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Multi-purpose Smart Card System

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Abstract: Currently , smart cards are carried by most of us for various applications such as transportation , cash, payment of bills, railway passes , ID cards , health cards , library cards . This paper aims to design a multipurpose smart card system that would perform various applications such as documents retrieval , attendance . From there we can see the potential of multipurpose smart card system and their usability.

Keywords *: M.P.S.C.S::Multipurpose smart card system , m.p :: microprocessor ,S.C ::Smart Card.*

Introduction Nowadays , we have all the personal data and information in digital form. Especially, personal identity or institutional identity are data which must be saved securely , such as voting card details , banking identity , transport passes, license etc.[2] Multipurpose smart card enables a smart card to store and secure all the personal data ;that can be used for variety of applications discussed further. [3]

***SMART CARD* :** It is a plastic card with a built in m.p , used typically to perform various applications such as financial transactions. [10] A S.C , chip card or integrated circuit card(ICC) is a physical electronic authorization device used to control access to a resource. S.C can provide personal identification , authentication , data storage and application processing.
M.P.S.C are designed to implement all the various applications in a single smart card.

DESIGN: THE M.P.S.C.S CAN BE DESIGNED USING THE COMPONENTS GIVEN BELOW

(a) RFID Tag
(b) RFID Reader
(c) Arduino Uno
(d) GSM
(e) GPS

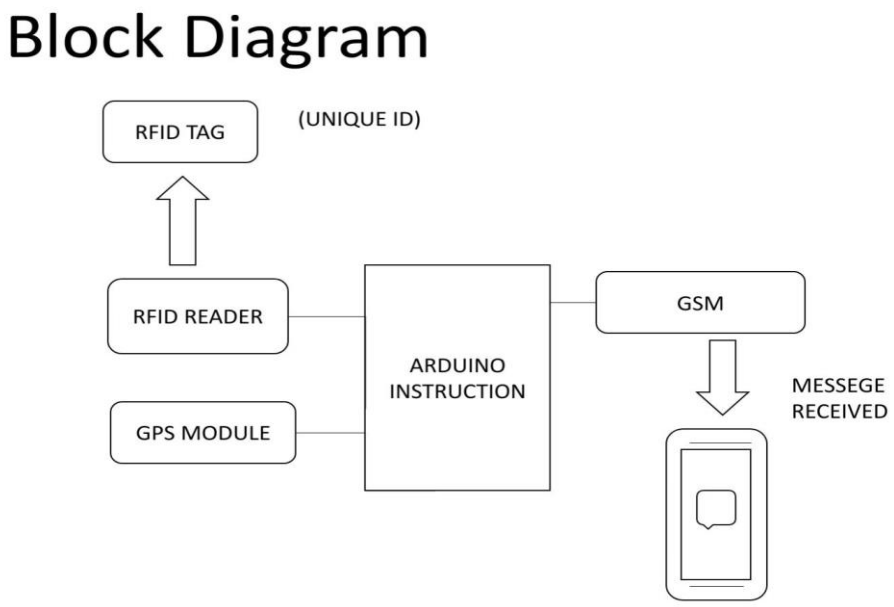

Fig. Block Diagram of M.P.S.C.S.

RFID system: An RFID system consists of various components that are connected by a dedicated communication path .[5] A RFID tag is an object that is attached to any product and uses a unique sequence of characters to define it. It comprises of a chip and the antenna. An antenna is responsible for the transmission of information between the reader and tag using radio waves .They come in stick antenna , di pole or multipole antennas etc. A reader is a scanning device that uses the antenna to realize the tags that are in its vicinity. It transmits signals at a certain frequencies.

Arduino Uno: The Arduino Uno is an open-source microcontroller board based on the microchip ATmega328P microcontroller and developed by Arduino.cc. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) via a type B USB cable.

GPS: The Global Positioning System(GPS) is a global navigation satellite system(GNSS) made up of a minimum 30,satellite placed into orbit by the U.S Department of Defence. It is a device that capable of receiving information from GPS Satellite and then to calculate the device geographical position. Using suitable software, the device may display the position on A map and it may offer direction .

GSM : The Global System for Mobile Communication (GSM) is a standard developed by the European Telecommunication Standard Institute to describe the protocols for second Generation (2G) Digital cellular networks used by mobile devices such as mobile phones and tablets. This system use digital signalling to connect the radio tower.

APPROACH: This section will go through the applications implemented for the proposed M.P.S.C.S . Some applications are tutorial attendance meant for large educational institutions and data retrieval for public places such hospitals etc. Since we are using Arduino Uno we will be using c++ programming and hence Arduino Uno will be used for communication between application and smart card . [5]

Circuit Diagram

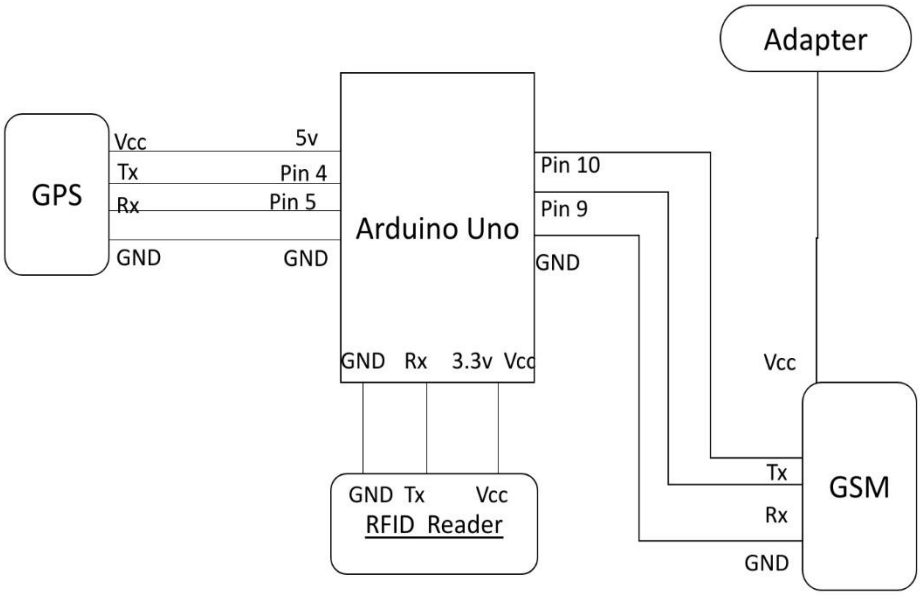

Fig. Circuit diagram of M.P.S.C.S

GENERATION OF O.T.P :

START as the name suggests , the process of the system begins. It requires cardholder to simply insert their card into the designated reader ,once done the system verifies the id, if the id exists.

The Cardholder is then asked to submit the password and then it is verified using O.T.P sent on the registered mobile number.

If the pin is correct access is granted otherwise denied.

When the ***access is granted ,*** the user will have to remove the card then student will have those options to display the information .

The information and location is displayed on the screen as well as message will be sent on the registered mobile number.

As a security feature incorrect pins can be entered so many times ; if the limit exceeds the card will be blocked immediately.

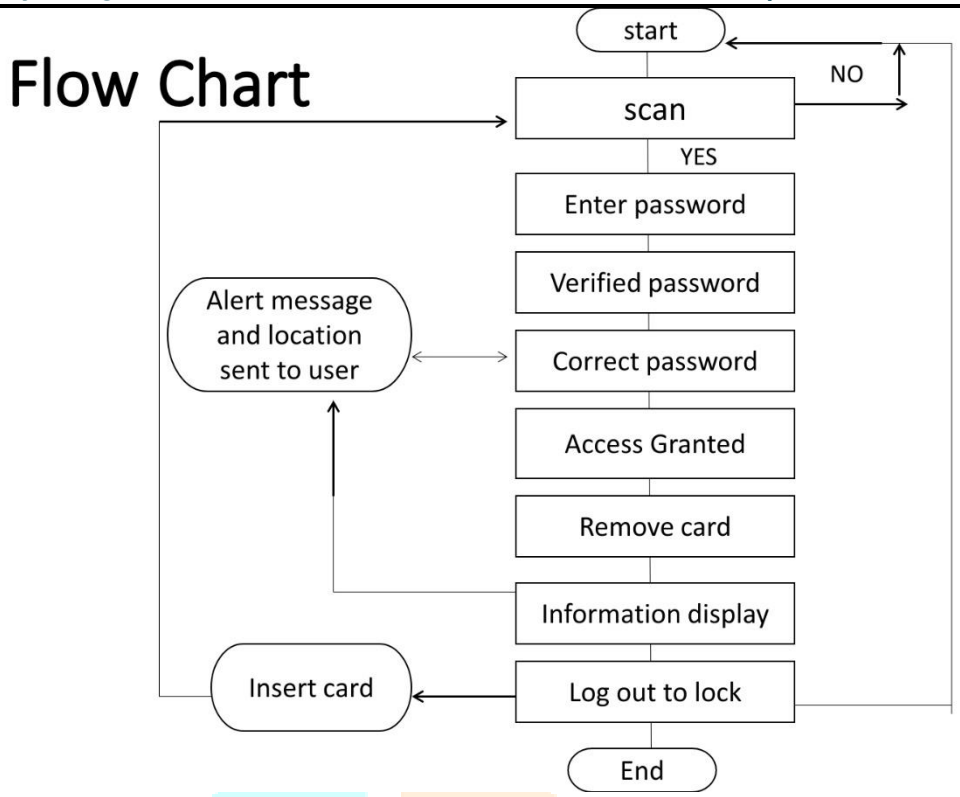

Fig. Flowchart of M.P.S.C.S

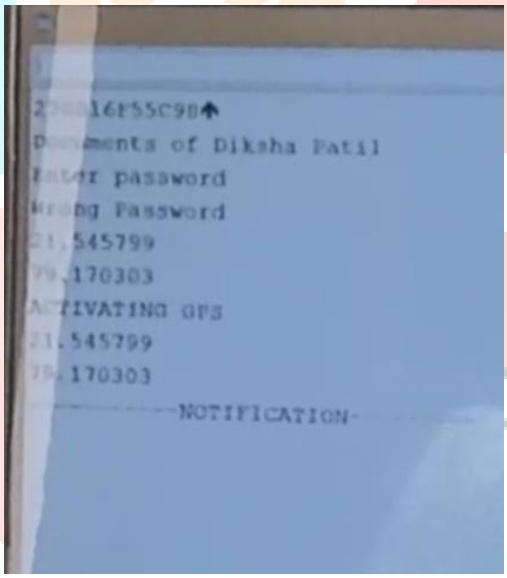

Fig. Screenshot of data retrieval in M.P.S.C.S

FEATURES AND BENEFITS :

1.SECURITY : M.P.S.C is more secure contrasted with different cards such as charge cards , ATM cards , fuel and telephone cards . As M.P.S.C.S use two way authentication i.e. O.T.P and unique pin.

2.PROTECTED : It is tamper resistant plastic card . The system is protected as it has its own unique number . The card can be blocked if the number of incorrect pins exceeds its limit.

3. INTELLIGENCE : The data on the card can be updated without renewing or issuing new card as only the programming fed to Arduino Uno needs to be changed .

4. COMFORT : light weight, easy to handle and carry as it is a plastic card . It is better to carry single card rather than carrying number of cards and one needs to remember single pin rather than memorizing various pins.

CONCLUSION:

Today we carry several smart cards such as I.D card, a credit card, a stored value cash card and a repository of personal information such as telephone numbers or medical history. In short to carry several smart cards in a single physical wallet can hamper our security . Currently smart card implementations can be seen around the world but they are not unified. In this paper we have tried to introduce multipurpose smart card system that will perform tutorial attendance and data retrieval application.

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