DEPARTMENT OF INFORMATION TECHNOLOGY

Welcome to the Department of Information Technology.

As we all know, this is an era of Information Technology, and almost every one of us uses some kind of gadgets which invariably leverages the benefits of Information Technology. The advent of Information Technology has revolutionized the way we live. Moreover, Internet and mobile wireless technology are the boons of Information Technology. So, the department strives hard to groom our students with this cutting edge technology, thereby instilling high valued ethics and morals. The department prepares them to take up the challenges of ever changing dynamic IT industry.

To fulfill the vision and mission of Information Technology Department towards imparting quality education to our students we conduct various activities like expert lecture, seminar, workshop and industrial visit to make teaching process effective. We provide a platform to our students to participate in many extra-curricular activities through various technical, non- technical contests for their overall personality development.

All India Shri Shivaji Memorial Society's
Institute Of Information Technology

Department Of Information Technology

VISION

To equip students with core and state of the art Information Technology.

MISSION

Imparting knowledge of Information Technology and teaching its application through innovative practices and to instill high morale, ethics, lifelong learning skills, concern for the society and environment.

PROGRAM EDUCATION OBJECTIVES(PEO)

- To prepare graduates to solve multifaceted and complex problems in IT industries.
- To inculcate core professional skills with latest information technology to prepare graduates for employment and higher studies.
- To develop cross domain competences that prepares graduates for lifelong learning in diverse career paths.
- To make graduates aware of their social responsibilities toward environment and society.

PROGRAM SPECIFIC OUTCOMES(PSO)

- Graduates will be able to demonstrate database, networking and programming technologies.
- 1.Graduates will be able to apply core, professional and state of the art Information Technology.

PROGRAM OUTCOMES(PO)

Graduates will be able to

- Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems. **[Engineering knowledge]**

- Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. **[Problem analysis]**

- Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and cultural, societal and environmental considerations. **[Design/ development solutions]**

- Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions. **[Conduct investigations of complex problems]**

- Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations. **[Modern tool usage]**

- Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice. **[The engineer and society]**

- Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development. **[Environment and sustainability]**
- Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. **[Ethics]**

- Function effectively as an individualand as a member or leader in diverse teams and in multidisciplinary settings. **[Individual and team work]**

- Communicate effectively on complex engineering activities with the engineering community and with society at large such as, being able to comprehend and write effective reports and design documentation, make effectivepresentations and give and receive clear instructions. **[Communication]**

- Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team to manage projects and in multidisciplinary environments. **[Project management and finance]**

- Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. **[Lifelong learning]**

Message From HOD

It is a great privilege and immense honor to inform you that the Department of Information Technology is publishing its 7th annual technical magazine "**ITLANTIC 2020**". It is reflection of student's hidden talents, skills and caliber. This magazine certainly would induce the young engineers to promote their creativity in approaching things differently.

This technical magazine is a platform to exhibit the literary skills and innovative ideas of students. Through this magazine students can convey inspirational articles, vibrant drawings, mind-scintillating poems and updates of current trends to others.

All these things have been made possible by the extraordinary vision of Shri Malojiraje Chhatrapati, Hon.Secretary, All India Shri Shivaji Memorial Society and the immaculate planning of Dr.P.B.Mane, Principal All India Shri Shivaji Memorial Society Institute of Information Technology.

I take this opportunity to congratulate the chief editor Prof. Mrs. R.P. Saste for bringing out this magazine as per schedule, which in itself is an achievement considering the effort and time required. I would like to thank all editorial team members for providing students a platform for creative thoughts and knowledge expansion. I express my considerable appreciation to all the authors of the articles in this magazine. I express my gratitude to all for their involvement, encouragement, support and guidance.

Dr. Meenakshi A Thalor
HOD-IT Department
AISSMS IOIT,Pune

Message from EDITOR

I proudly present 7th successive edition of our department's annual technical magazine **"ITLANTIC 2020"**.

This year we are showcasing innovative ideas and hidden talents of our young minds on the theme "Android & iOS". The objective of the magazine is to provide platform for our students to augment the technology focus and scope of it.The technical section of this magazine elaborates importance of Android and iOS in the field of communication

.Over the years, communication methods have evolved from simple text messages and audio calls to more efficient video calls and chat platforms which offer other communication services. The impact of technology in communication has influenced both individuals and businesses.

On behalf of the entire magazine team I would like to extend my gratitude to our respected Principal Dr. P.B. Mane and HOD Dr. M. A. Thalor for their invaluable guidance and support towards accomplishment of ITSA events successfully.

Special thanks to team of enthusiastic and dynamic students for their incredible contribution in making of the magazine. There is remarkable contribution of the student's editorial team to make this magazine amazing. I congratulate all the participants for sharing notable articles in the magazine.

Mrs. Rasika P. Saste

Chief Editor and Magazine Coordinator

Assistant Professor

Department of Information Technology

EDITORIAL TEAM

Technical Magazine Team Members :

Hrutik Surwade (T.E)

Abhishek Zade(T.E)

MESSAGE FROM EDITORIAL TEAM

Sometimes when you innovate, you make mistakes. It is best to admit them quickly, and get on with improving your other innovations.

\- Steve Jobs

We take it in our pride to present to you the 6th edition of technical magazine ***"ITLANTIC 2020"***

This issue will take you through the technological advancements in space sciences and globally evolving technologies.

This tech-crozier is a collection of a perfect balance of technology, knowledge, creativity and expression- exactly what we ENGINEERs are made of!

Rendering through the magazine will take you through latest technologies that are prevailing this new era of the Information Technology, from AI to Cryptocurrencies, we've tried to cover it all.

We hope this edition serves to enlighten and gladden all the readers.

Feedback has always been the breakfast of the champions.

Good feedback will give us the opportunity to improve; hence any suggestions are always welcome!

Mail us at:itsa.technicalmag@gmail.com

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Speed Of Development

Speed Of Development

1. Strategically adjust your team's size

The thing to keep in mind here is that, while hiring new people will eventually increase your development speed, it'll decrease it in the short term. Conducting technical interviews takes developers away from important tasks. Plus, once you hire someone, it'll take several months to train and mentor them properly.

More people also means more team coordination. If you don't keep coordination activities in check, you'll spend more time in poorly conducted meetings or on activities that don't directly add value.

Dividing teams and responsibilities this way ensures that some part of your development project is always making progress.

2. Increase your team's overall skill level

This transformation obviously won't happen overnight, but you can start by actively encouraging your team members' continuous learning and skill development. Create a learning library, and encourage book clubs. Send your developers to conferences. Create internal conferences or conduct employee-led workshops to facilitate knowledge sharing. Dedicate time in your work week exclusively to professional development or personal projects.

3. Decrease system complexity

Complexity is inevitable in software development, but it's also a considerable speed inhibitor. As a system increases in complexity, it becomes more difficult to add new features, spot and fix bugs, and generally understand what's going on within it.

You might partially solve this problem by following tip #2: skilled developers tend to build less complex systems, while novice developers tend to create fragile, overcomplicated solutions. However, when attempting to decrease complexity, there are a couple of other factors you should be wary of or avoid entirely.

4. Decrease rework

There are three primary sources of rework on development teams:

- Bugs
- Unclear requirements
- Incorrect task completion

5. Ask for customer and client feedback early

It's hard to know what your customers want if you don't ask them. Without talking to your customers, your developers might spend time designing, implementing, and testing features that nobody will ever use.

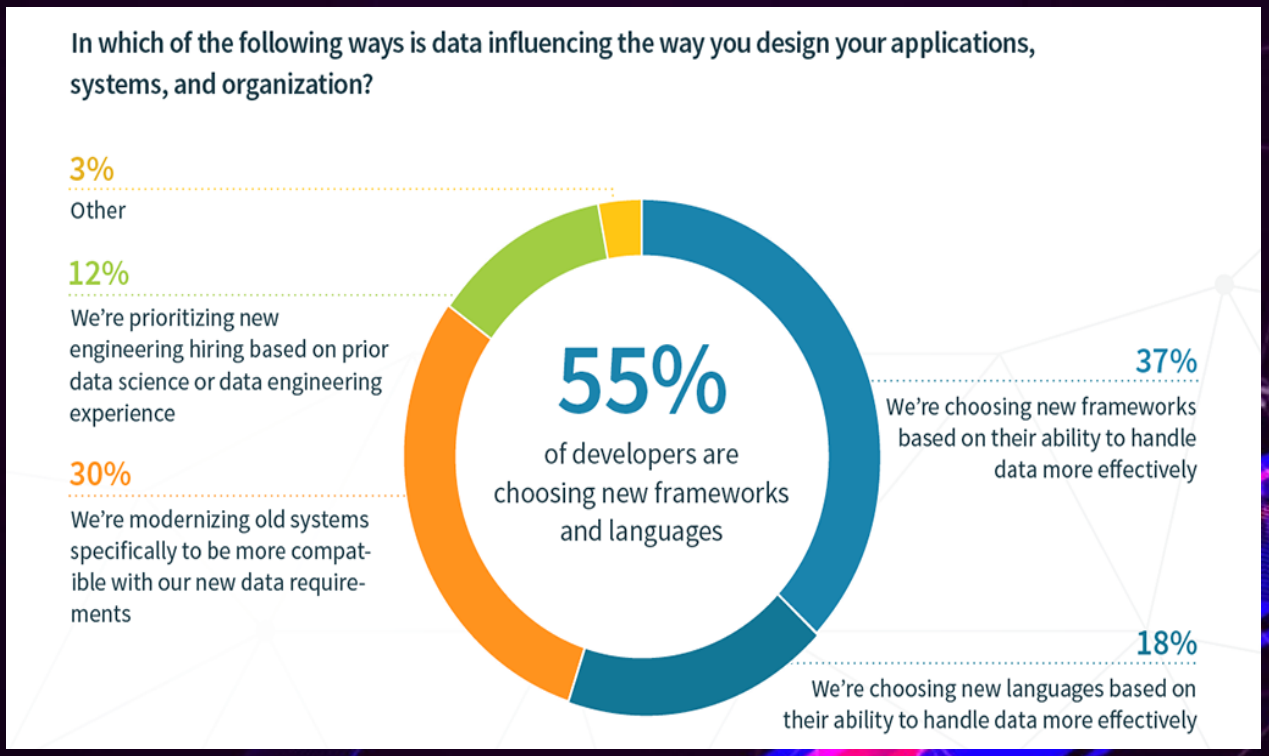
Before you launch new features or make significant UX changes, ask for feedback from customers. Create prototypes, share sketches, perform A/B testing, accumulate data, and analyze it carefully to reduce rework on your final product.

6. Encourage focused work

Software development demands deep concentration and focus. Programmers build huge models in their minds, and every single interruption pulls them away from these complicated mental systems.

Boosting speed in software development requires boosting your programmers' abilities to concentrate, as well.

Focused work cuts out wasteful activities and helps developers operate in a flow state. To help your developers, strive to reduce the distractions that can take them out of focused state as much as possible.



7.Cut back on activities that don't directly add value during sprints

When you're in a sprint, it's always crunch time. Every task becomes more urgent, and everyone should try to do as much focused work as possible. During a sprint, reduce time spent on activities that don't directly add value as much as possible.
Cut back on meetings unless they're absolutely necessary, and never go into a meeting without a clear agenda. Encourage developers to spend less time on side projects. If it doesn't directly contribute to your sprint goals, think twice about putting it on your team's to-do list.
It's important to stress that stepping away from work—even during a sprint—should not go on the list of activities that don't add value. Encouraging your developers to take regular breaks will actually increase productivity, thereby increasing development speed while still avoiding burnout.

8. Encourage a healthy work-life balance
The best way to increase development speed and avoid burnout is to make sure your developers aren't spending too much time working. Spending time on hobbies or with family and friends outside of work gives employees time to recharge. When they return to work after a vacation or even a weekend with no work emails, they can approach complex coding issues with a fresh mind.

Chaitanya Vyawhare

TE IT

Artificial Intelligence

Artificial Intelligence

Artificial intelligence (AI) makes it possible for machines to learn from experience, adjust to new inputs and perform human-like tasks. Most AI examples that you hear about today – from chess-playing computers to self-driving cars – rely heavily on deep learning and natural language processing. Using these technologies, computers can be trained to accomplish specific tasks by processing large amounts of data and recognizing patterns in the data.

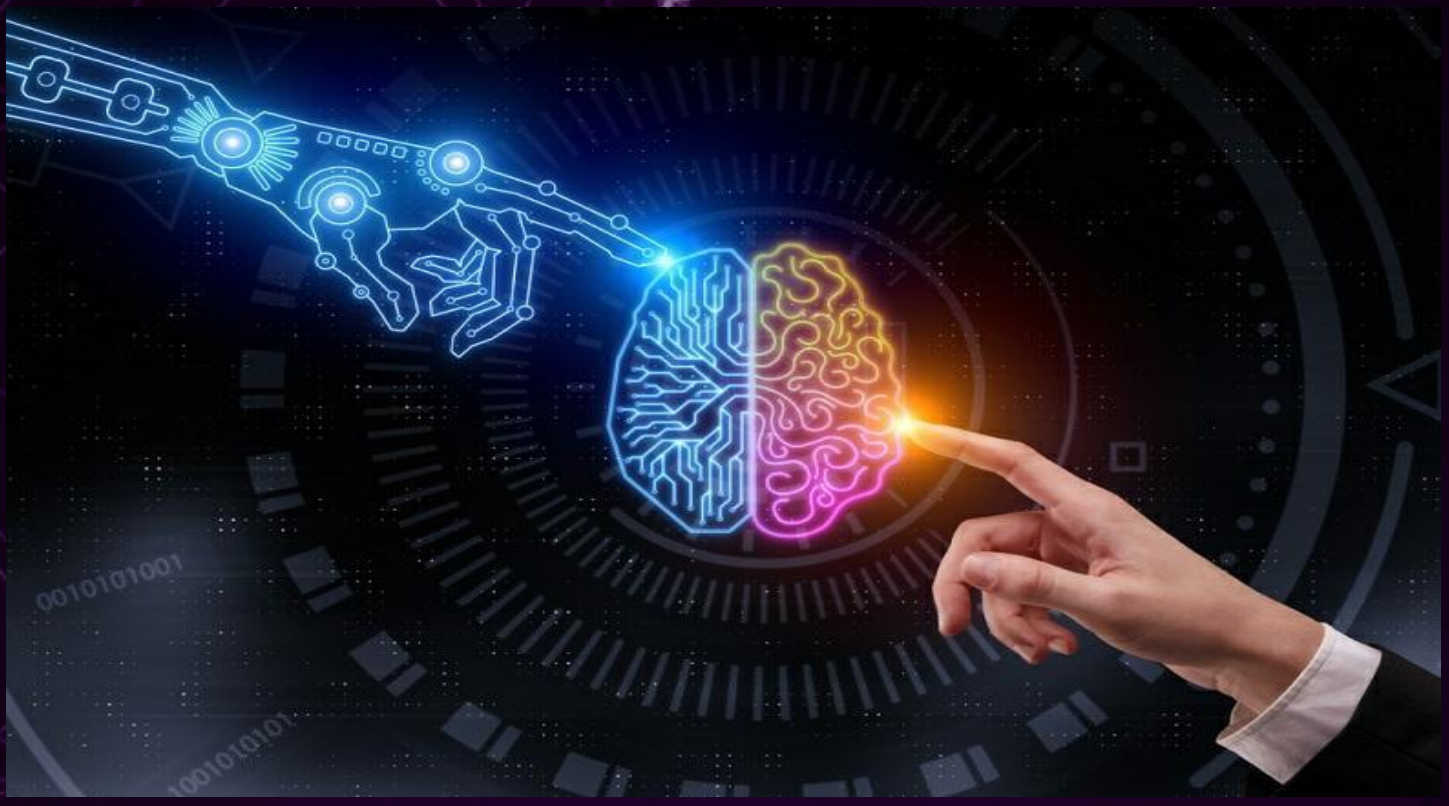
Artificial Intelligence History

The term artificial intelligence was coined in 1956, but AI has become more popular today thanks to increased data volumes, advanced algorithms, and improvements in computing power and storage.

Early AI research in the 1950s explored topics like problem solving and symbolic methods. In the 1960s, the US Department of Defense took interest in this type of work and began training computers to mimic basic human reasoning. For example, the Defense Advanced Research Projects Agency (DARPA) completed street mapping projects in the 1970s. And DARPA produced intelligent personal assistants in 2003, long before Siri, Alexa or Cortana were household names.

This early work paved the way for the automation and formal reasoning that we see in computers today, including decision support systems and smart search systems that can be designed to complement and augment human abilities.While Hollywood movies and science fiction novels depict AI as human-like robots that take over the world, the current evolution of AI technologies isn't that scary – or quite that smart. Instead, AI has evolved to provide many specific benefits in every industry. Keep reading for modern examples of artificial intelligence in health care, retail and more

Why is artificial intelligence important?



AI automates repetitive learning and discovery through data. But AI is different from hardware-driven, robotic automation. Instead of automating manual tasks, AI performs frequent, high-volume, computerized tasks reliably and without fatigue. For this type of automation, human inquiry is still essential to set up the system and ask the right questions.

AI adds intelligence to existing products. In most cases, AI will not be sold as an individual application. Rather, products you already use will be improved with AI capabilities, much like Siri was added as a feature to a new generation of Apple products. Automation, conversational platforms, bots and smart machines can be combined with large amounts of data to improve many technologies at home and in the workplace, from security intelligence to investment analysis.

AI adapts through progressive learning algorithms to let the data do the programming. AI finds structure and regularities in data so that the algorithm acquires a skill: The algorithm becomes a classifier or a predictor. So, just as the algorithm can teach itself how to play chess, it can teach itself what product to recommend next online. And the models adapt when given new data.

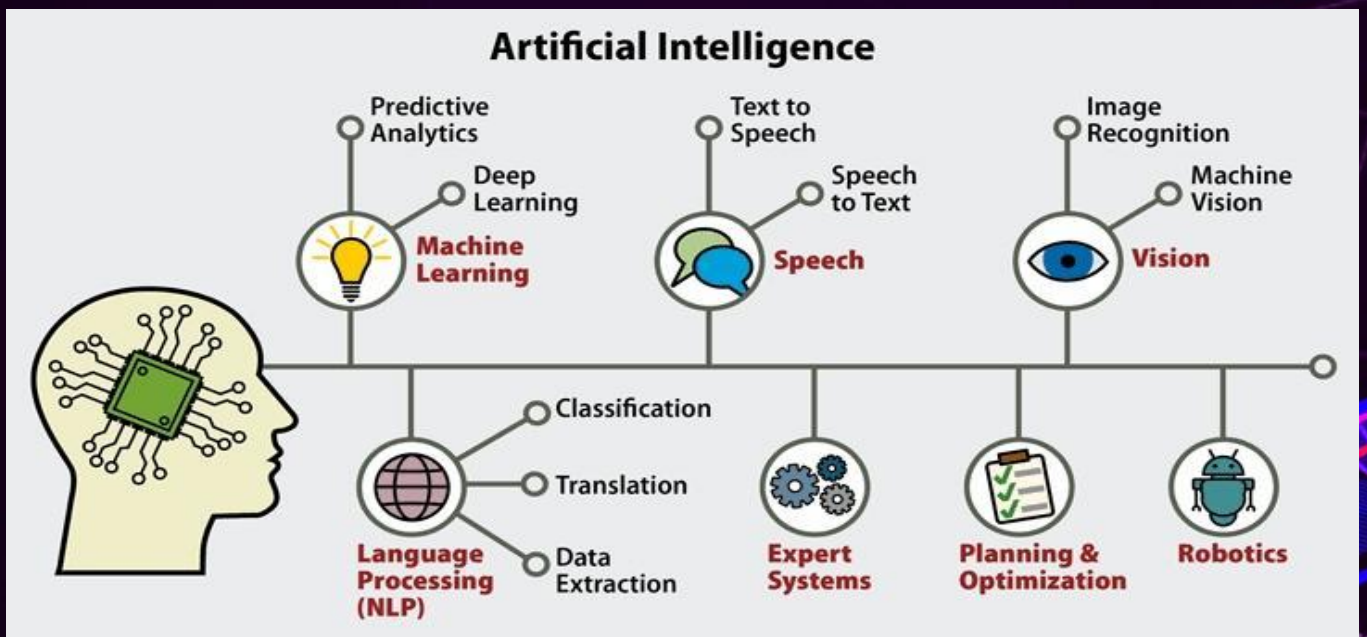
AI analyzes more and deeper data using neural networks that have many hidden layers. Building a fraud detection system with five hidden layers was almost impossible a few years ago. All that has changed with incredible computer power and big data. You need lots of data to train deep learning models because they learn directly from the data. The more data you can feed them, the more accurate they become.

How Artificial Intelligence Works

AI works by combining large amounts of data with fast, iterative processing and intelligent algorithms, allowing the software to learn automatically from patterns or features in the data. AI is a broad field of study that includes many theories, methods and technologies, as well as the following major subfields:

Machine Learning automates analytical model building. It uses methods from neural networks, statistics, operations research and physics to find hidden insights in data without explicitly being programmed for where to look or what to conclude.

A neural network is a type of machine learning that is made up of interconnected units (like neurons) that processes information by responding to external inputs, relaying information between each unit. The process requires multiple passes at the data to find connections and derive meaning from undefined data.



Deep learning uses huge neural networks with many layers of processing units, taking advantage of advances in computing power and improved training techniques to learn complex patterns in large amounts of data. Common applications include image and speech recognition.

Cognitive computing is a subfield of AI that strives for a natural, human-like interaction with machines. Using AI and cognitive computing, the ultimate goal is for a machine to simulate human processes through the ability to interpret images and speech – and then speak coherently in response.

Computer vision relies on pattern recognition and deep learning to recognize what's in a picture or video. When machines can process, analyze and understand images, they can capture images or videos in real time and interpret their surroundings.

Natural language processing (NLP) is the ability of computers to analyze, understand and generate human language, including speech. The next stage of NLP is natural language interaction, which allows humans to communicate with computers using normal, everyday language to perform tasks.

Hrutik Surwade

TE IT

Drone Delivery

Delivery drones

Delivery drones are unmanned aerial vehicles (UAVs) that can deliver lightweight packages. Drones generally use 4-8 propellers and rechargeable batteries to provide thrust and attach packages underneath the body of the drone. Delivery drones are operated autonomously or remotely, with operators potentially overseeing multiple drones at once. In several examples across the world, drones are being used for delivering time-sensitive items, such as medicine, or deliveries that would be difficult with traditional vehicle-based services. Delivery drones have the potential to change last-mile delivery economics for smaller and lighter packages as they could replace many deliveries currently made by traditional delivery vehicle.

Drone Delivery Lift Off

The driving power behind delivery drones innovation is to cut down on the delivery time of packages which are to be delivered. Many companies are promising to deliver packages in 30 mins or less, but how and where the drones take-off is crucially important.

Few ways of drone delivery have been adopted, the first course is to deploy the drone from dispatch centres located around the city. The travelling speeds and built-in battery time could reduce the range of a drone to around 20-30 kilometres. This means multiple dispatch stations would be needed for a city-wide fleet. The second method of delivery would be using the traditional delivery trucks that will operate as the dispatch centre for all the drone delivery operations. Drones will work with the road-bound vehicle's navigation system to deliver parcels to more rural areas.

In Air and On Route

Just like any aircraft, delivery drones have to anticipate with the laws of physics and aerodynamics. The design of delivery drones appears in all shapes and sizes. In a four-rotor drone, two blades spin clock-wise and other two counter clock-wise. Thus, the thrust generated by the rotation of the blades, along with stabilization technology, maintains the drone's position in the air. However, for delivery purposes, the extra load carried by the drone needs to be considered. The bigger package requires a more robust and efficient performance drone to carry out the delivery operation.

For delivery drones to fly independently, beyond visible line-of-sight technology is needed. Guided by GPS systems, drones will be able to deliver packages to the customer's location. But may encounter potential obstacles. Whether a bird, tree or even another drone, automatic sense and avoid systems is required to prevent in-air and ground accidents. Unmanned Traffic Management System (UTM) would control the skies shortly. Built-in sensors and cameras will be able to identify a nearby object's proximity and speed, enabling the drone to take a responsive action to avoid the obstacle.

Drone Delivery Software

A drone delivery software lets drone operators deploy and manage a fleet of drones in real-time, access and control with cloud connectivity with 4G/LTE networks to gain real-time flight data and control from a remote location. The drone can automatically create paths optimized for no-fly zones, elevation and obstacle avoidance. Deployed tags on the desired location help precisely land and deliver the package safely.

Possible Benefits

- The introduction of delivery drones has stimulated discussion of what the technology can accomplish in terms of reduced vehicle travel. We have outlined some potential benefits below:
- Reduced roadway congestion due to less vehicle miles traveled (VMT) by delivery vehicles
- Improved safety due to fewer at-grade rail crossings associated with less heavy traffic
- Reduced greenhouse gas emissions as smaller and lighter packages are transported via drones rather than traditional delivery trucks
- Greater route flexibility compared to traditional delivery vehicles, thus enabling drivers to avoid delivery stops at highly-congested locations.
- Improved safety due to fewer conflicts between delivery vehicles and other travel modes
- Reduced roadway and bridge maintenance costs due to less use by delivery vehicles

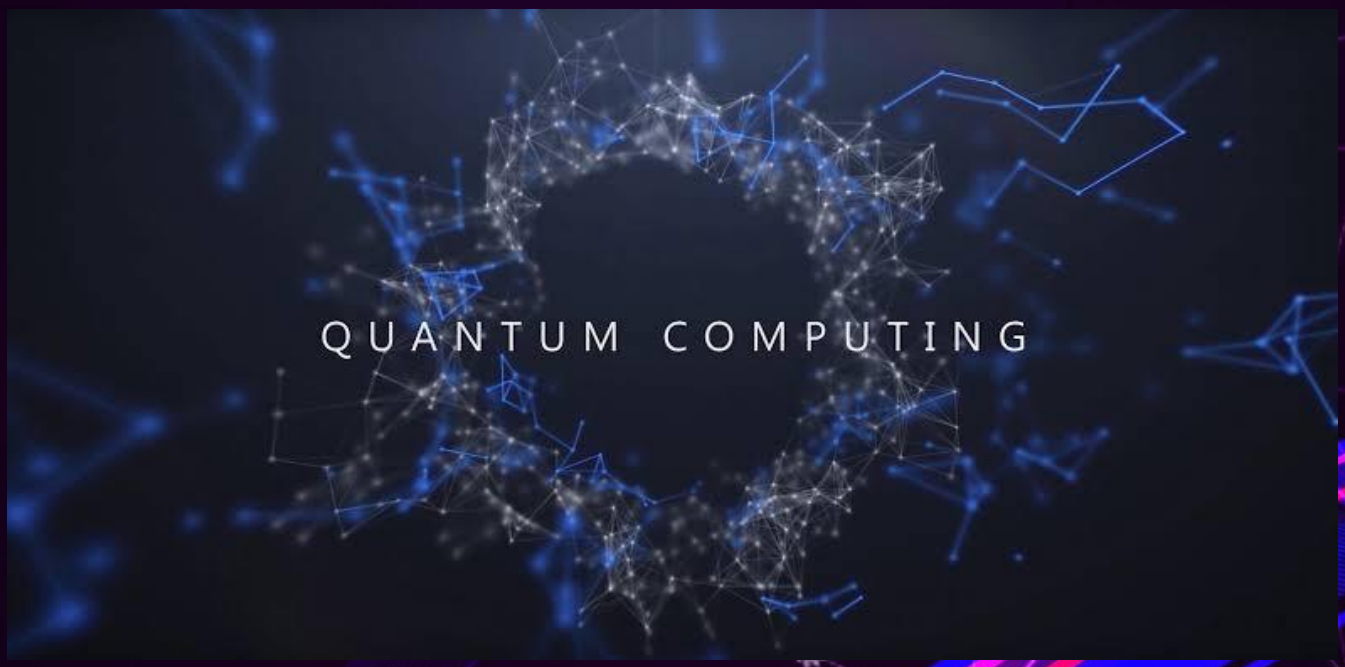
Possible Limitations

- A technology like delivery drones will surely face a number of hurdles before being adopted for commercial use. We have outlined some of the potential limitations of the technology below:
- Limited package weights will prevent heavier or larger items from being delivered via drone
- Required collision avoidance systems and airspace control regulations may become needed as drone deliveries are more commonplace
- Constrained flight times and ranges due to limited battery capacity
- Irregular and/or unpredictable events, such as weather, wildlife or vandalism/sabotage, could bring down a drone during a delivery, which could potentially become a safety hazard for those on the ground and/or adversely impact their reliability
- Designated drop-off locations may become difficult to determine in dense, urban areas

Yash Shah

TE IT

Quantum Computing



What is quantum computing?

Quantum computers can process massive and complex datasets more efficiently than classical computers.

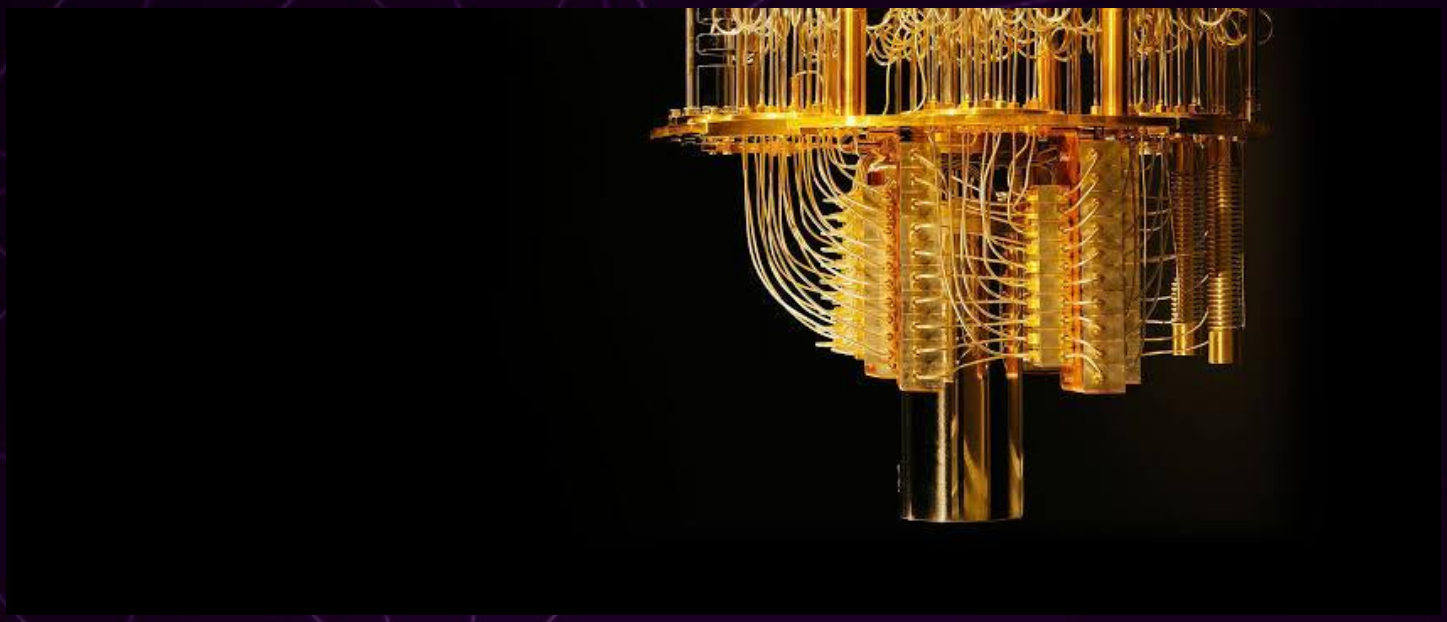
They use the fundamentals of quantum mechanics to speed up the process of solving complex computations. Often those computations incorporate a seemingly unlimited number of variables, and the potential applications span industries from genomics to finance.

Quantum computers are already reinventing aspects of cybersecurity through their ability to break codes and encrypt electronic communications. Some of the biggest players in tech — including Google, Microsoft, Intel, IBM, and Alibaba — are exploring quantum computing for better cybersecurity and more, a sign that the next big computing race is already underway.

While Google has been exploring quantum computing for ultra-fast internet search since at least 2009, it remains to be seen who will emerge as the leader in the nascent commercial quantum computing industry.

Quantum computing fundamentals

All computing systems rely on a fundamental ability to store and manipulate information. Current computers manipulate individual bits, which store information as binary 0 and 1 states. Quantum computers leverage quantum mechanical phenomena to manipulate information. To do this, they rely on quantum bits, or qubits.



Types Of Quantum Computing

1.QUANTUM ANNEALING

Quantum annealing is best for solving optimization problems.
In other words, researchers are trying to find the best (most efficient) possible configuration among many possible combinations of variables.
The algorithm could successfully reduce traffic by choosing the ideal path for each vehicle, according to VW.
Imagine applying this experiment on a global scale — optimizing every airline route, airport schedule, weather data, fuel costs, and passenger information, etc. for everyone, to get the most cost efficient travel and logistics solutions.
Classical computers would take thousands of years to compute the optimum solution to such a problem. Quantum computers, theoretically, can do it in a few hours or less, as the number of qubits per quantum computer increases.

2.QUANTUM SIMULATIONS

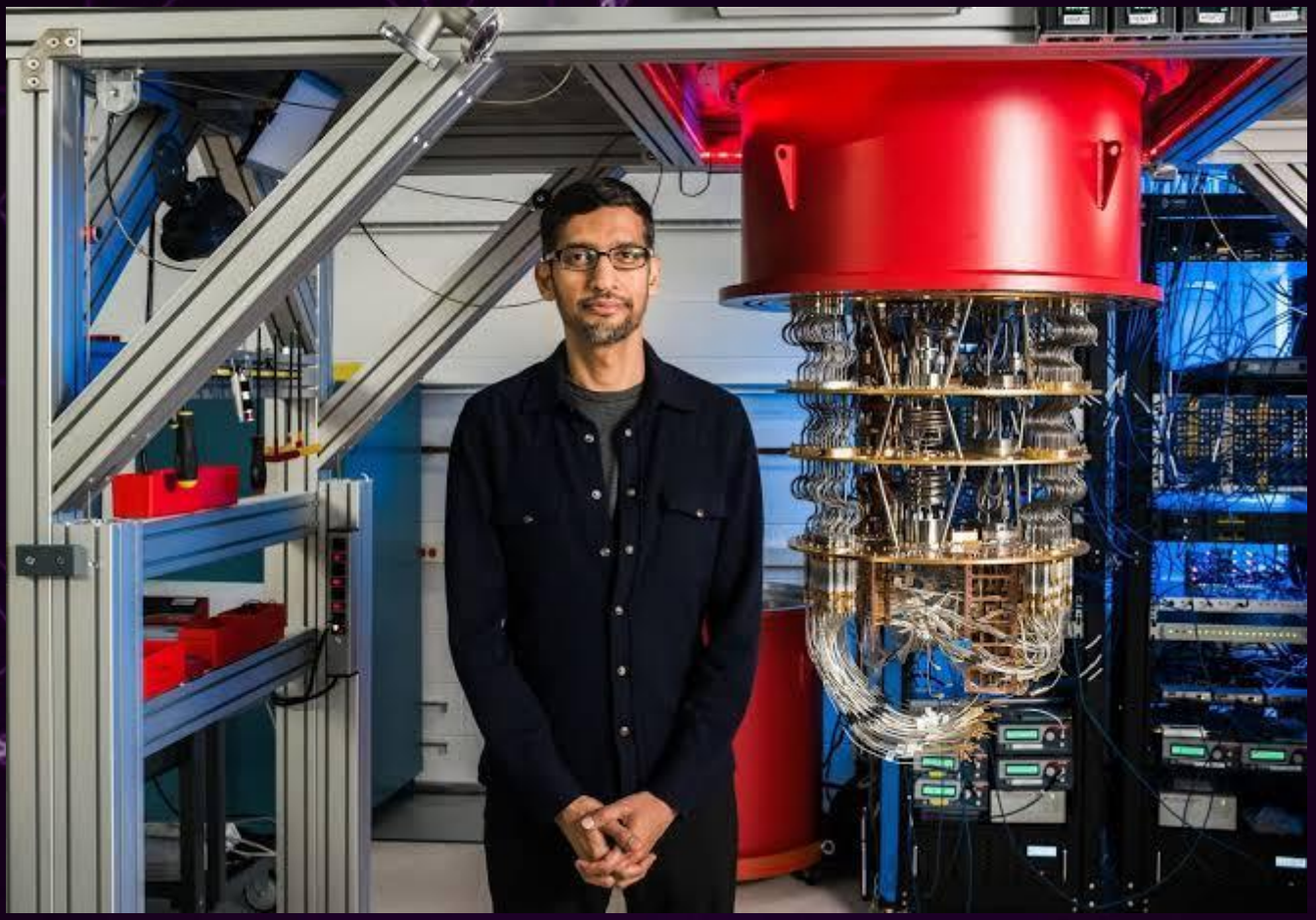
Quantum simulations explore specific problems in quantum physics that are beyond the capacity of classical systems. Simulating complex quantum phenomena could be one of the most important applications of quantum computing.
One area that is particularly promising includes modeling the effect of a chemical

stimulation on a large number of subatomic particles — otherwise known as quantum chemistry.
In particular, quantum simulators could be used to simulate protein folding — one of biochemistry's toughest problems.
Misfolded proteins can cause diseases like Alzheimer's and Parkinson's, and researchers testing new treatments must learn which drugs cause reactions for each protein through the use of random computer modeling.
It is said that if a protein were to attain its correctly folded configuration by sequentially sampling all the possible drug-induced effects, it would require a time longer than the age of the universe to arrive at its correct natural state.
A realistic mapping of the protein folding sequence would be a major scientific and healthcare breakthrough that could save lives.
Quantum computers can help compute the vast number of possible protein folding sequences for making more effective medications. In the future, quantum simulations will enable rapid designer drug testing by accounting for every possible protein-to-drug combination.

3.UNIVERSAL QUANTUM COMPUTING

Universal quantum computers are the most powerful and most generally applicable, but also the hardest to build. A truly universal quantum computer would likely make use of over 100,000 qubits — some estimates put it at 1M qubits. Remember that today, the most qubits we can access is not even 128.
The basic idea behind the universal quantum computer is that you could direct the machine at any massively complex computation and get a quick solution. This includes solving the aforementioned annealing equations, simulating quantum phenomena, and more.
Researchers have been designing algorithms for years that are only possible on a universal quantum computer.

Quantum Supremacy



On October 23, 2019 Google announced that it had achieved "Quantum Supremacy," meaning that they had used a quantum computer to quickly solve a problem that a conventional computer would take an impractically long time (thousands of years) to solve. IBM immediately contested this claim, saying that their conventional supercomputers could solve the problem in a matter of days

Udit Chaudhari

BE IT

5G Technology

What is 5G ?

5G is the 5th generation mobile network. It is a new global wireless standard after 1G, 2G, 3G, and 4G networks. 5G enables a new kind of network that is designed to connect virtually everyone and everything together including machines, objects, and devices.

5G wireless technology is meant to deliver higher multi-Gbps peak data speeds, ultra low latency, more reliability, massive network capacity, increased availability, and a more uniform user experience to more users. Higher performance and improved efficiency empower new user experiences and connects new industries.

Differences between the previous generations of mobile networks and 5G

The previous generations of mobile networks are 1G, 2G, 3G, and 4G.

First generation – 1G

1980s: 1G delivered analog voice.

Second generation – 2G

Early 1990s: 2G introduced digital voice (e.g. CDMA- Code Division Multiple Access).

Third generation – 3G

Early 2000s: 3G brought mobile data (e.g. CDMA2000).

Fourth generation – 4G LTE

2010s: 4G LTE ushered in the era of mobile broadband

5G is a unified, more capable air interface. It has been designed with an extended capacity to enable next-generation user experiences, empower new deployment models and deliver new services.

With high speeds, superior reliability and negligible latency, 5G will expand the mobile ecosystem into new realms. 5G will impact every industry, making safer transportation, remote healthcare, precision agriculture, digitized logistics — and more — a reality.

Usage of 5G

Broadly speaking, 5G is used across three main types of connected services, including enhanced mobile broadband, mission-critical communications, and the massive IoT. A defining capability of 5G is that it is designed for forward compatibility—the ability to flexibly support future services that are unknown today.

Enhanced mobile broadband
In addition to making our smartphones better, 5G mobile technology can usher in new immersive experiences such as VR and AR with faster, more uniform data rates, lower latency, and lower cost-per-bit.

Mission-critical communications
5G can enable new services that can transform industries with ultra-reliable, available, low-latency links like remote control of critical infrastructure, vehicles, and medical procedures.

Massive IoT
5G is meant to seamlessly connect a massive number of embedded sensors in virtually everything through the ability to scale down in data rates, power, and mobility—providing extremely lean and low-cost connectivity solutions.

How fast is 5G ?

5G is designed to deliver peak data rates up to 20 Gbps based on IMT-2020 requirements. Qualcomm Technologies' flagship 5G solutions, the Qualcomm® Snapdragon™ X55 and Snapdragon X60 Modem-RF Systems, are designed to achieve up to 7.5 Gbps in downlink peak data rates.
But 5G is about more than just how fast it is. In addition to higher peak data rates, 5G is designed to provide much more network capacity by expanding into new spectrum, such as mmWave.
5G can also deliver much lower latency for a more immediate response and can provide an overall more uniform user experience so that the data rates stay consistently high—even when users are moving around. And the new 5G NR mobile network is backed up by a Gigabit LTE coverage foundation, which can provide ubiquitous Gigabit-class connectivity

How and when will 5G affect the global economy ?

5G is driving global growth.
• $13.2 Trillion dollars of global economic output
• 22.3 Million new jobs created
• $2.1 Trillion dollars in GDP growth
Through a landmark 5G Economy study, we found that 5G's full economic effect will likely be realized across the globe by 2035—supporting a wide range of industries and potentially enabling up to $13.2 trillion worth of goods and services.

This impact is much greater than previous network generations. The development requirements of the new 5G network are also expanding beyond the traditional mobile networking players to industries such as the automotive industry.

The study also revealed that the 5G value chain (including OEMs, operators, content creators, app developers, and consumers) could alone support up to 22.3 million jobs, or more than one job for every person in Beijing, China. And there are many emerging and new applications that will still be defined in the future. Only time will tell what the full "5G effect" on the economy is going to be.

Prachi Pingle

BE IT

CRYPTOCURRENCIES

Cryptocurrencies

Cryptocurrency is a digital or virtual currency that is secured by cryptography, which makes it nearly impossible to counterfeit or double-spend. Many cryptocurrencies are decentralized networks based on blockchain technology—a distributed ledger enforced by a disparate network of computers. A defining feature of cryptocurrencies is that they are generally not issued by any central authority, rendering them theoretically immune to government interference or manipulation

Bitcoin

Since the introduction of Bitcoin in 2009, which is generally considered the first decentralized cryptocurrency, over 4,000 variations of cryptocurrency have been created worldwide. Bitcoin itself has never been compromised to date, so the coins themselves and the Bitcoin alternatives are considered safe and secure. However, cryptocurrency exchanges have been hacked and individuals' accounts have been compromised –resulting in hundreds of millions of dollars in cryptocurrency being stolen.

Ethereum

Ethereum is the second-largest cryptocurrency platform by market capitalization, behind Bitcoin. It is a decentralized open source blockchain featuring smart contract functionality. Ether is the cryptocurrency generated by Ethereum miners as a reward for computations performed to secure the blockchain. Ethereum serves as the platform for over 260,000 different cryptocurrencies, including 47 of the top 100 cryptocurrencies by market capitalization.

There are four ways to protect your cryptocurrency investment and enhance security :

1. **Avoid Cryptocurrency Scams**

There are currently over a 1,000 Active Cryptocurrencies on the market, and many come and go each month. Some of these are nothing more than just an online Bitcoin scam used as a way to pilfer coins from unsuspecting investors. One of the common ways fraudsters scam cryptocurrency users is by advertising a new coin and building up interest. Next, they offer an initial coin offering (ICO). Before users notice something has gone wrong, the fraudsters have pocketed the cryptocurrencies, and the site and the coin have vanished. Because of these 12th Annual Taste of IT Conference - #TOIT18 Wednesday, November 14 Sinclair College Ponitz Center 444 W Third St, Dayton, OH 45402scams, a great deal of research should be done to find a currency with a solid background.

2. **Secure Crypto Wallets**

When investing or applying cryptocurrencies for use, it is necessary to store cryptocurrencies in a secure wallet. Although there are hot wallets which are ideal for usability, hot wallets can be hacked. Cold wallets are the most secure. There are two types of cold storage wallets to choose from: paper and hardware. A paper wallet may be one of the simplest, but your keys are printed to paper, which is not the safest medium. The hardware wallet, which is much the same as a USB drive, is the more secure cold storage option.

3. Cryptocurrency Exchange Theft

Cryptocurrency exchanges exist around the globe, though many of these are not the ideal places to leave your coins. When looking at which cryptocurrency to invest in the chosen must be considered. Up until recently, Mt. Gox was the most well-known exchange to be hacked. Over $450 million worth of Bitcoin was stolen from their Hot Wallet over a period of time. This shows how crucial it is to conduct due diligence on the exchange, and never leave your coins in any one exchange for any length of time.

Shivani Pokharkar
TE IT

Role Of AI and ML in Cyber Security

AI and machine learning are the kind of buzzwords that generate a lot of interest; hence, they get thrown around all the time. But what do they actually mean? And are they as instrumental to the future of cybersecurity as many believe?

The terms go hand in hand

When a large set of data is involved, having to analyze it all by hand seems like a nightmare. It's the kind of work that one would describe as boring and tedious. Not to mention the fact it would take a lot of staring at the screen to find what you've set out to discover.

The great thing about machines and technology is that – unlike humans – it never gets tired. It's also better geared for being able to notice patterns. Machine learning is what you get when you reach the point of teaching your tools on how to spot patterns. The AI helps you interpret it all better and make the solution self-sufficient.

A looming opportunity for cybersecurity solutions

Cybersecurity solutions (antivirus scanners in particular) are all about spotting a pattern and planning the right response. These scanners rely on heuristic modeling. It gives them the ability to recognize a piece of code as malicious, even though it might be the case that no one has flagged it as such before. In essence, it has plenty to do with teaching the software to recognize and alert you when something is out of the ordinary.

As soon as something oversteps the threshold of tolerance, it triggers an alarm. From there on out, the rest is up to the user. For instance, the user may instruct the antivirus software to move the infected file to quarantine. It can do so with or without human intervention

AI can learn by observing

Applying AI to cybersecurity solutions is taking things up a notch. Without it, the option of having the software learn on its own by observing would not be possible. Imagine having an entity working in the background that knows you so well that it can predict your every move. It might be slight nuances. For example, the way you move your mouse or the parts of the web you're browsing on a frequent basis. Even the order of the applications you launch upon logging in. Without having to introduce yourself, the AI would get to know you and your habits pretty well. Thus, it would form a digital fingerprint of you. It sounds scary, but it could come in handy. For instance, it could raise the alarm if an unauthorized individual ever gets access to your PC.

Forming an identity of your normal computer activity

Of course, observing your behavior is not the end of what employment of AI and machine learning can do. Why not do the same thing for computer processes?

Imagine having to monitor what programs are running in the background yourself. Tracking how much resources they consume all day, every day, by hand.

The smart malware designers make it so that your system's CPU usage gets off the charts only when you're not using the PC. There's no way to spot such a thing while you're away from the keyboard. Unless you have AI-powered cybersecurity solutions to track it all for you 24/7.

You can fake an IP, but spoofing your activity is much harder

Webmasters keep trying to fend off bot traffic and automated scripts. These are used for automatic data scraping and similar activities. For instance, someone could write a script to harvest every bit of contact details on the website. They can then send unsolicited offers to all those contacts. Even when they don't scrape contacts, no one wants bot traffic because it consumes valuable server resources and slows everything down for legitimate browsers. Thus, it harms the user experience.

Now let's introduce some AI into the equation. By observing every browser's activity, it would be able to recognize repetitive behavior. It would associate it with an IP address that's currently browsing, then flag it. Sure, a script may discard an IP address and try with a new one. But the fingerprint left by its activities would remain since it's rather much pattern-based. In the end, the new IP could be flagged much faster by automated observation.

Conclusion

Since they came to be, AI and machine learning have changed the world of cybersecurity forever. As time goes on, they will keep getting more and more refined. It's a matter of question when it will reach the point of becoming your cybersecurity watchdog, tailored to your needs.

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Virtual Reality Vs Augmented Reality

AR and VR Are Not the Same

The terms "virtual reality" and "augmented reality" get thrown around a lot these days, thanks to the resurgence of VR headsets heralded by the Oculus Rift and the use of AR apps and games like Pokemon Go. They sound similar, and as the technologies develop, they bleed over into each other a bit. They're two very different concepts, though, with characteristics that readily distinguish them from one another. all businesses need to survive a disaster and the problems that follow, it’s nearly impossible to predict when a disaster will happen. Businesses will often push cyber and IT security out as an optional expense with an attitude of “if it ain’t broke don’t fix it.” When the disaster strikes (and odds are increasing at a fast pace for both natural disasters and cyber attacks), don’t leave your business unprepared. Planning will help you respond quickly.

What Is Virtual Reality?

VR headsets completely take over your vision to give you the impression that you're somewhere else. The HTC Vive, the Oculus Rift, and other headsets are completely opaque, blocking out your surroundings when you wear them. If you put them on when they're turned off, you might think you're blindfolded.

When the headsets turn on, however, the LCD or OLED panels inside are refracted by the lenses to completely fill your field of vision with whatever is being displayed. It can be a game, a 360-degree video, or just the virtual space of the platforms' interfaces. Visually, you're taken to wherever the headset wants you to go—the outside world is replaced with a virtual one.

Most tethered VR headsets like the Rift, the Vive, the PlayStation VR, and Windows Mixed Reality headsets use six-degrees-of-freedom (6DOF) motion tracking thanks to external sensors or cameras (for the Rift, Vive, and PS VR) or outward-facing cameras (for WMR). This means the headsets don't just detect the direction in which you're facing, but any movement you make in those directions. This, combined with 6DOF motion controllers, lets you move around in a virtual space, with virtual hands. This space is usually limited to a few square meters across, but it's much more immersive than just standing still and looking in different directions. The drawback is that you need to be careful not to trip over any cable that connect the headset to your computer or game system.

For both games and apps, virtual reality completely supersedes your surroundings, taking you to other places. Where you are physically doesn't matter. In games, you might sit in the cockpit of a starfighter. In apps, you might virtually tour distant locations as if you were there. There are tons of possibilities in virtual reality, and they all involve replacing everything around you with something else.

What Is Augmented Reality?

Whereas virtual reality replaces your vision, augmented reality adds to it. AR devices like the Microsoft HoloLens and various enterprise-level "smart glasses" are transparent, letting you see everything in front of you as if you are wearing a weak pair of sunglasses. The technology is designed for completely free movement while projecting images over whatever you look at. The concept extends to smartphones with AR apps and games like Pokemon Go, which use your phone's camera to track your surroundings and overlay additional information on top of it, on the screen.

AR displays can offer something as simple as a data overlay that shows the time, to something as complicated as holograms floating in the middle of a room. Pokemon Go projects a Pokemon on your screen, on top of whatever the camera is looking at. The HoloLens and other smart glasses like the mysterious Magic Leap One, meanwhile, let you virtually place floating app windows and 3D decorations around you.

This technology has a distinct disadvantage compared with virtual reality: visual immersion. While VR completely covers and replaces your field of vision, AR apps only show up on your smartphone or tablet screen, and even the HoloLens can only project images in a limited area in front of your eyes. It isn't very immersive when a hologram disappears once it moves out of a rectangle in the middle of your vision, or when you need to stare at a small screen while pretending that the object on that screen is actually in front of you.

Basic AR that overlays simple information over what you're looking at can function perfectly fine with 3DOF. However, most AR applications require 6DOF in some form, tracking your physical position so the software can maintain consistent positions for the images it projects in 3D space. This is why the HoloLens uses a stereoscopic camera and advanced pattern recognition to determine where it is at all times, and why more advanced, AR-centric

smartphones like the iPhone X use multiple rear-facing cameras to track depth. For games, augmented reality can build experiences using your surroundings. The detective game Fragments scans your room and creates crime scenes based on its layout, placing various set pieces around and producing a slightly different experience with each room. RoboRaid detects where the walls are and projects holograms of robotic arms breaking through them and robots pouring out. Young Conker places obstacles all over your furniture, assembling its levels from your surroundings. In all of these cases, the games change to fit the space.

The Difference Between AR and VR

Virtual reality and augmented reality accomplish two very different things in two very different ways, despite the similar designs of the devices themselves. VR replaces reality, taking you somewhere else. AR adds to reality, projecting information on top of what you're already seeing. They're both powerful technologies that have yet to make their mark with consumers, but show a lot of promise. They can completely change how we use computers in the future, but whether one or both will succeed is anyone's guess right now.

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Internet Of Things

What is the Internet of Things?

In the broadest sense, the term IoT encompasses everything connected to the internet, but it is increasingly being used to define objects that "talk" to each other. "Simply, the Internet of Things is made up of devices – from simple sensors to smartphones and wearables – connected together," Matthew Evans, the IoT programme head at techUK, says.By combining these connected devices with automated systems, it is possible to "gather information, analyse it and create an action" to help someone with a particular task, or learn from a process. In reality, this ranges from smart mirrors to beacons in shops and beyond."It's about networks, it's about devices, and it's about data," Caroline Gorski, the head of IoT at Digital Catapult explains. IoT allows devices on closed private internet connections to communicate with others and "the Internet of Things brings those networks together. It gives the opportunity for devices to communicate not only within close silos but across different networking types and creates a much more connected world."

How IoT works

An IoT ecosystem consists of web-enabled smart devices that use embedded systems, such as processors, sensors and communication hardware, to collect, send and act on data they acquire from their environments. IoT devices share the sensor data they collect by connecting to an IoT gateway or other edge device where data is either sent to the cloud to be analyzed or analyzed locally. Sometimes, these devices communicate with other related devices and act on the information they get from one another. The devices do most of the work without human intervention, although people can interact with the devices -- for instance, to set them up, give them instructions or access the data.

The connectivity, networking and communication protocols used with these web-enabled devices largely depend on the specific IoT applications deployed.

IoT can also make use of artificial intelligence (AI) and machine learning to aid in making data collecting processes easier and more dynamic.

Why IoT is important?

The internet of things helps people live and work smarter, as well as gain complete control over their lives. In addition to offering smart devices to automate homes, IoT is essential to business. IoT provides businesses with a real-time look into how their systems really work, delivering insights into everything from the performance of machines to supply chain and logistics operations.

IoT enables companies to automate processes and reduce labor costs. It also cuts down on waste and improves service delivery, making it less expensive to manufacture and deliver goods, as well as offering transparency into customer transactions.

As such, IoT is one of the most important technologies of everyday life, and it will continue to pick up steam as more businesses realize the potential of connected devices to keep them competitive.

Pros and cons of IoT

Some of the advantages of IoT include the following:

- Ability to access information from anywhere at any time on any device;
- Improved communication between connected electronic devices;
- Transferring data packets over a connected network saving time and money; and
- Automating tasks helping to improve the quality of a business's services and reducing the need for human intervention.

Some disadvantages of IoT include the following:

- As the number of connected devices increases and more information is shared between devices, the potential that a hacker could steal confidential information also increases.
- Enterprises may eventually have to deal with massive numbers -- maybe even millions -- of IoT devices, and collecting and managing the data from all those devices will be challenging.
- If there's a bug in the system, it's likely that every connected device will become corrupted.
- Since there's no international standard of compatibility for IoT, it's difficult for devices from different manufacturers to communicate with each other

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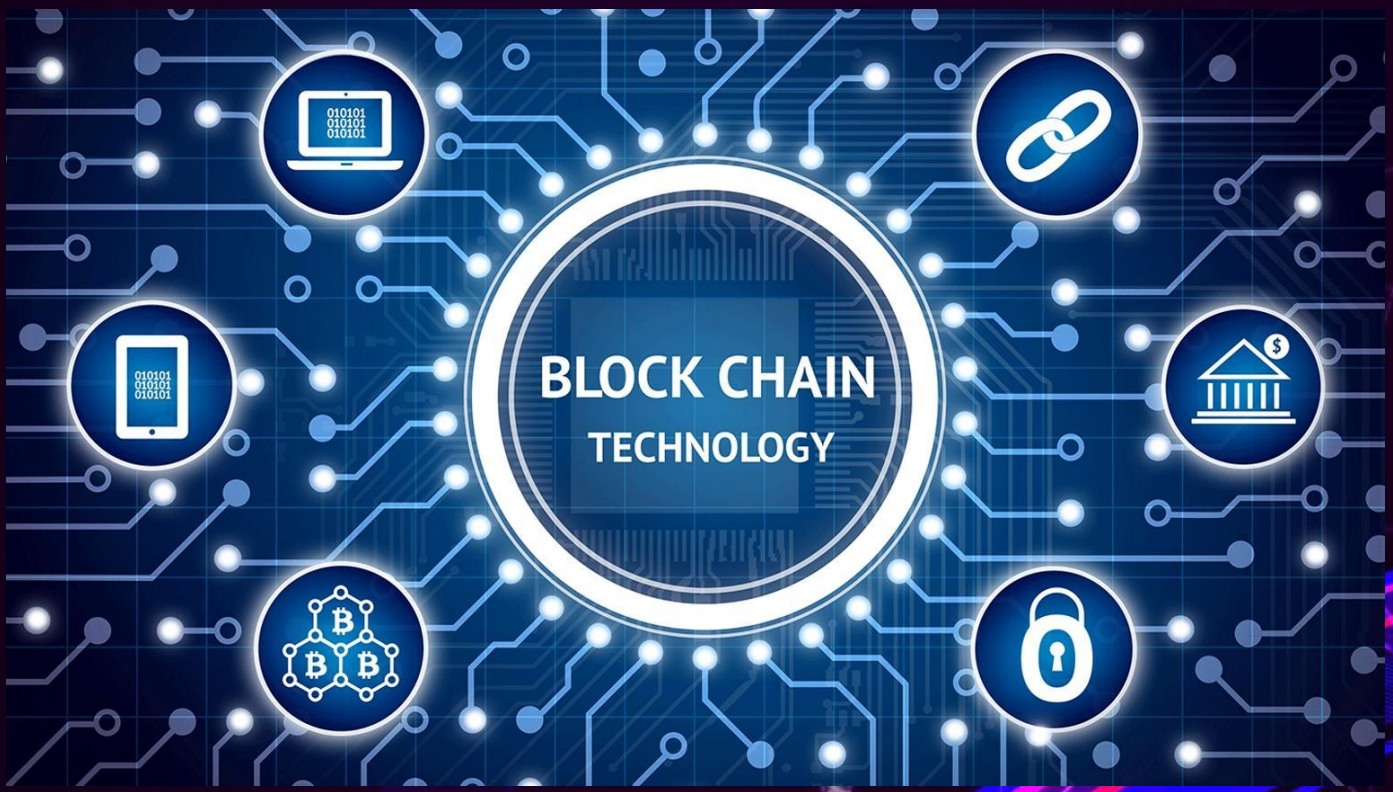
Blockchain

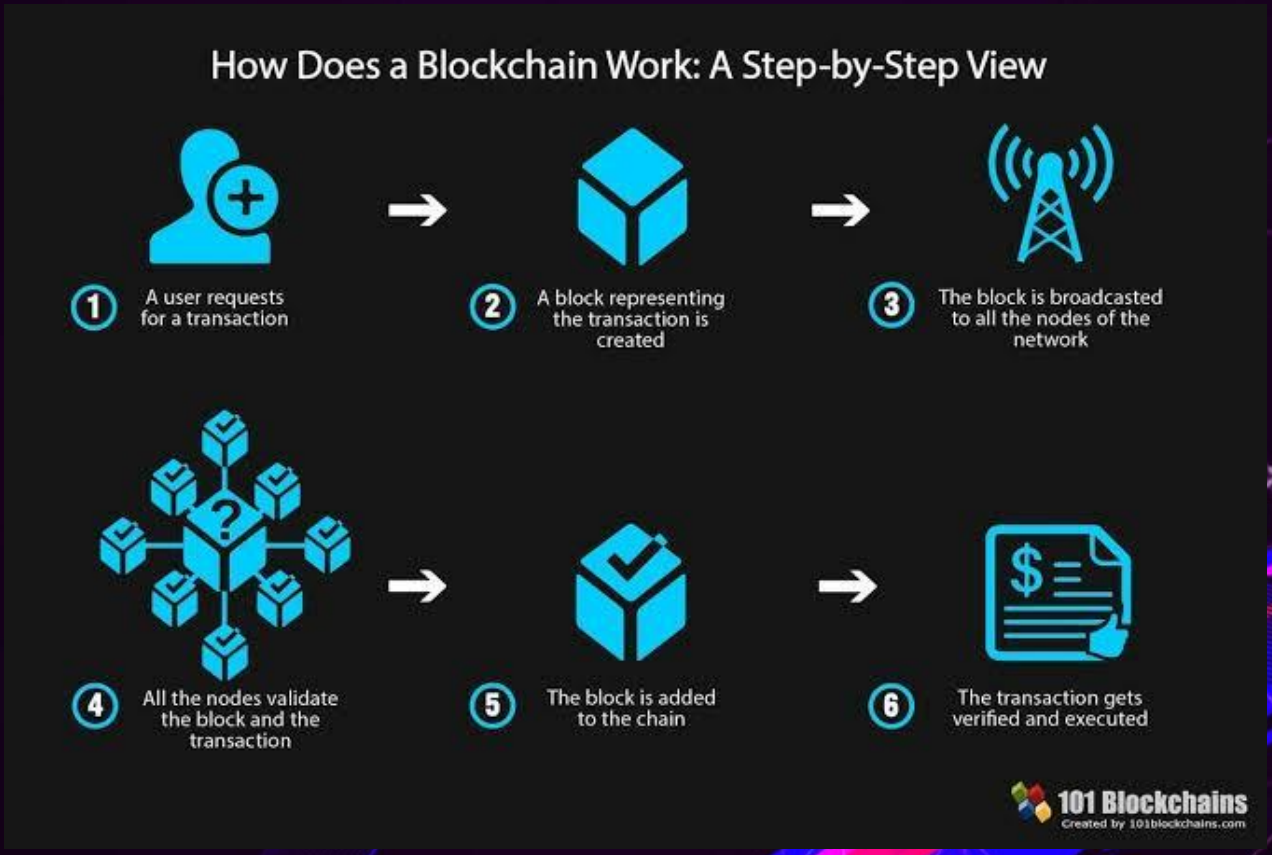
Although most people think of blockchain technology in relation to cryptocurrencies such as Bitcoin, blockchain offers security that is useful in many other ways. In the simplest of terms, blockchain can be described as data you can only add to, not take away from or change. Hence the term “chain” because you’re making a chain of data. Not being able to change the previous blocks is what makes it so secure. In addition, blockchains are consensus-driven, so no one entity can take control of the data. With blockchain, you don’t need a trusted third-party to oversee or validate transactions. You can refer to our Blockchain tutorial for a detailed and thorough understanding of the technology.
Several industries are involving and implementing blockchain, and as the use of blockchain technology increases, so too does the demand for skilled professionals. In that regard, we are already behind. According to Techcrunch.com, blockchain-related jobs are the second-fastest growing category of jobs, with 14 job openings for every one blockchain developer. A blockchain developer specializes in developing and implementing architecture and solutions using blockchain technology. The average yearly salary of a blockchain developer is $130,000. If you are intrigued by Blockchain and its applications and want to make your career in this fast-growing industry, then this is the right time to learn Blockchain and gear up for an exciting future.



“Blocks” on the blockchain are made up of digital pieces of information. Specifically, they have three parts:
Blocks store information about transactions like the date, time, and dollar amount of your most recent purchase from Amazon. (NOTE: This Amazon example is for illustrative purchases; Amazon retail does not work on a blockchain principle as of this writing)

Blocks store information about who is participating in transactions. A block for your splurge purchase from Amazon would record your name along with Amazon.com, Inc. (AMZN). Instead of using your actual name, your purchase is recorded without any identifying information using a unique “digital signature,” sort of like a username.

Blocks store information that distinguishes them from other blocks. Much like you and I have names to distinguish us from one another, each block stores a unique code called a “hash” that allows us to tell it apart from every other block. Hashes are cryptographic codes created by special algorithms. Let’s say you made your splurge purchase on Amazon, but while it’s in transit, you decide you just can’t resist and need a second one. Even though the details of your new transaction would look nearly identical to your earlier purchase, we can still tell the blocks apart because of their
unique codes.



How Blockchain Works

When a block stores new data it is added to the blockchain. Blockchain, as its name suggests, consists of multiple blocks strung together. In order for a block to be added to the blockchain, however, four things must happen:

A transaction must occur. Let's continue with the example of your impulsive Amazon purchase. After hastily clicking through multiple checkout prompt, you go against your better judgment and make a purchase. As we discussed above, in many cases a block will group together potentially thousands of transactions, so your Amazon purchase will be packaged in the block along with other users' transaction information as well.

That transaction must be verified. After making that purchase, your transaction must be verified. With other public records of information, like the Securities Exchange Commission, Wikipedia, or your local library, there's someone in charge of vetting new data entries. With blockchain, however, that job is left up to a network of computers. When you make your purchase from Amazon, that network of computers rushes to check that your transaction happened in the way you said it did. That is, they confirm the details of the purchase, including the transaction's time, dollar amount, and participants.

That transaction must be stored in a block. After your transaction has been verified as accurate, it gets the green light. The transaction's dollar amount, your digital signature, and Amazon's digital signature are all stored in a block. There, the transaction will likely join hundreds, or thousands, of others like it.

That block must be given a hash. Not unlike an angel earning its wings, once all of a block's transactions have been verified, it must be given a unique, identifying code called a hash. The block is also given the hash of the most recent block added to the blockchain. Once hashed, the block can be added to the blockchain.

Here's the bottom line: If your enterprise is connected to the internet, the risks may be both broader and deeper than you realize. It's time to invest in innovative security software that's easy and intuitive to use. For more information on Sophos security

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AI Transforming Agriculture

How AI Is Transforming Agriculture?

Agriculture and farming is one of the oldest and most important professions in the world. Humanity has come a long way over the millennia in how we farm and grow crops with the introduction of various technologies. As the world population continues to grow and land becomes more scarce, people have needed to get creative and become more efficient about how we farm, using less land to produce more crops and increasing the productivity and yield of those farmed acres. Worldwide, agriculture is a $5 trillion industry, and now the industry is turning to AI technologies to help yield healthier crops, control pests, monitor soil and growing conditions, organize data for farmers, help with workload, and improve a wide range of agriculture-related tasks in the entire food supply chain.

When it comes to interconnection, it's not productive to get wrapped up in the "here and now." Always have the future of your workloads in mind. (Side note: This also rings true for enterprises looking to implement a disaster recovery plan or solution). It's critical to recognize your organization's plans to replicate IT processes with interconnection. You'll also need to carefully consider compliance, your company's downtime allowance and the most effective ways to store your most sensitive data. While the process can seem challenging and time-consuming, ensuring proper interconnection will, in-turn, allow you to put more time, energy and resources back into your organization. Keep your eye on the prize: a stable and secure IT environment.

AI helping analyze farm data

Farms produce hundreds of thousands of data points on the ground daily. With the help of AI, farmers can now analyze a variety of things in real time such as weather conditions, temperature, water usage or soil conditions collected from their farm to better inform their decisions. For example, AI technologies help farmers optimize planning to generate more bountiful yields by determining crop choices, the best hybrid seed choices and resource utilization.

AI systems are also helping to improve harvest quality and accuracy -- what is known as precision agriculture. Precision agriculture uses AI technology to aid in detecting diseases in plants, pests, and poor plant nutrition on farms. AI sensors can detect and target weeds and then decide which herbicides to apply within the right buffer zone. This helps to prevent over application of herbicides and excessive toxins that find their way in our food.

Farmers are also using AI to create seasonal forecasting models to improve agricultural accuracy and increase productivity. These models are able to predict upcoming weather patterns months ahead to assist decisions of farmers. Seasonal forecasting is particularly valuable for small farms in developing countries as their data and knowledge can be limited. Keeping these small farms operational and growing bountiful yields is important as these small farms produce 70% of the world's crops.

In addition to ground data, farmers are also taking to the sky to monitor the farm. From drones, AI enabled cameras can capture images of the entire farm and analyze the images in near-real time to identify problem areas and potential improvements. Unmanned drones are able to cover far more land in much less time than humans on foot allowing for large farms to be monitored more frequently.

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