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ATM Security:GSM Based Anti-Theft Transaction System

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ABSTRACT:

Using an Automatic Teller Machine, customers can access their bank accounts. ATMs were originally developed as just cash dispensers; they have evolved to include many other bank-related functions such as Purchasing, Postage stamps, Lottery tickets, Train tickets. The problem is that, if our debit card is lost then we cannot transact the account. Also if our friend wants money from us immediately then we cannot give the money by ATM. In proposed system we have overcome the problems of manual system which are given above. We can access our account from ATM without using debit card. It is helpful for the user to withdraw money from another user's account with their permission in case of emergency. In this system GSM module is used.

KEYWORDS:

Card less, Secure transaction, Anti-theft, Fast process.

I.INTRODUCTION:

The basic motivation for our project is to help the user financially in case of emergency. Although ATMs were originally developed as just cash dispensers, they have evolved to include many other bank-related functions. A Talking ATM is a type of ATM that provides audible instructions so that persons who cannot read an ATM screen can independently use the machine. On most modern ATMs, the customer is identified by inserting a plastic ATM card with a magnetic stripe or a plastic smart card with a chip that contains a unique card number and some security information such as an expiration date. Authentication is provided by the customer entering a personal identification number (PIN). Some developed systems also use the biometric identification for secure transaction but it require large data base which stores the biometric information of each user.In this paper, it proposes an efficient and secure method for ATM transaction. This is helpful for the user to withdraw money from another user's account with their permission in case of emergency without using DEBIT CARD. It can be also implemented for emergency services for home or a building. There is no any problem of lost of ATM card or damage of ATM card. This paper also provides security system for ATM machines. Now a day there is no particular security system for ATM machines. The only security system provided at the ATM centers is ATM card detector near the door. When the attacker try to damage the ATM machine vibration detection sensors gets activated. A message is passed to the nearby police stations with the help of GSM modem. By using GSM module we can send information of balance status by message to user's registered number which solve the problem of paper wastage.

II. LITERATURE REVIEW:

There are various existing system are developed such as Security in e-banking via card less biometric ATMs [1] provides high security in authentication which also protects user from unauthorized access. In this model user required to authenticate himself with biometric identification (thumb/ fingerprint/iris etc.), personal identity number (pin) and selection of bank branch from displayed list if necessary. This model is designed for the rural farmers, semi-literate peoples.Protected cash withdrawal in ATM using mobile phone [2] describes a method of implementing two way authentications. Role of biometric technology over advanced security and protection in auto teller machine transaction [3] describe, different biometric techniques related security topics regarding ATM has been discussed. Enhanced voice recognition to reduce fraudulence in ATM machine [4] introduced to reduce cases of fraud and theft due to its methods used in identification of individuals, security based implementation of hidden mark ov model algorithm (hmm) to calculate speech

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rate, frequency and modulation pitch detection algorithm (PDA) for pitch calculation of voiceprints and accent classification (ac) for the accent analysis in voice. Anti-theft ATM machine using vibration detection sensor [5] provides security for the ATM machine itself. When the attacker try to damage the ATM machine vibration detection sensors gets activated. A message is passed to the nearby police stations with the help of GSM modem.

III.EXISTINGMETHODOLOGY:

The existing system of two-factor authentication using mobile phones, are used to generate the one time password (OTP) [7].By definition, authentication is the use of one or more mechanisms in order to prove that you are who you claim to be. Once your identity is validated, access is granted [6]. Three universally recognized authentication factors exists today: what you know (passwords), what you have (tokens, cards) and what you are (biometrics). Recent work has been done in trying alternative factors, for example somebody you know, a factor that can be applied in social networking.Two-factor authentication is a mechanism that implements two of the above mentioned factors and is considered stronger and more secure than the traditionally implemented one factor authentication system. For example, withdrawing money from an ATM machine uses two factor authentication: the ATM card (what you have) and the personal identification number (what you know).

Passwords are known to be one of the easiest targets of hackers. Therefore, most companies are searching more ways to protect their customers and employees. Biometrics is known to be very securing [7], but is used only in special organizations (such as military organizations) given the expensive hardware needed and their high maintenance costs. As an alternative, banks and companies are using tokens as a way of two-factor authentication. A token is a physical device that generates passwords needed in an authentication process. Tokens can either be software or hardware. Hardware tokens are small devices that can be easily carried. Some of these tokens store cryptographic keys or biometric data. Anytime a user wants to authenticate in a service, he uses the onetime password displayed on the token in addition to his normal account password. Software tokens are programs that run on computers and provide a onetime password that it is changed after a short amount of time (usually 30 seconds).

OTP algorithm's security is very important because no one should be able to guess the next password in sequence. The sequence should be random to the maximum possible extent, unpredictable and irreversible. Factors that can be used in OTP generation include names, time, seeds, etc. Several commercial two-factor authentication systems exist today such as RSA Secure ID [7].Multifactor authentication uses more than two form of authentication and it provides higher security [8].

IV.PROPOSED METHODOLOGY:

In this project we analyzed what is the problem people faced in the existing technology. Especially Multifactor Authentication (MFA) method provides more complexity to the user. This project helps to overcome the problem of complexity and provides easiest way to secure the ATM transaction. Whenever person enters account number onto the ATM machine, the system requires PIN to authenticate the user. If PIN gets verified, it makes a call to theuser's mobile. If the user replied to make a transaction, then transaction process takes place. The proposed system uses GSM modem for call from ATM to the user and getting reply from user to ATM. If user correctly entered amount and secondary password from mobile then transaction takes place. There is no any problem of lost or damaged ATM card. Also if the robbers try to damage ATM machine then the vibrations are detected by vibration sensor and give an alert message to the nearest police station and switches on the alarm.

Hardware Description:

Microcontroller- Microcontroller can be termed as a single on chip computer which includes number of peripherals like RAM, EEPROM, Timers etc., required to perform some predefined task. AVR is an 8-bit microcontroller belonging to the family of Reduced Instruction Set Computer (RISC). In RISC architecture the instruction set of the computer are not only fewer in number but also simpler and faster in operation. AVR microcontroller executes most of the instructions in single execution cycle. AVRs are about 4 times faster than PICs; they consume less power and can be operated in different power saving modes. Let's do the comparison between the three most commonly used families of microcontrollers. AVR follows Harvard Architecture format in which the processor is equipped with separate memories and buses for Program and the Data information.

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LCD:

A liquid crystal display (LCD) is a flat panel display, electronic visual display, video display that uses the light modulating properties of liquid crystals (LCs). LCs does not emit light directly. They are used in a wide range of applications, including computer monitors, television, instrument panels, aircraft cockpit displays, signage, etc. LCDs have displaced cathode ray tube (CRT) displays in most applications. They are usually more compact, lightweight, portable, less expensive, more reliable, and easier on the eyes. They are available in a wider range of screen sizes thanCRT and plasma displays, and since they do not use phosphors, they cannot suffer image burn-in.

DTMF:

DTMF stands for Dual Tone Multi Frequency and it is the basis for your telephone system. DTMF is actually the generic term for Touch-Tone (touch-tone is a registered trademark of ATT). Your touch-tone phone is technically a DTMF generator that produces DTMF tones as you press the buttons. Dual-tone multi-frequency signaling (DTMF) is used for telecommunication signaling over analog telephone lines in the voice-frequency band between telephone handsets and other communications devices and the switching center. The version of DTMF that is used in push-button telephones for tone dialing is known as Touch-Tone.

IVRS:

Interactive voice response (IVR) is a technology that allows a computer to interact with humans through the use of voice and DTMF keypad inputs. In telecommunications, IVR allows customers to interact with a company's database via a telephone keypad or by speech recognition, after which they can service their own inquiries by following the IVR dialogue. IVR systems can respond with prerecorded or dynamically generated audio to further direct users on how to proceed. IVR applications can be used to control almost any function where the interface can be broken down into a series of simple interactions. IVR systems deployed in the network are sized to handle large call volumes.IVR technology is also being introduced into automobile systems for hands-free operation. Current deployment in automobiles revolves around satellite navigation, audio and mobile phone systems.

MAX232:

MAX232 from Maxim was the first IC which in one package contains the necessary drivers (two) and receivers (also two), to adapt the RS-232 signal voltage levels to TTL logic. It became popular, because it just needs one voltage (+5V) and generates the necessary RS-232 voltage levels (approx. -10V and +10V) internally. This greatly simplified the design of circuitry.

CD4066BC Quad Bilateral Switch:

CD4066BC is a quad bilateral switch intended for the transmission or multiplexing of analog or digital signals. It is pin-for-pin compatible with CD4016BC, but has a much lower "ON" resistance, and "ON" resistance is relatively constant over the input-signal range.

KEYPAD:

keypadis a set of buttons arranged in a block or "pad" which usually bear digits, symbols and usually a complete set of alphabetical letters. If it mostly contains numbers then it can also be called a numeric keypad. The keypad Switches are connected in a matrix of rows and columns: The rows of the matrix are connected to four output port lines. The columns of the matrix are connected to four input port lines

Software Description:

The software part deals in programming the microcontroller. In the present work we have used the ORCAD design software for PCB layout design, the CODEAVISIONAVR software development tool to write and compile the source code, which has been written in the C language. The uCFLASH serial device programmer has been used to write this compile code into the microcontroller. The proteus software is used to simulate the project. The project also uses visual basic for interacting with the user.

IV. RESULT:

The result of this project is to withdraw money from ATM Machine by using Mobile phone. In this project the ordinary ATM card is replace by mobile phone for higher security than existing system. Also it gives the security of the ATM machine from robbers.

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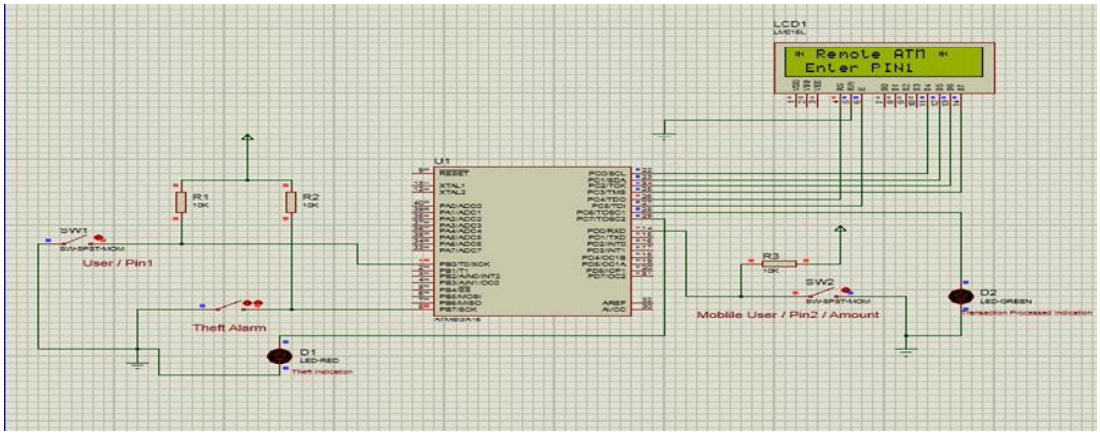
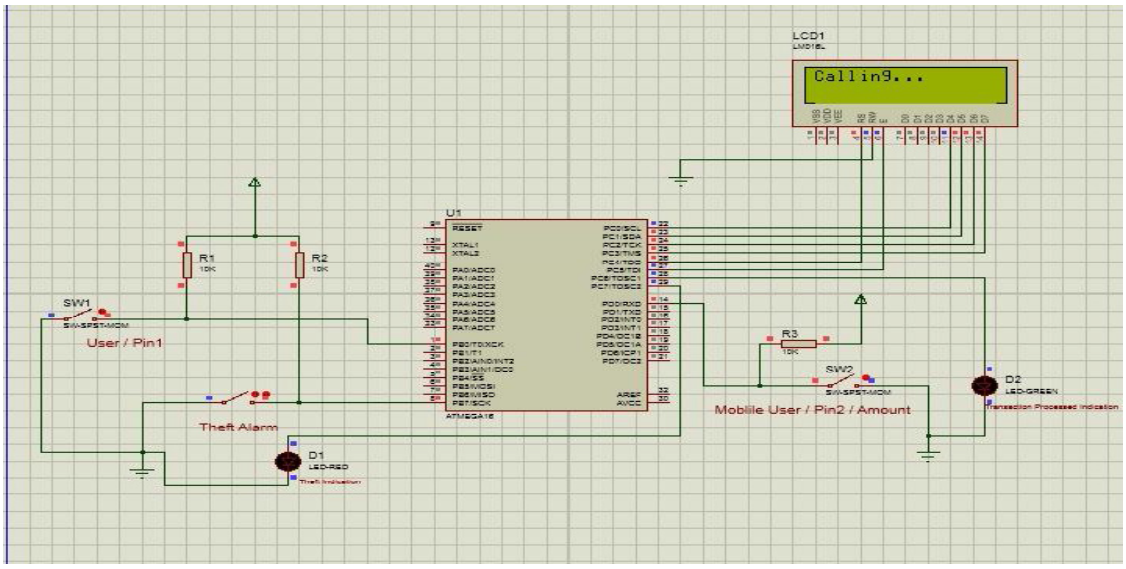
The code was written in AVR Studio and then was simulated using Proteus simulator. The results were satisfactory we went about with the hardware implementation part. The stepwise simulation process is as follows:

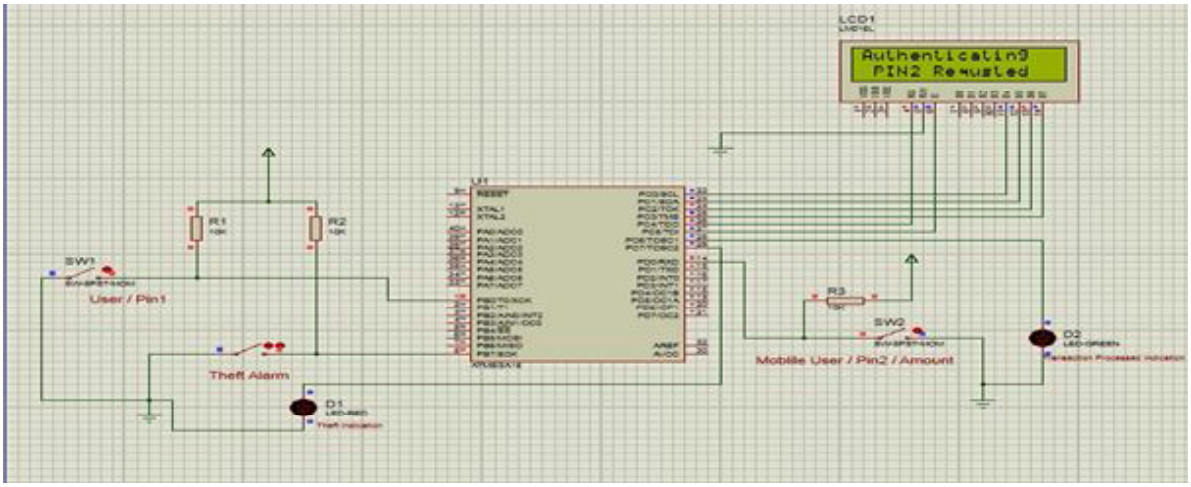
1.After entering account number system ask to enter pin1 which is entered by user at ATM machine.



2.After verifyng pin1 it call to user mobile by GSM modem.



3.Then it request to mobile user for pin2 for Authentication.



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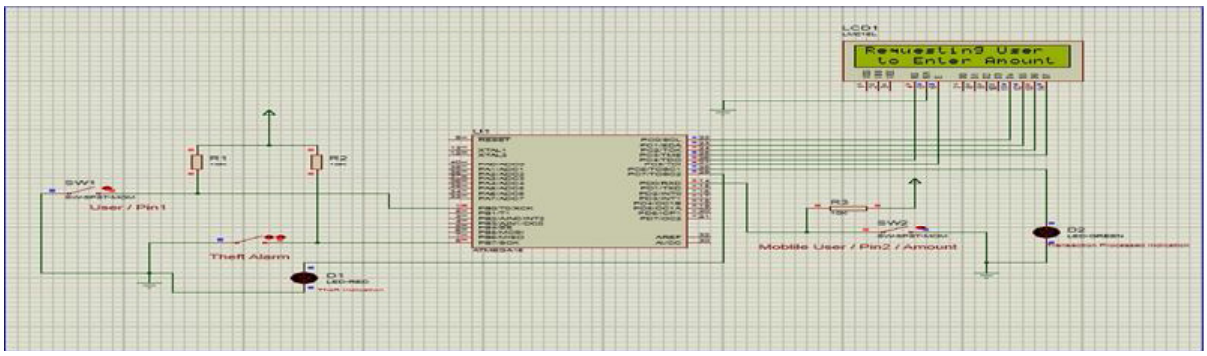
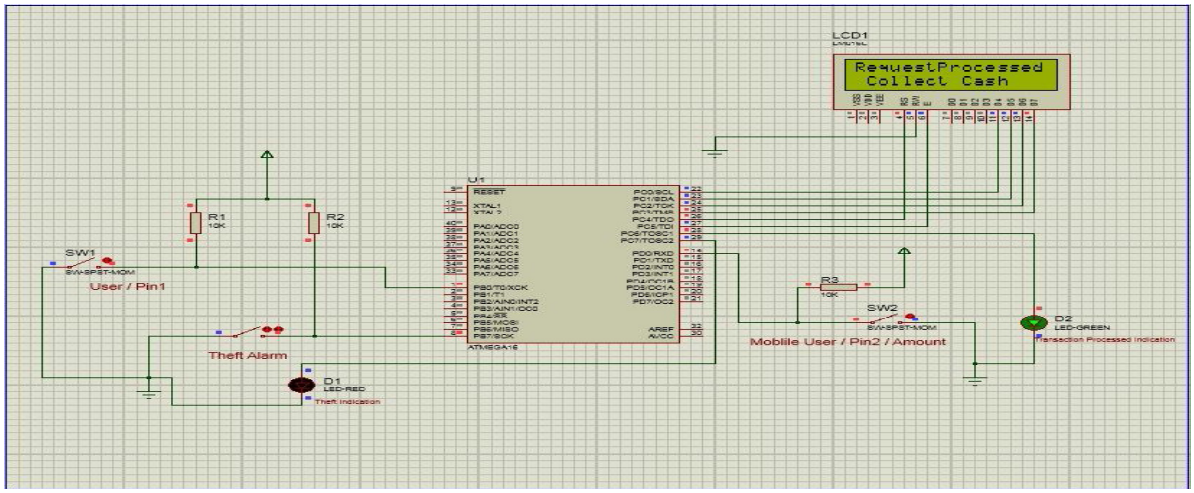
4.After verifying pin2 it request to mobile user to enter amount.

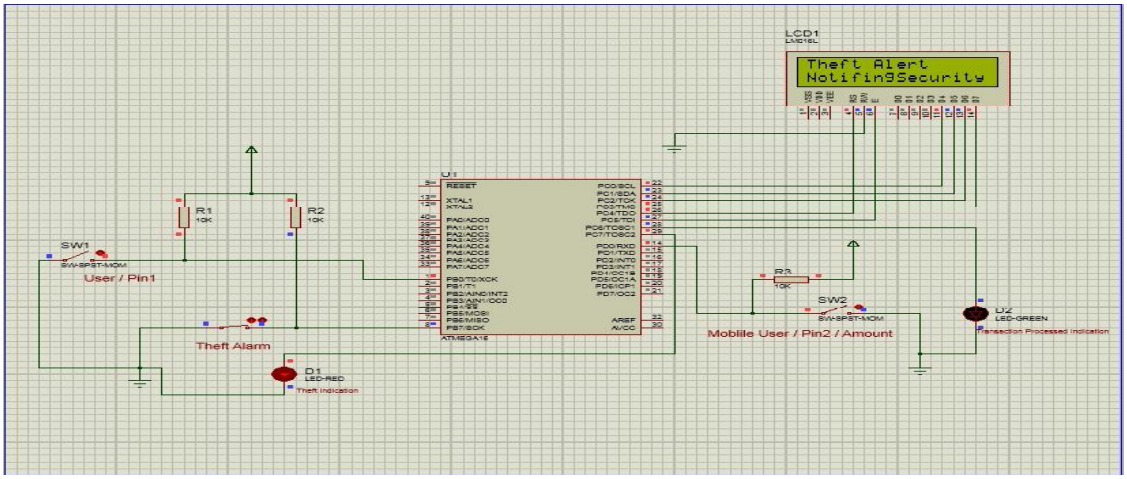


5.After processing cash is withdrow from ATM machine.



6. Then it send message on user mobile with information of available balance.

7. If robber try to theft money from ATM machine then vibration sensor connected at port B gives information to microcontroller then alert message will send to the nearest police station.



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VI.CONCLUSION:

The proposed system based on AVR microcontroller is found to be more compact, user friendly and less complex which can readily be used in order to perform several tedious and repetitive tasks. Though it is designed keeping in mind about the need for industry it can extended for other purposes such as commercial and research applications. Due to the probability of high technology (GSM) used this "Protected Cash Withdrawal in ATM Using Mobile Phone" is fully software controlled with less hardware circuit. The feature makes this system is the base for future systems.

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