CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The physical nature of this task has made it a bit slow and makes it difficult for progress and milestone to be monitored. As such, a computerized system is hypothetically a good way to speed up this process to be more effective and efficient.

In this project, there will be a software design which can operate with features such as data collection, storage, and retrieval. In summary, we build a web application with the basic features and the interaction between them and then allow it to be used as a basis for more industry level software we can find.

1.2 STATEMENT OF THE PROBLEM

The proposed implementation seeks to understand the learning and instruction methods and project that understanding in the form of a software. There will be some key considerations that will be taken during the implementation of this idea. These considerations include

- A good User Interface and User Experience
- A lesson level tracking feature to monitor progress in particular lessons under the topic of operating systems.
- Feedback mechanisms.

1.3 MOTIVATION OF THE STUDY

The study has its motivations in the fact of the ICT industry being a key part of our everyday life especially in the 21st century. An operating system e-learning platform will help digitize the education sector and especially in the field of computer science and information technology.

1.4 AIM AND OBJECTIVES OF THE STUDY

The aim of the study is to build a web application system which would be effective in storing data and offering instruction in particular subject matter.

The objectives include:

1. An extensive study of the literature around the implementations of various online learning platforms.
2. Identifying the key areas of operation in related e-learning projects where improvement is needed.

- Design of systems with the potential of proffering solutions to those areas identified in (ii) above.

1. Implementation of the designs in (iii) above and providing recommendations for the future.

1.5 SCOPE OF THE STUDY

The scope of the study is a typical online learning application platform. It will have up to 10 lessons on basic operating system concepts as a test run prototype. This reduced scope is due to the time constraints as well as the tedious nature of implementing such a software for an entire curriculum.

In pursuing a computer science degree, a clear understanding of operating systems and the algorithms around them is needed. It is one of the frameworks on which other computer science knowledge is based on. Over time, the instruction of courses like this in the university has been through physical or software document handouts.

1.6 SIGNIFICANCE OF THE STUDY

The significance is such that the study can be added to a long list of research papers that can be referred to, to imbibe the culture of automated systems into our daily educational operations in particular, the operations of learning institutions.

1.7 OPERATIONAL DEFINITION OF TERMS

1. E-LEARNING: E-learning refers to electronic learning and is a method of delivery of all or part of a course digitally through the aid of a computer.
2. EDUCATION: This a process by which instruction ins given especially at a school or university.
3. DISTANCE EDUCATION: Distance Education is defined as instruction between a teacher and students when they are separated by physical distance and communication is accomplished by one or more technological media (American Association of University Professors, 2007; Oregon Network for Education, 2000).
4. ONLINE LEARNING: Online learning simply refers to learning that takes place over the internet.
5. COMPUTER AIDED INSTRUCTION: What is computer-assisted instruction? "Computer-assisted instruction" (CAI) refers to instruction or remediation presented on a computer
6. CURRICULUM: A curriculum is a collection of lessons and assessments that a will be taught in an educational institution by a teacher.
7. ONLINE SYSTEMS: Online systems are systems where the input data enter the computer directly from the point of origin (usually a terminal or workstation) and/or in which output data are transmitted directly to that terminal point of origin

1.8 OUTLINE OF METHODOLOGY

The implementation of this idea and project would be achieved using server-side programming language PHP and the MySQL database querying language. These languages were chosen for their server-side compatibility,

Their high level of security and for the general web compatibility. The front-end technologies used include HTML, CSS, and JavaScript. This will also be hosted as a web application on an online domain.

1.9 ORGANISATION OF THE PROJECT

The project is organized such that; Chapter One gives a brief introduction in form of the Background of the Study of a general overview of the concept of e-learning worldwide. In Chapter Two, we have a broad look at the related implementations of e-learning information systems. Chapter Three examines the System Architecture, the system design and analysis. Chapter Four presents the implementation of the project using necessary programming languages and development models. It also presents the result of testing carried out. Chapter Five rounds off the project work with the summary, conclusions, and recommendations for future works.

SAMPLE #2

Design and Implementation of Biometric-Based Attendance Management System

ABSTRACT

Biometric technology is a method for identifying a person solely based on the attributes that make them that person. This method is becoming more popular, especially in higher education, where impersonation is occurring at an alarmingly high rate. Using characteristics like fingerprint, face, iris, and palm print, the technology effectively answers the identification issue. The major goal of this research is to create a fingerprint identification Imo State university enrolled students and to monitor their attendance in lectures and exams. As a result of this research, a system was created and configured to work properly with a biometric device. Dot net framework was used in the creation of the platform. All of the interactive interfaces were coded in visual basic.net, with the database running on SQL server 2008 as the back-end. The System Usability Scale technique was used to measure the produced system's usability efficiency in terms of usability (SUS). To assess the system's usability, the researchers had 60 students navigate through the system and then react to a questionnaire based on their experiences. The SUS technique of assessing the system's usability yielded an overall score of 82.7%. Because of this, the system proved to be very accurate, dependable, and safe for storing student biometric data, and it prevents unauthorized users from accessing it. As a result, it was determined that this method is crucial for preventing student impersonation and maintaining accurate student information. As a result, it's impossible to overstate the system's applicability and scholarly significance. As a result, in order to put a stop to the many instances of impersonation in lectures and tests at educational institutions. Akwa Ibom State University, in particular, may use the technology created in this research to completely eliminate this threat.

CHAPTER ONE

INTRODUCTION

1.1   Background to the Study

Student Identification and Tracking using Biometric Identification Systems are becoming increasingly important in the education industry to accurately identify and track pupils. Standard student attendance monitoring systems such as roll call have limits and inconsistencies [1]. Because these solutions are more precise, quicker, more practical, and a more valuable mechanism for maintaining students' credentials and security, academic institutions increasingly need biometric student monitoring systems. It has been reported that conventional student identification and presence techniques such as roll call or paper-based attendance are out of date and result in academics and supervisors spending excessive time recording student track. Manual monitoring is also challenging when dealing with huge classes of kids. As a result, current monitoring systems have flaws that make it impossible to guard against issues like proxy attendance, Identity card theft, impersonator, and monitoring mistakes that directly impact educational quality [2]. Students may check-in and exit swiftly and efficiently with the use of biometric identification technologies, according to Manoharan et al. [3]

To assure identification accuracy, avoid mistakes, and eradicate proxy attendance and in the instance of identical twins, biometric technology makes use of 's physiological and biometric traits (which are different for each individual). As a result of biometric technology's strong encryption, pupils are protected against identity theft. According to Thomas et al [4], Biometric attendance systems have improved capturing and monitoring student attendance accuracy. When a biometric attendance machine records a different physiological characteristic like a hand or fingerprint, an iris pattern, or even a voice recording, it serves as a record for identity verification, allowing the validated individual to carry out the work as permitted. Biometric attendance devices also keep track of the work schedules of workers, such as who did what and when, and so on. Biometric attendance machines are becoming more popular. To assure the accuracy of attendance, biometric attendance systems utilize failsafe technology like fingerprints. These systems are especially effective when dealing with huge numbers of workers or students. It gives administrators an easy method to keep track of both personnel and student absences as an added benefit.

For example, fingerprint, face, iris, and retinal pattern recognition are all examples of biometrics that may be used to authenticate an individual's identification. These physical data approaches are garnering attention as a personal identification method that is more convenient than standard methods such as passwords or ID cards since they employ measurement data and such data is unique to the individual and stays so throughout one's lifetime [5]. Testing, evaluation, and accreditation are all made possible by examination as a tool. However, students must first meet a specified percentage of class attendance requirements in most institutions before sitting for an examination [6]. However, because of the strain of manually taking attendance and keeping records, many institutions in developing nations have failed to meet this requirement. Most developing nation universities still utilize pen and paper to keep track of student attendance, which has shown to be stressful, time-consuming, unreliable, incorrect, and inefficient, according

to Adetiba et al. [7]. Students will be individually identified and verified to take a test using biometric technology in the same way. Unauthorized participation in an examination is prevented by verifying the behaviour features using a unique character like a fingerprint for each student.

To authenticate a person, biometric systems, such as fingerprints or signatures, analyze physical and behavioural traits, such as those found in Jaiswal et al [8]. Studies suggest that exams are the most prevalent tool around which the educational system revolves [9]. Most educational systems incorporate some evaluation as a way to gauge how effective the system is. It's a tool used to determine who gets to move forward on the academic ladder. In reality, the grading system that all students are categorized into on a yearly or more regular basis is formed by exams and professor evaluations [10]. Using non-automated biometrics stretches back to human civilization's earliest days when people started identifying one another based on physical or behavioural features. Biometrics is not a new idea. It is the oldest type of identification being used today. According to Woodward et al. [11], authentication via biometrics extends back over a thousand years to the practice of East Asian potters who used their fingerprints to identify their products. In traditional China, handwritten signatures (chops) were used as an early form of biometric identification, according to [9]. In 1882, Bertillon Systems measured their subjects' length, arm length, and thumb and forefinger duration. The use of biometric data (in this example, fingerprints) in criminal records was one of the earliest institutional uses of this technology.

Forensic scientists and law enforcement organizations' attempts to identify and categorize offenders in the late 19th and early twentieth century might be seen as the genesis of modern biometric systems. Commercial biometric systems (usually dependent on hand geometry) developed for use in physically accessing buildings in the 1960s and 1970s included (AFIS) automatic fingerprint recognition system utilized by law enforcement organizations. Biometrics have been used in computers for a few years now. Those designed with a certain purpose in mind but lacked the versatility to work in various settings. Consequently, many people were forced to use expensive solutions that they couldn't or didn't want to use. Although technology improved, biometric solutions were generally acknowledged as viable alternatives to security solutions such as fraud control, security breaches, and human administrative mistakes; biometric technology expanded [12].

Also, biometrics' development has addressed the drawbacks of previous verification techniques. Biometrics may establish a person's identification based on who you are, rather than "what you have" (like identity card) or "what you recall (e.g., a password). There are now a variety of biometric technologies in use to verify someone's identification. These include fingerprints, hand geometry (iris and retina), face, facial thermograms, signature, palm print, and voice. Compared to more conventional security approaches, biometrics has an advantage since the data cannot be stolen or shared easily. Biometric solutions improve security and simplify users' lives by eliminating creating and remembering complex passwords [13].

1.2   Statement of the Problem

In most universities, student attendance identification is now done manually using paper, pencil, and other antiquated tools where students write or sign their names next to them. This technique is time-consuming and unproductive since it is sometimes difficult to update student records, store and maintain such information, and calculate attendance percentages for test reasons. The mechanism used to identify student attendance does not track individual attendance records over time [14]. Furthermore, since the essential data for these records are collected so that the motivation for retaining student attendance records is undermined, data from these records are often fraudulent, inaccurate, and not legitimate. False attendance and impersonation are made extremely simple due to the present procedures utilized for obtaining and preserving data on student attendance. Students find it very easy to put their friends' identities on the attendance sheet without the teacher or any other official in charge detecting it.

In most cases, instructors have to deal with an empty classroom and an overflowing enrollment list. In most cases, absentee students attend courses for the first few weeks before dropping out and ask their regular classmates to sign their absence slips for them. There isn't enough time for lecturers to go over the attendance list one by one since they are too busy lecturing and checking students in [15]. Lack of an actual attendance list, as well as fraudulent attendance lists, have huge ramifications. Teachers have a tough time identifying actual lecture attendees or compiling accurate data on student attendance for record-keeping because of the University's current ineffectiveness at tracking students' attendance. Furthermore, with these inadequate student attendance-taking systems, impersonations during tests are also exceedingly difficult to detect. According to Stripling et al. [15], the consequences of non-attendance influence students' overall performance and the classroom community as a whole.

Class failure and instructor morale suffer when students fail to show up, and learning standards are lowered as a result. Additionally, class attendance decreases as the semester goes, especially on certain days of the week like Friday, as the weekend approaches. When students forget or lose their examination cards during semester exams, neither the students nor the school officials have any physical proof that they had the requisite percentage of attendance to be permitted to sit for the test. A fingerprint biometric identification system, on the other hand, might easily overcome these minor difficulties, preventing many students from skipping exams. Olaniyi et al. [16]confirmed this. Candidates' decreased self-development abilities and confidence in reading and writing exams are being harmed by the rising occurrence of examination impersonation among students in higher education institutions. Despite many tactics used by stakeholders to guarantee that applicants complied with test standards, it had a detrimental impact on Nigeria's educational system [17] With the emphasis on certificates these days, students in Nigeria are more likely to participate in criminal acts like skipping classes or boycotting school as a means of obtaining their desired outcomes.

While authorities at the University have made concerted efforts to address issues such as a lack of effective student attendance records and student impersonation by, for example, providing attendance registers for roll calls, the threat persists, with disastrous results for students, the

University, and society as a whole. That's why we carried out our research to create a biometric fingerprint that students can use. This study was undertaken to help us do just that.

1.3 Study Objectives

The major goal of this research was to create a design and implementation of the biometric-based attendance management system. The following specific aims have been devised to attain this primary goal:

1. Analyze the current method of student identification at the Akwa Ibom State University in Nigeria.
2. To create a biometric system that can be used with a biometric device to instantly identify students' fingerprints at the Akwa Ibom State University,

iii.   employ the method created to capture students' finger prints.

1. Using data from both registered and unregistered students, evaluate the performance of the developed biometric system.
2. Using the system usability scale, determine the application's usability developed for use with a biometric device (SUS).

1.4   Research Question

The implementation of the proposed system will answer the following research questions during this study:

1. What is Akwa Ibom State University's current student identification system?
2. How can a biometric system for instant identification of a student's fingerprint be developed?

iii.   How can the developed system capture students' fingerprints use a biometric device at Akwa Ibom State University?

1. How can the developed biometric system's performance be assessed using the data that included both enrolled and yet enrol students?
2. How can the usability of a developed application for use with a biometric device be calculated using the system usability scale (SUS)?

1.5   Significance of the study

The suggested method keeps a more efficient and precise student attendance record of identifying absenteeism and impersonated students. Furthermore, the system processes information quicker and more simply than the current paper-based student attendance register. Aside from that, this technique will let lecturers take student attendance more successfully without worrying about losing or ruining their attendance papers as they pass them around the class.

Furthermore, the system will enable institution administration to monitor students' class attendance in a specific course with low attendance, allowing management to correct the problem by giving relevant interventions. Imposters and impersonators will be unable to access examination halls because of the system's high degree of security. The technology will save past data using fingerprint biometrics, making it easier for instructors to access. Furthermore, the authentication method benefits the institutions and lecturers and the students by eliminating the tension associated with waiting, which sometimes results in delays and, in some cases, damage to the attendance sheet. It also eliminates the errors and inconsistencies associated with manual signing in, such as students who attend a class being registered as absent, resulting in the loss of the mark assigned to that attendance owing to numerous attendance sheets. Fingerprint Based Student Attendance Monitoring System is extremely useful in institutions, particularly during classes and exams when heavy security is typically used to validate students' identities to detect imposters. By using the Verification System, the number of security personnel will be significantly reduced. Additionally, the suggested method tackles the issue of missing examination attendance registers since information on students may be immediately created on the spot using the provided system.

1.6   Scope of the Study

A state-owned higher educational school, Akwa Ibom State University, was established in Uyo, the capital city of Nigeria's Akwa Ibom state. A wide range of biometric approaches is available. The focus of this investigation will be on fingerprints. A biometric fingerprint identification system was developed using student biodata from Nigeria's School of Technology at Akwa Ibom State University. From August 2018 to September 2019, the research will be conducted.