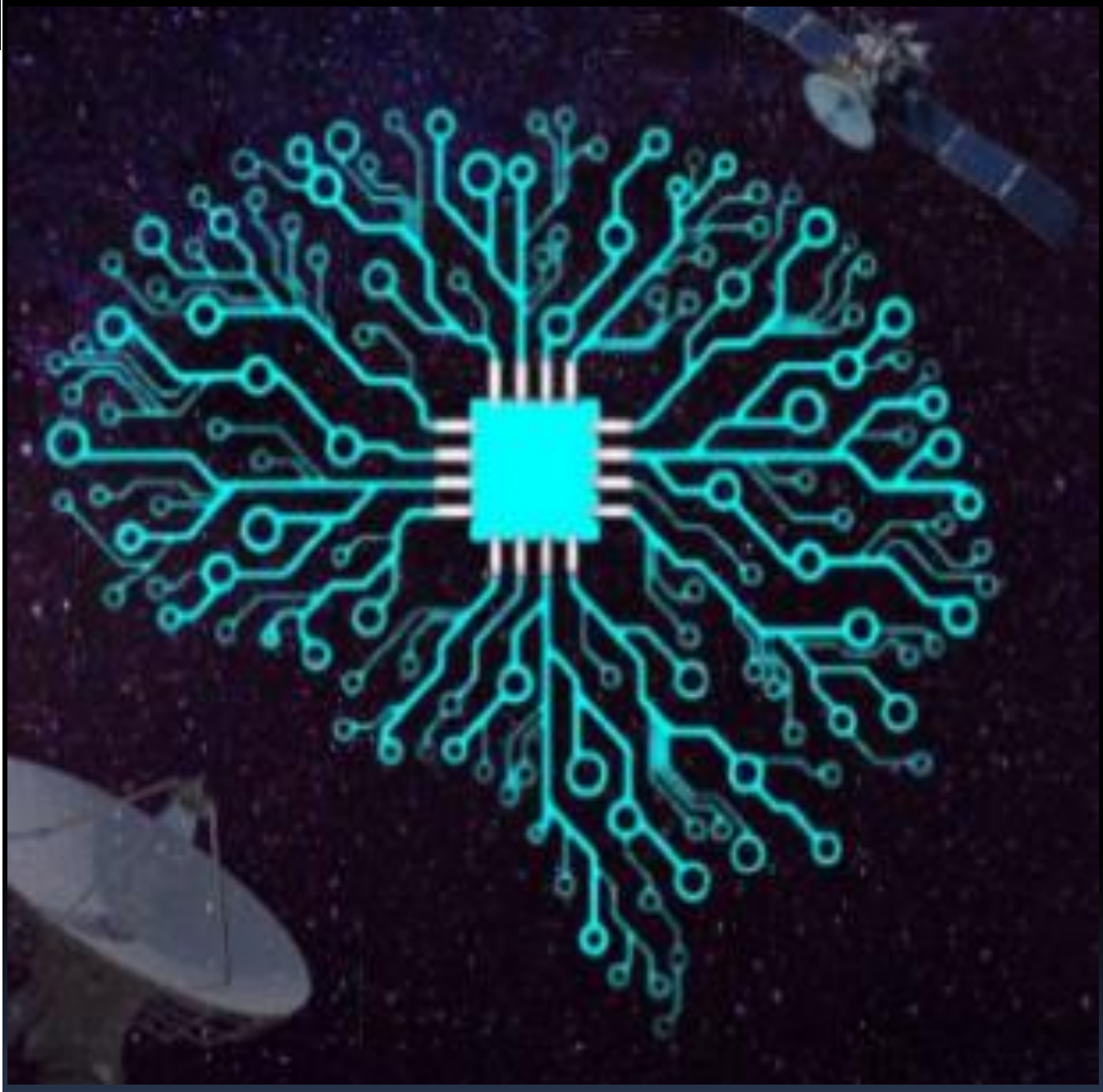
# "PESITRONICS"

Dept of ECE Magazine , Volume-7 , Issue -1



Prerana Educational and Social Trust (R.)
PES INSTITUTE OF TECHNOLOGY AND MANAGEMENT
NH-206, Sagar Road, Shivamogga-577204, Karnataka, India.
Affiliated to VTU, Belagavi, Approved by AICTE, New Delhi, Recognised by Govt. of Karnataka
An ISO 9001:2015 Certified Institute

Department of Electronics and Communication Engineering

## Our Vision

To be a leading centre of excellence in the field of electronics and communication engineering for learning and research with professional ethics.

## Our Mission

M1: To provide quality technical education for students to develop into globally component professionals.

M2: to develop a framework for collaboration and multidisciplinary activities to ensure ethical and value based education to address social needs

## Quality Policy

Our Quality Policy is to develop highly skilled human resources with the ability to adapt to an intellectually and technologically changing environment with the participative efforts of the management, staff, students and parents. PESITM is committed to comply with ISO 9001:2015 requirements and continually improve the quality of services and quality Management System.

## Program Educational Objectives (PEO's)

- PEO 1: To develop the ability among students to understand the concept of core subjects.
- PEO2: To give exposures to emerging technologies, adequate training and opportunities to work as team on multidisciplinary projects with effective communication skills.
- PEO3: To cultivate ethical practices in Professional, Societal & Environmental needs by engaging in life-long learning

## Program Specific Outcomes (PSO's)

- PSO1. Analyze and design analog & digital circuits or systems for a given specification and function.
- PSO2. Implement functional blocks of hardware-software co-designs for signal processing and communication applications.

# EMERGING DEVELOPMENTS IN ELECTRONICS

## The rise of the internet of things (IoT)

- As digitisation ramps up, consumers expect their electronics devices to provide uninterrupted connectivity, enhance efficiency and generate accurate real-time data — all of which the IoT facilitates.
- The extensive rollout of super-fast 5G will also facilitate superior connectivity to allow us to build a 'smarter' world, with IoT features in everything from cars and homes to workplaces and entire cities. Plus, not only do we find IoT in our homes and offices, but it is also becoming a driving force in manufacturing, with data from sensors and IoT-enabled devices being used to optimise factory functions, manage logistics chains and reduce downtime.
- The IoT is all around us. And IoT device propagation forecasts suggest nearly a threefold increase from the IoT installed base in 2019.

# BLOCK CHAIN EMERGING TECHNOLOGY


"***Blockchain is the first native digital medium for value, just as the internet was the first native digital medium for information.***"

- Block chain combines several technologies to provide a trusted, tamper-resistant record of transactions by multiple parties without a central authority such as a bank.

Blockchain is built on four main concepts:

- It is a distributed ledger, so every participant in the network has simultaneous access to a view of the information.
- Cryptographic functions ensure the integrity and security of the information.
- Participants confirm changes directly with one another. This replaces the need for a third party to authorize transactions.
- It can run additional business logic that allows the agreement on and automatic enforcement of the expected behavior of a transaction

## Advantages of Block chain:

- **Immutability.** Block chain supports immutability, meaning it is impossible to erase or replace recorded data.
- **Transparency.** Block chain is decentralized, meaning any network member can verify data recorded into the block chain. Therefore, the public can trust the network.
- **Traceability.** Block chain creates an irreversible audit trail, allowing easy tracing of changes on the network.
- **Censorship.** Block chain technology is free from censorship since it does not have control of any single party.

## Disadvantages Of Block chain:

- Speed and performance Block chain is considerably slower than the traditional database because block chain technology carries out more operations.
- Changing the data in block chain typically takes a lot of work.
- User has to keep track of their private keys to avoid losing their money.

The Metaverse is **a medium for communication that bridges physical and virtual experiences**. It's a digital environment complete with augmented reality and virtual reality technologies that will change how we connect, communicate, and access information.

## How does the metaverse work?

- metaverse is a digital ecosystem built on various kinds of 3D technology, real-time collaboration software and blockchain-based decentralized finance tools.
- The metaverse remains a domain of niche applications, used by consumers for entertainment and gaming but stopping well short of an all-encompassing virtual reality.
- The metaverse is controlled by large competing ecosystems -- for example, Apple and Android meta worlds -- with limited interoperability.
- The metaverse is a dynamic, open and interoperable space, much like the internet but in 3D.

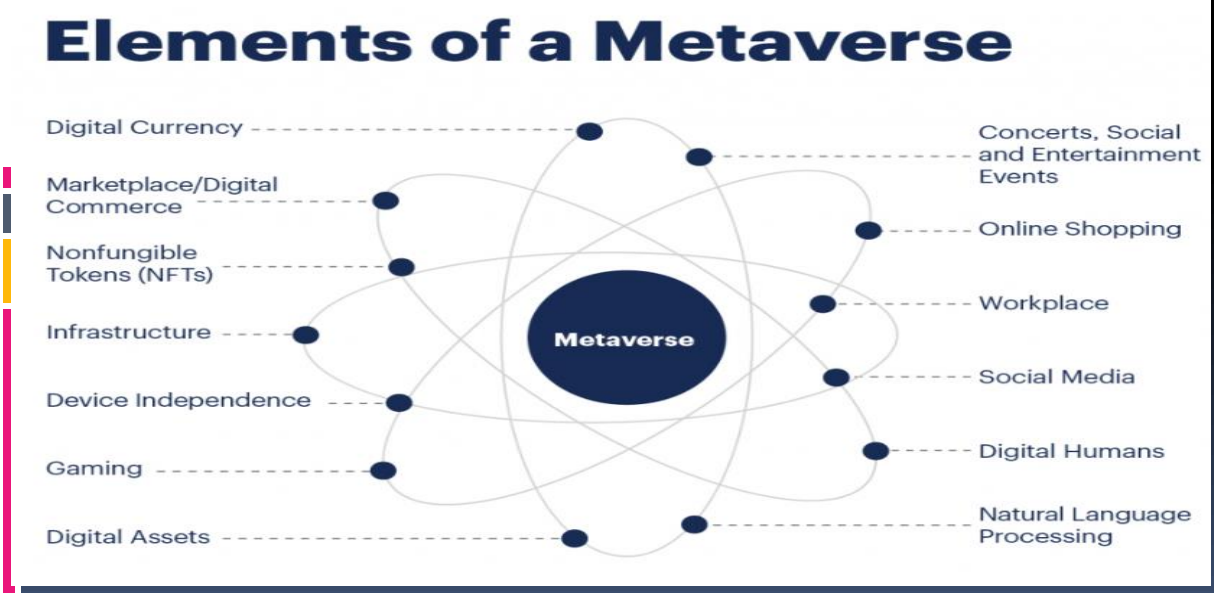
**How can the metaverse help businesses?**

- businesses can transform everything from how they interact with customers, products and services offered, production and distribution processes, organizational operations, and more.
- Spectrum of emerging consumer experiences and the business applications and models across the enterprise that will be remained and transformed.
- Multiple technologies including extended reality, block chain, artificial intelligence, digital twins, smart objects (including cars and factories), and edge computing.

**How much does it cost to build in the metaverse?**

The cost to build in the metaverse ranges from $0 to over $1,000, depending on your goals. The main cost to build in the metaverse include computer, internet, and virtual land and transaction fees etc..

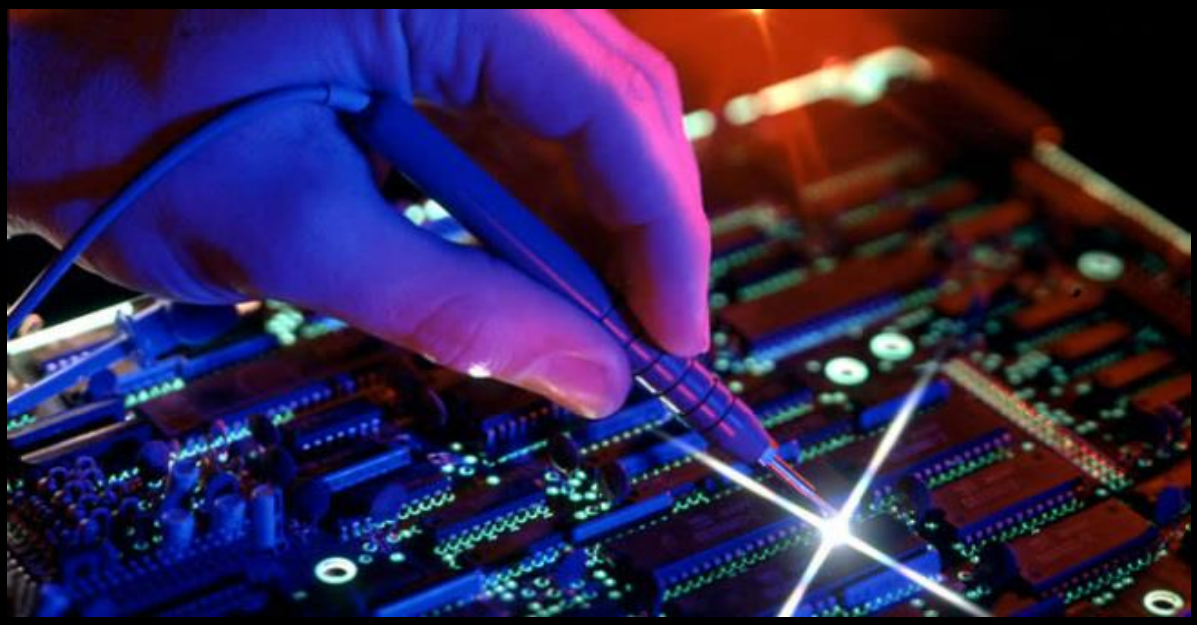
The adoption of metaverse technologies is still at an early stage



# THINK ABOUT HARDWARE


ECE full form in engineering stands for Electronics & Communication (ECE) and it involves research, design, development, and testing of electronic equipment that are used in various power and control systems, artificial intelligence, machine learning, smart devices, and more.

ECE engineers conceptualize and manufacture communication and broadcast networking and systems. It also deals with analogue transmission, basic electronics, microprocessors, solid-state devices, digital and analogue communication, analogue integrated circuits, microwave engineering, satellite communication, antennae & wave progression.



**Why to choose electronics?**

- The ECE branch offers the opportunity to redesign the world around and make it even more efficient, connected and sustainable.
- Electronics and Communications engineering jobs are among the highest-paid and have the highest job satisfaction.
- As an ECE engineering undergraduate, one gets thorough academic learning, hands-on experience and leadership development.
- A degree in ECE from the **Best Electronics and Communication engineering college in India** allows an individual to unfold and expand his/her knowledge in the world of electronics.
- Electronics is the leading edge of the world in the present time and also the wave of the future.

## Different Domain in ECE:

### VLSI

1. Soc Design
2. ASIC Design
3. Reusable IP core design and development
4. ASIC and FPGA research and development.
5. Application oriented working prototype of ASIC's and SOC's

As we all know VLSI always had tremendous demand in market the requirement for the workers for these jobs is very high.

### EMBEDDED SYSTEMS

1. Engineering for embedded systems
2. Engineering for embedded hardware
3. Trainer for embedded system
4. Executive in marketing and sales.

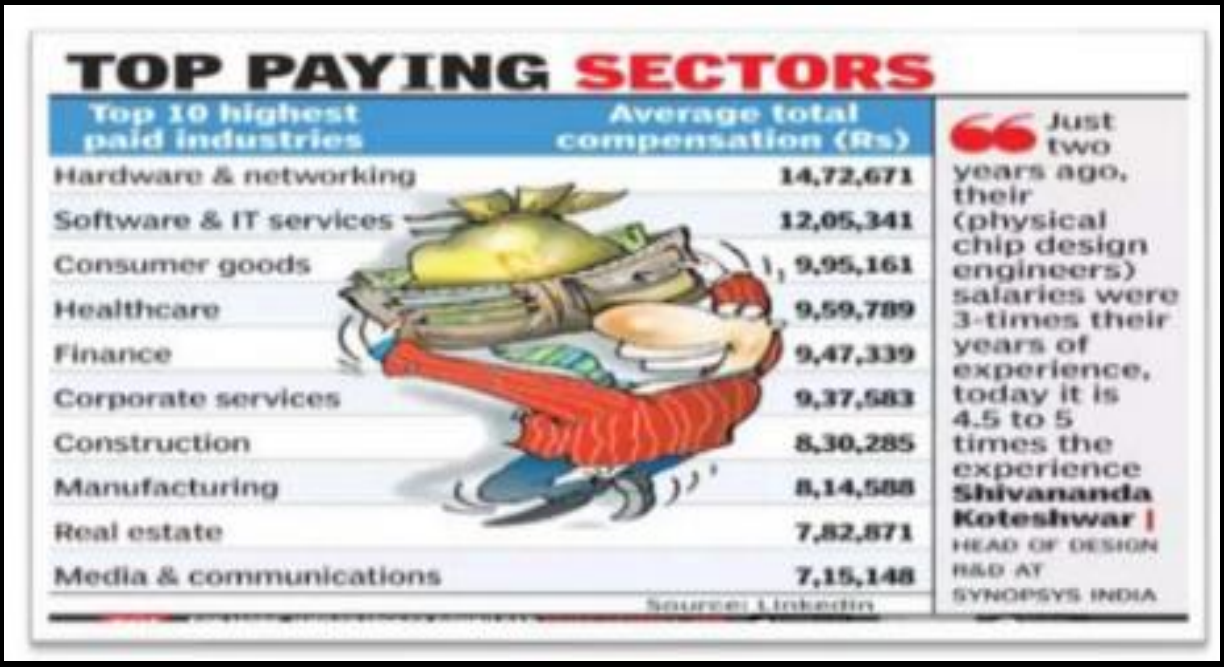
### NETWORK ANALYST

1. penetration testing.
2. Network engineering
3. Network architect
4. Web administration
5. Telecommunication.

### CHIP DESIGN

1. Chip Design Software Architect.
2. Layout Engineer
3. Physical Design Engineer
4. Digital Engineering
5. N & T Radio Designer.

## HIGHER STUDIES




1. Telecommunication Engineering .
2. Master of engineering in digital systems engineering
3. Master of engineering in micro electronics system.
4. Master of engineering in microwave engineering
5. Master of engineering in industrial electronics
6. Master of engineering in network and internet engineering.
7. Master of engineering in communication system.
8. post graduate diploma in communication design
9. Post graduate diploma in photogrammetry and remote sensing
10. Master of engineering in electronics circuit and design

Salaries


The major benefit of this electronics and VLSI field jobs is salary, Salary improves greatly as experience increases unlike all the other sectors in this specific sector there is a huge improvement in the salary according to work and experience.

The main intension of this article is not to create a negative opinion on software industry but to create a clear view about the job opportunities and career options which are available for an electronics student.

Here I want to highlight a main thing, most of the students who are joining in the ECE branch are initially interested towards the electronics and VLSI field but their interest towards the core industry is diverting to the software industry, awareness must be created on the students about this topic, lacks of opportunities are just before us but we must be aware of them.

# ACCICEDENT DETECTION USING SMART PHONE

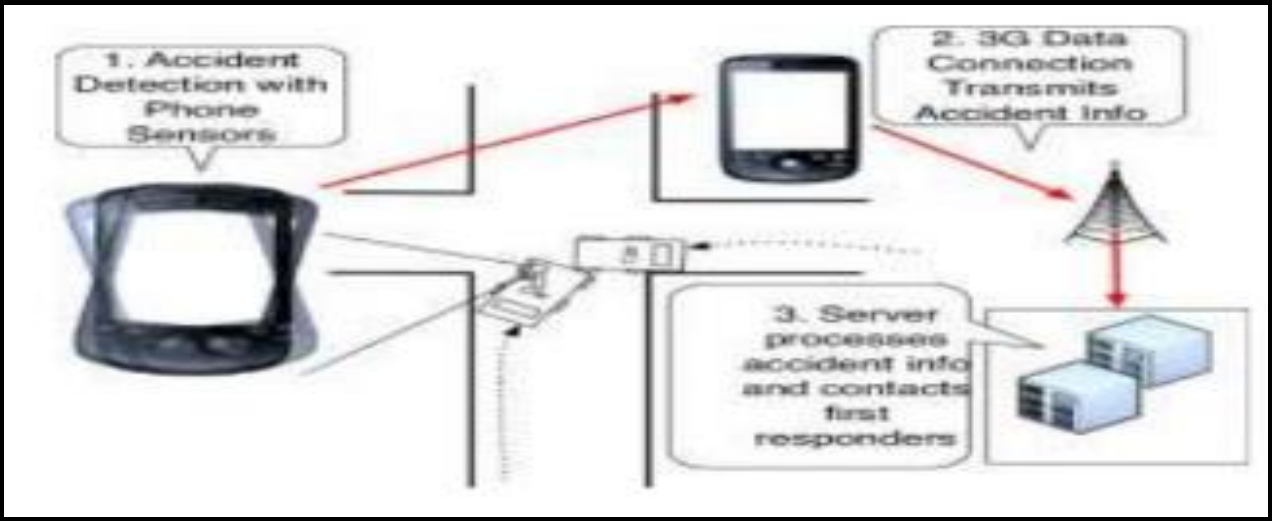
Now a days, nobody in this world is ready to look what's happening around them. Even though, if any accident occurs no one cares about it. This is an intention to implement an innovative solution for this problem by developing an Accident detection System using android smart phone from the accident zone. This system has been developed and implemented using the heart beat sensor based mobile technology integrated with the evolving android smart phone.

In case of an accident is occurred then the driver is prompted to respond by touch or voice in order to eliminate any false detection So the proposed system ensures that to reduce the human death ratio by accidents. Preliminaries are required as follow,

**Bluetooth:** Bluetooth technology is a cutting-edge open specification that enables short-range wireless connections between desktop and notebook computers, handhelds, personal digital assistants, mobile phones, camera phones, printers, digital cameras, headsets, keyboards and even a computer mouse. Existing users can purchase a D-Link Bluetooth USB Adapter to enable their computer with Bluetooth technology.

**GPS Technology:** GPS is a space based radio navigation system that provides accurate location and timing services to anyone with a GPS receiver. GPS receivers into mobile phone devices to support 911 emergency location. Most of today's smart phones are equipped with fully functional GPS receivers and supporting applications.

**8051 Microcontroller:** The AT89C52 is a low-power, high-performance CMOS 8-bit microcomputer with 8K bytes of Flash programmable and erasable read only memory (PEROM). the Atmel AT89C52 is a powerful microcomputer which provides a highly-flexible and cost-effective solution to many embedded control applications.




**Initializing sensor:** we use the external sensor to get the heart beat rate from the user after getting the signal from sensor this system filters out the background noise and detect only sound of the pulse. The entire work has to be integrated with the automobile to validate its functionality and reliability. Then it has great importance in day to day life of the people in the country like india. Thus this work ensures the reduction of death ratio and fatalities in the country like india and also which will have a great importance in day to day life.

# 5 G TECHNOLOGY


Fifth-generation wireless (5G) is the latest iteration of cellular technology, engineered to greatly increase the speed and responsiveness of wireless networks.

5G architectures will be software-defined platforms, in which networking functionality is managed through software rather than hardware. Advancements in virtualization, cloud-based technologies, and IT and business process automation enable 5G architecture to be agile and flexible and to provide anytime, anywhere user access.

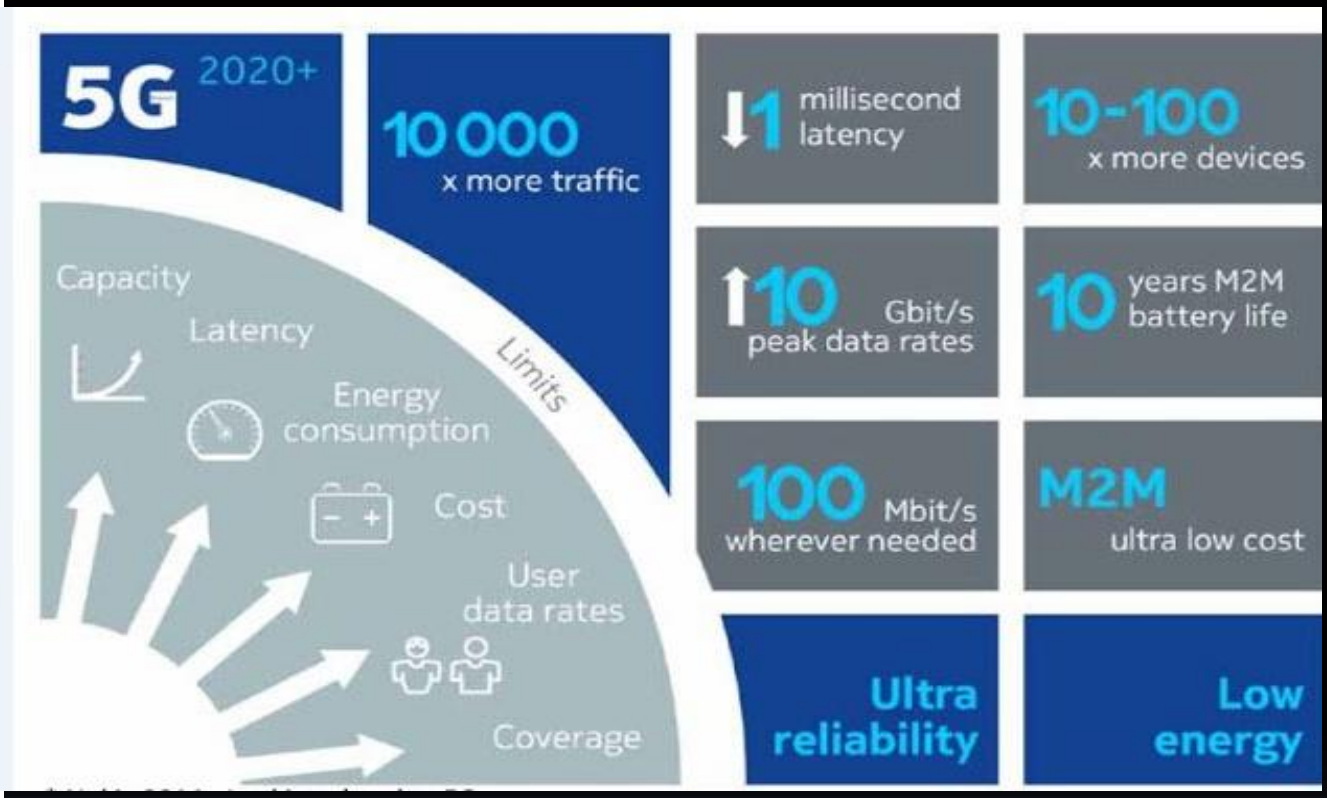
5G networks can create software-defined sub network constructs known as network slices. These slices enable network administrators to dictate network functionality based on users and devices.

# Evolution From 1G to 5G

| Generation | Speed | Technology | Key Features |
|---|---|---|---|
| 1G (1970 –1980s) | 14.4 Kbps | AMPS,NMT, TACS | Voice only services |
| 2G (1990 to 2000) | 9.6/ 14.4 Kbps | TDMA,CDMA | Voice and Data services |
| 2.5G to 2.75G (2001-2004 ) | 171.2 Kbps 20-40 Kbps | GPRS | Voice, Data and web mobile internet, low speed streaming services and email services. |
| 3G (2004-2005) | 3.1 Mbps 500- 700 Kbps | CDMA2000 (1xRTT, EVDO) UMTS and EDGE | Voice, Data, Multimedia, support for smart phone applications, faster web browsing, video calling and TV streaming. |
| 3.5G (2006-2010) | 14.4 Mbps 1-3 Mbps | HSPA | All the services from 3G network with enhanced speed and more mobility. |
| 4G (2010 onwards) | 100-300 Mbps. 3-5 Mbps 100 Mbps (Wi-Fi) | WiMax, LTE and Wi-Fi | High speed, high quality voice over IP, HD multimedia streaming, 3D gamming, HD video conferencing and worldwide roaming. |
| 5G (Expecting at the end of 2019) | 1 to 10 Gbps | LTE advanced schemes, OMA and NOMA | Super fast mobile internet, low latency network for mission critical applications, Internet of Things, security and surveillance, HD multimedia streaming, autonomous driving, smart healthcare applications. |

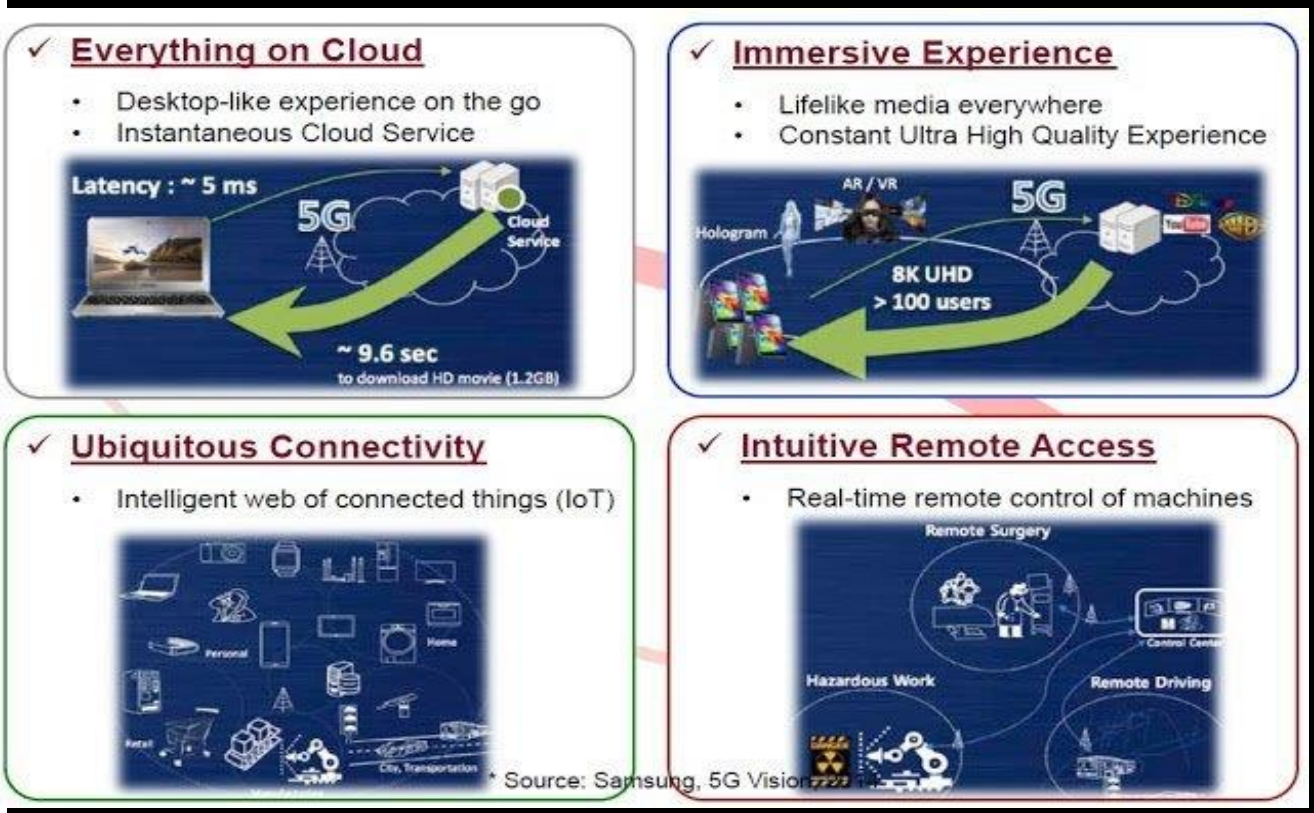
## Applications

1. High-speed mobile network




5G wireless technology will open greater opportunities for new device manufacturers and application developers. New VoIP devices and smart devices will be introduced in the market and thus more job opportunities as well

## 2. Entertainment and multimedia




5G can provide 120 frames per second, high resolution, and higher dynamic range video streaming without interruption. The audiovisual experience will be rewritten after the implementation of the latest technologies powered by 5G wireless.

## 3. Internet of Things – Connecting everything


5G is the most efficient candidate for the Internet of Things due to its flexibility, unused spectrum availability, and low-cost solutions for deployment. IoT can benefit from 5G networks in many areas

## 4. Satellite Internet

High-speed 5G network connectivity using satellite is one of the most significant improvements in internet technology for remote areas where conventional ground base stations are not available. Satellite internet technology offers connectivity in urban and rural areas across the globe with the help of a constellation of thousands of small satellites.

Category - III

# DEPARTMENTAL ACTIVITIES

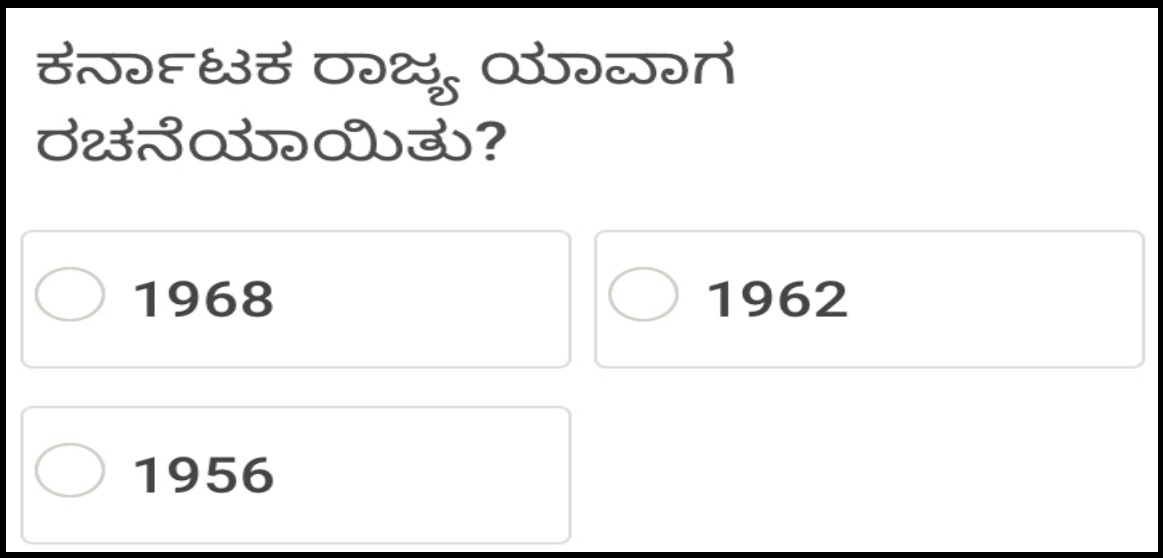
*"PESITRONICS"- ECE*


Department of E&CE Conducted One Day Expert Talk On Space Science And Engineering 15/10/2022

*"PESITRONICS"- ECE*

Department of E&CE Conducted One Day workshop on VLSI design for girls On 09/11/2022

*"PESITRONICS"- ECE*




Department of E&CE conducted the online quiz on behalf of kannada Rajyotsava on 14/11/2022 as a forum activity with some following questionnaires

*"PESITRONICS"- ECE*



Department of E&CE participated in ethnic day and represented uttar karnataka.

*"PESITRONICS"- ECE*

Department of e&ce students emerged as a runnes of VTU central karnataka division football tournament held at JNNCE on 5th and 6th dec 2022

*"PESITRONICS"- ECE*


Department of E&CE conducted the funny cricket event on 09/12/2022 as a forum activity

*"PESITRONICS"- ECE*



Department of E&CE conducted one day webinar on 09/12/2022 as a forum activity

*"PESITRONICS"- ECE*


Department of E&CE conducted the lagori event on 16/12/2022 as a forum activity



Department of E&CE organized the event on study abroad higher education avenue for BE graduates on 19/12/2022.

*"PESITRONICS"- ECE*



Under the social connectivity and responsibility Department of E&CE organized the awareness talk on plantation , organic forming for 3rd semester BE graduates on 17/0/2023.

*"PESITRONICS"- ECE*