RED TACTON

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Abstract
There is new concept of "RED TACTON" which makes the human body as a communication network by name HAN (Human Area Network). NTT lab from Japan is currently testing & developing this revolutionary technology. Red Tacton is the major requirement and advantage for people. Red Tacton uses the minute electric field generated by human body as medium for transmitting the data. The chips which will be embedded in various devices contain transmitter and receiver built to send and accept data in digital format. In this paper we consider about red tacton, its working principle, different applications and future development of red tacton.

Keywords
Red Tacton, Network, NTT.

I. Introduction

Red Tacton is a new Human Area Networking technology 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 Red Tacton transceiver. Communication is possible using any body surfaces, such as the hands, fingers, arms, feet, face, legs or torso. Red Tacton works through shoes and clothing as well. When the physical contact gets separated, the communication is ended [1].

Using Red Tacton enabled devices, music from a digital audio player in your pocket would pass through your clothing and shoot over your body to headphones in your ears. Instead of fiddling around with a cable to connect your digital camera to your computer, you could transfer pictures just by touching the PC while the camera is around your neck. And since data can pass from one body to another, you could also exchange electronic business cards by shaking hands, trade music files by dancing cheek to cheek, or swap phone numbers just by kissing.

Touch and action gives Tacton, and word Red – a warm colour – to emphasize warm and cordial communications. This technology was developed by Japanese Company Nippon Telegraph and Telephone Corporation.

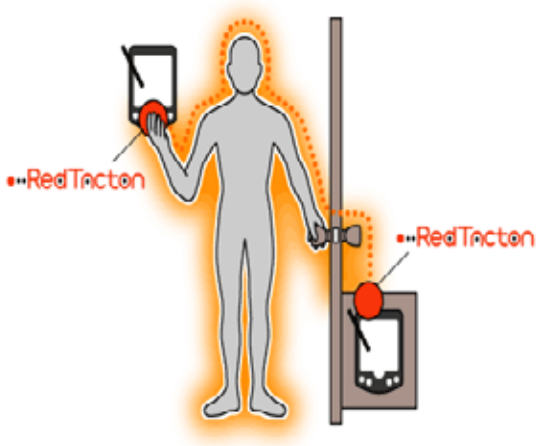

Fig. 1: Red Tacton

II. How Red Tacton works?

Using a new super-sensitive photonic electric field sensor, Red Tacton can achieve duplex communication over the human body at a maximum speed of 10 mbps. The Red Tacton transmitter induces a weak electric field on the surface of the body. The Red Tacton receiver senses changes in the weak electric field on the surface of the body caused by the transmitter [2]. Red Tacton relies upon the principle that the optical properties of an electro-optic crystal can vary according to the changes of a weak electric field. Red Tacton detects changes in the optical properties of an electro-optic crystal using a laser and converts the result to an electrical signal in an optical receiver circuit. The transmitter sends data by inducing fluctuations in the minute electric field on the surface of the human body. Data is received using a photonic electric field sensor that combines an electro-optic crystal and a laser light to detect fluctuations in the minute electric field.

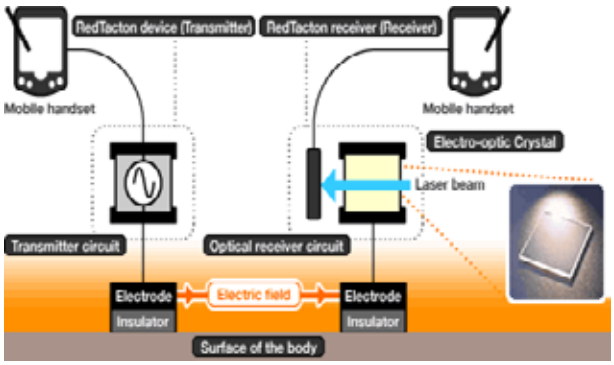

Fig. 2: Electro-Optic field sensor combined with Electro-Optic crystal and laser light [2].

The naturally occurring electric field induced on the surface of the human body dissipates into the earth. Therefore, this electric field is exceptionally faint and unstable. The photonic electric field sensor developed by NTT enables weak electric fields to be measured by detecting changes in the optical properties of an electro-optic crystal with a laser beam.

III. Transmission Steps [3]

1. The Red Tacton transmitter induces a weak electric field on the surface of the body.
2. The Red Tacton receiver senses changes in the weak electric field on the surface of the body caused by the transmitter.
3. It relies on the principle that the optical properties of the electro-optic crystal varies according to the changes in the weak electric field.
4. It detects the changes in the optical properties of an electro-optic crystal using a laser beam and converts the result into an electrical signal in a detector circuit.

IV. Red Tacton Transceiver

The block diagram of a Red Tacton Transceiver [4]. The signal from the interface is sent to the data sense circuit and the transmitter circuit. The data sense circuit senses the signal and if the data is present it sends control signal to the transmitter which activates the transmitter circuit. The transmitter circuit varies the electric field on the surface of our body. This change in the electric field

is detected by the electro-optic sensor. The output of the electro-optic sensor is given to the detector circuit, which in turn given to the interface of the receiving red tacton device.

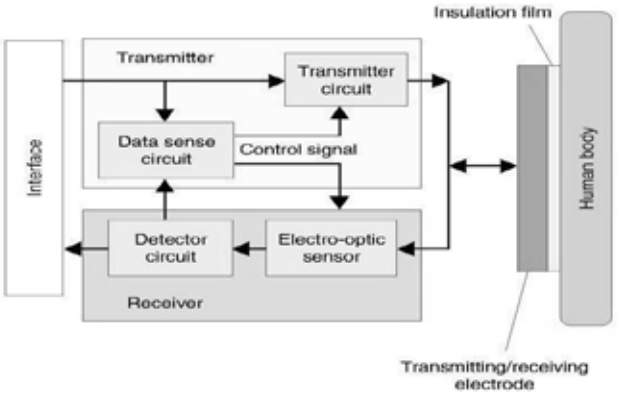

Fig. 3: Block diagram of RT Transceiver.

V. Applications of Red Tacton

There are many applications of red tacton in different fields. This technology will widely used in daily working schedule and provide convenience to people [5].

A. One–To–One Services

1. An Alarm

Red Tacton devices embedded medicine bottles transmit information on the medicines attributes. If the user touches the wrong medicine, an alarm will trigger on the terminal he is carrying. The alarm sounds only if the user actually touches the medicine bottle, reducing false alarms common with passive wireless ID tags, which can trigger simply by proximity as shown in fig. 4.

Fig. 4: One-To-One Services

Fig. 4 shows an alarm sounds automatically to avoid accidental medicine ingestion in the first application on the left side of fig. Right part of fig. 4 describes touch advertising and receive Information.

2. Touch Advertising

When a consumer stands in front of an advertising panel and information matching his or her attributes is automatically displayed. By touching or standing in front of items, consumers can get more in-depth information.

B. Intuitive Operation

1. Touch a printer to print

Print out where you want just by touching the desired printer with one hand and a PC or digital camera with the other hand to make the link Complicated configurations are reduced by downloading device drivers "at first touch" as you see in fig. 5.

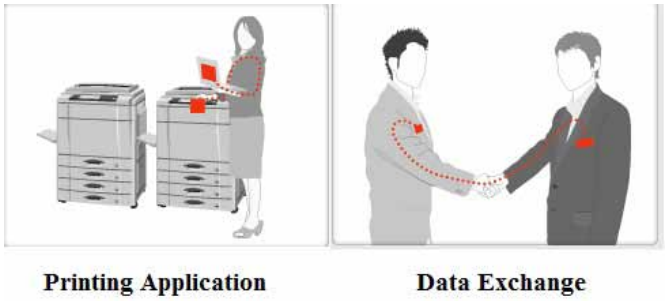

Fig. 5: Intuitive Operation

2. Instant private data exchange

By shaking hands, personal profile data can be exchanged between mobile terminals on the users. (Electronic exchange of business cards) Communication can be kept private using authentication and encryption technologies.

C. Personalization

There are many applications under personalization. Some applications are shown in fig. 6.

1. Just Touching a phone makes it your own

Your own phone number is allocated and billing commences. Automatic importing of personal address book and call history.

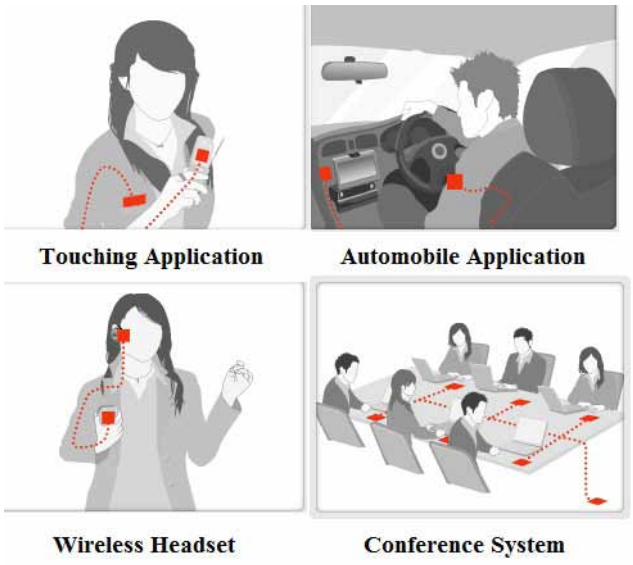

Fig. 6: Personalisation

2. Personalisation of Automobiles

The seat position and steering wheel height adjust to match the driver just by sitting in the car [6]. The driver's home is set as the destination in the car navigation system. The stereo plays the driver's favorite song.

3. Wireless Headset

Red Tacton can carry music or video between headsets, mobile devices, mobile phones, etc. Users can listen to music from a Red Tacton player simply by putting on a headset or holding a viewer.

4. Conference System

An electrically conductive sheet is embedded in the table. A network connection is initiated simply by placing a lap-top on the table. Using different sheet patterns enables segmentation of the table into subnets.

D. Security Applications

Red Tacton is very secure in all respects such as authenticity, authorization and verification as well as unlocking as we see in fig. 7.

1. User verification and unlocking with just a touch

Carrying a mobile Red Tacton capable device in one's pocket, ID is verified and the door unlocked when the user holds the doorknob normally. Secure lock administration is possible by combining personal verification tools such as fingerprint ID or other biometric in the mobile terminal.

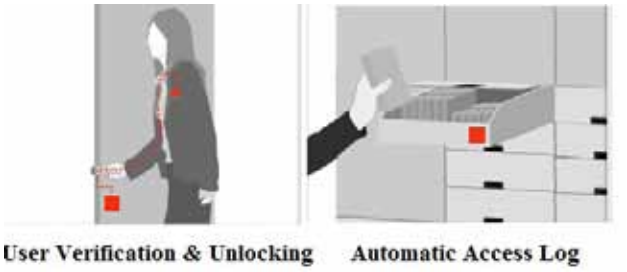

Fig. 7: Security Application

2. Automatic access log:

There is also a facility to access automatic log for confidential document storage. These access logs contain database information in the form of log files.

E. Other Applications

Red Tacton has many applications. So, it is not easy to explore all the applications. Some additional applications as shown in fig. 8.

1. Under Water Communication

Red Tacton allows communication in outer space and in water where the speech constraints are very high and thus enables a highly efficient means of expression of speech which is beyond the purvey of human beings.

Fig. 8: Other Applications

2. Communication inside body

Red Tacton is also used for the treatment. In human body, it is used to detect ailments such as abnormal growths, tumors and excrescences affected tissues and thus helps in curing different diseases.

V. Prototypes

A prototype is an early sample or model built to test a concept or process or to act as a thing to be replicated or learned from. Prototypes are shown in the fig 9.

NTT has made three types of prototypes:-

1. PC Card Transceiver (PC Card type)

PC Card was originally designed for computer storage expansion, but the existence of a usable general standard for notebook peripherals led to many kinds of devices being made available in this form. Typical devices included network cards, modems, and hard disks. In Red Tacton, we can use PC Card Transceiver having both the capabilities to transmit and receive of communication speed of 10Mbps and communication method used in this is Half-duplex. TCP/IP protocol suite is used in the transceiver and interface is PCMCIA which was developed by Personal Computer Memory Card International Association.

Fig. 9: Prototypes.

2. Embedded Receiver (Hub Type)

Receiver is used with the speed of 10 Mbps. Protocols and communication method is same as that of PC Card Transceiver. RJ 45 is used as an interface in the embedded receiver.

3. USB Transceiver (Box Type)

A type of connection between a computer and a peripheral device like a printer or a camera. The original USB could transfer data at a rate of 12Mbps (million bits per second), a new USB2.0 now transfers at a rate of 480 Mbps.

VI. Future Development

Red Tacton has a wide range of unique new functional features and enormous potential as a Human Area Networking technology [6]. Red Tacton is a big achievement given by NTT to people. NTT is committed to quickly identifying and opening up those application areas with the most commercial promise for Red Tacton as shown in fig. 9, a business development process to be coordinated under NTT's Comprehensive Producer Function program.

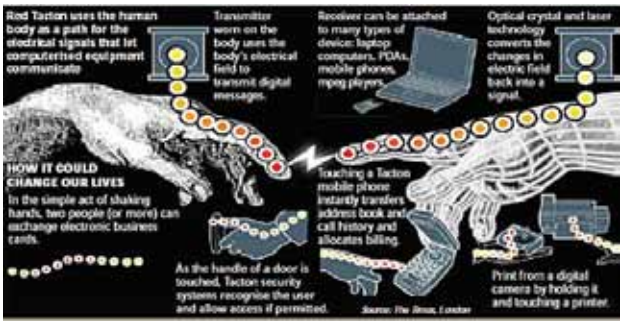

Fig. 10 : Future Development of Red Tacton.

Red Tacton looks remarkably like a big pot of kryptonite is said to allow over 200kbps of data through th10 human hands or feet. Telecom giant Nippon Telegraph and Telephone Corp (NTT) is planning a commercial launch of a system to enter rooms that frees users from the trouble of rummaging in their pockets or handbags for ID cards or keys.

Data will travel through the user's clothing, handbag or shoes, anyone carrying a special card can unlock the door simply by touching the knob or standing on a particular spot without taking the card out. It will have many future applications such as walk-through ticket gate, a cabinet that opens only to authorized people and a television control that automatically chooses favourite programs. The system also improves security. It ensures that only drivers can open their cars by touching the doors if the keys are in their pockets, not people around them. You will try to observe

and compare Red Tacton with other technologies in fig. 11 and analyze the benefits of it. It uses technology to turn the surface of the human body itself into a means of data transmission.

VII. Comparison with Other Networks

The positioning of Red Tacton with respect to existing communication technologies. The focus on ubiquitous service has brought about the shortening of distances in communication. Red Tacton is positioned as the last 1m solution to ultimate close-range communication. Wireless communication creates connections when signals arrive, allowing for easy connections because connectors are unnecessary. However, seen from another aspect, the arriving signals can be intercepted, so security becomes an issue. Several "human body communication" technologies using the human body as a transmission medium have been reported in the past.

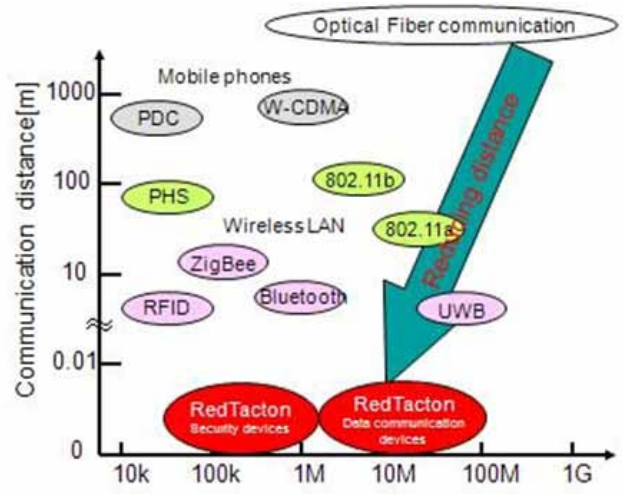

Fig. 11: Comparison with other networks [6].

But Red Tacton employs a proprietary electric field/photonics method, which surpasses the other methods in terms of communication distance, transfer speed, and interactivity.

VIII. Acknowledgement

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IX. Conclusions

The performance of Red Tacton is better as compared to other technologies. It is best to connect network within short distances. There is no any type of problem of hackers as our body itself is the transmission media. Today main issue is speed, it is solved by Red Tacton by providing very high speed of 10 Mbps within short distances.

The evolution of Red Tacton technology is a big achievement, which will likely be targeted for use in applications such as wireless headset, medical application, security applications, wireless transmission by applying different actions. This could get as simple as two people equipped with Red Tacton devices being able to exchange data such as text files as well as business cards just by shaking hands.

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