

# A Review on Wireless Technologies

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**Abstract** - Technology is making quick development and is making various things smoother. As the innovations of people are increasing day-by-day, new mode for wireless networking has been developed such as Bluetooth, Wi-Fi and Li-Fi. Today everybody is in urgency for receiving correct info at the correct time and exact dwelling which requires fast internet connectivity. So there are numerous styles of connectivity to catch on to internet such as Gateway access, Dial-up connection, Leased connection, DSL, Cable Modem Connection, VSAT and wireless connection such as Wi-Fi. In this paper we are discussing different types of wireless technology.

4. Low cost.
5. It can pass through partitions.

### Disadvantages of Bluetooth:

1. Having lower bandwidth as compared to Wi-Fi.
2. Security is major disadvantage of Bluetooth because it operates on Radio frequency and can pass through the walls so important and personal data can not be transfer with the help of Bluetooth.
3. Range is less.

**Key Words:** Wireless, Wi-Fi, Bluetooth, Zigbee

## 1.2 Wi-Fi Technology

## 1. INTRODUCTION

### What is wireless communication?

Wireless communication means transmission of data without using wires, cables or electrical conductors. It can be done with the help of different technologies such as Bluetooth, Ultra Wide Band, Zigbee, Cellular technology.

Wi-Fi stands Wireless Fidelity. Wi-Fi is created on the IEEE 802.11 family of principles and is primarily a local area networking (LAN) technology intended to offer in-building broadband treatment. Present Wi-Fi schemes support a peak physical-layer data rate of 54 Mbps and classically offer indoor attention above a space of 100 feet. Wi-Fi has developed the *de facto* standard for *last mile* broadband connectivity in households, workplaces, and community hotspot places. Schemes can characteristically deliver an exposure range of simply about 1,000 feet from the contact point. Wi-Fi offers curiously advanced topmost data rates than do 3G systems, primarily since it operates over a larger 20 MHz bandwidth, but Wi-Fi systems are not aimed to support high-speed motion. One major benefit of Wi-Fi over WiMAX and 3G is its inclusive accessibility of terminal strategies. A huge popular of laptops transported today have a integral Wi-Fi edge. Wi-Fi interfaces are currently also being made into a multiplicity of devices, counting personal data assistants (PDAs), cordless phones, cellular phones, cameras, and media

### 1.1 Bluetooth

Bluetooth is a wireless technology used to transfer data among different electronic strategies. The expanse of data transmission is lesser in contrast to other methods of wireless communication. This expertise removes the habit of cords, cables, adapters and documents the electronic devices to interconnect wirelessly between each other.

### 1.2.1 Radio Signals

Radio Signals are the sources, which mark Wi-Fi interacting possible. These radio signals spread from Wi-Fi projections are selected by Wi-Fi receivers, such as laptops and cell phones that are equipped with Wi-Fi cards. Whenever, a PC obtains any of the signals within the range of a Wi-Fi network, which is usually 300 — 500 feet for antennas, the Wi-Fi card reads the signals and thus produces an internet connection between the user and the network without the use of a card. Access points, comprising of antennas and routers, are the chief foundation that spread and collect radio waves. Antennas work solider and have a lengthier



Fig -1: Bluetooth symbol

### Advantages of Bluetooth:

1. It produces adhoc link instantly without any wires. Connection development is very fast. Operator only wants to pair the Bluetooth PAN connection between two strategies.
2. It has little power consumption.
3. Better range as related to infrared communication.

radio broadcast with a range of 300- 500 feet, which are used in open regions.

### 1.2.2 Wi-Fi Cards

Wi-Fi cards are used to connect PC to the antenna for a direct joining to the internet. Wi-Fi cards are external or internal. If a Wi-Fi card is not installed in your computer, then you may purchase a USB antenna attachment and have it externally connect to your USB port, or have an antenna-equipped expansion card installed directly to the computer



Fig-2: Wi-Fi Card

### 1.2.3. Wi-Fi Hotspots

A Wi-Fi hotspot is formed by mounting a contact point to an internet assembly. The entrée point transmits a wireless signal over a small space. It characteristically shields about 300 feet. When a Wi-Fi aided device such as a Pocket laptop meets a hotspot, the device can then join to that network wirelessly. Most hotspots are situated in residences that are readily available to the community such as airports, coffee shops, hotels, book stores, and campus locations. 802.11b is the most common specification for hotspots universal. The 802.11g standard is backwards compatible with .11b but .11a uses a different frequency range and requires isolated hardware such as an a, a/g, or a/b/g device. The largest unrestricted Wi-Fi networks are delivered by private internet service providers (ISPs); they charge a fee to the operators who need to access the internet.

### 1.2.4 How to protect Wi-Fi

Easy steps to protect the Wi-Fi are:

#### One should change the name of wireless network

One should give provocative name for its Wi-Fi network.

#### One should select strong and unique password for wireless network

Wireless router already have pre-set default password. But hackers can easily hack this password. So password should be strong enough to protect the Wi-Fi, it should contain numbers, letters and various symbol.

#### One should improve Wi-Fi security by enabling network encryption

WPA2 AES settings are done to improve security of Wi-Fi which is also a standard security system

#### One should disable the wireless network when not in use

In case of prolonged absences, one should disable the wireless network, which will avoid malicious use of network

#### Keep router at proper place

Route should be placed at proper place so that it will have same access everywhere.

#### Keep strong network administrator password

One should change the name of network admin and its password to make cybercriminals harder to hack the password.

#### One should disable remote access

It's a good practice to disable remote access to avoid people from accessing data which are not connected to wireless network.

#### One should keep router's software up-to-date

If router's software is updated, it will give better functioning with respect to market updating.

#### Make use of firewall to secure Wi-Fi network

Hardware firewall in router are use to safeguard system from malicious hacking tries in contradiction of wireless network.

#### One should protect devices that are connected frequently to wireless network

The devices which are connected often to wireless network must have antivirus and antispymware security software installed.

### 1.2.5 Application of Wi-Fi

1. Sharing of internet
2. Share properties among PCs
3. Files can be access via a NAS drive
4. Print & scan can be done
5. Sync your matter
6. It can be work as remote control of entertainment system
7. Use to listen music
8. Video can be stream
9. Use to play online games

### 1.3 Zigbee

Zigbee is an open universal standard for wireless technology intended to use low power digital radio signals for personal area linkages. Zigbee works on standard of IEEE at 802.15.4 requirement and is used to construct networks that needs a low broadcast rate, energy effectiveness and protected networking.

The applications of zigbee are as follows:

- .Used for building automation system
- .Used for heating and cooling control
- .Used in medical devices

Zigbee frequencies:

- .It works on Unlicensed Bands
- .Operated at ISM 2.4 GHz Universal Band at the rate of 250kbps
- .Operated at frequency of 868 MHz of European Band at the rate of 20kbps
- .Works at frequency of 915 MHz of North American Band at the rate of 40kbps

### 1.4.1 Applications of Ultra Wide Band

Applications of Ultra Wide Band are as follows:

- . It can be used for file transfers without a PC
- . It can be used for wireless printing
- . It can be used for wireless monitors
- . It can be used for high-definition video
- . It can be used for wireless USB

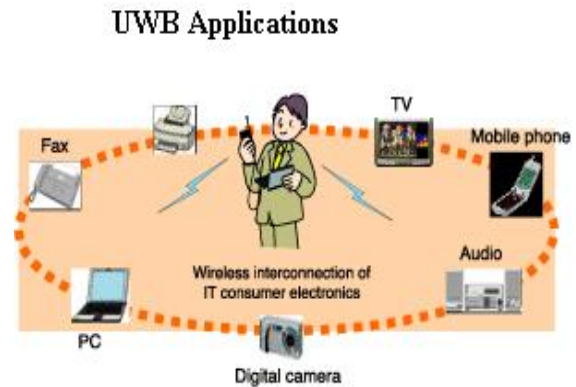


Fig-4: UWB Applications

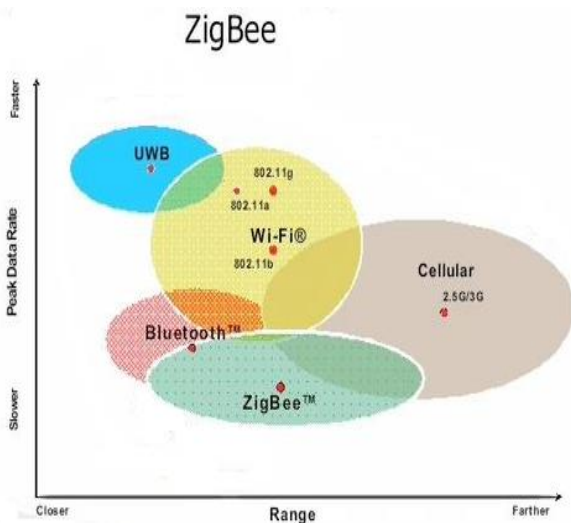


Fig-3: Zigbee Range

### 1.4 Ultra Wide Band (UWB)

Ultra -Wide Band is a technique used n wireless communication for low power consumption and high bandwidth connection it simply means sending large amount of data over short distance with less amount of power. It's mainly designed for commercial radar system. In this technology data is transmitted over a number of frequency channels at once, whatever above 500 MHZ. In case of spread spectrum, ultra wideband spectrum has advantage over narrowband that it doesn't interfere with other transmission in the same frequency band.

### 1.5 Cellular Technology

Cellular technology makes use of different technologies like GSM (Global System for mobile communication), GPRS(General Packet Radio Service),CDMA2000.Out of which GSM is use most frequently.GSM and CDMA both makes use of multiple access technology for their operation.

Market Name	ZigBee™	---	Wi-Fi™	Bluetooth™
Standard	802.15.4	GSM/GPRS CDMA/1xRTT	802.11b	802.15.1
Application Focus	Monitoring & Control	Wide Area Voice & Data	Web, Email, Video	Cable Replacement
System Resources	4KB - 32KB	16MB+	1MB+	250KB+
Battery Life (days)	100 - 1,000+	1-7	3-6	1 - 7
Network Size	Unlimited (2%)	1	32	7
Bandwidth (KB/s)	20 - 250	64 - 128+	11,000+	720
Transmission Range (meters)	1 - 100+	1,000+	1-100	1 - 10+
Success Metrics	Reliability, Power, Cost	Reach, Quality	Speed, Flexibility	Cost, Convenience

Fig-4: Difference between different technologies

## 2. CONCLUSION

India is moving towards development. With the help of advanced technology it can server in better manner. Different wireless technologies like Wi-Fi, GSM plays vital role into it. Life is going to be simpler with help of it. With the help of Wi-Fi, Digital India movement is in progress. People can do more and more transaction online so it encourages cashless transactions and it's possible to reduce corruption at certain level. So all wireless technologies are meant for making things simpler provided proper precautions are to be taken.

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