Implementation of Secure ATM by Wireless Password Transfer and Shuffling Keypad

[1]Kumaresan S, [2]Suresh Kumar K, [3]Dinesh Kumar G

[1,2]M.E-VLSI Design, [3]Assistant Professor, Knowledge Institute of Technology, Salem, India

Abstract: **The main objective of this system is to develop a secure ATM in future. In general, all the keypad based authentication system having several possibilities of password guessing by means of shoulder movements. Shoulder-surfing is an attack on password authentication that has traditionally been hard to defeat. This problem has come up with a new solution by following two methods of proposal idea one is designing shuffled ATM keypad which displays the shuffled numbers in the LCD keypad which confuses person who standing near you to guess the password. Another one is to develop the Bluetooth application between the user and ATM counter for communicating a password via the wireless medium. This type of awareness preventing PIN theft in future and the proposed idea is implemented using the UTLP kit.**

Keywords: **ATM, UTLP, LCD, PIN, OTP, GLCD.**

I. INTRODUCTION

Now-a-days, in the self-service banking system has got wide popularization with the typical offering high-quality 24 hours service for customer. In this era of technology, ATM (Automatic Teller Machine) card is the essential part of life. To have transaction ATM pin code is compulsory and it must be secure. The existing self-banking system has got very high popularity with 24 hours service. Use of ATM is helpful for money transaction. ATM is activated by placing the card, then entering the pin number of the particular card. But this system is not safe to use because anybody can access the system. Passwords remain the dominant means of authentication in today's systems because of their simplicity, legacy deployment and ease of revocation. Unfortunately, common approaches to entering passwords by way of keyboard, mouse, touch screen or any traditional input device, are frequently vulnerable to attacks such as shoulder surfing and password snooping. Current approaches to reducing shoulder surfing typically also reduce the usability of the system, often requiring users to use security tokens, interact with systems that do not provide direct feedback or they require additional steps to prevent an observer from easily is ambulating the input to determine the authentication methods do not support traditional password schemes. Shoulder surfing is an observation technique of theft the information by looking over someone's shoulder [1]. In some ATM counter fake keypads were placed over the true keypad and fit over it like a glove. Therefore the person takes the finger touch on the fake keypad. This problem may overcome by designing ATM keypad as a touch LCD display with shuffled numbers for every different user. In some cases the thieves may steal the original ATM PIN number by placing the external devices like cameras on the top of the ATM counter which is focused on the keypad when person enter the password. The solution for this type of problem is to develop the Bluetooth application between the users and the ATM counter. Whenever the person enters into the ATM counter after card insertion the Bluetooth of ATM ask to authenticate to enter the password. The person who is inside the counter enters the password via his/her mobile Bluetooth application after the authentication. The proposed idea is helpful to reduce this type of password guessing in future and also reduce the legal person to access the personal savings.

II. DETAILED STUDY AND ANALYSIS

The security levels of ATM counter are increased day by day at different ways. Some of the authentication techniques added in password protections is analyzed below.

A. Fingerprints:

A customer will be required to enter a login id and authenticate his finger print and both will be sent to the bank for validation as part of each transaction. This makes the developed ATM software more secure as compared to the software that authenticates the user merely by using a PIN or password [2].

B. Face recognition:

The proof of identity of a person by their facial image can be done in a number of different ways such as by capturing an image of the face in the visible spectrum using an optical camera or by using the infrared patterns of facial heat emission. Some of the dares of facial recognition in the visual spectrum include decreasing the impact of variable lighting and detecting a mask or photograph. Foremost benefits of facial recognition are that it is non-intrusive, hands-free, and continuous and accepted by most users [3].

C. GSM:

Bankers will collect the customer 4 digit OTP (One Time Password) password through the GSM (Global System for Mobile Communications) after the card insertion. After validation of OTP the user moves for further processing [5].

D. Voice or speech recognition:

The capability of a machine or program is to receive and interpret dictation, or to understand and carry out spoken commands. Severely speaking, voice is also a physiological quality because every person has a different pitch, but voice recognition is mainly based on the study of the way a person speaks, commonly classified as behavioral. The voice based security fails sometimes at a person affected by fever or any vocal sound problem.

III.   METHODOLOGY

The security level in ATM counter is further increased by modifying the existing ATM into our proposed idea one is to develop the ATM keypad as virtual shuffle manner which reduces the PIN theft from shoulder movements the person who stand outside the counter. Another one is develop the wireless password transfer from mobile application to ATM counter Bluetooth.

A. Shuffling keypad:

Random generation of number is one of the techniques to generate the random number in many applications. All the ATM keypad is designed on the basis of resistive touch therefore the key arrangements should be change for separate user. Our proposed idea is to implement the keypad by capacitive touch based screen which changes the number display for each different user. The random number is generated by using LFSR (Linear Feedback Shift Register) one of the techniques to generate the shuffled numbers in a display. Random number is generated by using linear feedback shift register (LFSR).LFSR is shift register whose input bit is a linear function of its previous state. The only linear functions of single bits are XOR and inverse- XOR thus it is a shift register whose input bit is driven by the exclusive-or (XOR) of some bits of the overall shift register.

B. Wireless Password Transfer:

The mobile based security level is developed by creating the mobile application as Bluetooth which is used only by the ATM counters. Similarly the ATM counter has respective Bluetooth which is used to exchange the data between the ATM database and user passwords. Connection establishment of Bluetooth between user and ATM counter by the following procedure:

➤ User inserts the card into the respective slot

➤ System asks to switch on the Bluetooth and also display the pairing random number to pairing user and system devices. This may avoid the person who stands near you to pairing the device.

➤ After authenticate system ask to send 4 digit password through Bluetooth.

➤ Transfer data to and from other devices Verify the password for further processing.
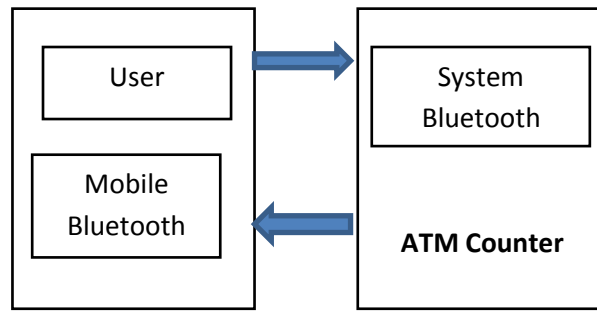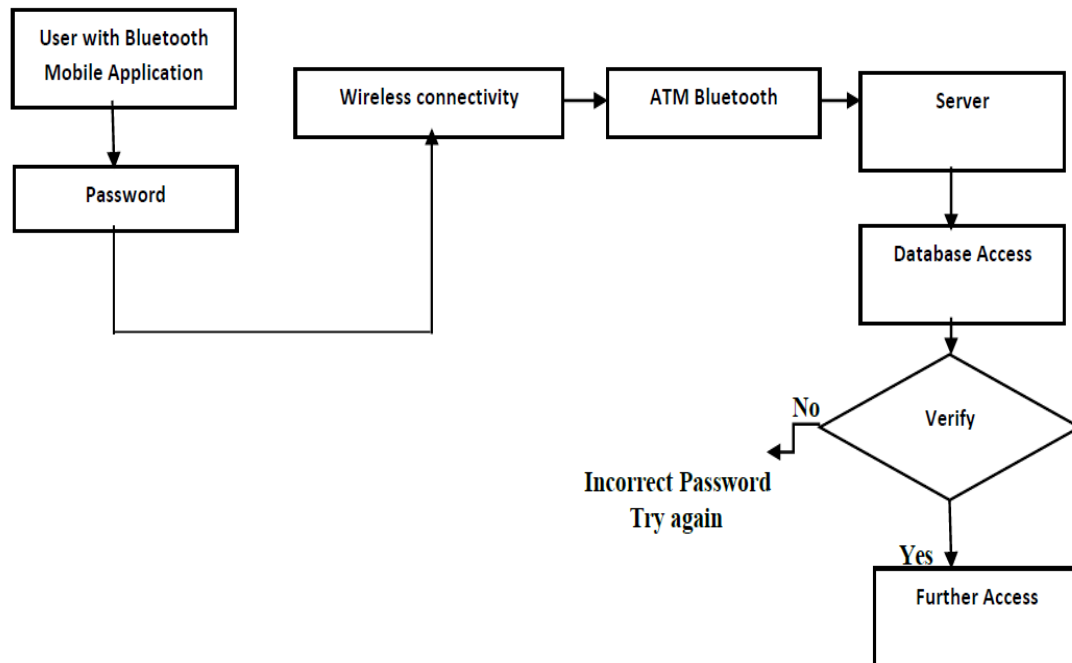
Fig. 1. BLUETOOTH AUTHENTICATION

Fig. 2. WIRELESS Bluetooth PASSWORD TRANSFER

IV. SOFTWARE DESCRIPTION

Unified Technology Learning Platform is an ardent facilitator for aiding engineers gain hand-on, learn and understand complex and advance technologies simply. Eventually, UTLP embraces modern technologies to bridge the gap between academia and industry. It increases individual learning towards subjects and supports and motivates students towards building and integrating concepts keeping in mind organizational practices.

Unified Technology Learning Platform (UTLP) is an integrated learning environment consisting of hardware and software tools the features of UTLP are,

➤ TI OMAP 3530 SOC with ARM Cortex A8 600MHz CPU,

➤ DM64X+ 430MHz DSP,

➤ Xilinx Spartan-6 LX25T FPGA,

➤ 128MB CPU RAM –mDDR

➤ 64MB FPGA RAM-DDR2

➤ 128MB NAND FLASH

➢ Video OUT-VGA, LCD-local/external

➢ AV Support & TV Out

➢ Video IN-Camera, Audio in, audio out, stereo out

A. Eclipse and Ubuntu:

With the help of UTLP kit, the eclipse software can be performed. The parameter can be monitor and control by using the UTLP of ARM8 processor. Eclipse is a Java-based open source platform that allows a software developer to create a customized development environment (IDE) from plug-in components built by Eclipse members. Eclipse is managed and directed by the Eclipse.org Consortium. Eclipse got its start in 2001 when IBM donated three million lines of code from its Java tools. The original goal of Eclipse was to create and foster an open source IDE community that would complement the community that surrounds Apache.

Ubuntu is an operating system that is developed by a worldwide community of programmers as well as by employees of Ubuntu's commercial sponsor, Canonical. Ubuntu is based on the concept of free or open-source software, meaning that you do not pay any licensing fees for Ubuntu, and you can download, use, and share the operating system free of charge.

B. ARM8 PROCESSOR:

The ARM 8 Cortex processor, based on the ARMv7 architecture, has the ability to scale in speed from 600MHz to greater than 1GHz. The Cortex-A8 processor can meet the requirements for power-optimized mobile devices needing operation in less than 300Mw and performance-optimized consumer applications requiring 2000 Dhrystone MIPS.
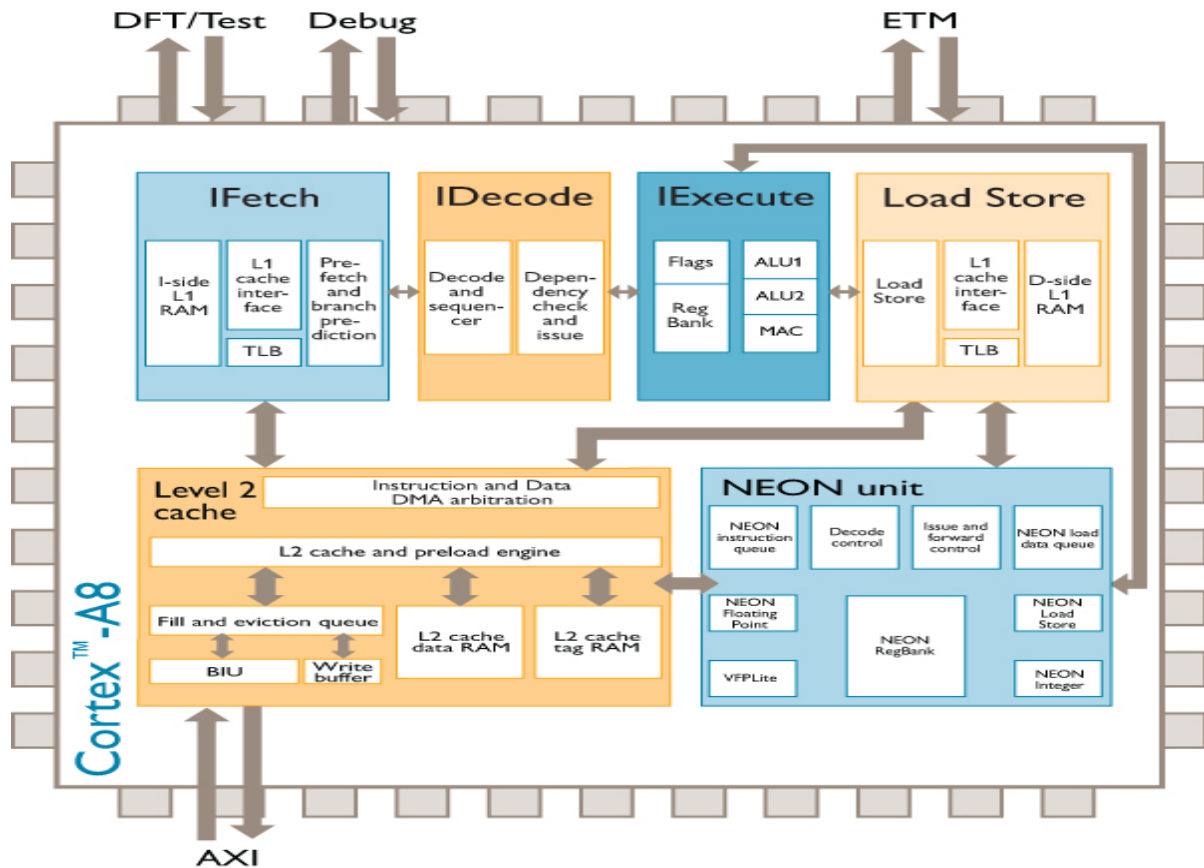

Fig. 3. ARCHITECTURE OF ARM8

The Cortex-A8 high-performance processor is proven in end devices today. From high-end feature phones to net books, DTVs, printers and automotive-infotainment, the Cortex-A8 processor offers a proven high-performance solution with millions of units shipped annually. The processor is particularly suited to high-performance applications.

V. RESULT AND DISCUSSIONS

The proposed idea of shuffling keypad is implemented using ARM processor kit which consists of GLCD (Graphics LCD), LED (Light Emitting Diode), CLCD (Character LCD) output displays used to display the output. In our proposed idea random number keypad result is displayed using GLCD displays.

Fig.4. SHUFFLED KEYPAD USING ARM PROCESSOR

VI. CONCLUSION

This paper recognizes a model for the modification of existing ATM systems by virtual shuffling of keypad and wireless password communication provide an effective way of preventing PIN theft. The Proposed idea will confuse the Password guessing and password thieving in future from unauthorized person. Therefore this kind of additional technique preventing pin theft in future.

VII. FUTURE WORK

In future the process of wireless Bluetooth password transfer is developed by creating the mobile applications and corresponding Bluetooth arrangements in all the ATM Centre will reduce the unauthorized access. The government should take the responsibilities to prevent PIN theft in future.

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