**CHAPTER THREE**

1. **SYSTEM ANALYSIS OF THE EXISTING SYSTEM**

The present system as stated in the previous chapter involves manual procedures of university accreditation. Thus, it is my desire to go into the System Analysis of the present system to ascertain the reason it failed and modify the problems associated with it. It is important to realize from the on-set that the success of the effort depends on the skill and faithfulness of the person involved. This is true because of the fact that no human being is above error. One thing is certain; the system is full of very obvious errors because of the fact that the collection, storage, retrieving analysis and decision making based on data are done manually. As such, the present system do cause some delay in the accreditation of universities and /or programmes offered.

**3.1 System Investigation**

System Investigation involves carrying out very detailed investigations in order to fully understand the current system and the proposed new system.

Reasons for system investigation include:

1. Determining the scope of the project, by evaluating the complexity of the problem and the effort required to complete it. This information can assist with planning the project and allocating the necessary resources to it.
2. Increasing user confidence, by reassuring users that the analysts fully understand the nature of the problem, and the business operations that the system will carry out.

**3.1.1 Data Collection**

Data collection is the process of gathering and measuring information on variables of interest in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes. The data collection component of research is common to all fields of study including physical and social sciences, humanities, business, etc. While methods vary by discipline, the emphasis on ensuring accurate and honest collection remains the same. The goal for all data collection is to capture quality evidence that then translates to rich data analysis and allows the building of a convincing and credible answer to questions that have been posed.

The types of data collection include:

1. Surveys: Standardized paper-and-pencil or phone questionnaires that ask predetermined questions.
2. Interviews: Structured or unstructured one-on-one directed conversations with key individuals or leaders in a community.
3. Focus groups: Structured interviews with small groups of like individuals using standardized questions, follow-up questions, and exploration of other topics that arise to better understand participants.

However, the Interview method of data collection is adopted here where all relevant data concerning manual accreditation procedures were collected from the students and support services department of the Nigerian University Commission (NUC).

* + 1. **Information Captured**

Information is a processed data. Hence, the Information I captured from the students and support services department of the Nigerian University Commission (NUC) are accreditation instruments such as a copy of the *Self Study Form*, *Programme Evaluation Form(PEF) ,Manual of accreditation procedures,* *Accreditation Panel Report Form (APRF) and Minimum Academic Standards Document.*

1. Self-Study Form (SSF): The self-study form is divided into two sections; section “A” and Section “B”. The Section “A” solicits general information about the University and requires the Vice-Chancellor or a designated officer of the University visited to provide the information. The Section “B” solicits information about the programmes to be accredited and requires the Head of Department of the programmes to be accredited to provide the information.
2. Manual of Accreditation Procedure for Academic Programmes in Nigerian Universities: This document provides the detailed information on the objectives, processes and specimens of the other forms that have been completed by the universities and panel members for each of the programmes.
3. Programme Evaluation Form (PEF): This form is to be completed by each panel member. The form provides scoring columns and columns for relevant comments.
4. Accreditation Panel Report Form (APRF): The Chairman of the panel completes this form for each of the programmes being accredited. The summary of scores and accreditation status are entered into the space provided in the form.
5. Minimum Academic Standards Document: The Minimum Academic Standards Document contains the minimum course content in each degree programme, minimum physical facilities; minimum laboratory space; library and the staff/student ratio.

**3.2 Analysis of Existing System**

Research reveal that all data inputs for the present system are in paper form and contain written inputs from suitable personnel. For instance, before accreditation is carried out in a University, a *Self Study Form* which is paper-based is issued to the University for completion within two (2) months and twelve copies of the *Self-Study Form* would be returned in respect of each programme/discipline/sub-discipline to be accredited. An accreditation panel is then set up to evaluate the accreditation exercise of the concerned University for three (3) working days and report of assessment is generated on Programme Evaluation Form (NUC/PEF) which is also paper-based.

Hence, all data records (registered Universities and respective programme, accredited Universities) are presently held on paper forms and end up in file-folders. For management of the accreditation record, the file must be arranged physically for decision making. The present system has a lot of problems such as the problem of inadequate storage facility, since the files needs to be stored alphabetically in the cabinet, loss of documents in the events of fire outbreak since papers is quite susceptible to fire, time consuming, error prone and as such leave Universities unsatisfied.

**3.2.1 History of Nigerian University Commission (NUC)**

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 (Okojie, 2008).The Commission is, therefore, absolutely relevant to the running of all universities in the country. In specific terms, the Commission:

1. advices Mr. President and the State Governors, on matters bordering on the establishment of new universities and other degree-awarding institutions in the Federal Republic of Nigeria;
2. prepares master plans, from time to time, for the balanced and coordinated development of universities in Nigeria;
3. ensures that quality is maintained in the academic programmes of the universities;
4. carries out higher education-related investigations;
5. advises the Federal Government on the financial needs of the universities;

Executive Secretary

Director Inspection and Monitoring

Director Finance and Accounts

Director Students and Support Services

Director Management and Support Services

Deputy Executive Secretary

Director Research and Innovation

Director Academic Standards

Board

Director Information and Communication

Fig 3.1 Organizational Structure of Nigerian Universities Commission (NUC)

Source: Director, Students and Support Services, NUC.

**3.2.2 Modules of Operation**

Fig. 3.1 shows the organizational structure of Nigerian Universities Commission.

It shows the different units that make up the organization and the flow of authority. The units and their functions are:

1. **Board:** The board has the highest authority and so all heads of the different units report to him. They make comments to the president/governor concerning additional departments on the commission for approval. It is then presented to the federal/state council for final approval.
2. **Executive Secretary:** The Executive Secretary is a career officer ordinarily appointed as in state by the state chief executive on the advice of the civil service commission. He oversees the activities of the *ministerial* and non-*ministerial* departments.
3. **Deputy Executive Secretary:** The Deputy Executive Secretary clears all correspondence and other matters coming into and out of the Executive Secretary’s office.
4. **Director Academic Standards:** This unit develops policies and programmes towards enhancing orderly development of University education as well as its quality and relevance to national development and global competitiveness.
5. **Director Research and Innovation:** This department is responsible for delivering desired, relevant, innovative, and quality-driven interventions in Nigerian universities in partnerships with other stakeholders to enhance the infrastructure and capacity of Nigerian universities to better execute their research and development mandates.
6. **Director Inspection and Monitoring:** This unit seeks to ensure that Nigerian universities comply with all the Benchmark Minimum Academic Standards (BMAS) and other quality assurance guidelines that Government may lay down (through the commission) from time to time through scrupulous inspection and regular monitoring
7. **Director Management and Support Services:** This department is the nerve centre for the strategic management of the commission’s human capital towards the successful accomplishment of its goals and objectives.
8. **Director Students and Support Services:** This department is responsible for promoting the deployment of career management initiatives that will enable students acquire critical life skills inorder for them to make informed career decisions.
9. **Director Finance and Accounts:** This unit helps to provide sound financial management counsel to the commission and quality services by implementing financial policies and procedures with generally accepted accounting standards.
10. **Director Information and Communication:** This unit assists the NUC to carry out its mandate in the deregulated Nigeria University System by enabling University and NUC to take advantage of Information and Communication to reap from.

**3.3 Problem of the Existing System**

Some of the problems of the existing system are:

1. Inaccurate information is a problem due to the manual method of recording, so the information gotten from the management is rarely accurate.
2. Delay in accrediting certain programmes in Universities.
3. The manual system of NUC accreditation can lead to loss of vital information about a University.
4. Immediate access to certain programmes offered by a University is mostly difficult.
   1. **Alternative of the Existing System**

The alternative of the existing system involves the design of a Computer-Based NUC Accreditation System that will effectively handle the various activities involving accreditation. The advantages of this alternative include:

1. To quicken accreditation exercise in Universities;
2. The proposed system allows Universities to view the criteria on accreditation of certain programmes as well as know their status based on NUC accreditation.
3. Access to the application is done online from any location.
4. Accuracy is maintained, as the system will yield more reliable result.
   1. **Feasibility Studies of the Proposed System**

This study is carried out in order to ascertain the possibility of achieving the proposed system goals. It is done on the basis of technical, economic and operational feasibilities etc.

1. **Technical Feasibility**

The programming language and the server used are very compatible, and so produce output at a very high speed with a quick response time when data is entered. The programming language used is PHP and MySQL.

1. **Economic Feasibility**

This is the cost/benefit analysis in which a decision is made to design and implement the system if benefits outweigh cost. The associated benefits and cost of the system are listed below;

1. Provide information for better design.
2. Improve accreditation management services for universities through more responsive procedure.
3. User friendly.
4. It will also afford universities to know their accreditation status.
5. The speed of operation is increased.
6. Because of the systems low requirement of labor, salary paid to staff will be reduced.
7. Accuracy is maintained, as the system will yield more reliable result. Table 3.1 shows the tangible benefits of the proposed system.

**Table 3.1: Tangible Benefits of the Proposed System.**

|  |  |  |
| --- | --- | --- |
| **Tangible Benefits** | | |
| 1 | Cost reduction | N4,000 |
| 2 | Error reduction | N2,500 |
| 3 | Increased flexibility | N11,000 |
| 4 | Increased speed quality | N11,000 |
| 5 | Reduced labor | N8,500 |
| 6 | Improved management planning and control | N9,000 |
|  | **TOTAL** | **N46,000** |

1. **Cost**

This is the cost of developing and maintaining the system. Though the cost of developing may be high, its reward will be much as it reduces the cost of labor and quickens accreditation exercise.

Tables 3.2 and 3.3 below shows the recurring and one-time costs respectively.

1. Recurring cost: this is the cost resulting from the ongoing evolution and use of the system.
2. One-time cost: this is the cost associated with project development and start-up.

**Table 3.2: Recurring Cost of the Proposed System.**

|  |  |  |
| --- | --- | --- |
| Recurring cost | | |
| 1 | Application software maintenance | N18,000 |
| 2 | New hardware and software | N3000 |
| 3 | New storage medium | N2000 |
|  | TOTAL | N23,000 |

**Table 3.3: One-Time Cost of the Proposed System.**

|  |  |  |
| --- | --- | --- |
| One-time cost | | |
| 1 | Development cost | N20,000 |
| 2 | software |  |
| i | Dreamweaver application | N1500 |
| ii | Wamp server application | N1500 |
| 3 | User training | N7,000 |
|  | TOTAL | N30,000 |

1. **Time Value of Money (TVM)**

This is a concept which reflects the notion that money available today is worth more than the same amount tomorrow.

Assuming a 10% interest rate, the TVM will be;

PVn= (Y×1)/(1+i)n

Where; i= interest rate

n= number of year

PV= present value of future cash

Y= amount its value is to be found

Using the discount factor (D.F) method

D.F= 1/(1+i)n

Where; i= interest rate = 10%

n= number of years = 5 years.

From tables 3.1, 3.2 and 3.3 above;

Benefit = N40000

One-time cost = N30000

Recurring cost = N23000

Therefore;

10% = 10/100 = 0.10

1/(1+0.10)1 = 1/(1.10)1 = 0.9

1/(1.10)2 = 1/1.21 = 0.83

1/(1.10)3 = 1/1.331 = 0.75

1/(1.10)4 = 1/1.4641 = 0.68

1/(1.10)5 = 1/1.61051 = 0.62

The table 3.4 and figure 3.2 below shows the cost-benefit analysis

**Table 3.4: Cost-Benefit Analysis of the Proposed System.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| TIME(YEAR) | 0 | 1 | 2 | 3 | 4 | 5 | Total |
| Benefits | 0 | 46 | 46 | 46 | 46 | 46 |  |
| D.F | 1 | 0.91 | 0.83 | 0.75 | 0.68 | 0.62 |  |
| PV | 0 | 41.86 | 38.18 | 34.50 | 31.28 | 28.52 |  |
| NPV | 0 | 41.86 | 80.04 | 114.54 | 145.82 | 174.34 | 174.34 |
|  |  |  |  |  |  |  |  |
| COST | 30 | 23 | 23 | 23 | 23 | 23 |  |
| D.F | 1 | 0.91 | 0.83 | 0.75 | 0.68 | 0.62 |  |
| PV | 30 | 20.93 | 19.09 | 17.25 | 15.64 | 14.26 |  |
| NPV | 30 | 50.93 | 70.02 | 87.27 | 102.91 | 117.17 |  |
| TOTAL | (30) | (9.07) | 10.02 | 27.27 | 42.91 | 57.17 | 117.17 |

From the table 3.4 above, it can be concluded that between the 2nd and 3rd year of operation, the firm will start making profit.

1. **Operational Feasibility**

Presently, all work is done manually. As such, response time is long. The structure of the organization will not be changed, but the system will improve operations. All the computational work will be done automatically and response time will be short.

The operation of the proposed system will require skilled operators and as such, training is mandatory.

* 1. **Selection of Alternative**

After a well detailed study of the existing system, it is obvious that it does not fulfill the objective of the organization. Thus, to make the objective possible for the organization, it is required to have a computerized information system to facilitate the processing of tasks more accurately and quickly. As such, to achieve this, it is necessary to design and develop a new system which makes effective and perfect utilization of man power and resources. Some of the expectations of the new system include:

1. Automate accreditation procedure
2. Provide information for better design.
3. Improve accreditation management services for universities through more responsive procedure.
4. User friendly.
5. It will also afford universities to know their accreditation status.
   * 1. **Use Case Diagram**

This is a structured outline or template that describes user requirements modeled in a structured language like English.

In software and systems engineering, a use case is a list of steps, typically defining interactions between a role i.e. an actor; and a system, to achieve a goal.

In systems engineering, use cases are used at a higher level than within software engineering, often representing missions or stakeholder goals. The detailed requirements may then be captured in systems modeling language.

However, as an important requirement technique, use cases have been widely used in modern software engineering over the last two decades.

Use case diagrams depict:

1. **Use cases:** A use case describes a sequence of actions that provide something of measurable value to an actor and is drawn as a horizontal ellipse.
2. **Actors:** An actor is a person, organization, or external system that plays a role in one or more interactions with your system. Actors are drawn as stick figures.
3. **Associations:** Associations between actors and use cases are indicated in use case diagrams by solid lines. An association exists whenever an actor is involved with an interaction described by a use case. Associations are modeled as lines connecting use cases and actors to one another, with an optional arrowhead on one end of the line. The arrowhead is often used to indicating the direction of the initial invocation of the relationship or to indicate the primary actor within the use case. The arrowheads are typically confused with data flow and as a result I avoid their use.
4. **System boundary boxes (optional):** You can draw a rectangle around the use cases, called the system boundary box, to indicates the scope of your system. Anything within the box represents functionality that is in scope and anything outside the box is not. System boundary boxes are rarely used, although on occasion one can use them to identify which use cases will be delivered in each major release of a system.
5. **Packages (optional):** Packages are UML (Unified Modeling Language) constructs that enable you to organize model elements (such as use cases) into groups. Packages are depicted as file folders and can be used on any of the UML diagrams, including both use case diagrams and class diagrams. One can use packages when diagrams become unwieldy, which generally implies they cannot be printed on a single page, to organize a large diagram into smaller ones.

Fig 3.2 shows the components used for the design of use case approach and the use case diagram of the Computerized NUC Accreditation is shown in figure 3.3 below:

1. Actor :
2. Use case:
3. Relationship/Association:
4. System boundary:

Fig 3.2: Components of Use Case Diagram.

**3.6.2 Problem Statement**

1. University’s registration
2. Store university’s record
3. University’s login through registrar
4. View accreditation status
5. Process accreditation
6. Leave a comment
7. Generate report

Admin

Staff

University’s registration

Store University’s record

University’s login through Registrar

View accreditation status

Process accreditation

Leave a comment

Generate report

Fig 3.3: Use Case Diagram of the Proposed System

* + 1. **Detailed Description of the Use Case**

1. **University’s Registration:** This is done by the Admin and University registrar. The University’s registrar enters necessary details of the University and the admin registers these details.
2. **Store University’s Record:** This is done by the Admin who stores all the necessary information provided by the registrar of the University in the database to aid easy retrieval when needed.
3. **University Login:** This is done by the University registrar and the admin. With the help of the university’s details (username and password), the admin logs in the university.
4. **View Accreditation Status:** The University’s registrar views accreditation status of the University particular programme, discipline or sub-discipline.
5. **Process Accreditation:** This is done by the admin who processes university’s accreditation based on information obtained. After processing, the result is automatically updated in the “view accreditation status” of the university’s page.
6. **Leave a Comment:** This is done by both the admin and the university registrar through sending email. The registrar can send a comment through mail to the admin of the NUC which could be an expression of dissatisfaction of accreditation status and the admin can as well reply to the comment.
7. **Generate Report:** Report is generated by the admin and this report describes the names of universities, address, programmes offered, number of lecturers and accreditation status.