Smart Card Reader for Engineering Students [SCR - All in One]

K. Suresh Kumar, D. Ganesh Kumar, K. Sakthivel, J. SenthilMurugan, A. Mohan

Abstract: Magnetic strip cards have very low storage mainly a few bytes and in general smart cards can store hundred times more information than magnetic. With more space to store information, smart cards can have more use and may be more versatile than magnetic cards, in addition to being a student identification card it could also be used to store monetary values such as a cash card for retail and as an access card to login to computers and enter rooms. Smart cards have the benefits of storing comprehensive records with the advantages of accuracy and reliability, in other words it can he seen as a mobile database.Our implementation will be very useful to trace the students for college gate, Hostel gate, Library, Transport, Academic attendance, Academic scores, Student details, Achievements. Once college administrator will store student details, staff details and authentication details after that student will be traced and information store automatically to concern database. Then the attendance IS sent to parents via SMS. Student's will store their attendance via biometric fingerprint reader without staff intervention.

Keywords: Magnetic Strip, RFID, BioMetirc, Sensor, Scanner

I. INTRODUCTION

The main concept behind the paper is to trace the student's activities throughout the college years using a software that minimizes the paper work done by the staffs. The smart card consists of IC chip technology which is secured enough with high storage capability and this helps to store more data compared to RFID and other types of cards.

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The biometric device helps to store the fingerprint of each student and this allows the student to punch their fingerprint while entering the class and if they don't attend the classes automatic message will be send that the ward is not present to their parents. The student's details, attendance details, Hostel details, accounts details, library details, transport details are stored and only can be modified by staff using that smart card.

The main concept behind the paper is to trace the student's activities throughout the college years using a software that minimises the paper work done by the staffs. The smart card consists of IC chip technology which is secured enough with high storage capability and this helps to store more data compared to RFID and other types of cards. The biometric device helps to store the fingerprint of each student and this allows the student to punch their fingerprint while entering the class and if they don't attend the classes automatic message will be send that the ward is not present to their parents. The student's details, attendance details, Hostel details, accounts details, library details, transport details are stored and only can be modified by staff using that smart card. Attendance details of hostel students when they leave the hostel and enter the hostel are also recorded. The student's marks are stored and percentage is calculated from the database. Keeps the record of transport used by the students to the college. The system keeps track of library books issued and also renewal details of those books issued. The student's fee details like exam fee, tution fee, hostel fee, transport fee are monitored and the status is shown in the database.

The basic idea behind the proposed system is, the software developed reduce the administrator work by saving time and work. As the technology evolved to a much higher level this type of technology should be adapted in colleges. Smart card issued to all student's as identity card with more enhancement. The biometric enables reduction of malpractice by students or staffs.

In recent days it is difficult to maintain records of the students by the staff as the work is done in paper work. It is maintained in separate records by different staffs and maintaining all record becomes a difficult task.There are cases of malpractice in case of attendance and in some cases there are errors.

This paper seems to be in a great need for college as this stores the details of each student and maintains them in database throughout their academic year. By sending SMS about the attendance of the students daily it reduces the work of staffs by calling each parent and informing about the absence of their ward. The biometric device helps the automatic update of the attendance without the intervention of staffs.

II. LITERATURE SURVEY

Abhishek Singh[1] proposed the concept of combination of digitization and digital economy and aim to propose designing and implementation of a Student Card System for higher educational institutes using smart card technology.

Smart card is a card which contains a barcode which is nothing but a unique card that is assigned to the student. This card is useful for the students in places like library, canteen, stationary shops and online storage of important documents. We understand the limitations of this paper, Linear barcodes can only store small amount of data. Barcode, once distorted cannot be scanned correctly.

Jones[2] proposed Electronic commerce demands different security requirements for its many different applications. In the near future one smartcard may be used for many electronic commerce applications, such as payment systems, access to banking services and financial transactions over the Internet. We understand is   There can be lack of system security, reliability or standards owing to poor implementation. There could be some software/hardware the compatibility issues, as some e-commerce software may be incompatible with some operating system orany other component.

Jan and Tseng[3] in 1998 proposed two integrated schemes of user authentication and access control which can be used to implement a protection system in distributed computer systems. This paper will propose an improvement of Jan-Tseng's first scheme using smart cards to withstand Lee's attacks and the replay attack. We estimated about this paper does not allow servers simplify verification processes for multiple access request of a user at the same time.   In   all likelihood, bills and coins, a variety of credit cards, a driver's license, a transit pass, a voter registration card, a library card, a video rental card, insurance cards, frequent flyer and car rental cards, a telephone charge card. By the end of the century, all of these documents might be replaced by just two or three smartcards. Because they can store and protect relatively large amounts of data, smartcards are being used in a number of ways around the world, replacing a wallet's contents bit by bit. A single application is implemented in one smartcard. Less security for payment issues.

Wange[5] offers a view on the issues associated with the further expansion of IT'S and in particular the smart card into the transport sector. The emphasis is on payment, and the article discusses the technology (interfaces, memory, reliability etc.). Methods for the transfer of funds are discussed. It seems that there are still many open issues associated with the use of smartcards. Some of these, such as, is the technology mature, is the price right, are the cards secure can only be addressed as large scale trials are considered and implications of mass deployment addressed.

Mass[6] transit fare collection has advanced over the last couple of decades from cash and tokens to magnetic stripe cards. In mass transit applications, smart cards combine the secure, cashless transactions and personalized applications that encourage passengers to use mass transit, while they provide transit authorities with demographic information. Paper does not reveal about mass storage of information, it is been tested only for less data.

It is developed to ease the work of student's, involves a card containing a barcode which is nothing but a unique card that is given to each student. The smart card can be used at many places like office, library and canteen. The amount (balance) in the card can always be refilled with the help of admin. The unique id is scanned with the help of barcode scanner. Therefore it makes easy for a student to carry a single card rather than cash. There can be case where the student ID may not be scanned properly due to some system error and thus the student may fail to make the payment or pay fine or may fail to submit important documents.

Existing one is No system is available to trace the student details using a single software only different software like library management and accounts. For maintaining attendance the staff uses register or do paper work. The old system consumes more time in storing and retrieving data. Our implementation is tracing the student details on college gate or hostel gate. If any students enter / leaving the gate means student compulsory show their identity card to smart card reader. On library campus if any book taken / return means system easily checks the same student already taken or not, if the student already taken the book means system allow their only return the books if the student not taken any books system allow their only take the book.

ADVANTAGES

➢ Student absence time easily inform to the parent & HOD.
➢ In library time consuming process.
➢ System not allow more than one book taken by the same student.

III. HARDWARE COMPONENTS

➢ Smart card
➢ Smart card reader
➢ MSF100 biometric scanner

3.1 Smart Card

A smart card is a physical card which has an embedded integrated chip. This chip acts as a security token. Smart cards are typically the same size as a driver's license. They are made out of metal or plastic. They connect to a reader either by direct physical contact or through a short-range wireless connectivity standard. The chip on a smart card is either a microcontroller or an embedded memory chip. Smart cards use encryption to provide protection for in-memory information. The cards with microcontroller chip performs on-card processing functions and can manipulate information in the chip's memory. They are used for a variety of applications, though most commonly are used for credit cards and other payment cards. It can provide a higher level of security than magnetic stripe cards.

Fig 3.1 Smart Card

3.2 Smart Card Reader

Smart card readers are used with smart cards. They are made of plastic with a built-in chip used for electronic. These easy-to-install devices read the data that is stored on contact or contactless smart cards. Smart card readers are available in either contact, contactless, or a combination of contact and contactless models. In contact smart card readers the card is manually inserted into the reader by the user. This application is most commonly used for applications that require more security. Contactless smart card readers operate with a radio frequency that communicates when the card comes close to the reader. Contactless card readers offer the added convenience and speed of not having to insert the card into a reader.

Fig.3.2. Smart Card Reader

3.3 Mfs100 Biometric Scanner

MFS100 is a high quality USB fingerprint sensor for fingerprint authentication in desktop or network security. It is based on optical sensing technology. It efficiently recognizes poor quality fingerprints also. MFS100 is been used for authentication, identification and verification functions that let your fingerprint act like digital passwords that cannot be lost, forgotten or stolen. It has the ability to Store image, Raw Data and minutiae of the fingerprint captured for Verification. Also has a feature of Multi-threaded code design fully utilizing multi-core CPU power. Plug and play USB 2.0 high speed interface Supports multiple devices handling 500 dpi optical External fingerprint sensor. Supports operating system platforms like Windows 98 SE, Me, 2000, XP, Windows7, windows vistaand Linux.

Fig.3.3 Biometric Reader

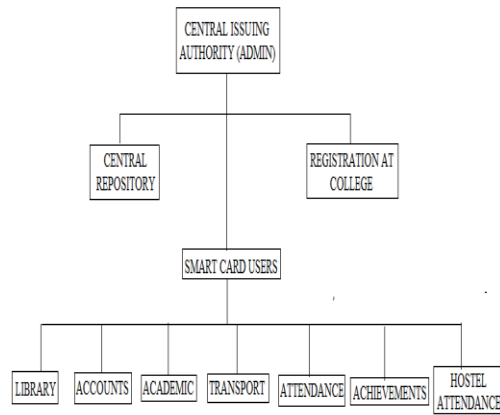## IV.   ARCHITECTURE DIAGRAM

Fig 4.1 Architecture diagram for SCR

4.1 Registration

The admin stores the details of the students who are for new registration. The details include name, date of birth, phone number and all other details with finger print and their photo. This module stores parent's phone number in order to send the absence of their ward in college. The details are stored in the database and the roll number is stored in smart card. The admin need to login for registering the student detail. For login the admin has a username and password by using which they are able to access the software. The registration form also includes school details of the student, marks obtained in school, parents information, transport details, details about the student stay whether a day scholar or a hosteller.

4.2 View Details

The data stored in registration module are viewed in the data grid in which we can view the detail of a single student or a specific department or a complete year or specific department and year or full records. This module displays the data that is stored during registration. The data is viewed in a table format. This is useful for staff to check for any detail to be found about a particular student. It is useful for comparison of data in future purpose.

4.3 Library

This module is used by students for entering the library and for lending books from the library. This stores all the details about the list of books taken by the student and at what date they had returned. Also it also indicates the date of renewal for the books. The library administrator can easily record the student activity of lending books and keep a record of those data. It help the library officials to maintain the records of books taken by the student. It reduce the work load of librarian by minimizing paper records and save time while searching for any book detail. All the books records are maintained easily in software.

4.4 Academic Details

This module is responsible for handling the marks secured by each student and calculates the GPA of them. The staff maintains these records for reviewing the academic scores of the students and keep track of the growth of each student in academics.

It requests for points secured in each subject by the student. The points is obtained point out of total 10 points. This module stores the marks obtained in the final semester exam and calculates the GPA. This reduces the staff work by minimising their paper work for calculating GPA for each student and maintaining them. Also saves time for staff in calculating GPA.

4.5 Accounts

The accounts module is used for maintain the payments of the students. This actually fixes the amount of fees to be paid by each student. If the student has paid the fees it stores as paid otherwise it alerts to pay the fees. It also maintains fees like transport fee, exam fee and other dues for each student. This module is useful in calculating the due amount for each student that is to be paid by the end of each semester. Each student is provided with a status box in which the status is updated whether the fee is paid or not. This format helps in reducing the work for accountants to manage the list of students yet to pay fees.

4.6 Attendance Details

This module is implemented using a biometric fingerprint scanner. It actually stores the fingerprint of each student while entering the classroom daily morning. If the student is absent for the college it automatically sends a message to their parent regarding their ward's absence. While the student punches the scanner, it actually stores the time of entry to the classroom. The deadline time for attendance is 9'O clock and if the student does not arrive before that the message is sent. This helps in maintaining the attendance details for the overall college.

4.7 hostel attendance

This module is used to store the timing of student's exit and entry to the hostel. The hostel students while leaving the hostel need to keep their fingerprint and while returning to the hostel keeps the fingerprint. This stores the timing of the student entry and exit. It maintains the record and sends the details of who all have not been to college daily morning to the college. The hostel admin can view the details of about student entry exit activity regularly.

4.8 Achievement

The respective staff stores the details of the student achievements and keeps a record of each student. This module helps in maintaining the records for further purpose. This helps in viewing a student performance in each semester in co-curricular activities. This also include competitions out of their college premise also. The college can easily identify which student is strong in which field. This also includes sports achievements, non-study achievements and all small activities. This also helps in encouraging students in other activities.

4.9 Transport

This module stores the mode of transport of each student whether college bus or MTC or own vehicle. This helps to identify how each student reaches the college. If students come via college bus, their bus route is also recorded. This helps in maintaining record of student arrival and exit mode to college. The college administration can easily search for

details in any emergency case and report the student in any emergency circumstances. This helps in maintain the parking area for own vehicles of students. It enhances the maintenance of complete detail in mode of transportation. By storing these detail the college can view the entire details in efficient manner.
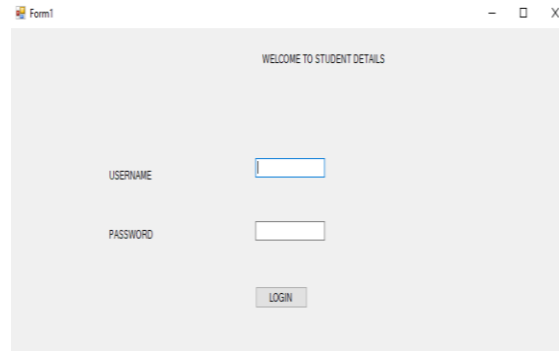
V.   RESULT AND DISCUSSION

Fig. 5.1 Login form

This is the login form for the admin. By logging only they are able to store the student's details in the server. By clicking on LOGIN button, it checks whether the login credentials are correct or not, if they are correct it opens the next form.
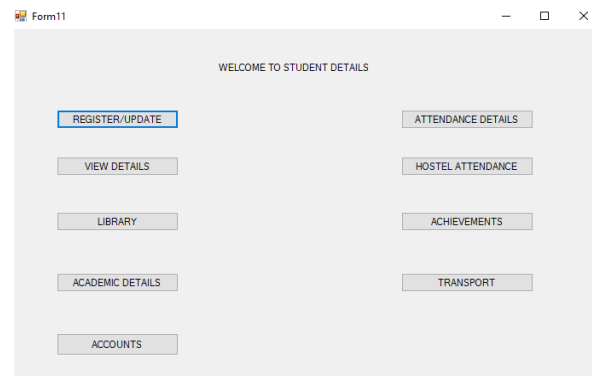

Fig 5.2 Modules

This form displays all the modules such as registration, update, view, attendance, library, academic details, accounts, transport that are needed to be stored by the admin to be stored in SQL server. By clicking on each button it moves to the respective form. This form can be identified as main page for the software.
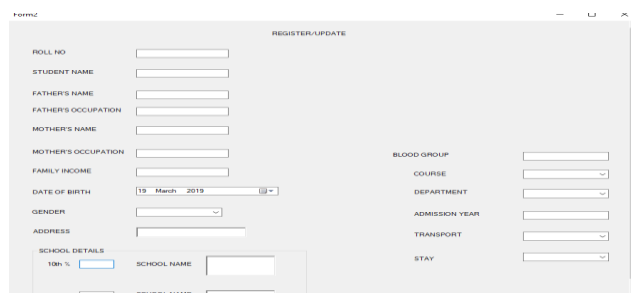

Fig 5.3 Registration form

This form is the registration form that is responsible for registering the student's details. The admin or staff is responsible for registering each student's detail by collecting documents from each student. This form consists of all basic details of student including school details .

Fig 5.4 View details

This form is view details form that is used for viewing each student details by entering roll number, or department or year or both department and year together. The list displays all the details that is stored in registration form. This form is useful in viewing the stored details.

Fig 5.5 Library form

This form is library form that is used to store the details of books lend from library. It shows the taken date and the returned date for each book. By just entering the book number the book name and author name will be added automatically to the form.

Fig 5.6Academic form

This form is used for storing the marks details obtained by each student in each semester. The duty of staff is to choose the points secured by student for each subject. This calculates GPA for that student and stores it.

Fig 5.7Achievements

This form is used to store the achievement details of each student. In this form details such as competition name, venue, place secured, date, and specification. In this we can store and view those achievements

Fig 5.8 Transport form

This form is used for the purpose of storing the transport details of each student whether it is college bus or MTC or own vehicle. By storing these details the college is able to identify how each student arrives the college and leaves the college.

Fig 7.9 Accounts form

This form is used for storing the accounts details. It updates the fee payment whether payed or not when the student pays the fees. The fee includes tution fee, exam fee and transport fee.

VI.   COMPARATIVE STUDY

Our project implements the concept of smart card and fingerprint. This overcomes poor security and provides high security.
 This paper overcomes the issues of reliability. The card can be accessed in any operating system. Since the smart card is integrated with chip, it provides large storage compatibility and high security.

VII. CONCLUSION

In Smart card system it aims to store details of the student including their attendance, personal data, marks, achievements, library details, transport, accounts details in efficient manner. It provides a different environment to staffs to save their time in maintaining records of each student separately with lots of paper work. It enhances technology implementation in day to day lifestyle and maintains large amount of data in secured manner.

The smart card can be enhanced by including GSM into the card such that it helps to track the student whether he or she is present inside the college campus or left the campus during the college hours. Also it can be interconnected with account so that the same card can be used in canteen or store for buying any items and the amount can be debited in accounts. This helps students to not spend money in college campus. And later the accounts department can notify the amount they had spent at end of each semester.

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