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An Overview: RedTacton- Human Area Networking (HAN)

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Abstract: RedTacton is an user-friendly persuasive technology that establishes a communication between people and objects in an closer proximity. This paper proclaims model of an human area networking technologies that enables communication by means of "Touching". **Human Area Networking** transmits with mobile terminal and terminals that are embedded in environment. Redtacton technology was implemented to overcome the weak radio signals, data speeds and security –risks on unwanted signal interceptions. Here, human body is the transmitting medium supporting **IEEE 802.3** half-duplex communication at **10 Mbits/s**. Redtacton uses the minute electric field generated by human body as an medium to transmit the data. In,this paper it implies that RedTacton technology is based on the principal of Human Area Networking.

Keywords: *Red-tacton Mechanism, IEEE 802.3, Human Area Networking, etc.*

I. INTRODUCTION

Red Tacton technology is a**Human Area Networking (HAN)** which was introduced by **Nippon telegraph and Telephone Corporation (NTT's)** that uses the human body surface as an high speed and safe network transmission path. Human area network is an technology used for communication between mobile terminals and between the terminals that are embedded in the environment has become most important. When cables are used for communication between terminals, the clarity of the cables is clearly inconvenient. So, technology for solving such problems includes the use of the person's body as a signal path for communication.

A transmission path is formed automatically when a person comes into contact with an device and communication between mobile terminals begins.**RED -** It is an auspicious color according to Japanese culture for **warmth/TACTON-** meaning **"action triggered by touching"**.

In the past, Bluetooth, infrared communications (IrDA), radio frequency ID systems (RFID), and other technologies have been proposed to solve the **"last meter"** connectivity problem. But, they each had an various fundamental technical limitations that constrain its usage, such that precipitous fall-off in transmission speed in multiuser environments producing network congestion. The concept of intra-body communication was first proposed by **IBM** in **1996**.This communication mechanism was later evaluated and reported by several research groups around the world.

Finally, all limitations were overcome by **NTT** (**Nippon Telegraph and Telephone Corporation**) located in Tokyo, Japan by using **photonic electric fieldsensors** and finally came up with a human area networking technology called **'RedTacton'.**

II. RED-TACTON MECHANISM

- RedTacton transmitter induces a weak electric field on the human body surface.
- The RedTacton depends on the proposition of the optical properties of an electro optic crystal which varies according to the changes in the weak electric field.
- RedTacton detects the changes in the optical properties of an electro-optic crystal using a laser and converts the result into an electrical signal in a detector circuit.

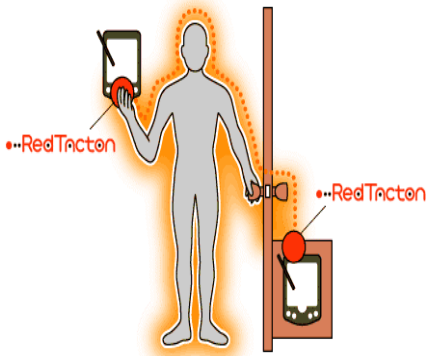

Figure 1: Mechanism of Redtacton

Photonic electric field sensor

Ea – Eb – Ec = Es
Ea Electric field induced by the transmitter
Eb Electric field returning to the ground of the transmitter
EcElectric field at the receiver
EsDetected electric field at the receiver.

III. FEATURES OFREDTACTON

Generally,there are three features based on Red-tacton they are as follows

A. Touch Feature

In this technology, every mode of communication can be done with a touch. All physical movements like touching, gripping, sitting, walking, stepping and so on are used as triggers for various processes of the equipment. The processes can be the START and STOP of the equipment, data retrieval or even locking and unlocking.

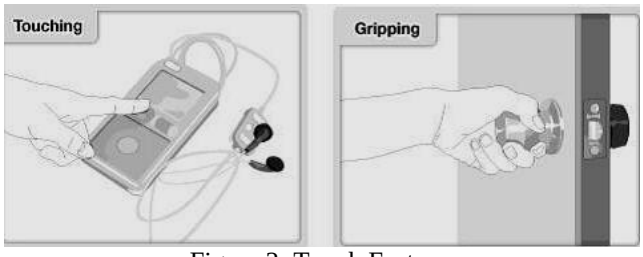

Figure 2: Touch Feature

B. Broadband Feature

For broadband communication, the ideal speed with this method is said to be **10Mbps.** This is constant for full duplex communication. Even if multiple communications are been used through this technology, the speed will not be affected as the signal is been transmitted through the human body.

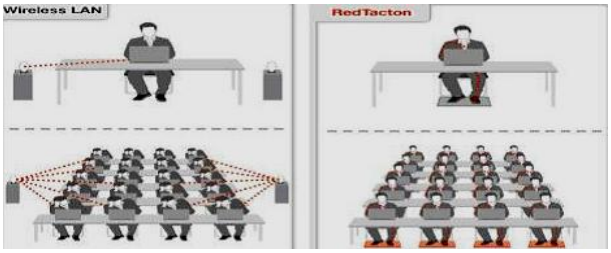

Figure 3: Broadband Feature

C. Any-Media Feature

In addition to human body, Redtacton can utilize a wide range of materials as a transmission medium, as long as the material is conductive and dielectric. **Dielectric**- (Signals pass through material)**Conductors** - (Signals travel along surface)

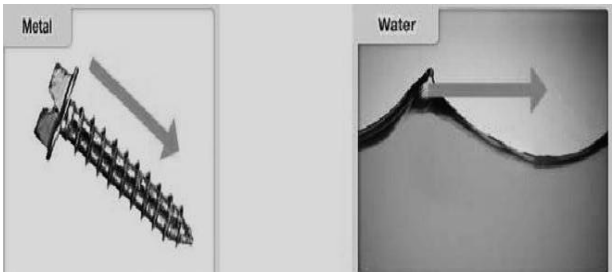

Figure 4: Any-Media Feature

IV. WORKING OF REDTACTON

Similar to other technologies, RedTacton Technology, will havea transmitter and a receiver.As soon as the human body comes in contact with the RedTacton transceiver, the signals will start to be transmitted. When the contact is been taken off, the transmissions will bestopped. The terminals are either embedded in the devices or carried by the user itself. According to the natural and physical movements of the user, the communication will happen in various combinations. The communication through the user can occur only through his body surface parts like hands, fingers, arms, feet, face, legs or torso. The technology also works in shoes and other clothing's as well.

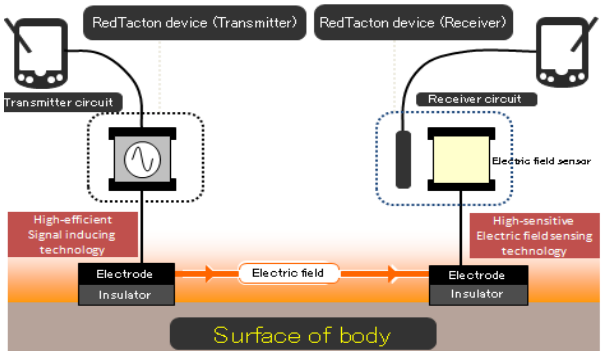

Figure 5: Block Diagram

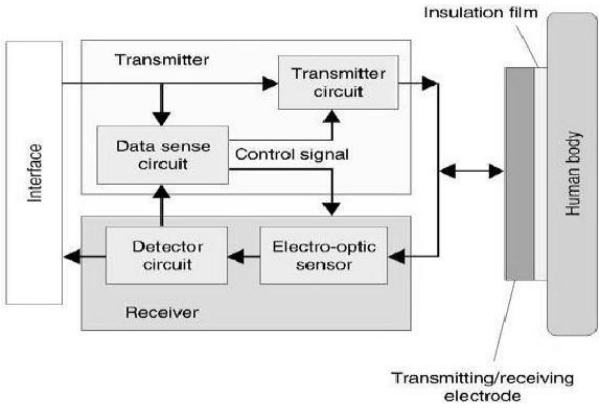

Figure 6: Transmitter block diagram

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. Thetransmitter 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.

V. APPLICATIONS

Basically, there are many applications based on Red-tacton in different fields. It will be widely use in daily working schedule and they are as follows

A. One-to-One Services

- Attribute information recorded in the RedTacton device is sent to the touched objects.
- The appropriate service is provided based on the attribute information received by the RedTacton receiver.

B. Marketing Applications

When a consumer stands in front of an advertising panel, advertising and information matching his or her attributes is automatically displayed. By touching or standing in front of items they are interested in, consumers can get more in-depth information. Inside a shop, shoppers can view related information on their mobile terminals immediately after touching a product.

C. Intuitive Operations

- 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".
- Transfer songs to portable music players from notebook PCs with just a touch.

D. Data Exchange

- Communication can be kept private using authentication and encryption technologies.
- Group photos taken with digital cameras are instantly transferred to individual's mobile terminal.

- Diagrams written on white boards during meetings are transferred to individual's mobile terminals on the spot.

E. Security Application

RedTacton could be installed on doors, cabinets and other locations calling for secure access, such that each secure access could be initiated and authenticated with a simple touch. At the same time, all the transaction details and relevant user attributes (personal identity, security clearance, etc.) could be logged by the security system. An Alarm sounds automatically to avoid accidental medicine ingestion Touch advertising and receive information.

VI. FUTURE DEVELOPMENT

Red Tacton has an wide range of unique new functional features and enormous potential as a Human Area Networking technology. 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 a business development process to be coordinated under NTT's Comprehensive Producer Function program.

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 walkthrough ticket gate, a cabinet that opens only to authorized people and a television control that automatically chooses favorite 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.

Advantages

- Data transfer is faster and easier through this technology.
- Data loss during transfer is **minimum.**
- Use of minimum amount of power.
- **Security** is more.

Disadvantages

- It is been used only within a few centimeters.
- Cost is more.

CONCLUSION

Red-Tacton technology is better when compared with other technologies; it is well-known for its data transmission at **10 Mbps** within a shortest distance .This technology that enables the first practical Human area Networking between body-centered electronic devices and PCs or other network devices embedded in the environment a new generation of user interface based on totally natural human actions such as touching, holding, sitting, walking or stepping on a particular spot. RedTacton technology is expected to overcome the Bluetooth technology in the future. This technology could put the use of cables to an end. Finally, I conclude that **"Future Technology Is On Red-Tacton Technology"**.

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