Red Tacton

A detailed analysis on emerging technology of transmission

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Abstract: **We have known about various infrared and Bluetooth wireless technologies in our recent times. But the technology has been moved along that these technologies have been overvalued. Now, examiners are trying to build a new path for transmission of signals called Human Area Networking. As the name indicates, such a technology will have the human body surface to transmit and receive signals at very high speeds. Now we are going to go through such a technology, which is currently under growth, called Red tacton Technology. Red tacton is a technology or wireless network of Human Area Networking, which makes use of the surface of the human body as a safe, high speed network transmission path. It is purely definite from wireless and infrared technologies as it makes use of the minute electric field emitted on the surface of the human body.Red tacton technology lies directly between wired and wireless communication. The fact reveals that it is better than wireless LAN as signals don't weaken/loosen. Currently, Red tacton is preparing to compete with Bluetooth, Zigbee, IrDA (infrared data association), UWB (ultra wide band), and other wireless communication forms. Whenever there is an emerging technology in a particular domain, it is brought into the process of analysis, researches and suggestions. So, in this research material, we will discuss about the technology along with its functionalities, requirements, applications and its competition in real-time world.**

Keywords – Networking, transmission, signals, data

I. INTRODUCTION

RedTacton is a technology or wireless network of Human Area Networking. It is developed by SaiCharanEtikala.It is a technology that makes useof the surface of the human body as a safe, high speed network transmission path. It is purely definite from wireless and infrared technologies as it makes use of the minute electric field emitted on the surface of the human body.A transmission path is created at the moment a part of the human body comes in contact with a RedTacton transceiver. Communication is established using anybody surfaces, such as the hands, fingers, arms, feet, face, legs or torso. RedTacton operates effectively through shoes and clothing as well. When the physical contact gets parted apart, the communication is terminated.

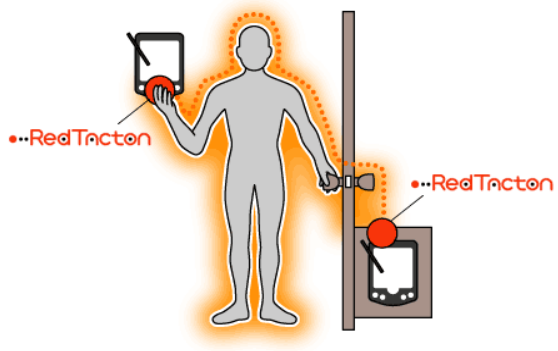

Fig: RedTacton Technology

RedTacton is a technology that establishes connection between the last networking gap, creating the Human Area Network with connection of the last meter. It works effectively by utilizing the electric field on the surface of the human body to transmit data between a RedTacton receiver and other devices. Data can be transferred and transmitted at the speed up to 10 mbps. According to Technology reviews& studies, the "transceiver gets combined with an optical receiver circuit which is equipped with a super-sensitive photonic electrical field sensor and a crystal to transmit data." [1]

Other competing technologies are different in that they use radio frequency or light to transmit/transfer data at short distances. They also try and manage to work at slower speeds that RedTacton which, as mentioned before, uses the body's electrical field to transmit at a high level speed. In addition to that, since RedTacton requires physical contact and has a low level of potential for interference, it is much more secure when with other competing technologies. Recently, the developer of RedTacton, NTT has recently started to try and commercialize the technology. As reported on Gizmodo in 2008, the technology is currently being commercialized and marketed as an approach to turn a human into a swipe card. People could wear their RedTacton device and touch the doors/filing cabinets/other objects which would receive the security clearance from the respective device, instead of carrying access cards or wearing a wireless device. It would be more secure and efficient than traditional swipe cards, keys, or wireless signals.

According to science studies, we know that our body is creating minute electric charges all the time. This electric field thus created is used for RedTacton technology to transmit and receive [duplex communication] the signals. Thus, this method of functioning and approach is entirely different from other signal transmitting technologies like wireless and infrared. Thus, like LAN and WAN, a new network protocol called HAN [Human Area Network], is being configured. [2]

II. FEATURES OF RED TACTON:

RedTacton has three main functional features.Here are the three main features of this technology.

- Touch –
  In Red Tacton technology, every mode of communication is possible with a physical contact. During various processes of this equipment, all physical movements like touching, gripping, sitting, walking, stepping and so on is used as triggers. The functions and processes can be the START and STOP of the equipment, data retrieval or even locking and unlocking.Human movements like gripping, touching, walking,sitting, stepping are some of the triggersresponsible for unlocking or locking, starting or stopping equipment, or obtaining data.

- Broadband and Interactive –
  For the proper functioning of broadband communication, the ideal speed with this method& operation is said to be 10 Mbps. This is considered to be constant for full duplex communication.Even if various and multiple communications are used through this technology, the speed will not be affected or terminated as the signal is transmitted/ transferred through the human body. The mode of transmission and the path is on the surface of the body and the speed does not lose its quality and efficiency in congested areas where many people are communicating at the same time. So, Duplex, interactive communication is possible and achieved at a maximum speed of 10Mbit/s.

- Any media –
  In addition to the human body, other various objects such as conductors and dielectrics can be used as transmission media. Dielectrics and conductors may also be used in combination. It works with many transmission media which are common in human life. [3]

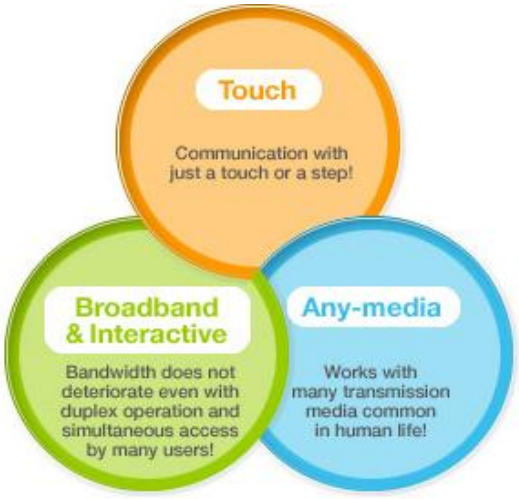

Fig: Features of RedTacton

III. WORKING OF RED TACTON TECHNOLOGY:

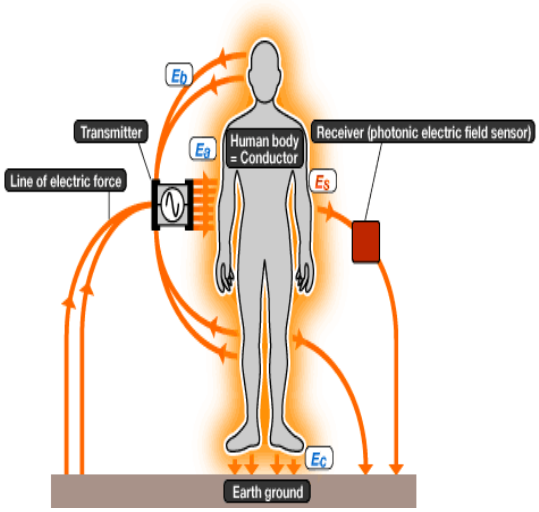

Fig: Working of Red Tacton Technology

RedTacton makes use of a point to point network, which is known to be as a piconet. The point to point network allows information and data to be exchanged/transferred between two transceivers.It is done without the need of a server to store or process data/information.

This technology operates on the idea that optical properties of an electro-optic crystal can vary according to the changes of a person own electric field. After contracting with the another RedTacton enabled device, the transmitter one wears induces an electric field on the body. And next, the transceiver on the device verifies and detects changes in the wearers' electric field which was caused by the device. The devices then communicate and pass information by inducing fluctuations in the electric field of the human body. Data/Information is received using a photonic electric field sensor that combines an electro-optic crystal and a laser light to verify and detect fluctuations in the minute electric field.

Now let's consider an example. Think of an action of holding digital camera in one hand and touching a printer with the other hand which initiates the transferring of images from camera to printer. In an instant of time, you can observe that you have downloaded your pictures and it is ready to beprinted out without the need for connecting cables or any intermediary devices such as a computer. [4]

WORKING- IN DEPTH:

- Similar to other technologies, RedTactonTechnologyalso has a transmitter and a receiver.
- The signals will start to be transmitted, as soon as when the human body gets contact with the Red Tacton transceiver. The transmission will also stop, when the contact is taken off.
- The terminals are embedded in the devices.Or else they canalso be carried by the user itself. The communication will happen in various combinations, according to the natural and physical movements of the user.
- The communication establishment through the user can done only through the body surface parts like fingers, hands, arms, face, feet, legs or torso. This Red Tactontechnology also works in clothing's and shoes as well.

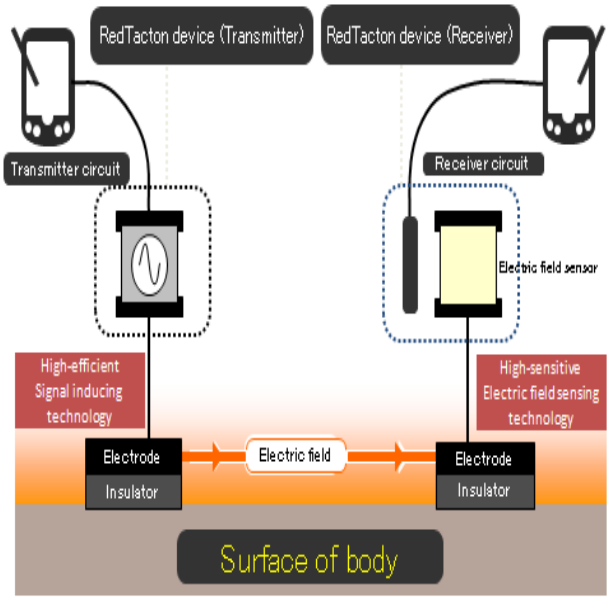

Fig: How RedTacton Works

- In Red Tacton, a mild electric field is induced by the transmitter, and it is done on the human body surface. A photonic electric field sensor or a transistor will be settled up as the sensor for the electric field on the RedTacton receiver. This sensor verifies and detects the electric field and the signal will also be processed in the receiver as well.
- As a result, this processed signal thus becomes the data or information that is to be downloaded.
- The basic understanding about the Red Tacton Transceiver can be obtained from the below diagram.[5]

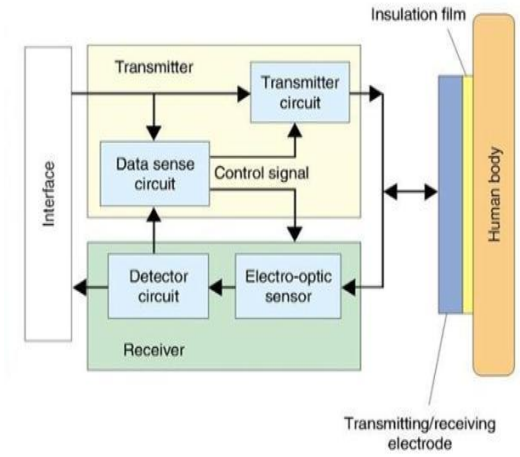

Fig: RedTacton Transceiver Block Diagram

- Like the digital signals, the signals will definitely depend on the fluctuations in the electric field which is induced in the body. A highly sensitive sensing technology is used in the receiver part, as we observed that the electric field is mild in nature.

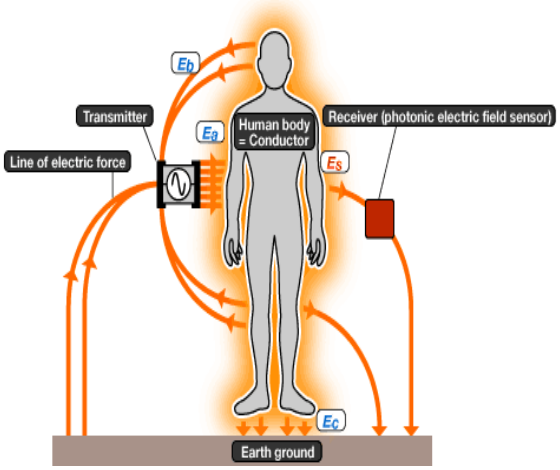

Fig: RedTacton Working

- There will also be very small and unstable electric fields on the surface of the body,other than the electric field that transmits the data. This is carried out naturally and will be sent back to earthautomatically. [6]

IV. NEEDS AND REQUIREMENTS:

NEEDS & REQUIREMENTS 1:

When a device is to be communicated with other device, we must ensure that it is equipped with a RedTacton transceiver which is able to verify &detect the messages programmed into our own device. We can able to program and make our devices to exchange specific types of data/information by using a transceiver which is programmable that connects to any computer and also allows users to customize their transmission settings through a GUI (graphical user interface). Once when the transmitter is designed or programmed to verify &recognize and to exchange information with other devices we select, such as printers, and we will be able to communicate with them easily.

In the event which we require the data/information we are exchanging to interact with or to be processed by other applications, we will likely require a broadband connection to send that particular data/information over the internet to be processed and retrieved back. This would be the case scenario with our subway turn style example.

NEEDS & REQUIREMENTS 2:

In the consumer market, all bargaining power lies with the device manufacturers who could be our buyers/customers. NTT, the company which acts as our supplier, provides this technology to the manufacturers of the device. Now, we define a device as any handheld communication medium such as PDA or a cell phone. As this technology evolves and its popularity expands, a device could be any piece of technology that we wish to transfer data/information.

While manufacturers of this device may see the potential benefits of this technology, they will be in need of a significant monetary contribution to influence them to construct this technology into their devices. Introducing of new technologies into existing devices often needs significant design/model changes which could be time consuming and costly. The device manufacturer should stand to benefit from the design change or else they may reject the new technology in favour of developing and promoting the old one. Lot of research and development is required in Red Tacton Technology. The military, medical or the government officials and professionals might be ideally suited to help for further promotion and development of the technology and finds out other uses for it. [7]

V. ED TACTON: COMPARISON & COMPETITIONS:

COMPARISON WITH OTHER NETWORK TECHNOLOGIES

Detailed work process and function on ubiquitous service has achieved the act of shortening of distances in communication. RedTactontechnology is been positioned as the last 1m solution to ultimate communication (close-range). Wireless communication makes out connections when signals approach, making a way for easy connections because connectors are not important. When we look from another view, the incoming signals can be intercepted, so security factor becomes an issue here. Wired communication transmits information/data between two connection portals, so interception is quite difficult and security factor can be considered to be high. However, nuisance is made by the connectors and cables. Analysing the above points and taking into account, RedTacton technology lies directly between wired and wireless communication.The fact reveals that it is

better than wireless LAN as signals don't weaken/loosen and whereas in blue-tooth, the communication is more secured and it is possible only between two devices and not more than that.

Examine the chart diagram below. The chart showcases the current and exact position of Red tacton technology when compared with other wireless technologies.

Red tacton actually is mostly useful for short distance communication. When this technology is compared with a Wi-Fi i.e. a wireless communication, this technology seems to have more advantages. In Wi-Fi wireless communication, there is no requirement of any wired or physical connections. This shows that communication is established as soon as the signals arrive at it. When it comes forprotective measures and security reasons, Wi-Fi will be seen as a problem. As the data and signals can be hacked easily by others, extra security measure is a mandatory factor.

As we already discussed that when we put comparison with wired transmission, Redtacton has more advantages. Herephysical or wired connection is much needed at a higher rate for data transmission to happen. When dealing with more users, trying to store and retrieve data from a source, the wired or physical connections becomes an issue for problem. But, there will not be many issues with security factors as concerned.

Hence, we can assure and realize that this Redtacton technology exactly comes right in between wireless and wired connection. It can provide data transfer without the use of physical connections as well as maximum security. The security will be strong factor as the data transmission can occur between two contact points only. The following picture depicts the exact comparison between all the technologies.[8]

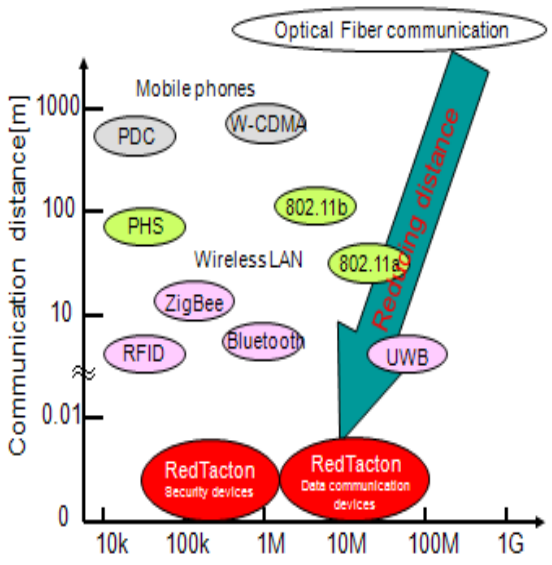

Fig: RedTacton– Comparison with other network technologies

THE COMPETITION

Currently, there are many popular and widely used technologies which exist in the marketplace that provides functions similar to this Redtacton technology. The first wireless connection in thatis Bluetooth. Bluetooth is awidely used wireless technology with short range frequency which allows users or clients to transmit/tranfer data within approximately of a 10M range. Bluetooth, however, is considered to be unsecure communication. The signal can be hacked or tapped into and can be used by others. As we already discussed earlier, Zigbee, IrDA, and UWB are also considered to be potential competitors.

VI. APPLICATIONS OF REDTACTON:

If you are wishing to listen to music or a song from your MP3 player, you should have to adjust the headphone to your ears in such a way and then switch/turn on the player that is kept in your respective location i.e for example pocket. But, with this Red tacton technology, as there are no wires for transmission, the digital signals can be passed from your player to the headphone through your body, clothes, and shoes and so on. In order to play the next song or to adjust the player settings you can do it by selecting one of the touching features as already explained above.If you wish to send the pictures that are stored in your camera to a device (e.g.Laptop), all you have to do is to establish a contact between the laptop and the camera.Other interesting applications also includes the delivering of business cards to each other just by a shake hand, exchange telephone numbers while you are dancing, sending e-mails with a touch and so on.

VII. USES OF RED TACTON:

Many different domains and areas can benefit from this Red tacton technology. Initially, this Redtactontechnology could target and mainly focus on security, the medical field, and the device communication field. The medical field would benefit in many different ways. For example, implanted devices may or may not use the tech to transmit/transfer information regarding their performance or action to doctors, patients wearing the device could quickly and securely transmit/transfer their medical history, and medicine containers could have chips embedded in them that when sensed and touchedcould send an alarm to the user, if the user's device is designed and programmed to aware and know that an allergy to the medicine that exists. Device communication is the domain where Redtacton would compete and challenge with Bluetooth. As Redtactontechnology is more safe and secure than Bluetooth, it would excel at connecting cell phones to headsets and transmitting data from one person's PDA to another's. As we discussed earlier, Redtactontechnology is already positioning itself major place to become a 'human swipe card' and become the ultimate security device in the upcoming era. One potential application that will be explored and examined in depth is gun control. [9]

VIII. OBSTACLES IN RED TACTON TECHNOLOGY:

While RedTacton may or may not prevail to be a superior technology, we could also see that adoption could be slow since Bluetooth and other radio technologies are already

entrenched. Like those products, as it is adopted, RedTacton technology will become more valuable. If there is nothing and not more for a person's RedTacton device to talk to, it is essentially considered to be useless. Also we need to consider the fact that, initially, it will definitely be comparatively expensive. If security applications are taken off, particularly in the field of military, it may or may not be years before the technology becomes available to clients/consumers. However, it does have the potential to disrupt the market of Bluetooth, since it is considered more secure and works at much higher rate of speeds. When we look into the field of medical, it may create a new market as well. As far as the security applications are concerned with high priority, it could be disruptive because it is such a secure mode for communication. Radio swipe cards are much easier and effective to manipulate than a RedTacton human swipe card. Again, the biggest obstacle will be convincing clients/consumers that the product is worth the premium that will be charged because it seems to be, on the surface, so similar to other technologies that already exist. Explaining why it is more efficient and more secure could be a great challenge. Management will need to seriously examine and consider how it will be marketed and hire expertise marketing people to promote the product in an effective manner. They will also be in need to find partners for sharing in the cost of development and production.

The most important and obvious barrier for entry is that the cost and time to develop and promote Personal Area network technology is considered to be very expensive. Secondly, as a new technology Personal Area networks need to gain fame and promote among users to help pull the technology into the market instead of just having it pushed upon them. On addition to that, widespread marketing campaigns will require to be developed/promoted to highlight the benefits and uses of PAN technology to facilitate its adoption. On conclusion, this technology will not likely to be very useful until a large number of users/consumers and devices have adopted it which means a significant time investment. [10]

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