

**Department of  
Electronics & Telecommunication Engineering**

**TECHNO-  
SPHERE**

**Annual Technical Magazine  
2023-2024**



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**VISION:**

**To produce Electronics and Telecommunication Engineers for development of the society.**

**MISSION:**

**To impart excellent technical knowledge through modern infrastructure and laboratories.**

**To promote innovative thinking in the minds of budding engineers.**

**To develop the students competent to face the challenges incorporating technical and entrepreneurship**

**To inculcate moral and ethical values.**

**ABOUT THE DEPARTMENT**

As we step into the New Year 2025, let's first pause and thank God for keeping us in good health and spirit to be in this moment. Last few years has gone very tough. It has indeed been an emotionally testing and turbulent one and taught many lessons. I am sure the year 2025 shall bring new opportunities and hopes for all of us. Undoubtedly, everyone contributed to keeping the Educational and other activities in motion during the lockdown period. On reopening, earnest efforts were made at DETE (Dept. of Electronics and Telecommunication Engineering, Govt. Polytechnic, Sakoli) to speed up the critical tasks and make up for the time lost during the containment period. The DETE has started online classes one week before the commencement of academic activities by MSBTE. The DETE has conducted practical's using various online mechanisms, including youtube videos, live demonstrations, etc. Also, the DETE has conducted a physical workshop on "PCB Design Simulation & Implementation" by following the Govt. norms of Covid-19. DETE is doing all activities as per the guidelines of MSBTE, DTE, AICTE, and Govt, norms of Covid-19. The result of the collective efforts may not be apparent right now but shall in the near future. Our day-to-day teaching work has taken a new definition and dimension in the overwhelming challenges of COVID-19. A surge in online usage during Pandemic offered us an opportunity to develop new ways to deliver our lectures, conduct practical's and PA tests to build stronger relationships with students and the community. Of course, such technological challenges will require us to make significant changes in the ways we operate. Still, I am happy to say DETE is undertaking the necessary steps in the direction in all possible capacities. Finally, I wish readers and their families a delighted and prosperous new year. Stay safe and beat the Pandemic with new energy.

## PRINCIPAL'S DESK

Expressions to inherent and nurtured qualities possessed are possible through oral and written means. The communications among human beings are always by these means but sometimes may transcend these verbal or sensory means but can occur at intuitive and unspoken manner. The kind of world we live in need to dwell upon these expressions in speech or through written material. The intention to provide platform for these expressions for students of our institute is very natural need.

Techno-Sphere magazine launched by Electronics and Telecommunication department of the institutes right approach and is important milestone in this direction.

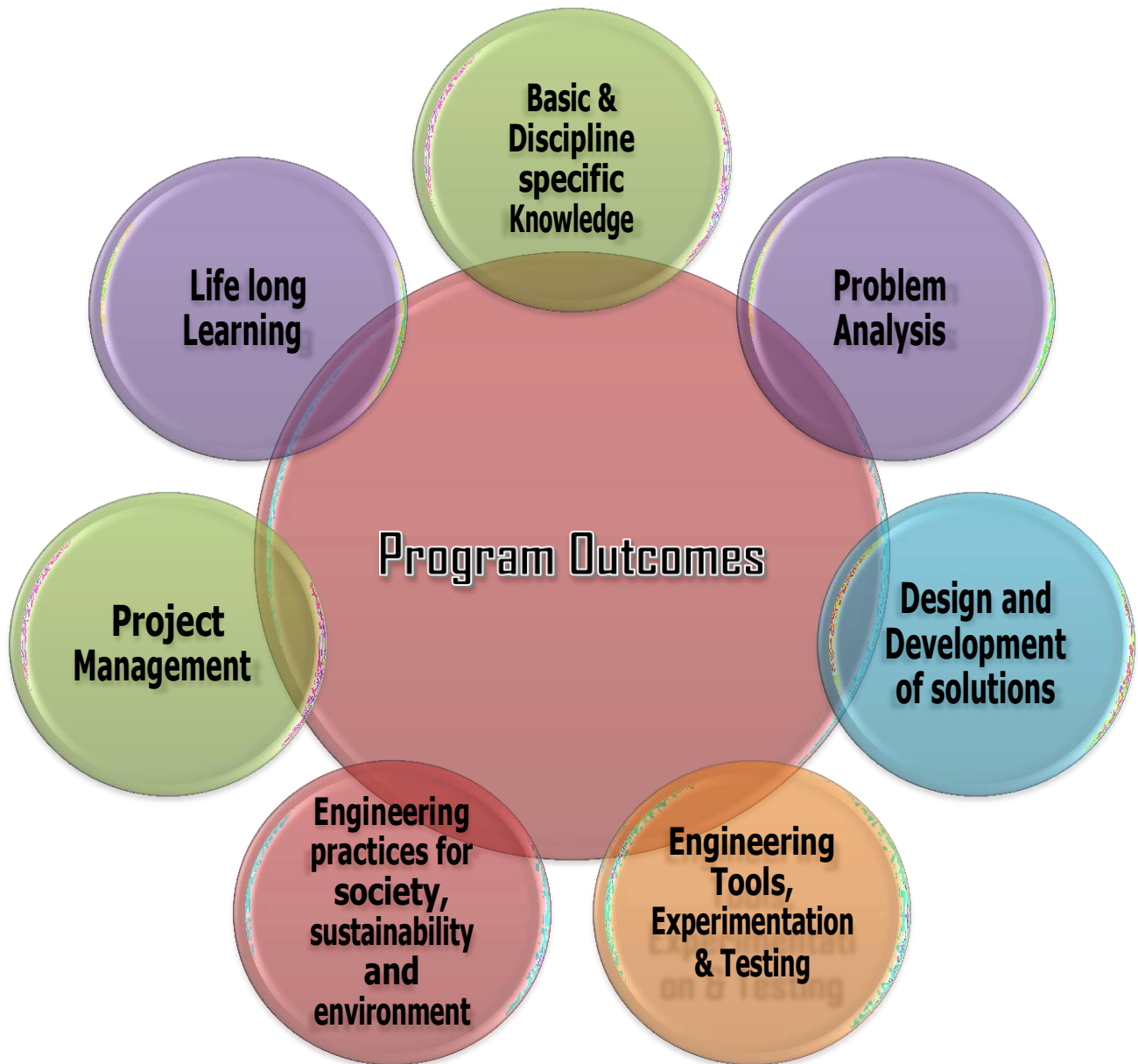
I extend my heartfelt greetings to all participants, authors, report writers, faculty, staff & students associated in this endeavor. I also appeal to all that with these upcoming new dimensions of E-World, one shall adjust oneself with exhaustive reading on internet to encourage learning by oneself. I also express the deep desire that the wonderful, beautiful & creative expressions of some individuals shall promote better human values, culture & affection among all.



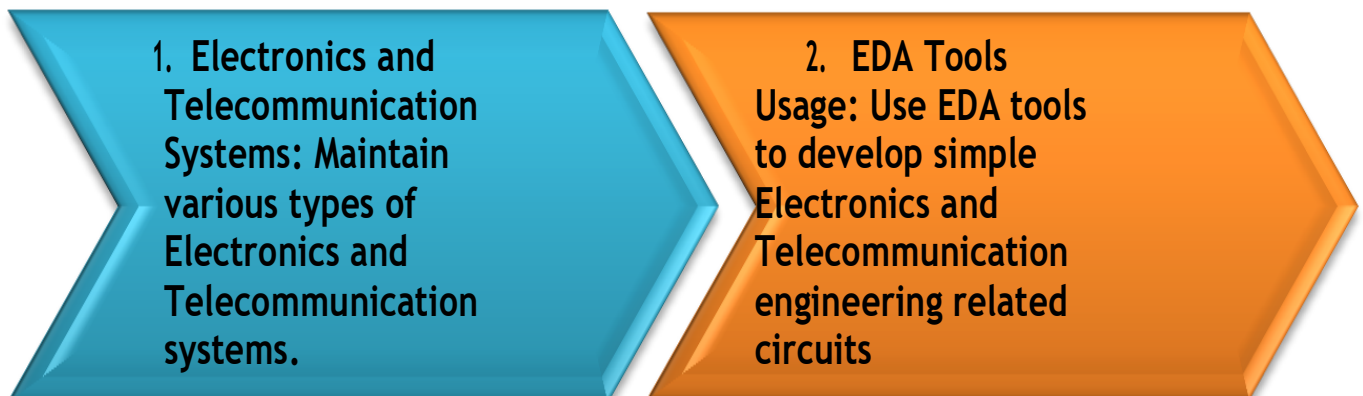
**Mr. S. P. Lambhade**  
**Principal**  
**Government**  
**Polytechnic, Sakoli**



## **PROGRAM OUTCOMES:**



## **PROGRAM SPECIFIC OBJECTIVES (PSO):-**



## HOD'S DESK

It gives me immense pleasure to present the Techno-Sphere 23-24 Technical Magazine of the department. Techno-Sphere, an elusive boundary of faith trustworthiness and affection. It is the talent and outcome of our students which is reflected through this. This is one of the best platforms for our students to present multifaceted personalities and innovative ideas.

I thank all the students for their wonderful response and enthusiastic participation without whom this would not have been possible. Commendable job has also been done by the Editorial team in planning for and producing the masterpiece. I respect their efforts and really proud of them. I hope you will enjoy Techno-Sphere 23-24.

**“Either write something worth reading or do something worth writing”- says Benjamin Franklin.**



**Mr. A. A. Ali**  
**Head of Department**  
**Electronics and**  
**Telecommunication**





## ***From the Editor's Desk.....***

Dear Reader,  
Greetings!!!

We are pleased to present you “**Techno-Sphere 23-24**” – The technical magazine from our Department of Electronics & Telecommunication Engineering.

The name of the magazine, “Techno-Sphere” may seem difficult, but it just means “Deep Insight into the wide spectrum of Electronics and Telecommunication engineering”, a clear vision. This magazine is a platform to showcase the literary skills and innovative ideas of faculty as well as students. "Techno-Sphere 23-24" presents the hard work and dedication of students and contributions of teachers. I would like to thank all my editorial team members for helping me whip up through. I express my considerable appreciation to all the authors of the articles in this magazine. These contributions have required a generous amount of time and effort. It is this willingness to share knowledge, concerns and special insights with fellow beings that has made this magazine possible.

Thank you all !!

### **The Editorial Team**

**Mrs. S. S. Pampattiwar**



**FACULTY  
EDITOR**

**Mr. R. B. Sathe**



**Mr. Yash Thawkar**



**STUDENT  
EDITOR**

**Ms. Neha Bopche**



# Top 15 Electronic Magazine Publication

## 1. Electronics For You



Electronics For You is the digital avatar of Electronics For You magazine. It was launched in 1969, and is counted amongst the leading publications in the fields of electronics and technology - across the globe. They cater to the electronics fraternity with the aim to discuss latest technology and trends, and to share knowledge.

## 2. Electronics Hub

Electronics Hub is an excellent educational blog for engineering students in providing great information on various electronics projects ideas, circuits, electronics tools, etc. from basic level to advanced level. Here you can find Electronics Projects, Free Circuit Diagrams, Project Ideas, Basic Information for EEE, ECE, IE.



## 3. All About Circuits



All About Circuits is an international, web-based community of electrical engineers and designers seeking ideas, education, and discussions with over 300K engineers, who collaborate every day to innovate, design, and create.

## 4. EE Times

EE Times connects the global electronics community through news, analysis, education, and peer-to-peer discussion around technology, business, products and design. From semiconductors to the companies that manufacture them, and everything in between, EE Times has you covered with news, editorials, and in depth analysis.





## 5. Electronic Design

**Electronic Design** is a trusted resource for more than 50 years, the Penton Electronics Group is the electronic design engineer's source for design ideas and solutions, new technology information, and engineering essentials. They aim to be a trusted authority on emerging technologies for design solutions, keeping readers informed and engaging them in an exchange of views and ideas.



## 6. EDN Network



The **EDN Network** is an electronics community for engineers, by engineers, with the information, tools, courses, and professional connections you need to get your job done and get your ideas from concept to reality as quickly as possible. Connect and voice your opinion with fellow engineers, electronics industry leaders, bloggers, manufacturers, etc to explore what's new and how you use it.

## 7. Open Electronic

**Open Electronics** is the brainchild of a world leader in hobby electronics Futura Group srl. Open Electronics is devoted to support development, hacking and playing with electronics. Open Electronics wants to become the reference open source site with ideas and feedback aimed to enrich the community.



## 8. Arduino Blog



**Arduino** is an open-source electronics platform based on flexible, easy-to-use hardware and software. It's intended for artists, designers, hobbyists, and anyone interested in creating interactive objects or environments.

## 9. OCTOPART

**Octopart** is a search engine for electronic components and industrial products. Today, over 700,000 engineers, scientists and sourcing professionals use their tools to search for parts across thousands of suppliers. Their mission is to open up access to electronic part data for design, sourcing, and manufacturing.



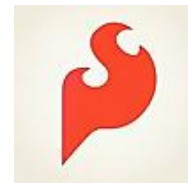
## 10. Mouser Electronics Bench Talk



**Bench Talk for Design Engineers is the official blog of Mouser Electronics. Mouser's Blog is updated regularly with the newest topics and categories. Mouser Electronics is a worldwide leading authorized distributor of semiconductors and electronic components.**

## 11. SparkFun Electronics

**SparkFun has been committed to helping the world achieve electronics literacy. No matter your vision or skill level, our products and resources are designed to make electronics more accessible.**



## 12. Robu.in Electronics Blog



**Learn from our series of articles on trending electronics topics: Arduino, Raspberry Pi, IoT, Automation, Robot Making, etc. Robu.in is a company that develops as well as distributes mechanical and electronic tools and services across the globe.**

## 13. Altium

**Altium is a global company with a passion for innovation, with the goal of providing the best electronics design and data management tools for every level of engineering and PCB design. Their software promotes innovation and creativity in electronics design teams, while connecting them to their critical collaboration partners**



## 14. ELE Times



**ELE Times provides a comprehensive global coverage of Electronics, Technology and the Market. It is a leading source of electronics news, design ideas, articles, learning center, latest technologies, innovations, market insights and more.**

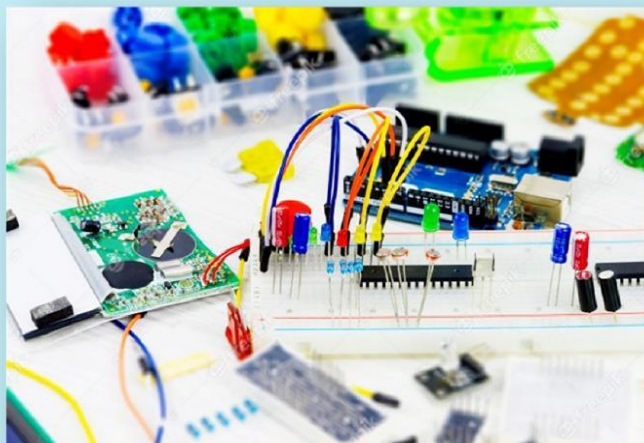
## 15. Electropages



**Electropages is a digital content platform that delivers real time product news to global electronics industry**



# Student Showcase





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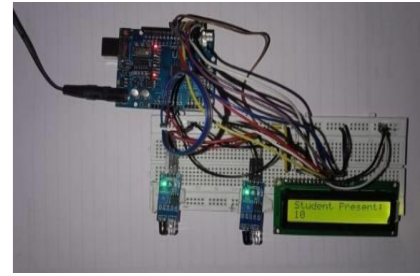
**CLOUD PROCESSOR**

**WIRELESS COMMUNICATION**

**ARTIFICIAL INTELLIGENCE**

## Visitors Counter & Attendance Counter

*As we know that, in this updating World everything is changing or upgrading and digitalized .So we are also updating and upgrading our skills and innovating something to be helpful for this Morden era. If we are studying something, then after learning, we have to implement it for better understanding.*



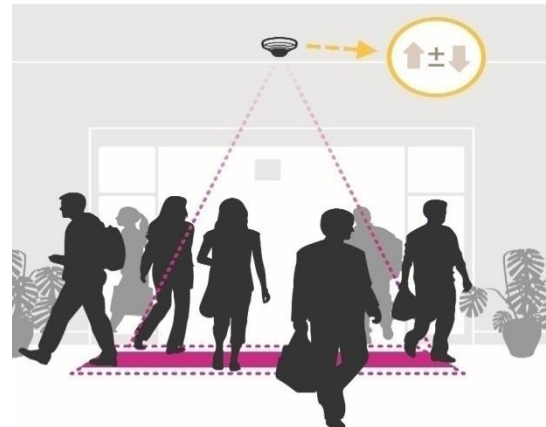
**IF YOU WANT SOMETHING NEW, YOU HAVE TO STOP DOING SOMETHING OLD.**

In this Article we are going to see the how this Visitors Counter system works and now a day's what is the role of that system in this present time and how it's work and there uses. As we know everything is going to be digitalized by the extraordinary thinking of mankind and their talent or skills .So, we also have to update our thinking of young generation to do and made something. There are 2 IR (INFRARED SENSORS) one connected at Entry and other one at Exit .When someone will enter from entry gate



IR sensor will detect that suddenly as our IR sensors used in this are high active .If someone comes between Infrared rays they will obstruct the rays and the rays will get reflected towards the receiver of IR sensor.

It will display the number of peoples in room on LCD display. And if someone exits from the room the number of peoples shown on LCD will decrease. According to the number of peoples present in room electronics gadgets like Fans and lights will be ON/OFF. It is more beneficial because it's performing multiple task and now a days we are also looking towards it and everyone are doing multi-tasking work to save our time and money.



### Where we can use this System?

- It can be used in classroom as an attendance counter, as well as in office.
- It also has its Industrial use like it can be used in factories for counting the items and goods.
- It can be also used for automatic switching purpose of lights and fans or other electronic gadgets.
- It detects the number of peoples in room and according to that it will switch electric gadgets like Fans, Lights etc.
- It can be used to overcome over power consumption scenarios.

In this today's present time this System is more beneficial not only for the business sector but more efficient for the educational institution. This type of system is already invented for

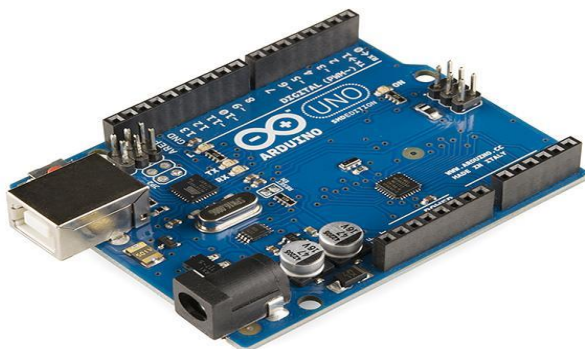
its not similar to this because they are embedded do it a one particular task like as biometric attendance. In this Visitors Counter we build a multi task System its doing

### **What is the main Advantage of that visitor counter?**

The Advantages of the visitor counter include

- Quick attendance.
- Easy to use.
- power saver

### **Which type of embedded system we use in this system?**



**Fig.1 :Arduino Board**

Arduino Uno is a microcontroller board based on the ATmega328P (datasheet). In our project, the main and most essential component we used is aurdino UNO. Microcontroller IC is to be used in our project's circuit but in aurdino UNO the microcontroller IC is inbuilt. And we uploaded coding in UNO with the help of software called aurdino IDE and then install UNO in circuitry. Aurdino UNO is very useful microcontroller in today's era. It is used in

weighing machine. Traffic Light Count Down, Timer, Parking Lot Counter, Embedded systems, Home Automation. etc. And we used this UNO to count the number of persons get in and out of room with the help of IR sensors. This will help us to count persons and saving electricity as if 5 persons come in then one light and one fan will on and if 10 persons come in then 2 lights and 2 fans will on and so on...And if 5 persons goes out then 1 light and fan will be off, this means we have no need to switch on switch off the light and fan.In this article we see About the visitor counter system which has been more beneficial for now present time and upcoming future. Because in this project not only he is going to do only one task but it's performing multiple task and also we know the man also doing the same they are finding and innovating something which do multiple tasks o many more. So now we are upgrading not only developing.



**YASH THAWKAR**  
ETX 3RD YEAR



**VISHWAS THULKAR**  
ETX 3RD YEAR

## **Sixth Sense:- The Miraculous Technology**



Hey Readers!!!

Is it possible to interact with digital world by using gestures? Yes it will be possible by taking some part of physical world in digital world and this process called Sixth Sense Technology. Basically it is wearable gestural interface that enhances the physical world around us with digital information and lets us use natural hand gestures to interact with that information. Mr. Pranav Mistry



**Ms. Bharti Rahangdale**  
**ETX 3rd Year**

invented the prototype of next level of digital to real world interfacing like camera, projector, mobile and colored sensors which are put on the fingers of a human being. The device efficiently senses the motion of the colored markers. This technology enables people to interact in the digital world as if they are interacting in the real world for the purpose of projection, the hand movements with Color markers (gestures) can act as input to application which is projected by the projector.

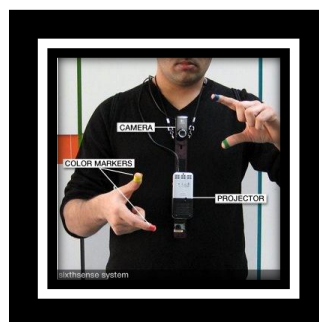


### **It conveys OBJECT & GESTURES**

The sixth sense technology uses different technologies like gesture recognition, image processing.

This technology has variety of applications. Likewise the painter can use his fingers as a paint brush.

A photographer can capture photo by arranging the fingers in rectangular pattern. We can use our palm as a call dialler.



We can use the wall for projection just by using simple little watch and millions of applications are there. It's damn true and miraculous that sixth sense technology will act as a bridge between digital world and

real world. Truly it's fantabulous, amazing futuristic technology that will surely write a new chapter in the history of science, technology and advancement. You visualize it and sixth sense technology will make it All soon.

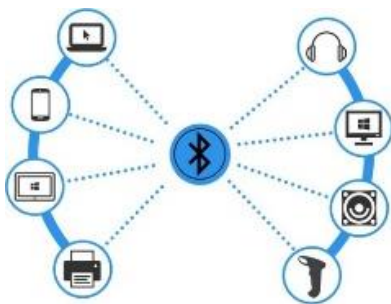
## Bluetooth Technology



**Ms. Kajal Gautam**  
**ETX 3rd Year**

Bluetooth is a short-range wireless technology standard that is used for exchanging data between fixed and devices over short distances using UHF radio waves in the ISM bands, the frequency is 2.45 GHz.. The Jaap. C. Haartsen was first discover the Bluetooth in the mid-1990. The Ericsson T39 was the first mobile phone with Bluetooth.

The Bluetooth Technology allows devices to communicate with each other without using cables or wire Bluetooth relies a short range radio frequency and any device that corporate the technology can communicate as long as it is within the required distance .The Bluetooth Technology is used to allow two different types of devices to communicate with each other. Now the Bluetooth is widely used in home electronics such as phone, camera, television, speakers and headphone. A Bluetooth mobile phone can wireless connect to headphone to



talk in your mobile phone or the Bluetooth can send pictures and, videos and files to another phone or computer. The headset and headphone is most popular appliances.

Bluetooth can connect a laptop or desktop to a device such as a mouse, keyboard or speakers without having to use wires. Additionally, Bluetooth can be used to transfer files between two computers that have Bluetooth chips or send documents to an enabled wireless printer. Bluetooth's short range makes it ideal for office situations with several enabled devices in close proximity, and the technology can also be used to transfer files from computers to mobile devices such as tablets and smartphones to transport information out of the office. The advantage of Bluetooth is easily upgradeable, The Bluetooth is used for voice and data transmission, Bluetooth devices are available in market at a very low cost and it's free to used if the devices is installed with bluetooth And there is so many disadvantages of Bluetooth. The loss connection in certain conditions, low bandwidth as compared to wi-fi, it allows only short range communication between devices and the security can be hacked.



The Bluetooth devices is used more than Five Billion people in worldwide. The Bluetooth has changed not only the way of electronics devices connect with each other, but also how people can connect and communicate.

## The Internet of Things in Modern Day life

Well, this day and age, everything is now becoming digitalized. Everyone is striving to enhance up with money and technology. Science has arrived at the point where everything has narrowed in size. Nanotechnology is gaining popularity these days. Every scientist is striving to get their fingertips on this technology. IoT is concentrated on certain lines of code, pre-programmed programmes, and sensors that are embedded specifically in customer-requested items. IoT is a device that functions, i.e. everything you can access from your phone or computer at any time and from anywhere. IoT has made life easier and faster, for



**Mr. Soham Bawankar**  
**ETX 3rd Year**



example, we can now manage electronic equipment from far using our handsets. Let's focus at some of the IoT-based product applications. You've probably heard of sensors like heat sensors, temperature sensors, vibration sensors, and so on.

Consider the following scenario: you are on your way home from work, exhausted from the day's activities, and

it is a great task to arrive home with cooked meals, isn't it?

Now that you have an IoT-controlled chapatti maker, you can save time and effort by asking or setting an instruction for a specific amount of chapati. Because we need to start the air conditioner half an hour ago for proper settling, i.e. to adjust to the climate, we may also use IOT to control it. You may now turn on your air conditioning using your phone half an hour before you leave for home, allowing you to settle into your comfortable zone when you arrive. Not only that, but there are thousands of other IoT operations. By combining a sensor with an IoT device, it can detect human presence and turn on the lights, as well as turn them off when no one is present. These IoT items have already been programmed to perform in this manner, and when we give them a command, they respond as follows.

So, I believe I've demonstrated how the Internet of Things works. The only disadvantage is that it demands high-speed internet.



## The Smart Attendance

### The Challenge

- Manual attendance is tedious and time-consuming.
- Teachers spend their precious teaching time in administrative task.

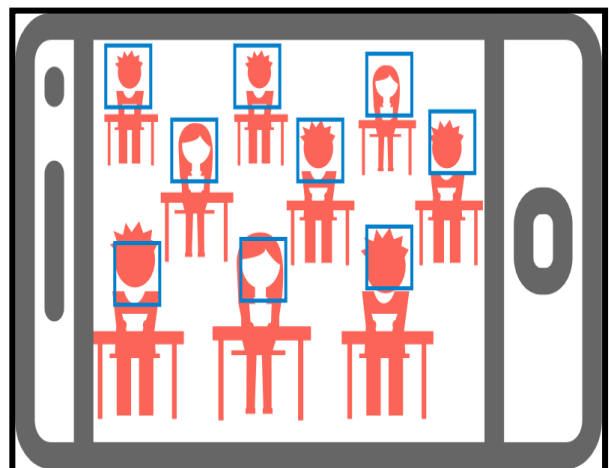
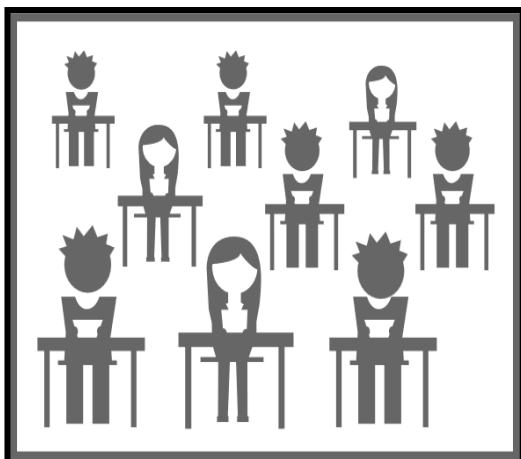
### The Solution

Smart Identification is an AI powered face recognition solution which uses Computer Vision and Machine Learning algorithms to mark the attendance of the students of the organization.

The system will work on face recognition where each student in the class will be photographed and their details will be stored in a server. The teacher can then record the attendance by just clicking some pictures of the classroom. The system will recognize the faces and verify the presence or absence of each student.



**Mr. Jhanak Saud**  
**ETX 3rd Year**



Based on artificial intelligence, this system will completely eliminate any chances of human error. The system is equipped with state-of-the-art face detection and recognition algorithms, making it completely fool proof.

### How it Works?

The system works on face recognition where each student in the class is photographed and their details are stored in a server. The teacher can then record the attendance by just clicking some pictures of the classroom. The system will recognize the faces and verify the presence or absence of each student.

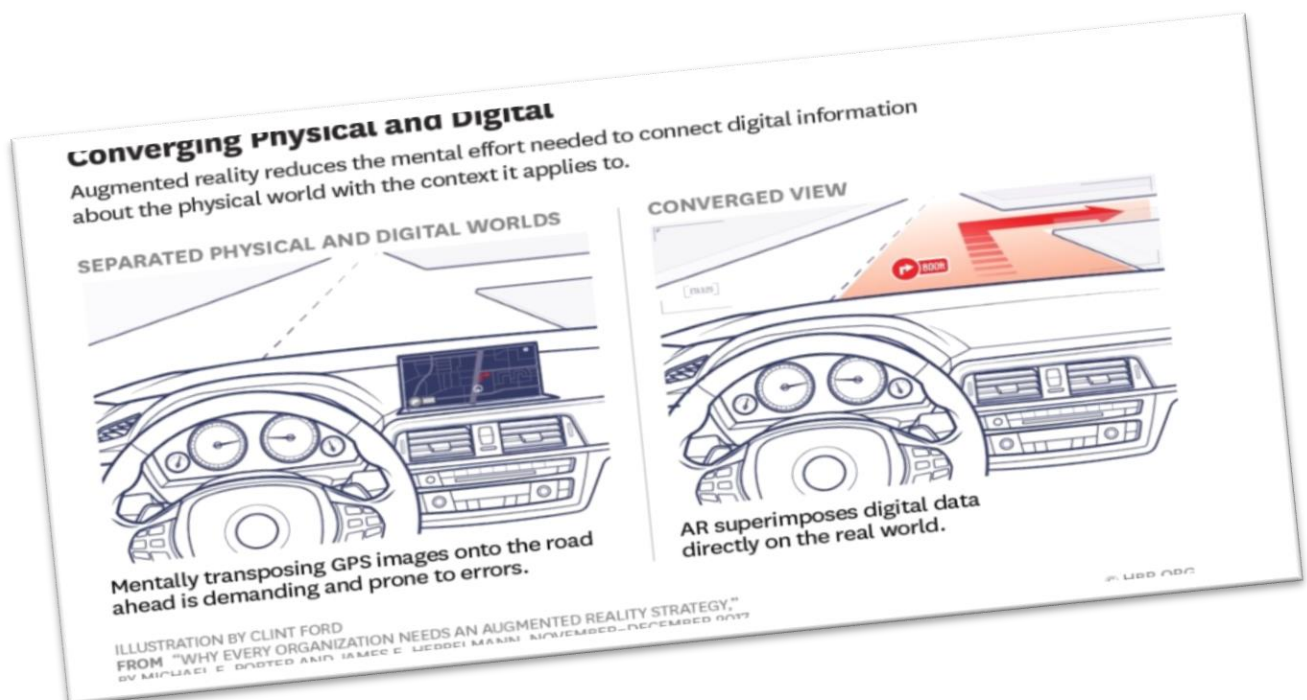
## Why Every Organization Needs an Augmented Reality Strategy?

AR displays in cars are a vivid illustration of this. Until recently, drivers using GPS

navigation had to look at a map on a flat screen and then figure out how to apply it in the real world. To take the correct exit from a busy rotary, for example, the driver needed to shift his or her gaze between the road and the screen and mentally connect the image on the map to the proper turnoff. AR heads-up displays lay navigational images directly over what the driver sees through the windshield. This reduces the mental



**Ms. Shikha Rahandale**  
ETX 3rd Year



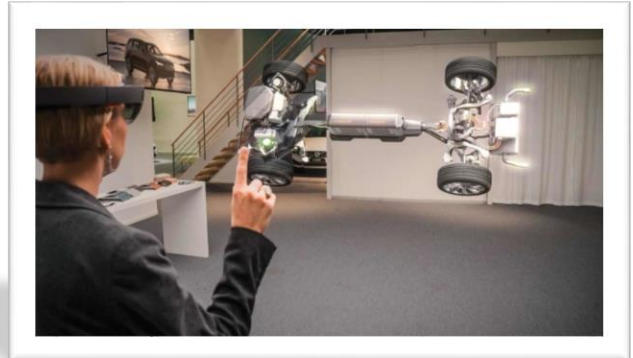
effort of applying the information, prevents distraction, and minimizes driver error, freeing people to focus on the road.

AR is making advances in consumer markets, but its emerging impact on human performance is even greater in industrial settings. Consider how Newport News Shipbuilding, which designs and builds U.S. Navy aircraft carriers, uses AR near the end of its manufacturing process to inspect a ship, marking for removal steel construction structures that are not part of the finished carrier. Historically, engineers had to constantly compare the actual ship with complex 2-D blueprints. But with AR, they can now see the final design superimposed on the ship, which reduces inspection time by 96%—from 36 hours to just 90 minutes. Overall, time savings of 25% or more are typical for manufacturing tasks using AR.

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- **AR's Key Capabilities**

As we've previously explained (see "How Smart, Connected Products Are Transforming Competition," HBR, November 2014), the SCPs spreading through our homes, workplaces, and factories allow users to monitor product operations and conditions in real time, control and customize product operations remotely, and optimize product performance using real-time data. And in some cases, intelligence and connectivity allow SCPs to be fully autonomous. AR powerfully magnifies the value created by those capabilities. Specifically, it improves how users visualize and therefore access all the new monitoring data, how they receive and follow instructions and guidance on product operations, and even how they interact with and control the products themselves.



## Smart Card



Ms. Bhairavi Ambhore  
ETX 2<sup>nd</sup> Year

The smart card is a regular credit card sized card with the microchip integrated on it and the smart card is made up of plastic and the integrated chip in it is capable of saving information and also it carries the information between the users. The data of the card can be transferred through a reader which is a component of a computer system.

The smart card increases security and at present, they are in avail in many fields like healthcare i.e. hospitals, banking, and entertainment etc. Up to many levels, the users of smart cards and the application fields of smart card get an advantage from the features of smart card that it furnishes and an example of it is the security parameters. Some of the applications of the smart card applied science are the credit card, debit card, and identification cards, and also the loyalty cards. Now, because of the bringing of the high-level cards





like java card as the SIM card, even the mobile phone will have the feature of payment applications.

The smart card gives more protection than the other kind of data storing devices and smart card furnishes better solutions and increases the protecting feature of the system. The smart card is the modern innovation to the world of information applied science, the memory cards are just capable of saving the information and plays the role of a tiny floppy disk but the microprocessor has additional features like adding the data, deleting the data, and manipulating the data in the memory that is present in the card.

In the year of 1968, two Germans namely Jurgen Dethloff and Helmet Grotrupp made the plastic to be the carrier of microchips. In the year 1970, Dr. Kunitaka Arimura from Japan filed the foremost and exclusive patent on the concept of a smart card. In the year of 1974, Roland Moreno filed a genuine patent on the smart card. In the year 1977, the three commercial people namely Bull, Schlumberger, and SGS Thomson started advancing the IC card.

In the year of 1979, Motorola advanced the foremost chip microcontroller for the purpose of French banking. In the year of 1982, the foremost IC card testing was done and in the year of 1992, a project began in Denmark on the nationwide prepaid card. In the year of 1999, the Federal government started the smart card identification for federal employees.

The smart cards are classified into two categories and they are as follows:

- 1. Contact Vs contactless**
- 2. Memory Vs microprocessor**

**Contact Vs contactless:** The smart card has integrated microprocessors and requires energy to work, along with it the smart cards have some techniques to exchange the information, receiving the information, and transmitting the information. Few smart cards consist of golden plates and contact pads at the corner of the card, this category of the smart cards are known as the contact smart cards. The plates present at the corner of the card supply the required amount of energy and for exchanging the information through direct electrical contact with the help of a reader. The contact pad will not be present on few smart cards and in such cards, the connection between a reader and the card will be created through radiofrequency.

The contactless cards do not need a reader and they have a serial interface and an antenna will be present which is used to connect the card.

**Memory Vs microprocessor:** The usual and the affordable smart cards are the memory cards and they have the non-volatile memory and the electrically erasable programmable

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read-only memory i.e. EEPROM. As it is a non-volatile memory, if we displace the card from the reader or have issues with the power like power cut then the card saves the information. The microprocessor cards are similar to the computers and they contain the RAM, ROM, and EPROM with the 8-bit microprocessor or the 16-bit microprocessor.

The abbreviation of the Subscriber identification module i.e. SIM is a smart card that is used for mobile phones to identify each mobile machine with the other. The mobile network furnisher furnishes this card and it will have a special key and in simple words, the SIM card is a smart card's application that puts into action the specification of GSM.

**Applications of Smart card:**

The applications of the smart card are as follows:

- Payment system
- Transportation
- Communication applications
- Retail and loyalty
- Smart networking
- National ID or Authentication
- University identification
- Financial applications

**Advantages of smart card:**

The advantages of the smart card are as follows:

- Reliability
- Flexibility
- Portability
- Security
- It increases the capacity of storing the information.

**Disadvantages:**

The disadvantages of the smart card are as follows:

- It can be easily stolen.
- It needs to avail the similar reader technology.
- It is very costly.

## Cloud Processor



**Mr. Chiranjeev Sanwane**  
ETX 2nd Year

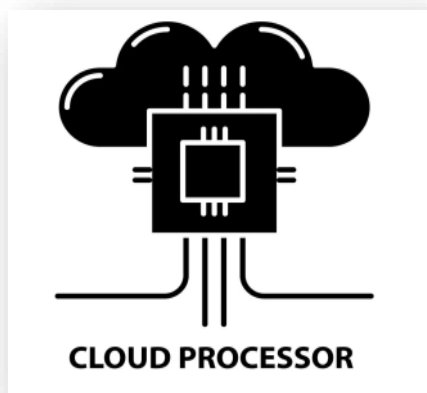
A cloud processor is a third party dependent virtual processor that will be dependent on a supercomputer through internet by means of optical fibre or wireless connection. To perform high-end program, perform basic arithmetic, logic



**Ms. Rahemin Saiyyad**  
ETX 2nd Year

controlling and other than that a cloud processor also drastically will change the

future by reducing the manufacturing cost of all devices like PCs, smart phones, tablets, and other computers. The Cloud processor is a connecting link between Micro-processor and a Micro-controller on the basis of their cost and their application. A micro-controller is used in embedded systems where fewer calculations are needed but necessary whereas a microprocessor is used in computer system where high-level calculation and performance are necessary.

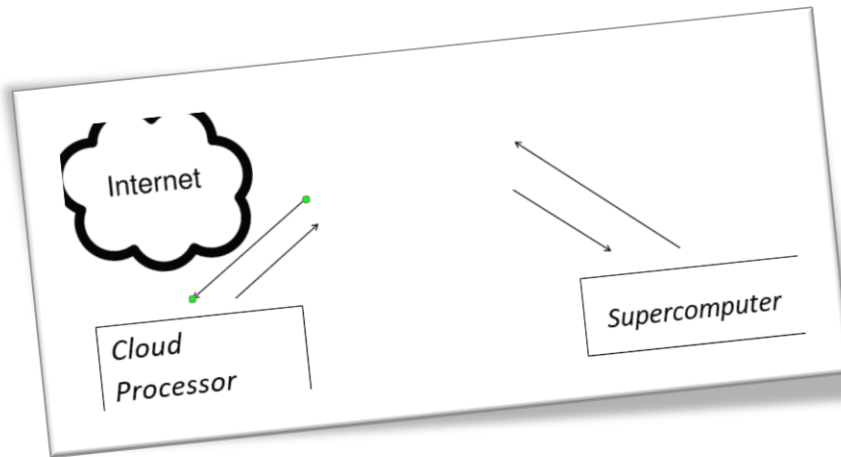


### FUNCTION OF CLOUD CAST:

The cloud cast is a high-tech modem that can connect to any device, including PCs, cell phones, and tablets. This will lessen the stress on CPUs by shifting the process/function to a cloud-based external machine (internet). A Supercomputer, for example, might be in charge of all the gadgets in its zone. This will result in a new type of technology in which a new generation of computer will emerge in which the size and other features such as RAM, ROM, and CPU are no longer optional. As a result, in the future, we will have computers and phones whose sole purpose is to present material or display content, replies, and outputs, with all computations and processing conducted by a supercomputer connected to each and every gadget by wireless networks or optical fibre cable networks. Only metro cities will be able to use this technology.



Let's look at a block diagram of a cloud computing system to better grasp this hypothetical processor.



As you can see in the block diagram above two key components to perform cloud processing are a supercomputer and a cloud processor itself. Internet act has a medium of data transfer

for both sides to establish connection. Different networks and data transfer mechanisms that are superior than today's may be used as a medium for cloud processing in the future. We utilise the internet as a tool or medium for data transport since it is so widely available. Consider a low-cost, low-power gadget that can do tasks as complex as a supercomputer using only basic hardware. The goal of this procedure is to give a low-end PC the ability to run high-end programmes, or to stream high-end programmes, so that all devices, such as PCs, smart phones, and tablets, can be used as a streaming and input device for all types of operations, such as running high-graphic programmes (video games), design-related programmes, and virtual memory programmes. This will also allow for high-quality gaming and virtualization. It can also help in the fields of science, space travel, and other fields on a vast scale.

Some of the cloud providers are -

- Amazon Web Services (AWS)
- Microsoft Azure.
- Google Cloud.
- Alibaba Cloud





## Wireless Communication



**Mr. Vedant Dandale**  
**ETX 1st Year**

Communication is the process of exchanging information. Where in the past for technology communication, wired medium was the main type and widely used for Communication and where wires were playing major Role. But later as the technology Increased day by day, the communication process become more convenient with the help of wireless communication. In this type of

Communication, signals are transmitted and received with the help of electromagnetic waves through the Air medium.

### How wireless communication system works?

Transmitter side transmits the signal and receiver side receives the signal through the free space(air) medium. But for transmitting as well as receiving one of the main element is Antenna which helps to radiate/receive signal in free space.

### How Wireless Communication Changed our Life?



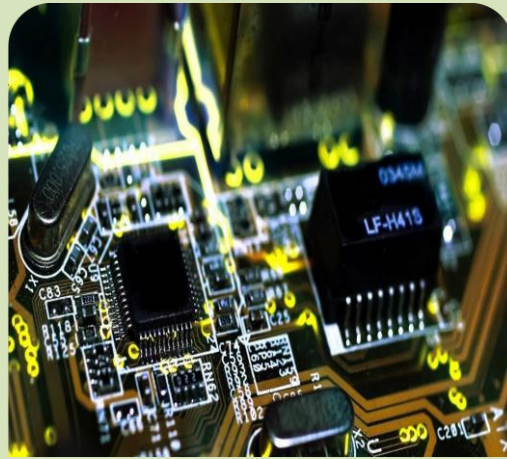
Before it was difficult to Communicate over long distance. Even for shorter distance due to wires it was little bit difficult. But due to wireless communication it became easy to communicate over long distance, country to country as the main medium used for transmission is Free Space (Air). Due to increased technology, even obstacles are

unable to stop wireless communication.

### How it is Harmful for us?

As the Wireless technology depends on the electromagnetic waves for transmission and receiving, they are useful as well as harmful for our body. As the frequency of such waves are very high, they affect the human health directly and indirectly. But not only humans they are also harmful for Birds, Animals and nature.





# Faculty Section

## TABLE OF CONTENT

❖ WIRELESS BODY  
AREA NETWORK

❖ SIGNAL  
INTEGRITY



## Artificial Intelligence Bot: ChatGPT

ChatGPT is a powerful artificial intelligence bot developed by OpenAI. Altman, Musk, and other Silicon Valley investors created an artificial intelligence research non-profit organization in 2015 and unveiled it to the world on 30th November 2022. Its popularity grown by leaps and bounds. ChatGPT is Chat Generative Pre-Trained Transformer. It is a powerful AI bot that is capable of understanding human speech and producing in-depth writing that is easily understood by humans. The question-answer format use in ChatGPT makes it interesting.



Mr. L. K. Kothwar

OpenAI's ChatGPT has garnered the attention of the whole world with its unique feature to answer the public's questions. Chat GPT full form is **Generative Pre-Trained Transformer**. With its wide range of uses, people have been keen on knowing what is ChatGPT, how to use it, whether it is free or one has to pay a fee to use it and many other questions. Let us answer to all your queries here.

### Is ChatGPT free?

Yes, chat GPT is free to use. However, a paid version of Chat GPT has also been launched by OpenAI in the US. The paid version of chat GPT is termed **ChatGPT Plus**. People who wish to use the paid version of Chat GPT can use it by paying USD 20 per month. While people who do not intend to pay the price of using it can use the free version of the app.

### How Can You Access ChatGPT?

ChatGPT can be accessed on your mobile browser or computer/laptop. Using ChatGPT is very easy. To know how to use chatGPT, follow the steps mentioned below:

- Step 1: Visit <https://chat.openai.com/auth/login> to get started.
- Step 2: Sign up on this website by entering your full name.
- Step 3: Verify your account through a code sent to your mobile phone or email id.
- Step 4: Once the verification is completed from your end, you can begin using it.

### What kind of questions can you ask on ChatGPT?

In recent days, the hype around ChatGPT has accelerated to such a great extent that this tool has a huge potential in the near future. With so many uses of ChatGPT in daily life, it has garnered attention of people of every age group. Chat GPT generates human like responses through texts. It holds the capability of answering questions in a lucid and conversational tone. It can generate codes, write stories, poems, etc. It gives natural answers to generate responses in a way a human would provide. Let us have a look at some of the uses of

**ChatGPT:**

- Write codes
- Do translations
- Debug
- Recommend you songs, party ideas, etc.
- Write a compelling poem or prose
- Help you prepare for a Law exam
- Write an essay for your school or college project
- Give you the recipe for your favourite dish
- Give you the lyrics of any song

**Is ChatGPT better than Google search?**

Google search helps you to get suggested answers to your questions by giving you a list of websites that are relevant to your questions. On the other hand, ChatGPT gives you the to-the-point answers in a natural flow. It is like using a guidebook.

Much comparison has been made over ChatGPT vs Google search since the ChatGPT was launched. However, one should always do a deep analysis when using ChatGPT to get answers. Getting an answer through ChatGPT is getting raw text with no credible source of information or citation or link attached to it. One is advised to verify the answers when using it.

**Google Bard AI**

To compete against the AI bot, Google launched its own AI which is Google Bard. It was launched in February 2023 and has been developed on the Lamda Model (Language Model for Dialogue Applications). This means that it can give answers to your questions in a conversational way, similar to ChatGPT.

However, within days of its launch, it was criticized for giving improper factual data. Hence, it is still in the development stage. Thus, in order to be used perfectly with 100% accuracy, google employees have been working tirelessly to compete with ChatGPT.

**ChatGPT Alternative**

ChatGPT is not the first tool that has been developed to make work easier. Many other types of AI chatbots have been developed in the past that are capable of solving human problems.

Here is a list of tools that are the best ChatGPT alternatives:

Replika, ChatSonic, Microsoft Bing, Jasper Chat, Character AI, YouChat, DialoGPT, and more.

**Limitations**

ChatGPT suffers from multiple limitations. OpenAI acknowledged that ChatGPT "sometimes writes plausible-sounding but incorrect or nonsensical answers." This behavior is common to large language models and is called artificial intelligence hallucination. The reward model of ChatGPT, designed around human oversight, can be over-optimized and thus hinder



performance, otherwise known as Goodhart's law.

ChatGPT has limited knowledge of events that occurred after 2021. According to the BBC, as of December 2022, ChatGPT is not allowed to "express political opinions or engage in political activism". Yet, research suggests that ChatGPT exhibits a pro-environmental, left-libertarian orientation when prompted to take a stance on political statements from two established voting advice applications. Apart from this it has some ethical issues for which ChatGPT has been met with widespread criticism from educators, journalists, artists, ethicists, academics, and public advocates.

Now to explore the capability of ChatGPT author has asked some questions and answers given by it are shared below.

Q: Can you give one page essay on chatGPT?

Ans: Certainly! Here's a one-page essay on ChatGPT:

### **ChatGPT: The Revolutionary Conversational AI**

ChatGPT is an advanced conversational AI language model developed by OpenAI, a leading artificial intelligence research organization. Using the transformer architecture, ChatGPT can generate human-like responses to a wide range of questions and statements. This model is trained on a vast corpus of text data using deep learning algorithms, making it one of the most sophisticated language models in the world.

One of the key benefits of ChatGPT is its ability to provide personalized responses to users. Unlike traditional chatbots, ChatGPT generates unique and context-sensitive responses based on the user's input. It's ideal for customer service, technical support, and content creation.

Another benefit of ChatGPT is its ability to generate highly accurate and informative responses to complex questions. With access to vast amounts of knowledge from its training data, ChatGPT can provide insightful responses to even the most complex queries.

Despite its many benefits, there are concerns about ChatGPT's potential risks, such as generating misleading or harmful content. To address these concerns, OpenAI has implemented ethical guidelines to ensure ChatGPT is used responsibly.

In conclusion, ChatGPT is a revolutionary conversational AI that has the potential to change the way we interact with technology. With its ability to generate human-like responses, ChatGPT can provide personalized and accurate support in various areas. While there are concerns, ethical guidelines aim to ensure ChatGPT is used responsibly.

The readers can explore ChatGPT for various applications.

**Conclusion:**

Chat GPT is a large-language model for users to generate text that resembles human speech. Its chat system allow users to write their queries and receive answers from machine learning and artificial intelligence chatbots. The answers are presented in a conversational tone and decent detail, but they are not always correct. So, it is at readers discretion to use it for their requirement. There are times when you might get a wrong answer, too. Therefore, it's still a work in progress. We're expecting to see a lot of improvement in the coming years.

**References:**

- ✓ <https://www.jagranjosh.com/general-knowledge/what-is-chat-gpt-1676870553-1>
- ✓ <https://en.wikipedia.org/wiki/ChatGPT>

## Challenges in Wireless Communication



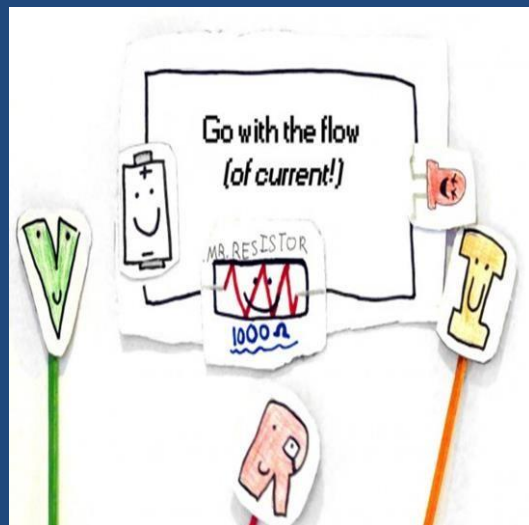
**Mr. R. V. Sakhare**

By empowering connectivity between people, then between people and the Internet, wireless communications basically turned our daily life and created a fully connected society. Through the past two-decade, mass-offering of mobile broadband (MBB) access to the Internet has been the dominating theme of wireless communications and recently became a reality with introduction of various advanced transmission technologies, including multiple antenna transmission and reception (MIMO), multicarrier transmission, channel- adaptive transmission, etc. These technological developments also establish a solid foundation for the future enhancement of MBB services.

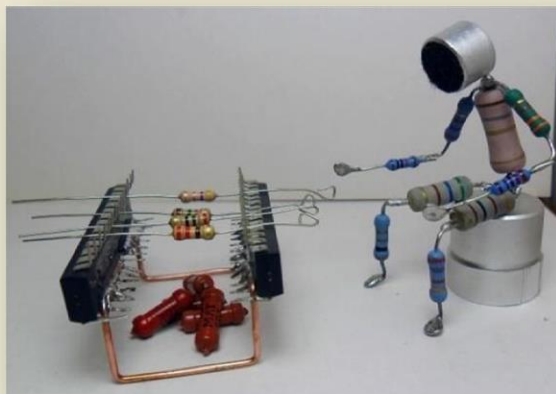
The increasing demand of extremely high data rate services, together with emerging advanced Internet of Things (IoT) and Industry 4.0 applications bring new technical challenges to wireless communications. New service classes, such as ultra-HD video and multisensory virtual reality, push for even higher spectral efficiency, and the exploration of extreme frequency bands. While accommodating fast growing enhanced MBB services, future wireless systems need to simultaneously support the communication demands of massive IoT devices as well as various mission critical equipment. Advanced IoT applications require ultra-reliable low-latency and high energy efficient communications for miscellaneous connected devices. Future human-centric services demand accurate localization and multi-dimensional sensing. The full integration of

computing, communication, and control with the application artificial intelligence and machine learning is essential to the realization of Industry 4.0.

Future wireless communication system should effectively support a universal and all-over cyber physical infrastructure for a huge variety of applications with novel network structure, spectrum access schemes, and resource allocation solutions, while taking into account the energy efficient and security/privacy considerations. To effectively deliver ultra-high data rate, massive connectivity, and seamless coverage, while accommodating dramatically different quality of service requirements, highly innovative technological solutions are required to address various challenges facing wireless communications, several big challenges inherent to future wireless systems.



## Fun With Electronics



*DID YOU KNOW?*

*CROSSWORD PUZZLE*

*FUN FACTS*



# did you know?

One of the best ways to remember something is to tell someone else about it. Studies show when you immediately relay what you've learned, you're more likely to remember the details for longer than if you just re-read your notes or textbook. When your brain categorizes memories, it keeps the most important ones more accessible, because it assumes the information you've told someone else must be pretty important.




PHOTO: PAPRIE.COM DIDYOUKNOWFACTS.COM

*There is a common misbelief that because the browser is named Firefox, the logo must be a fox. Surprisingly, the cute furry creature in the logo is actually a red panda!*



*The first Apple logo isn't what you would think.*

*Originally, it featured Sir Isaac Newton sitting beneath a tree, with an apple about to fall on his head. It was designed back in 1976 and featured a phrase around the border that read "Newton..A mind forever voyaging through strange seas of thought..alone".*



*The name for "robot" has dark origins.*

*If you look into the etymology of "robot," it comes from the Czech word "robota" which translates to forced labor or work.*

*The word was first used to refer to a fictional humanoid in a play in 1920.*



*The first-ever VCR was the size of a piano.*

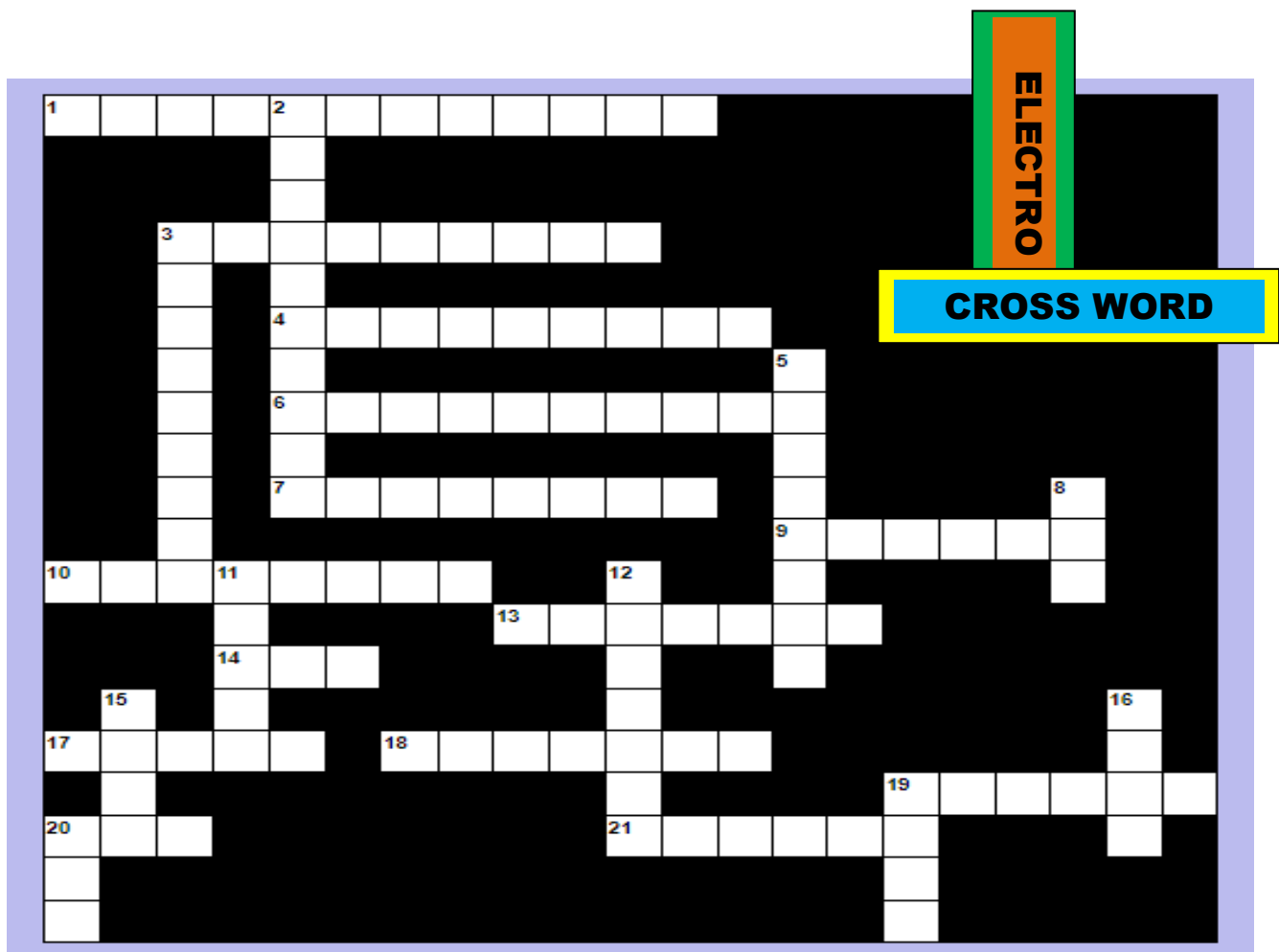
*When the first VCR (Video Camera Recorder) was made in 1956, it was the size of a piano. Way bigger than I would have guessed!*



*Samsung is 38 years and 1 month older than Apple.*

*Samsung was founded as a grocery store on March 1, 1938, by Lee Byung-Chull. Apple Founders Steve Jobs and Steve Wozniak created Apple Computer Inc. on April 1, 1976.*



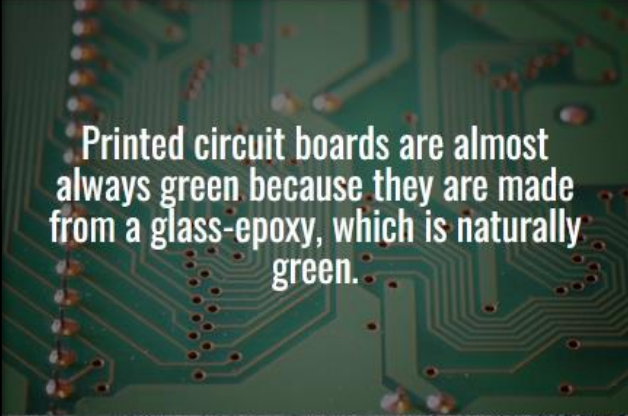
**Across:**

1. A connection that should not be there
3. Electricity can flow through
4. Does not conduct electricity -
6. Temperature changes its resistance
7. This component reduces the flow of electricity
9. This means three in the colour code
10. An adjustable resistor
13. Measured in amps!
14. Short for a type of circuit board
17. The unit of potential difference and emf
18. A source of power!
19. Buzzers and leds are examples of an -
20. A light sensitive resistor
21. Turn a circuit on or off with this

**Down:**

2. This component is able to switch or amplify
3. This component stores electric charge.
5. A solder joint that does not conduct electricity -
8. 2% tolerance
11. Sensors are -
12. What comes between input and output?
15. 5 per cent tolerance
16. Helps the solder flow
19. Resistors are measured in -
20. Usually produces a red light!





Printed circuit boards are almost always green because they are made from a glass-epoxy, which is naturally green.



Flexible PCBs are built on flexible high-temperature plastic like Kapton.

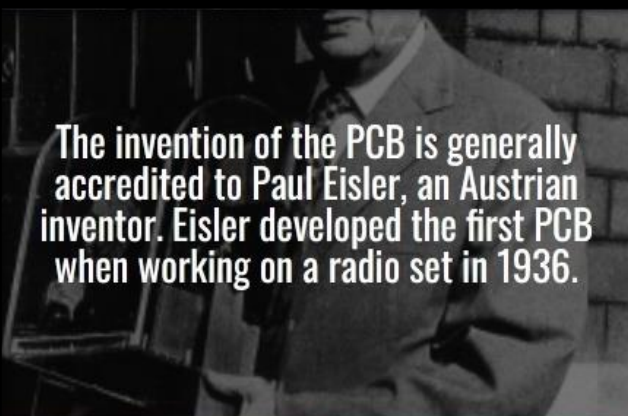


Manufacturing floors need to be above 30 percent (rH) humidity or the solder paste dries out causing process issues.




Some manufacturers have mist machines, which humidifies the dry air during the winter months. The mist evaporates before it hits the ground.

## FUN FACTS ABOUT ELECTRONICS



The invention of the PCB is generally accredited to Paul Eisler, an Austrian inventor. Eisler developed the first PCB when working on a radio set in 1936.



The revenue of circuit board and electronic component manufacturing in the U.S. ranged at about \$44 billion in 2014.



In 2015, there was a record 225 million placements done in the Vancouver BU.



The worldwide EMS market now accounts for almost 40 percent of all assembly.

# SAETE

STUDENT ASSOCIATION OF ELECTRONICS AND  
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