent to a full time *lecturer*. In particular a visiting lecturer is assessed equivalent to half a full time lecturer as stipulated in 2007 NUC BMAS [10][11].

3. METHODOLOGY

The Methodological approach to the development of the NUC lecturers' information system is based on Object Oriented Analysis & Design (OOAD) approach with the Structured System Analysis and Design Methodology (SSADM). A Top-Down Design approach was used, where the entire system was broken into several subsystems and each subsystem was further sub-divided into different modules.

4. Implementation and Test Results

Hypertext Preprocessor (PHP), MYSQL, and Cascading Style Sheets (CSS) were used as development tools. PHP was used because it is a general purpose server side scripting language originally designed for web development to produce dynamic web pages. MYSQL was adopted in this study as the database engine because of its ability to run as a server providing multi user access to a number of databases. Unified Modeling Language (UML) was used as a graphical language to specify diagrams for documenting the system behavior.

The NUC lecturers' information system after been implemented was test and run in different systems. The Various modules have successfully transformed all NUC academic accreditation tasks from being manual activities to secured digitized ones on a dynamic website. Some of the main modules in the system are shown in Figure 1, figure 2, figure 3 and figure 4. Meanwhile, there are several other modules in the portal.

4.1. Main Menu Implementation

The main menu contains various actions that the users can perform on the system. It is the landing page of the propose system which enable the users to interact with the system by simply selecting from the list of possibilities (menu) through which many other interface can be accessed

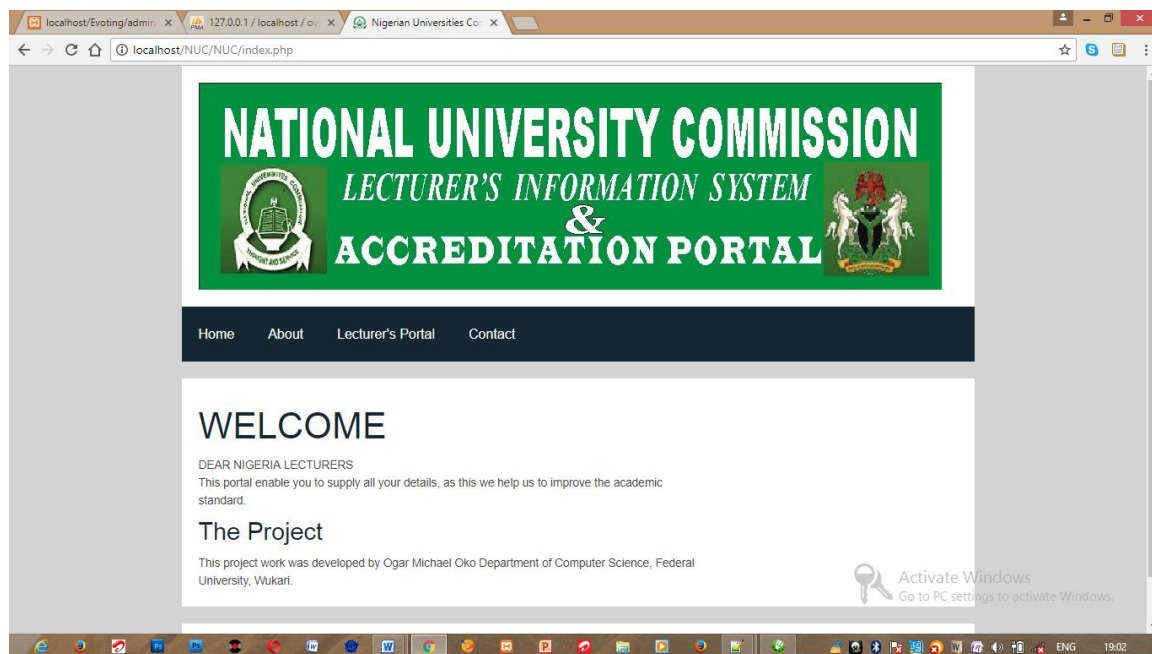


Fig 1: Main menu implementation of the NUC Lecturer information system.

4.2. One Time Password Verification Implementation: The OTP is a password generated by the system administrator (NUC) to all Universities. Every lecturer must obtain this password for his/her main university of service to register on the portal.

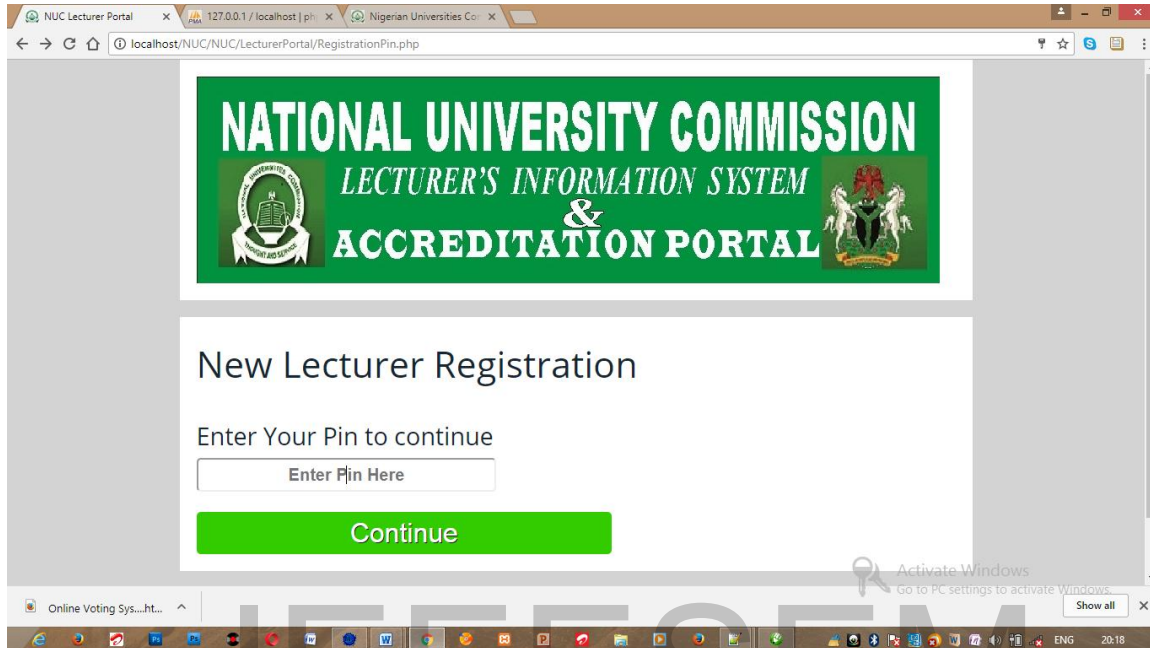


Fig 2: One time password verification

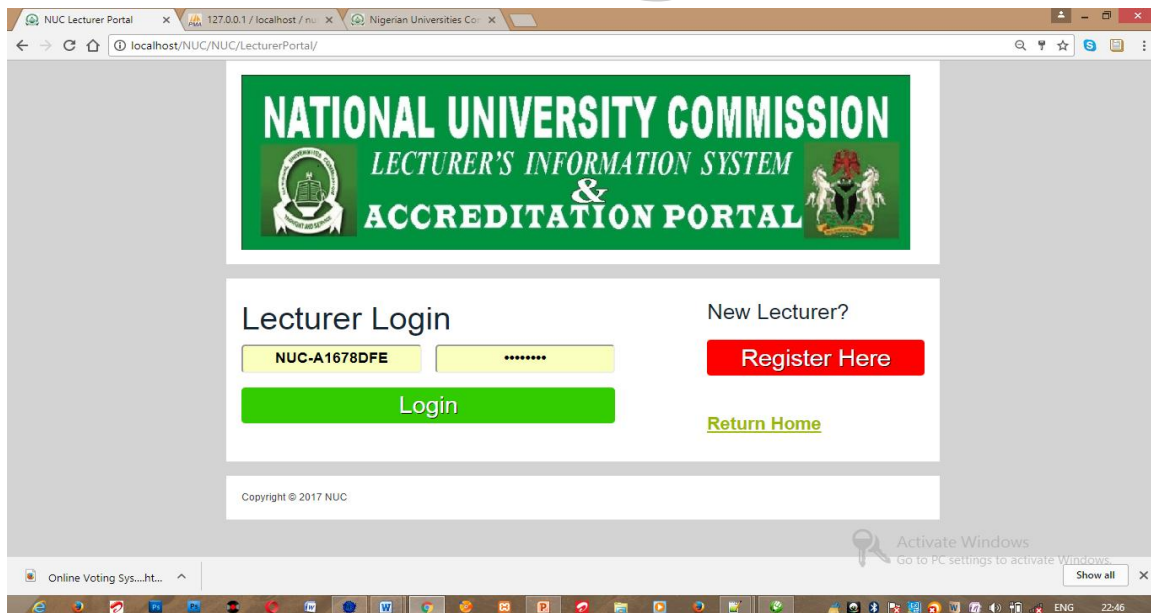


Fig 3: Lecturer Login Page.

4.3. Lecturer Registration form implementation: The lecturer registration form is an interface where the lecturers fill all their detail information, it is organized into Bio-Data form, Educational Data, Professional

Qualification and Current position. These serves as input medium of capturing the required lecturers' details.

4.3. Lecturers Home Page implementation: This page is accessed after the lecturer login. On this page, the lecturer can view and edit his/her profile

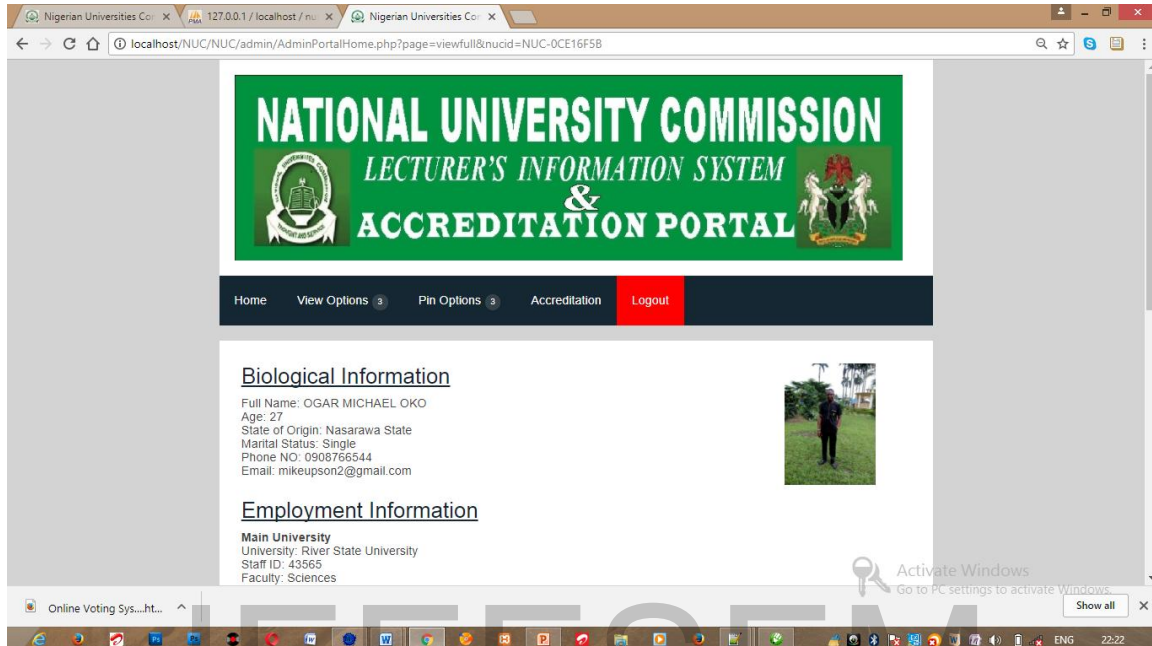


Fig 4: lecturer Home Page

4.5 Admin login page implementation: This interface enable the system admin to login to the system to view all lecturers that has signup on the portal, generate one time password, sort lecturers and carryout accreditation.

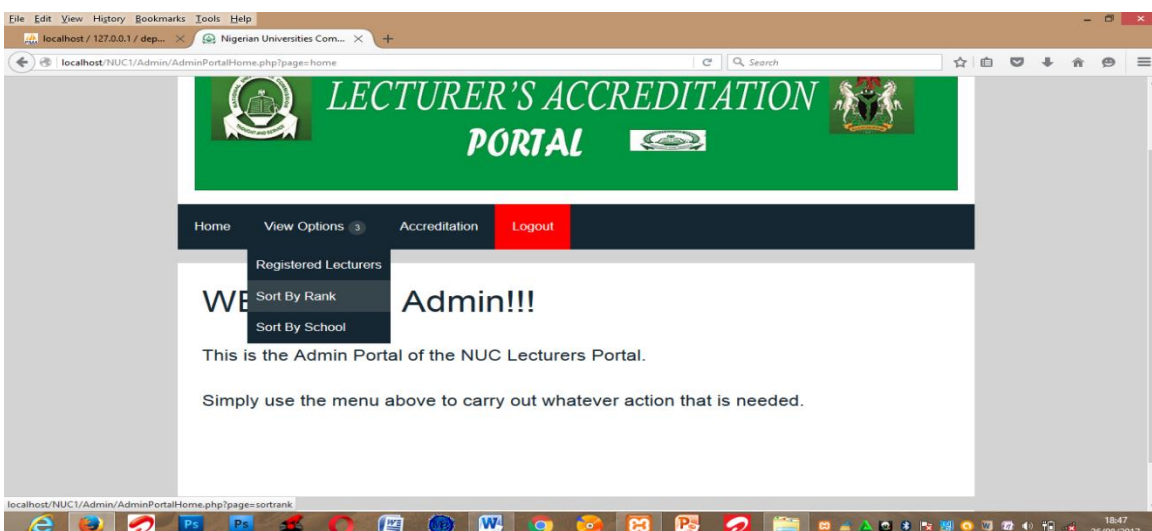


Fig 5: Main System Administration Page

5. Recommendations

To take advantage of the benefits provided by this study, it is recommended that the Nigeria University Commission (NUC) adopt the use of this computerized system of lecturers' accreditation across universities in the country for their accreditation/quality assurance exercise. The accreditation agents should be adequately trained by way of workshops and seminars to be able to use the new system when deployed.

Necessary funds should be made available to the Nigeria University Commission (NUC) for a smooth take-off of the new system. Lastly, a proper maintenance culture should be adopted and funds committed to maintenance. This will ensure that the lifespan of the new system is elongated.

4.1 Conclusion

Accreditation of lecturers/academics programs in tertiary institution in Nigeria by the National University Commission (NUC) is a necessity as the place of academic staff in any academic institution cannot be overemphasized. The type, quality, and quantity of lecturers in the nation's University system for the achievement of its goals and objectives are very crucial to its success.

The research centred on secured lecturer information capturing and minimizing unduly lecturer migration during university accreditation, the finding of this study clearly show that lecturers migrate from one university to another during accreditation. The result is a web base application that capture all university details in Nigeria, and assign a unique ID to them in order to restrict this unduly migration. This enable the accreditation agent to verify the university to which a particular lecturer belong.

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