

# Development of A Computerized Biometric Control Examination Screening And Attendance Monitoring System With Fees Management

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**Abstract**— Examination is one of the ways to assess the receptiveness of student to various class teachings in various schools or institutions from primary to post - primary and tertiary institutions. But this is not without problem like impersonation, student class absenteeism and debtor student sitting for examination especially in private institutions. The proposed system developed with the aim of solving stated problems. The system did not only has the ability to take student class attendance and screening before and after examination but it can also be used to verify whether such student is in debit to the institution or whether the student has paid required percentage of the tuition before being allowed to sit for the examination thereby reducing number of student in debit before examination started, it will also eliminate impersonation during examination and stress of manual class attendance taking and record keeping, also avoid writing of name of absent student unlike in manual process of class attendance. The system will also make it easier to calculate required percentage of class attendance before any student is allowed to sit for an examination in any institution. The system adopted biometric access control techniques, which is designed with extended graphical user interface by using Microsoft visual studio 2010 and integrated with Microsoft fingerprint reader. The student information is stored by MySQL which serve as database located in the user's computer or server.

**Keywords**- Biometric; Fingerprint; Examination; Attendance; Tuition; Fees; Institution.

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## I. INTRODUCTION

Biometric can be defined as any automatically measurable, robust and distinctive physical characteristics or personal trait that can be used to identify an individual or verify the claimed identity of an individual [9]. It is also science and technology of authentication by measuring persons' physiological or behavioural features.

According to [6] examination is an instrument for testing, assessment evaluation and accreditation. But in most institution before any student is allowed to sit for examination such student needs to meet specified percentage of class attendance but due to stress of manual attendance taking and record keeping the percentage required before sitting for an examination has not been adhered to in many institution of developing nation.

In order to keep record of class attendance in most institution in developing country the process being adopted is the use of pen and paper for student class attendance, and this has been prove to be very stressful, time consuming, unreliable, inaccurate and inefficient [1].

According to the research carried out by [7], it was discovered that the use of biometric for attendance has eliminated need for stationary materials and personnel for

keeping records, thereby reducing stress of manual attendance process.

The use of computerized biometric examination screening and class attendance monitoring system with fees management will eliminate impersonation of candidates during examination; also eliminate idea of student writing names of absent student on the class attendance list. The system can also be used to verify student tuition payment status either in the classroom or before entering examination hall.

A fingerprint scanner will be used to collect fingerprint sample and with the aid of an application it will be used to detect those unique features to identify the person by comparing the features to sample on database. The uniqueness of fingerprint is determined by the pattern of ridges and furrows as well as the minutiae points [8].

## II. LITTERATURE REVIEW

In information technology, biometrics is usually refers to as technologies for measuring and analyzing physiological characteristics such as fingerprints, eye retina and iris, voice patterns, facial patterns and hand measurements, DNA, ear, palm prints and this has been categorized into two types of biometrics namely physiological and behavioural biometrics [3].

The manual attendance system average execution time for eighty (80) students is 17.83 seconds while it is 3.79 seconds for the automatic attendance management system using biometrics [7].

Reference [7] developed attendance management system using biometric but it lacks ability to be used as examination screening and tuition payment status of student that is fees management.

Reference [6] also developed biometric model for examination screening and attendance-monitoring system using finite state automata but the model did not include ability to be used as tuition payment confirmation status of student or student fees management. The need for students' tuition payment confirmation status cannot be overemphasis especially in private institution where that is there major source of generating funds for the running of the school.

Reference [2] developed a Radio Frequency Identification (RFID) based student attendance management system but the problem with the system is the possibility of RFID card been stolen and possibility of impersonation whereby attendance of absent student can be taken which is one of the problem with manual method of attendance.

According to [6] an examination is credible if it possesses the following key elements; free and fair, devoid of partiality, cheating and all forms of examination malpractices. And to achieve these key elements there should be proper way of identifying and verifying the credibility of the candidate before sitting for an examination

Reference [4] developed an automatic attendance system using Fingerprint Verification Technique. This work did not only focus on attendance management, but also on the specification of accuracy of the minutiae during enrolment and verification process.

The author reported a high degree of accuracy in the enrolment and verification process, but the attendance management software is a desktop application; hence it can only be used on standalone PCs where the application is installed. Again it cannot be used for examination screening and fees management.

The wireless fingerprint based attendance system developed by [8] can send report of the attendance to each student, parents, head of department and lecturers through e – mail and also show updated attendance but it cannot be used for student fees management and screening of student for examination.

In the research carried out by [5], it was discovered that fingerprint scanning can records an average of 93.4% and

93.81% accuracy and this is complementing findings of [4] also to support the use of fingerprint as source of input for the developed system.

#### METHODOLOGY

The system adopted biometric access control techniques, which is designed with extended graphical user interface by using Microsoft visual studio 2010 and integrated with

Microsoft fingerprint reader. The student information is stored by MySQL, which serves as database located in the user's computer or server.

The access point is through the use of fingerprint scanner as an input device.



Figure 1: Fingerprint Reader

### III. SYSTEM ILLUSTRATION PROCESS

In the first block, new or existing student's biometric data such as fee management, department, semester and level are registered together with the fingerprint at the school's registration post (e.g. Bursars' office).

The second block is the Biometric application database which serves as the central database in which all information of each students is stored. It can be accessed based on the user rights assigned to all users by the admin. Other users can be the lecturer, department worker etc.

In the third block (various school departments), courses for students that have payed their tuition(s) are registered in the database and stored.. This can be done only if the school's registration post validates and gives permission to the student record.

The fourth block is divided into the lecture mode and examination mode. In the lecture mode, the lecturer uses a fingerprint module to get the attendance of all students in the class. The lecturer can either save or print the attendance taken.

In the examination mode, the fingerprint module is used for examination screening and attendance, whereby it would verify each students' qualification for the examination according to the stored information (fees management, course registration and 80% attendance in class). Also it takes the attendance for the examination twice, before entry into the examination hall during screening and after signing out.

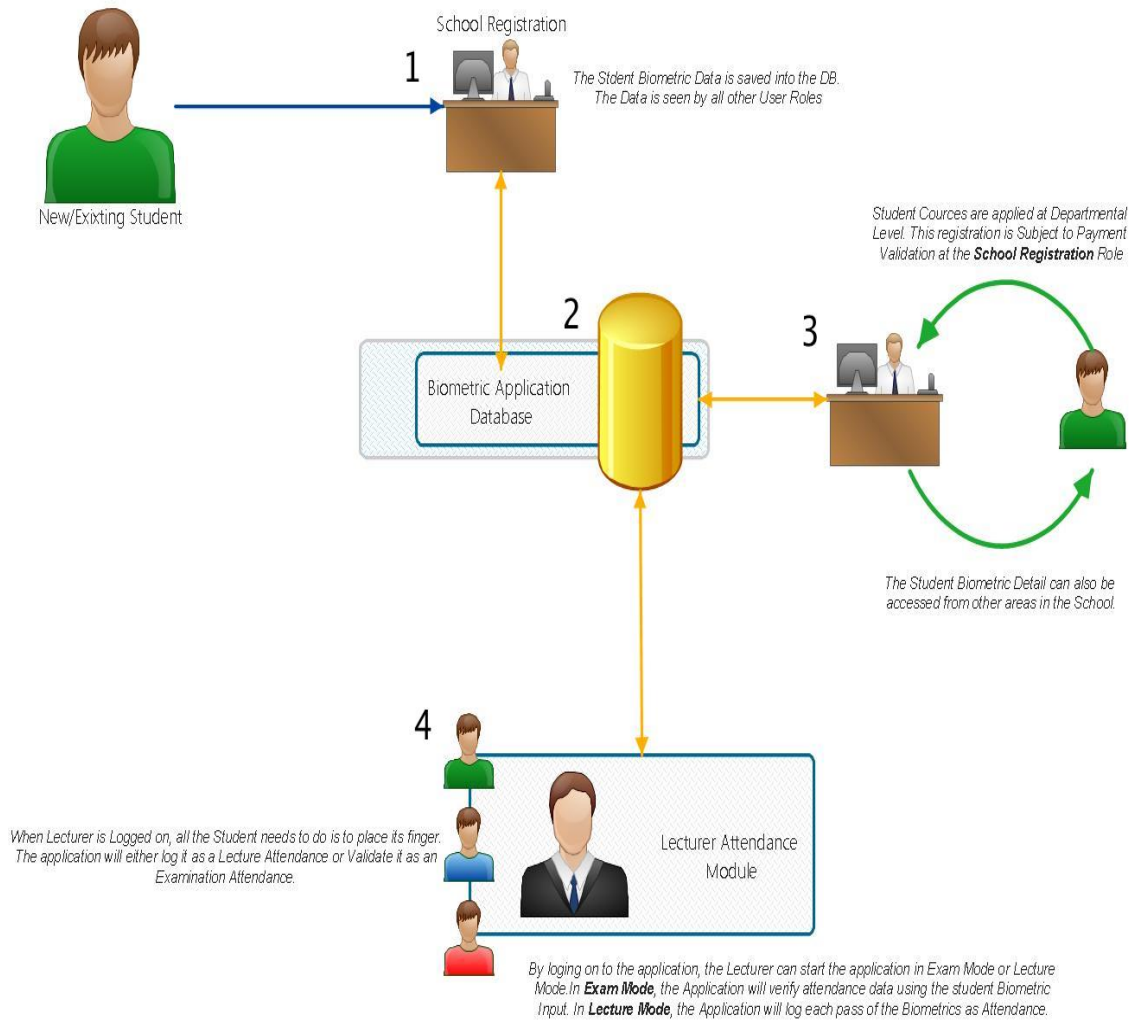


Figure 2: System process illustration

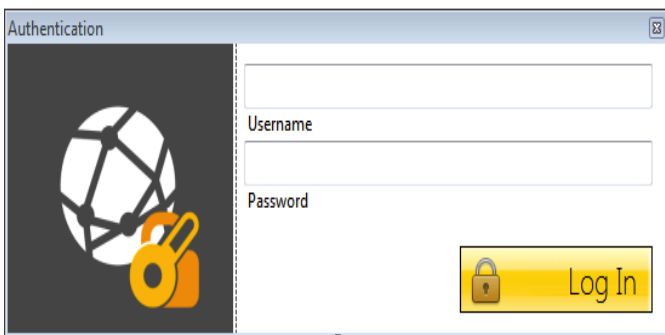


Figure 3: Application Login Page

Default Administrator login page. After Login, the admin user can create more users for the software.



Figure 4: Administrator Welcome Page

The first page that pops up after the default administrator has logged in



Figure 5: Fingerprint



Figure 6: Lecturer Welcome Page

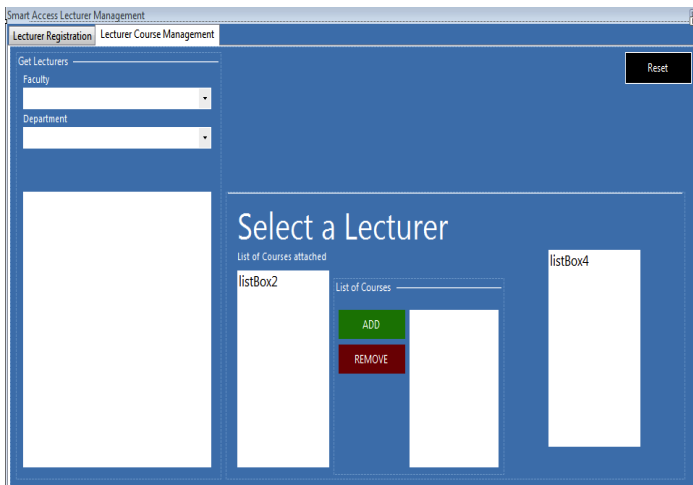


Figure 7: Lecturer Registration Form Page

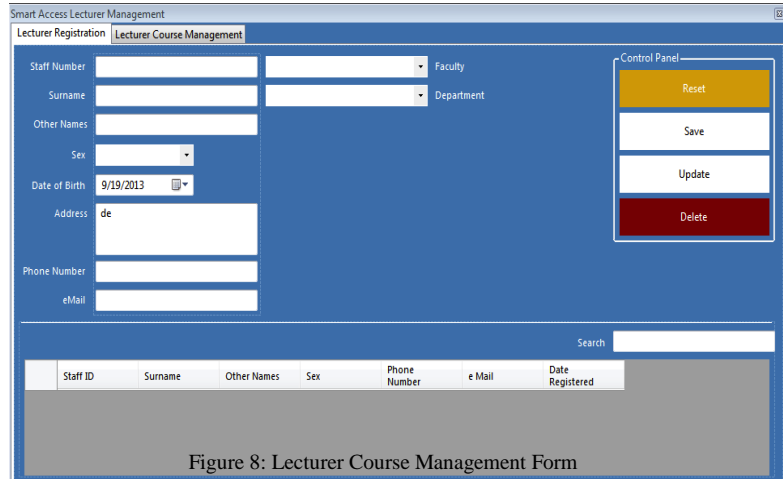


Figure 8: Lecturer Course Management Form

Page

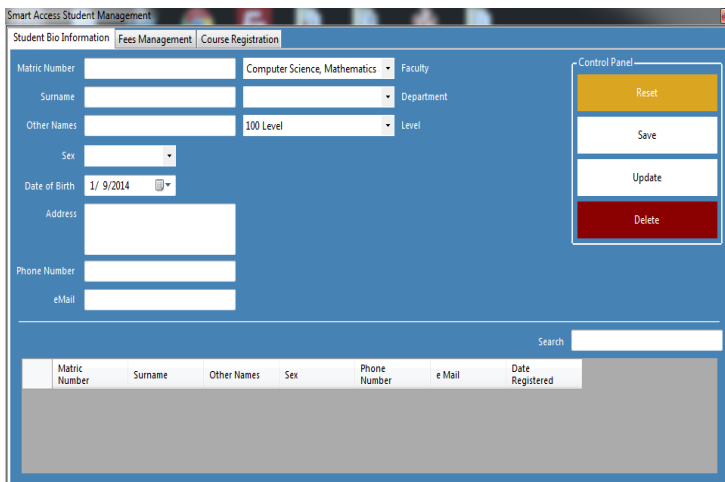


Figure 9: Student Registration Form Page

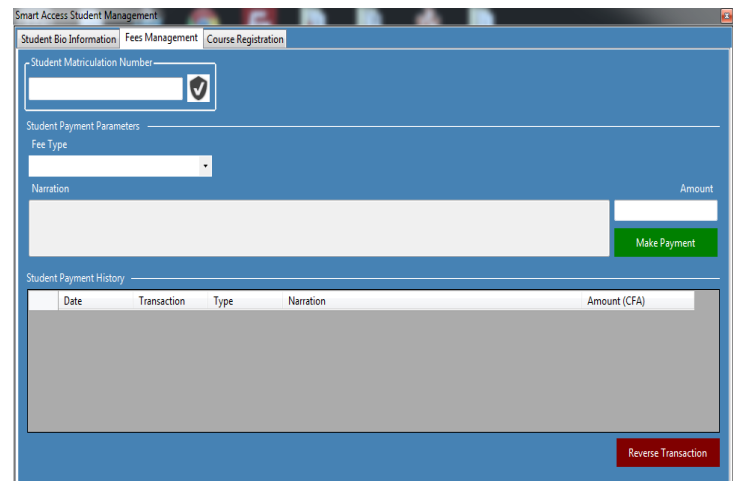


Figure 10: Student Fees Management Page

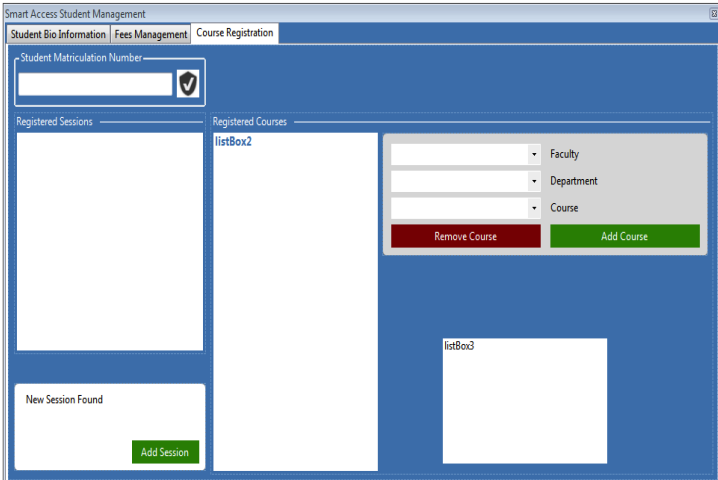


Figure 11: Student Course Registration Form Page

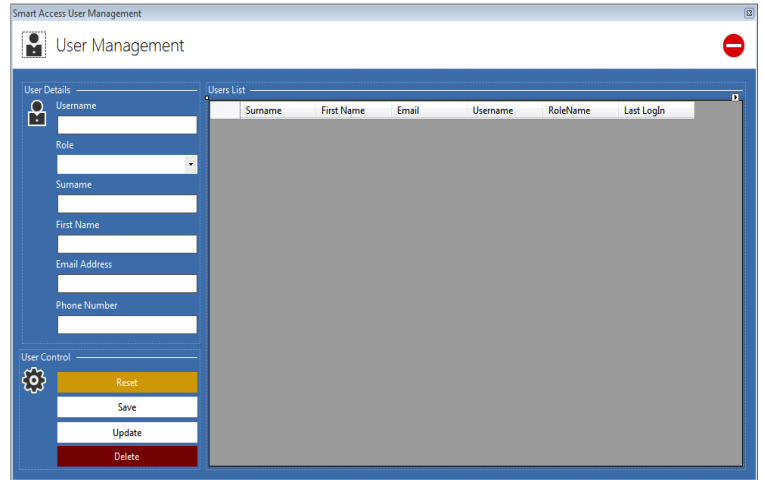


Figure 12: User Management Page

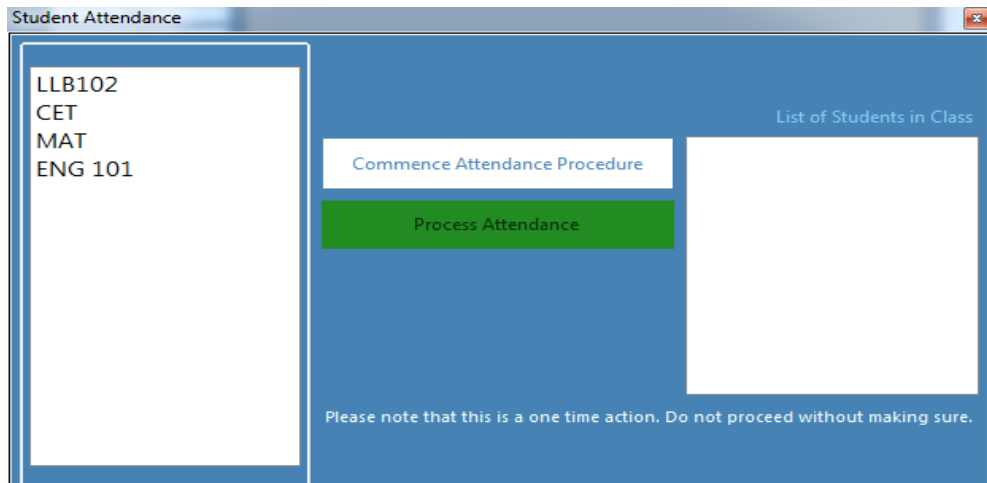


Figure 13: Student Attendance Process Page

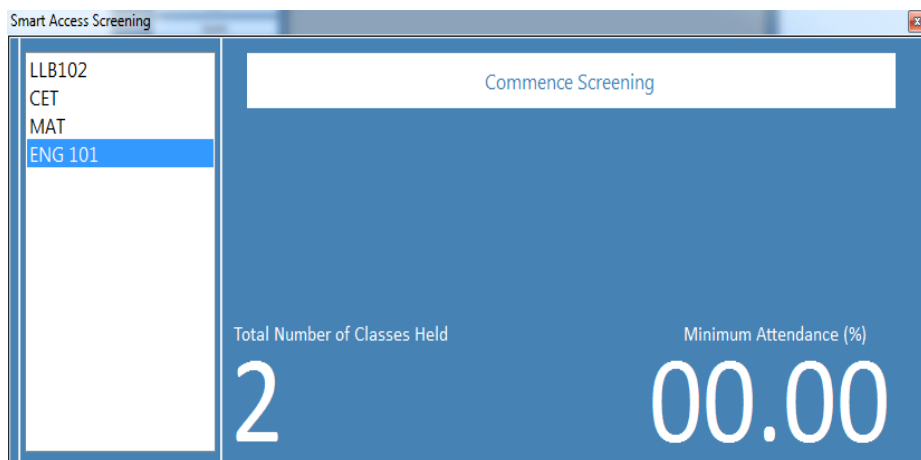


Figure 14: Student Examination Screening and Attendance Processing Page

#### IV. BENEFITS OF THE SOFTWARE

- A. Consistency: The use of relational database system to store data eradicates problems of data errors, redundancy and data duplication; hence increasing data consistency.
- B. There is Security and Integrity in Fees & Data management.
- C. This software is very efficient in terms of speed of processing, student screening and space as records are accessed and modifications are made faster.
- D. The system is very flexible to operate and personnel can easily be trained to handle it. File operations are automatically maintained.

#### V. CONCLUSION

The paper present a framework in which attendance management and examination screening and fees management can be made automated. Which serve as an aid to check debtor student before entering examination hall or class room if required fees has not being paid by using fee management page thereby helping institution to generate more fund.

Biometric Access is a better substitute for the use of identity card in verifying user's identity. Various researches have shown the porosity of identity cards in uniquely identifying individual in the face of sophisticated forgery technology but the natural uniqueness in the use of fingerprint makes it a reliable access control technique thereby eliminating impersonation in examination and in the case of class attendance elimination of writing absent student name on attendance list and also easy of calculating require class attendance percentage before student sit for an examination. It is a comprehensive system which if implemented by any institution it will improve academic and financial status of such institution, which will also lead to rapid development of the institution.

The paper present a framework in which attendance management and examination screening and fees management can be made automated. Which serve as an aid to check debtor student before entering examination hall or class room if required fees has not being paid by using fee management page thereby helping institution to generate more fund.

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