DATA TRANSFER FROM HUMAN BODY

[1] Robin George, [2]Siddharth A. Sharma, [3]Snehal A. Pawar, [4]Sneha B. Yadav, [5] Prof. Rajiv Iyer
[1,2,3,4] B.E Students, Electronics and Telecommunication, K.C. College of Engineering, & Management Studies & Research Thane, India.
[5] Assistant Professor, Electronics and Telecommunication, K.C. College of Engineering, & Management Studies & Research Thane, India.
robingeorge1992@gmail.com, siddharth.s1992@ymail.com, snehal9029@gmail.com, sneha7208@gmail.com, extc.kccoe@gmail.com

Abstract

Red Tacton is a break-through technology that uses the surface of the human body as a safe, high speed network transmission path. So we, in this paper are explaining the unique new functional features and enormous potential of Red Tacton as a Human Area networking technology. Technology is making many things easier; we can say that our concept is standing example for that. So far we have seen Local Area Network(LAN),Metro-Politian Area Network(MAN),Wide Area Network(WAN), INTERNET & many more but here is a new concept of "RED TACTON"[1] which makes the human body as a communication network by the name HAN(Human Area Network).

Keywords—Red Tacton; HAN ; Microcontroller etc.

I. INTRODUCTION

Data transfer from human body uses Human Area Network (HAN) that uses human body as a communication network. We will be developing a hardware involving an 8051 microcontroller which will be responsible for the basic data transfer between two mobile phones.

Since the human body houses weak electrical field, it will be the carrier for the data and the data will be transferred between two mobile devices using nothing but human body with a rate up to 10mbps.

This new technology needs just the human body for transferring the data between two devices. Whenever we touch the device, human body becomes the medium for carrying the data across the devices just like Ethernet cable.

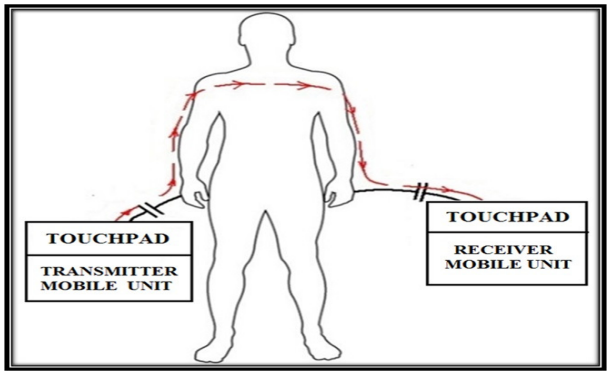

Fig1. Path of current

II. EVOLUTION OF RED TACTON

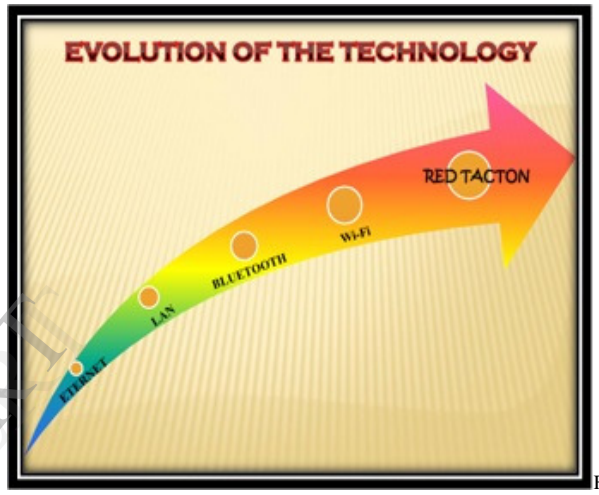

Fig 2. Evolution of Red Tacton

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.

However, they each have various fundamental technical limitations that constrain their usage, such as the precipitous fall-off in transmission speed in multi-user 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.
All those reported technologies had two limitations.

- The operating range through the body was limited to a few tens of centimeters.
- The top communication speed was only 40 bit/s.

These limitations were overcome by NTT[2](Nippon Telegraph and Telephone Corporation) located in Tokyo, Japan by using photonic electric field sensors and finally came up with a human area networking technology called Red Tacton.

III. SYSTEM MODEL

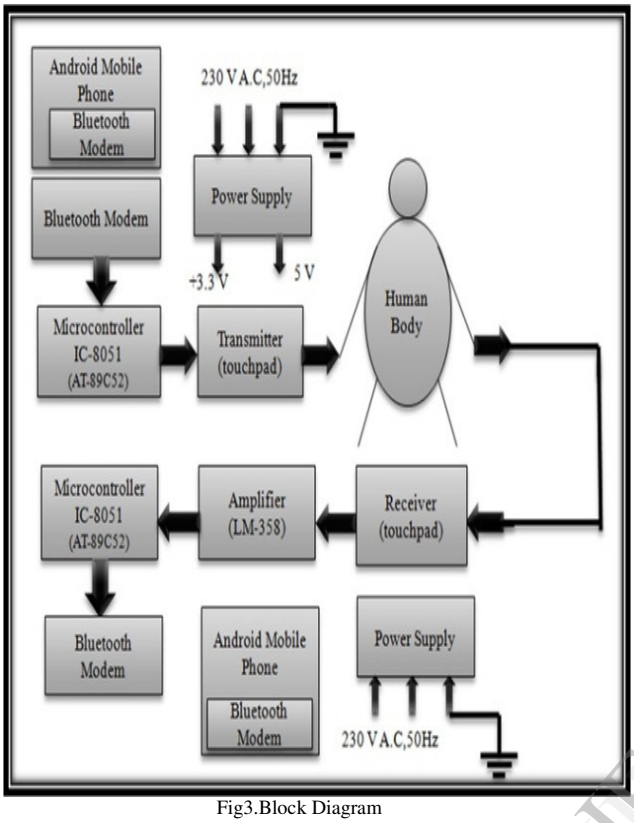

Fig3.Block Diagram

- The human body works like an electrical circuit with both resistance and capacitance. When we transfer data, we send a signal through the human body and it acts like a capacitor which stores charge.
- Data is capacitive coupled[11] between the transmitter and receiver through the body.
- When transmitter sends data i.e. one hand is kept on the copper insulated transmitter touchpad, the charge circulates inside the body and is captured at the other end on to the receiver touchpad.
- Due to the low frequency of the signal being transmitted and the resistance of the body the signal gets attenuated which is why we have used an LM-358 amplifier at the receiver.
- The Microcontroller- IC-AT89S52 manages the complete transmitting and receiving process.
- A threshold voltage level is set to which the received signal is adjusted.
- On successful reception of data LED blinks and data transfer is ensured.

IV. IMPLEMENTATION

1) Measurement of voltage at the receiver immediately after the signal is captured on touchpad:

- There is a variation in pulse width because of charging and discharging function of the capacitor.
- To overcome this we have to use an OP-AMP (here it is LM-358).
- When the preset is not adjusted we get a constant output.
- The pulse width can be changed to get desired value by changing the preset accordingly to avoid occurrence of garbage value in the output.

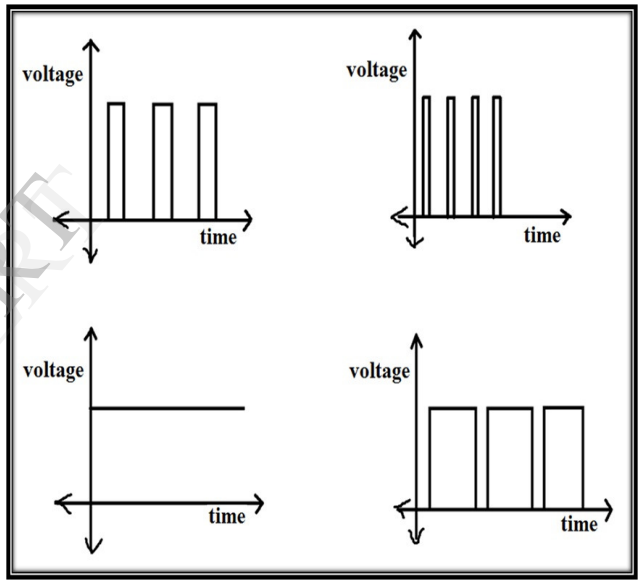

Fig.4 Graph for different preset values

2) Measurement of the output after OP-AMP is added:

- Human body is not a noiseless channel; it absorbs frequencies from the surrounding.
- Due to this when the data travels through the body it gets distorted.
- To remove this noise we use the OP-AMP as a comparator.
- If the input oscillates and is below reference output is Pure 0.
- If the input oscillates and is above reference output is Pure 1 as shown in the figure below.

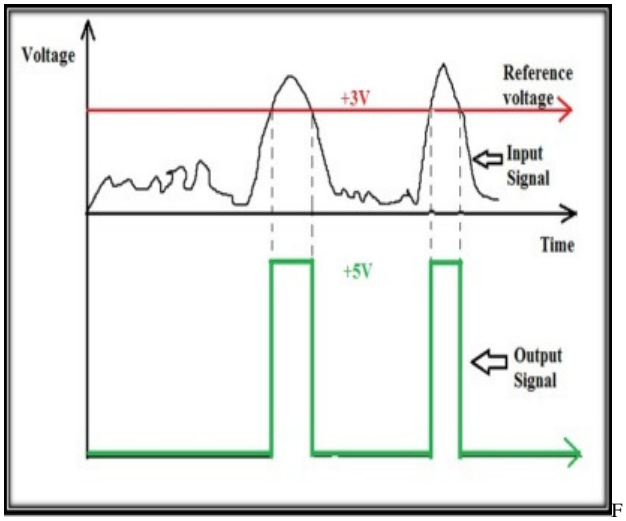

Fig5. Graph for desired output.

V. FEATURES AND SAFETY

Features:

- Using the Mechanism explained above we will be exchanging business card information between two Android based mobile phones simply by shaking hands[12] which is one of the key features of this technology that data transfer is easier.

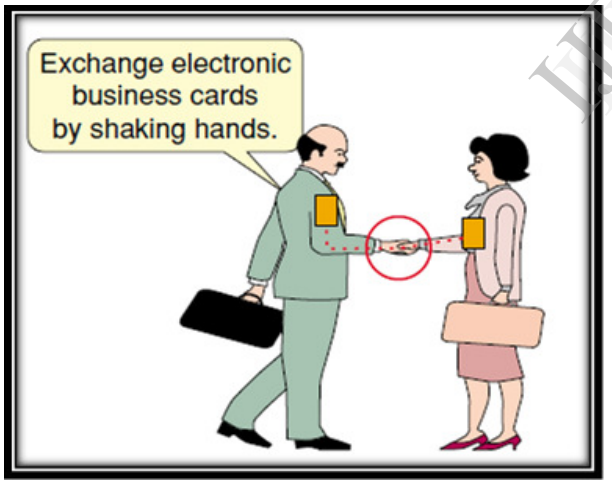

Fig6. Exchange of business card data

- Data transfer is faster through this technology.
- Data loss during transfer is less.
- Use of minimum amount of power (of some mini volts).
- Security is more since element responsible for data transfer is only the human body and that person decides with whom to share and what to share.
- Can provide with authentication[4] also.

Safety:

- Main part of the transmission and reception is done using the touchpad which is completely covered with copper tape.
- So the body of the person acting as the transmission medium is completely insulated.
- This makes it impossible for current to flow into a person's body from the transceiver.
- When communication occurs, displacement current is generated by the electrons in the body because the body is subjected to minute electrical fields.
- However, such displacement currents are very common everyday occurrences to which we are all subjected.

VI. FUTURE SCOPE

1) Connect to the network just by putting a lap-top on a table.[12]

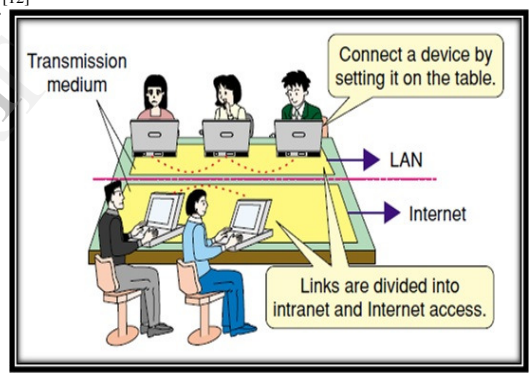

Fig7. Communication between devices mediated by conductor (conferencing system)

2) Communication from a device on a Person to a device embedded in the environment[14]

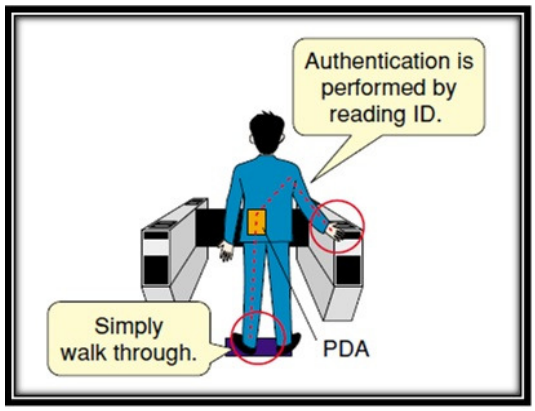

Fig8. (Gateway system)

3) Communication from a device embedded in the environment to a device on a person.[14]

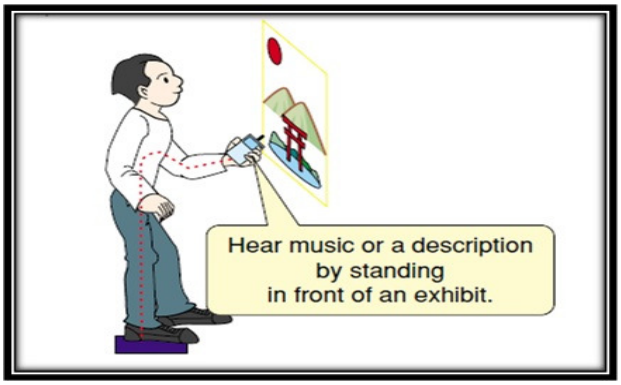

Fig9. (Explanatory tour in a museum)

4) 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[14] which is beyond the purvey of human beings.

5) Communication inside body[10][13]:
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.

VII. CONCLUSION

The performance of Red Tacton is better as compared to other technologies. It is best to connect network within short distances since data transfer from human body[12] uses short distance communication loss of data during transfer is very less.

There is no problem of hackers as our body itself is the transmission media[15] and it is the person who decides with whom to share and what to share.

Today main issue is speed; it is solved by Red Tacton [1] by providing 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, and wireless transmission by applying different actions.

Many areas can benefit from this technology. Human society is entering where everything is networked. In such ease of technology Red Tacton will give future where we could really live in a world not bounded by length of wires and bandwidth of wireless.

VIII. REFERENCES

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