**1. INTRODUCTION**

Due to wide range of development in technologies, the electronics world has being playing important role. There is always a chance for technology to be super-fast in various fields and needs to be expertise. Such a one among the growing technology is RedTacton a HAN based technology which is founded by NTT by Japanese corporation. RedTacton refers to warmth in touch and in turn action. This is nothing but whenever there is a contact made on device it should authenticate if the user is owner. This is spreading technology which can overcome LAN in networking, WLAN, Bluetooth, infrared etc. RedTacton provides secured communication.

The implementation of ubiquitous services requires three levels of connectivity-Local Area Networks (LAN), Wide Area Networks (WAN), and Human Area Networks (HAN) for connectivity to personal information, share data, media and communication appliances within the much smaller areas for communication. RedTacton is a technology that uses the surface of the human body as a high speed and safe network transmission path. Here, the human body acts as a transmission medium supporting half duplex communication at 10Mbit/s. RedTacton technology is an electronic future where information can be accessible whenever and wherever needed at finger tips. The communication equipment is incorporated into our attire. RedTacton is a new Human Area Networking technology that uses the human body surface as a high speed and safe network transmission path. RedTacton is a Break-through technology that enables reliable high-speed HAN for the first time.

RedTacton processes based on three features which are unique for every application. The three main features are Touch, Broadband Interactive and Any-Media.

Touch: Touch of human body parts like toes, hands, fingers, foot etc. can be a part of communication interface for locking and unlocking the devices with these data.

Broadband Interactive: There is no chance for data to be loss in middle. The speed of communication is of 10Mbps which is duplex communication.

Any Media: Various conductors and dielectrics are used as a part of transmission media.

RedTacton works by the usage of minute electric field emitted on the surface of human body which is different from various technologies. A communication path is established when body comes in contact with transceiver. Using this type of communication signals can be carried to the device for accessing and controlling. It can also work through clothes and shoes within distance of 10cm.

**2. LITERATURE SURVEY**

The author in paper [1] discuss about RedTacton, which employs an exclusive electric field/photonics method in Human Area Networking which give better performance in comparison with other existing short distance technologies. It surpasses the other methods in terms of communication distance, transmission speed and interactivity. Since it provides high speed communication, it can provide seamless service wherever, whenever and whoever uses it. It is highly secure due to the involvement of the two devices in end-to-end basis, thus impossible to get hacked.

The paper [2] portrays human region organizing innovation that empowers correspondence by

Touching, which is called RedTacton. RedTacton utilizes the moment dynamic plot produced by mortal part as connecting for communicating the information. The scratch will be implanted as different gadgets have transmitter and beneficiary worked to pass and acknowledge information in advanced type. In this paper they overviewed the RedTacton technology, working standard of RedTacton over human region network, application, and protocols for information transmission.

The paper [3] focuses on a model of human range organizing innovation that empowers

Correspondence by touching, an innovation called RedTacton. Human territory organizing innovation for correspondence between portable terminals and between terminals that are inserted in the earth has gotten to be vital. At the point when links are utilized for correspondence between terminals, the steering of the links is obviously badly designed. The mortal part goes about as a communicating part aiding IEEE 802.3 partially paired correspondence at 10Mbit/s.

The author in paper [4] discusses RedTacton as new technology ubiquitous computing services. This is because it brings user-friendly ubiquitous services to people and objects in a network at very close proximity. By just a small PCMCIA card-sized transceiver prototype, RedTacton evokes the first practical HAN comprising devices, human body, PCs and other networks in an environment triggered by a natural human actions such as touching, holding, walking, swiping, stepping on a surface etc. In this article we look at RedTacton as a ubiquitous computing services enhancer.

The paper [5] demonstrates various applications of RedTacton Technology such as Smart Security Card System for ATM Machines, Instant Private Data Exchange, Marketing Applications, Personalization of Mobile Phones, Personalization of Automobiles etc. RedTacton is a break-through technology that uses the surface of the human body as a safe transmission media using DTMF (dual tone multi frequency) system, high speed network transmission path.

The paper [6] explains RedTacton as another Human Area Networking idea that uses the outer of the mortal part as a sheltered, rapid system communicating way. RedTacton uses the moment voltaic field transmitted on the outer of the mortal body. In fact, it is totally particular than remote and rust. A communicating way is shaped right now a part of the mortal body interacts with a RedTacton handset. Bodily isolating finishes the contact and consequently closes correspondence Using RedTacton, correspondence begins when ends conveyed the client or implanted in gadgets was connected in different mixes as per the client's communication is conceivable utilizing anyone surfaces, for example, the human parts.

RedTacton works regular physical developments. The element is envisioned as a place slithering with receiving wires and emitters, because of the tremendous development of remote interchanges. Furthermore, it appears that the present method for exchanging information may as of now have an intense contender none other than the human body.

The author in paper [7] explains the working of RedTacton includes starting correspondence with a contact that will bring about an extensive variety of activities accordingly. It doesn't depend on electromagnetic or a shine frequency to pass information. The information exchange between RedTacton empowered gadgets does not require any dialing or sign in, the information exchange would be basically momentary. While the reality of the matter is that comparative individual territory systems are as of now available by utilizing frequency based advances like Wireless or Bluetooth, these are frequently blocked by irregular administration and will in the end be supplanted by "human region systems".

The paper [8] illustrates the design principle of transceiver system which works using RedTacton technology for various applications. The electric field induced towards the body by the transmitter signal electrode is represented by Ea. The system requires a ground close to the transmitter signal electrode, so electric field Eb induced from the body can follow a return path to the transmitter ground. Moreover, since people are usually standing on a floor or the ground, electric field Ec escapes from the body to ground, mainly from the feet. the electric field Es that reaches the receiver is Es= Ea– (Eb+ Ec). It couples to the electro-optic crystal and changes the crystal’s optical properties. This change is detected by laser light and transformed into digital data by a detector circuit.

ATM machine which will work smartly by using the RedTacton technology is explained in the paper [9]. Tacton means “Touch-Act-on” is known as action triggered by touching. RedTacton uses weak electric field on the surface of the body as a transmission medium. A transmission Path is formed at the movement of human body come in a range of RedTacton Transceiver. RedTacton transmitter consists of Dual Tone Multi Frequency encoder. The signal is encoded as pair sinusoidal tones. Which generate valid & invalid signal and can be transmitted through human body to RedTacton receiver for additional processing. According to the particular sequence enhance the security of ATM card, RedTacton based smart ATM card is designed.

This paper [10] explains about RedTacton, its working guideline, distinctive applications and future improvement of RedTacton. it is another Human Area Networking innovation that uses the outer of the mortal body as a secured, rapid system communicating way. It is totally unmistakable from remote and rust advancements as it uses the moment dynamic field transmitted on the outer of the mortal part. A communication way is framed right now a part of the mortal part interacts with a RedTacton handset. Correspondence is conceivable utilizing anyone surfaces, for example, the hands, face, legs or middle. RedTacton works with shoes and garments also. At the point when the physical touch gets isolated, the correspondence is finished.

**3. MOTIVATION**

Present technologies like Bluetooth and Zigbee have communication speed maximum up to 3Mbps. These technologies rely on Electromagnetic waves or light waves to carry data, which have hazardous effect on human health.

To solve these problems RedTacton technology is being implemented. This technology uses weak electric field on the surface of the body as transmission medium and has a communication speed of 10Mbps. RedTacton Communication is possible using any body surfaces such as hands, fingers, arms, feet, face, legs or toes. RedTacton also works through shoes and clothes as well.

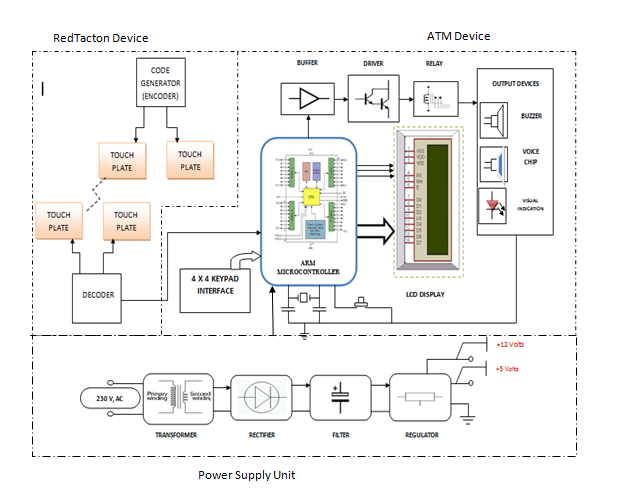
Now a day’s Hacking ATM’s is a recurring problem which can be avoided by secured transaction through RedTacton technology.

**4. OBJECTIVES**

The objectives of the project work are:

1. Study of RedTacton Communication and various applications.
2. Study of ARM Microcontroller and DTMF encoder and decoder.
3. Designing of RedTacton Communication module.
4. Programming of ARM processor in embedded C using keil software for smart ATM Machine.
5. Implementation of ATM security system using RedTacton technology.
6. **DESIGN METHODOLOGY**

Fig 1. Shows Block diagram of smart ATM Machine Using RedTacton Technology. It consists of RedTacton transmitter, RedTacton receiver, Driver, Microcontroller unit and the Voice bank.

Fig 1.Proposed Block diagram of smart ATM Machine Using RedTacton Technology

* **HARDWARE REQUIREMENTS:** ARM LPC2148, LCD, Relay Driver,

Relays, Resistors, Capacitors, LEDs, Crystal, Diodes, Transformer, Voltage Regulator, Push Button.

* **SOFTWARE REQUIREMENTS:** KeilcompileruVision 3, Language: Embedded C.
* **Power supply unit**

This section needs two voltages viz., +12 V & +5 V, as working voltages. Hence specially designed power supply is constructed to get regulated power supplies.

* **4X4 Keypad:**

A keypad is 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. Keypads are found on many alphanumeric keyboards and on other devices such as calculators, push-button telephones, combination locks, and digital door locks, which require mainly numeric input.

* **DTME Encoder:**

The DTMF Encoder uses a radio frequency to transmit the control signals for generating the DTMF frequencies, a dedicated IC UM95089 (which is used a dialer IC in telephone instruments) is used here. It uses a quartz crystal of 3.58MHz.

* **DTMF Decoder:**

This project uses DTMF decoder UM 8870 IC. The DTMF decoder identifies the transmitted signal. If a valid code is received then only the switch sends the signal to the ARM controller, the ARM controller used is ARM7LPC2148.

* **Buffers:**

Buffers do not affect the logical state of a digital signal (i.e. a logic 1 input results in a logic 1 output whereas logic 0 input results in a logic 0 output). Buffers are normally used to provide extra current drive at the output but can also be used to regularize the logic present at an interface.

* **Drivers**

This section is used to drive the relay where the output is complement of input which is applied to the drive but current will be amplified.

* **Relays:**

It is electromagnetic device which is used to drive the load connected across the relay and the o/p of relay can be connected to controller or load for further processing.

* **Buzzer:**

A buzzer or beeper is an audio signaling device, which may be mechanical,

Electromechanical or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke.

* **Voice recorder:**

The aPR33A series are powerful audio processor along with high performance audio analog-to-digital converters (ADCs) and digital-to-analog converters (DACs). The aPR33A series are a fully integrated solution offering high performance and unparalleled integration with analog input, digital processing and analog output functionality. High quality audio/voice systems with lower bill-of-material costs can be implemented with the aPR33A series because of its integrated analog data converters and full suite of quality-enhancing features such as sample-rate convertor. In this messages must be recorded or played back sequentially, specially designed for simple key trigger, user can record and playback the message. Meanwhile, this mode provides the power-management system**.**

**Methodology:**

RedTacton is a Human Area Networking technology, which is developed by Robin Gaur Jind that uses the surface of the human body as a safe, high speed network transmission path. It is completely distinct from wireless and infrared technologies as it uses the minute electric field emitted on the surface of the human body.

A transmission path is formed at the moment a part of the human body comes in contact with a RedTacton transceiver. Communication is possible using any body surfaces, such as the hands, fingers, arms, feet, face, legs or torso. RedTacton works through shoes and clothing as well. When the physical contact gets separated, the communication is ended.

* The RedTacton transmitter induces a weak electric field on the surface of the body.
* The RedTacton receiver senses changes in the weak electric field on the surface of the body caused by the transmitter.

The block diagram consists of RedTacton transmitter, RedTacton receiver, Driver, Microcontroller unit and the Voice bank. RedTacton is a HAN; body of human being is used for transmission of signals. RedTacton transmitter consists of a DTMF encoder which generates both valid and invalid signals and can be transmitted through human body through the RedTacton receiver (DTMF decoder) for further processing. In RedTacton receiver by the use of DTMF decoder the transmitted signal is identified.

As the transmitted signal is of very low voltage, buffers and drivers are used to send the received signal to the electromagnetic switch. Electromagnetic switch checks the received signal with the predefined valid code. If an invalid code is received and detected in the switch then the buzzer starts ringing indicating that an invalid card is trying to access the ATM. If a valid code is received, then only the switch sends the signal to the main control unit which is the microcontroller. If Microcontroller gets active it switches on the keyboard where predefined options are stored to perform various tasks such as Enter password, Change of password, New password, etc. After entering the valid password the voice bank gets activated. In voice bank predefined options with keys are present which guides the user to select appropriate action in the ATM such as Cash withdrawal, Pin change, Account balance, etc.

**6. EXPECTED OUTCOMES**

RedTacton based smart security card system for ATM will be implemented. When RedTacton technology is compared with other technologies, it provides better security and communication speed. As human body itself acts as transmission media, lot of additional features (scream activation, voice alarm etc.) can be integrated with existing ATM system which ensures secured and reliable transaction.

**7. PROJECT SCHEDULE**

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| --- | --- | --- |
| **Sl no.** | **Content** | **Date of execution** |
| 1 | Literature survey and understanding of the topic | 1st Jan 19 – 13th Jan 19 | |
| 2 | Synopsis preparation | 14th Jan 19– 20th Jan 19 | |
| 3 | Gathering information about RedTacton Technology | 14th Jan 19 – 20th Jan 19 | |
| 4 | Learning to work with ARM LPC2148 and Keil uVision | 21st Jan 19 – 3rd Feb 19 | |
| 5 | Design and implementation of smart ATM Machine  using RedTacton technology. | 4th Feb 19 – 24th Feb 19 | |
| 6 | Product development and testing | 25th Feb 19 – 10th Mar 19  11th Mar 19 – 17th Mar 19 | |
| 7 | Results, comparison and analysis | 18th Mar 19– 24th  Mar 19  25th Mar 19 – 31st  Mar 19 | |
| 8 | Conclusion and final report | 1st Apr 19– 10th Apr 19 | |

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