Handheld Electronic Banking System Using Fingerprint Module by Arm7 Processor

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Abstract:

In this paper a banking system may also be operated within and on the far side of the regular banking hours. The main aim of the handheld electronic machine is to provide banking services such as cash withdrawals and cash deposit. To create a secured handheld electronic banking system, it is a mobile banking system which is used to provide more secured and banking service for the people in villages. The transaction can be done by fingerprint scanner and OTP for every transaction and more secure. Once this kind of systems is launched by banks, the customer could easy banking services with the bank person. This system is used as banking machine with connected to server and which is carried by the banking person who is authorized by the respective bank. Also the money transferring can be done by the same banking hours.

Keywords:

ARM7, Fingerprint module, GPS technology, GSM technology.

I.INTRODUCTION:

Now a days, like going to the ATM and withdrawing cash make people, miss their working hours and, as a result, people lose a significant time of their income as well work hours. For them it has to design a system that helps those people who cannot leave their business hours for banking transactions.

Using an ATM machine, customers can access their deposit the cash or credit accounts in order to make a variety of transactions such as cash withdrawals, cash deposit Thus, ATMs often provide the best possible exchange rates for long travelers, and are widely used for this purpose. The scope of my work helps the people to get banking services such as cash cash deposit and cash withdrawal. It would save the people time and money as they need not to leave the place where they are.

II.SYSTEM MODEL:

The project and its security features along with the system flow will be explained in a step by step format in the following text.

Step 1:

The customer who wants bank services (withdraw or deposit) must call to the customer care line of the bank and report.Then the bank server will choose the appropriate bank area and will send a query message or information to that. The bank machine should reply with an acknowledge message when it sees the bank query. Then the server will dispatch a message about the details of the customer including his/her account balance. The message contains a One-Time Password (OTP) to the bank machine that is allocated for that transaction. The same OTP (one time password) is also sent to the mobile number to the customer.

The bank system is always connected to the central banking server using GSM communication.

Step 2:

The device has a built-in high accuracy GPS unit to get precise time as well as accurate location information. Minimum 3 hours transaction expiry period is set by default. This means the transaction can be completed within the time period, if not the electronic handheld device automatically cancels the particular transaction process. This information will be sent to the banking server.

Step 3:

Bank machine is permitted to be used, within a particular region in order to prevent illegal issues out of that region and thus the device is locked in terms of its position. The exact location of the device is tracked from GPS (Global positioning system) signals and the position is verified with the region previously indicated by the bank server. This helps to keep track of the location of the bank machine in the event of misuse or a theft condition. If any out of region condition brings the electronic device to a halt and the error info is sent to the bank server.

Step 4:

On meeting the customer, the customer should verify the OTP in customer's mobile against the bank device. This mutual verification would authenticate both members, and the transaction can now be started.

Step 5:

The identity of BC (business correspondent) is first verified using a built in Fingerprint Scanner. The device stores the fingerprint of the BC as well as the entire customer's. Now the machine will be asked to enter customer fingerprint. If it is verified, then the transaction has been done. This shows the authenticity of each party. After finishing the fingerprint verification,

Step 6:

After finishing the fingerprint verification, now the customers needs to enter his/her secret number on the keypad similar to that on the ATM machines. Once the secret number is entered and verified, the machine will unlock the device for the final step in the transaction. Now the customer needs to enter the amount to be withdrawn or deposit on the shown in display and the BC will dispatch the money to the customer. Now the device checks this and sends a "cash paid" message to the bank server. If the customer needs to deposit the money, he/she must to enter the cash as previously described and the cash should be handed over to the BC. Now the BC will scan the fingerprint again. Then the device verifies this and sends a "money collected" message to the bank server.

Step7:

The device uses a buzzer sound to indicate automatically print the receipt as soon as the message has been sent. The bank server immediately knows that Transaction Over. If any of the steps is not validated properly, then the device will send the appropriate error message and stop further transaction immediately.
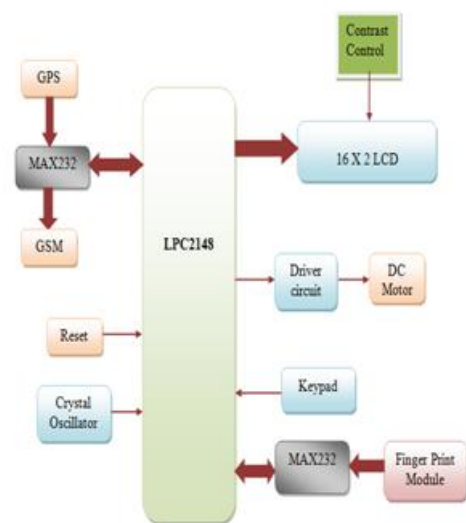
Fig 1-block diagram

III. METHODOLOGY

Fingerprint Scanner

Fingerprint recognition is done of the methods of verification for the banking transaction to take place. Fingerprints are nothing but of biometrics used to identify the individuals and verify their identity. The identity of the business correspondent, customer should verified through this scanner for bank transactions. The storage capacity of the fingerprint scanner is in greater than 250, but can be extended to more than thousand if required.

Fig 2-Fingerprint Scanner

GSM:

Global System for Mobile communications (GSM), as the world's most widely used mobile phone technology. It is an electronic equipment that accepts a SIM card and operates similar to the phone. Global system for mobile communication is a globally accepted for the digital cellular communication.
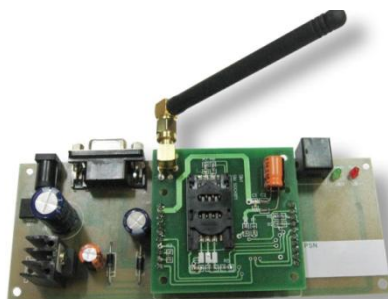
Fig 3- GSM Modem

GPS:

The earth has 24 satellites of which at least 4 are always visible. The GPS receiver calculates the location using the triangulation method. The 66 channels GPS receiver is interfaced via NMEA protocol. The small antenna is track up to 66 satellites at a time. Global positioning system is to calculate the latitude and longitudinal distance of the device.

Fig 4- Global Positioning System

LPC 2148 Microcontroller:

The LPC2148 microcontrollers is widely used IC from ARM7 family. It is a 16-bit/32-bit ARM7TDMI-CPU with real-time emulation and combine microcontroller with embedded high speed flash memory from 32 KB to 512 KB. It requires the crystal frequency of 12 MHZ and runs voltage of 5v. LPC2148 are ideal for applications where it is a key requirement, Serial communications interfaces from a USB 2.0 Full-speed device, 2 UARTs, 2 SPI, 2 I2C-bus and on-chip SRAM of 8 KB up to 40 KB, two 32-bit timers, single 10-bit DAC, watchdog timer, real time clock (RTC), PWM channels and GPIO lines with up to nine edge or level sensitive external interrupt pins make these microcontrollers.

IV. SOFTWARE:

Keil compiler is a software tool, which is used as machine language code is written and compiled. After compilation is done, the machine code is converted into hex code which is to be dumped into the microcontroller for processing. Keil compiler also supports C language code.

IV.RESULTS AND CONCLUSION:

In this project, we reported and implemented a complete working model using an ARM7 Processor. This work includes the study of fingerprint module and this project can be very much useful in real time applications. This is a real-time based paper which tells that there is a handheld electronic banking system for the people in villages. This system is helps to avoid transaction fee. This is more systematic approach for the people in villages and it would save people time and money. For the future scope, we can captured the image process to impure more secure.
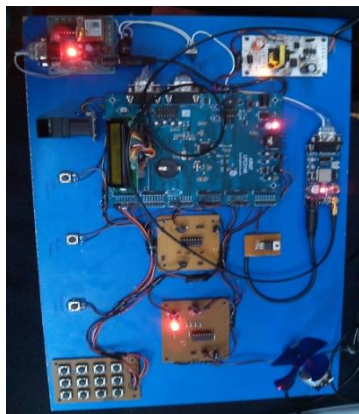
Fig 5. Output of Handheld   Electronic device

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