



Multi-Purpose Smart Card for College Students

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Abstract

The aim of this proposed solution is to make the life of students comfortable so that they can focus their energy on education. A single card will suffice to This gives the opportunity to the parents to keep track of their wards by being aware of their involvement in college and classes. The parents can also keep track of the monetary expenses of their ward during college life. The college administrators are facing this struggle to keep track of the students' attendance in the college and classes. With education being more professional and stricter, there is a need for a centralized tracking system which can track the students' attendance in colleges regularly based on which they can take necessary action on the student.

Index Terms – Smart card, one card for college students, multipurpose college ID

1. INTRODUCTION

It has been over three decades the smart card technology has come in use. This technology was first used for the payphone system since it got introduced in the market. But during that era, the card was very expensive. Use of this card expanded when its manufacturing cost decreased. The card was then used in other industries in manufacturing, telecommunications, retail and banking (Casset and Lanet in 2002) purposes.

Smart card is plastic piece having the size of credit card that has computer chip embedded on/in it. The card is programmed for storing data or information along with the capacity of performing specified task. The card is designed in a way that can be used in more than one field (e.g. cash cards, identification cards, etc.). Usually, it has a shape of a credit card having micro-processor and memory that enables the storage and processing of data. Smart cards are therefore known as youngest member of the plastic card family. This concept was designed by Merck ling and Anderson in 1994. The card was also used as carrier for micro-chips thereby when a German inventor, judge Dethloff along with Helmut Grottrup, filed a patent in 1968 for its use.

The way smart card performs is totally different than that of credit cards though these both cards look similar. The advance way of performance of the card has widened the area of its applications. Smart cards have so much scope these days that people use it in various fields in day to day life. People use these Cards vigorously for achieving advance certainty while constructing access control like in computer system application logically along with the trusted authentications for electronic transactions.

This paper proposes a smart card for the college going students that serves multiple purposes.

These days, students' attendance, lab and library usage are performed in a manual way. Students have been using their own students' card which is merely used for the identification in the institute since the card they use doesn't have any sorts of microprocessor chip. So the card that is for student's use can't help in automated system of presence in the college, monetary transaction within the campus and library uses. So as to bring the advancement in the process this research is significant to develop a prototype; conceptual framework

2. LITERATURE REVIEW

Smart Cards are advantageous than Magnetic Strip Cards as they can be encoded to accumulate data as well as perform pre-programmed tasks. Magnetic Strip cards are normally used for single variety of tasks, but Smart Cards are multi-tasking, reliable, can store more information, very safe, disposable, reusable as well as compatible.[1]

There is no doubt regarding the advantages of the smart card in colleges and universities. Studies were conducted regarding the acceptance and confidence of the students and for this “University Smart Card Technology Acceptance Model (USCTAM)” was developed. Survey was conducted with the students of multiple universities and it was concluded the smart card is student friendly with respect to multiple factors namely usefulness, security, trialability, satisfaction etc.[2]

3. TYPE OF CARD

Smart Cards can be “contact” or “contactless”. The earlier is programmed using a reader which links to the computer chip present on the card. Contactless ones communicate via radio waves through a built in antenna to an external receiver (which acts like a reader). Though cost wise contact cards are better, contactless is more user-friendly and hence would be more suitable for the proposed system. But practically, the cost would be difficult to bear for the parents and the college management. Hence “contact” cards are used here.

“Contact” cards can be subdivided into two types:

- (i) containing microprocessor and a memory chip-can change and vary the data inside the card
- (ii) containing only a memory chip with non-programmable logic-can only perform pre-defined operations

Obviously, the former one i.e.(i) will be suitable for the proposed system.

Since lots of data are to be stored in the card, the file structure should also be pre-defined:

Identification – First and last names, Student ID number & Degree enrolled (with class and section)

Status – Whether the card is “enabled”(regular) or “disabled” (passed out/discontinued from the course), Expired date of the card

Personal details - Telephone & Address

Daily details – College entry & exit timings

Library details-books issued, books returned, fine paid(if any)

Canteen/Stationary-details of money spent.

4. SCOPE OF THE PROPOSED

This study is completely oriented on the technology that would help using the student identification card as smart card in colleges.

The conceptual framework is developed keeping in mind the issues faced by the college students and the respective institutions. In order to assist the institution and students for its standardization this study is carried out.

Three main aspects that have been stressed upon while designing this card are:

- (i) Identification
- (ii) Security
- (iii) Cash

5. RESPONSIBILITY OF COLLEGE ADMIN

The colleges, who are using this card, should have a corresponding website to track the cards. The institutions have to fix an admin who will take care of the following work(as shown in figure 1):

- (i) Adding the students to the website and generating login credentials for them
- (ii) Issuing smart cards to each of them
- (iii) Keep a track of their day to day activities
- (iv) Report any suspicious activities to the head of the institution

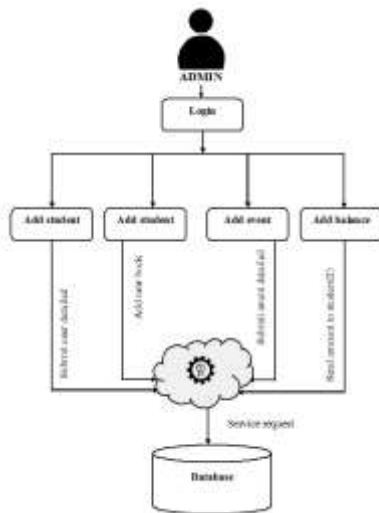


Fig 1. Admin Interaction with the Stored Data

6. STUDENTS' BENEFITS

The students will get a card and login credentials of the corresponding site once they get admitted to the college. They can login anytime and see their activities. The main benefits that the students will get by using the card(as shown in figure 2):

- (i)As soon as the students enter the college, the card will be automatically swiped by the sensors at the entrance. Same thing will happen when the student leaves the college.
- (ii)Since the card will also be used as debit card, the students can recharge the card through their login. The card can be swiped at the college canteen, college stationary and for depositing fine in the library.
- (iii)The card can be used as a library card to issue books from the college library.
- (iv)The card can be used to automate attendance collection of any lecture by swapping the card with a card reader at the beginning of a class

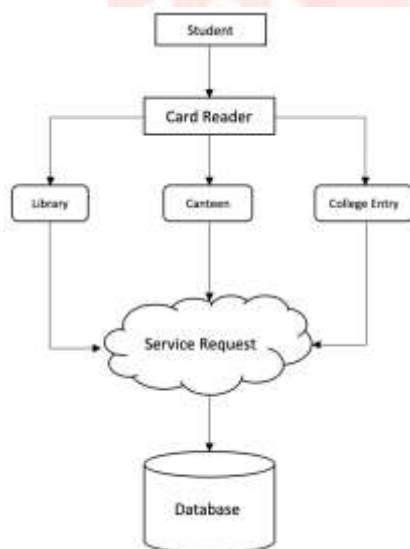


Fig 2. Functionalities Involving Students

7. PARENTS' LOGIN

The parents will also have login credentials, so that they can keep an eye on the activities of their ward. They can see when the child is entering and leaving college, details of library fines the child is paying, money the child is spending at canteen as well as college stationary. The details are shown in fig.3:

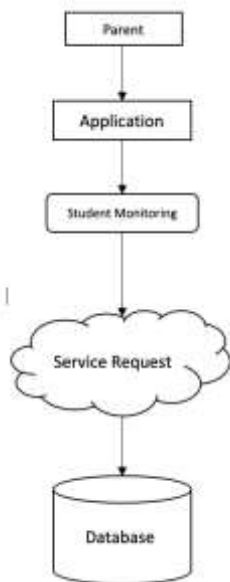


Fig3. Parent Interaction with the Stored Data

8. IMPLEMENTATION

8.1 Tools and Technologies Used

The hybrid technology used in the proposed system is the combination of HTML, CSS along with the JavaScript. The front end part of android based hybrid applications is a native part which is developed using platform specific app development language and the container should be created with different versions for different platforms. The android platform supports the app with apk extension whereas the iOS supports app with extension called ipa and windows phone support app with xap extension.

The back-end part of android application is, developed with various web technologies, is purely a web application. The various technologies are used to make the web part compatible with the entire mobile browser engines that are in use so as to support multiple platforms. Using web view control in web applications can render the files of HTML5 and JavaScript in full screen.

The apparatus which helped building cross-stage applications for android, iOS and windows gadgets is Microsoft visual studio.

8.2 Developing the system

The developed system always ought to be in machine readable language. This is possible only through the programming language or in short coding. The programming language facilitates transformation of the procedures into the machine understandable control specification. This is the stage where the control specifications are transformed into machine readable instructions i.e. programming, in order to control the complete system processing. Many modules are developed and tested so as to erase if any bugs present and then integrated as a single system.

The main purpose of this phase in this project is to:

- Incorporate project plans into proper execution
- Expect ocular and most enhanced transformations
- Assure if in surrounding aspects, the complete infrastructure, available resources, etc. are viable

9. CONCLUSION

As Internet is growing in massive scale almost every year, security challenges are a big issue to college security. so We have tried my best to design a prototype to make the communication more secure within the college area through digital student smart card. We have come across a new technology that helped enhance my knowledge on a new and emerging platform like android platform. During this project, we have come across many new technologies and tools that were completely unfamiliar to me. This project summarizes about the way we can integrate the smart card technology with our normal student identification card and how it can be helpful in maintaining the security of our communication with the college or campus. This is just a small prototype developed by studying the journals that has been published to emerge with new ideas and technologies.

10. FUTURE ENHANCEMENT

Though the proposed application has covered various aspects, we will add a few more in future. We thought of connecting this card to the college transport services and for class wise attendance. One hindrance is that to make these possible, we need to install swiping systems in each and every classroom as well as in the college buses which will be a costly matter.

11. ACKNOWLEDGMENT

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