INFOLINE

DEPARTMENT OF COMPUTER TECHNOLOGY AND INFORMATION TECHNOLOGY

KONGU ARTS AND SCIENCE COLLEGE
(Autonomous)

Affiliated to Bharathiar University, Coimbatore
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KONGU
Assuring the Best

CONTENTS

WIRELESS POWER TRANSFER

Wireless power transfer (WPT), wireless power transmission, wireless energy transmission (WET), or electromagnetic power transfer is the transmission of electrical energy without wires as a physical link. In a wireless power transmission system, an electrically powered transmitter device generates a time-varying electromagnetic field that transmits power across space to a receiver device; the receiver device extracts power from the field and supplies it to an electrical load. The technology of wireless power transmission can eliminate the use of the wires and batteries, thereby increasing the mobility, convenience, and safety of an electronic device for all users. Wireless power transfer is useful to power electrical devices where interconnecting wires are inconvenient, hazardous, or are not possible.

Wireless power techniques mainly fall into two categories: near field and far-field.[3] In near field or non-radiative techniques, power is transferred over short distances by magnetic fields using inductive coupling between coils of wire, or by electric fields using capacitive coupling between metal electrodes. Inductive coupling is the most widely used wireless technology; its applications include charging handheld devices like phones and electric toothbrushes, RFID tags, induction cooking, and wirelessly charging or continuous wireless power transfer in implantable medical devices like artificial cardiac pacemakers, or electric vehicles.

In far-field or radiative techniques, also called power beaming, power is transferred by beams of electromagnetic radiation, like microwaves or laser beams. These techniques can transport energy longer distances but must be aimed at the receiver. Proposed applications for this type include solar power satellites and wireless powered drone aircraft.
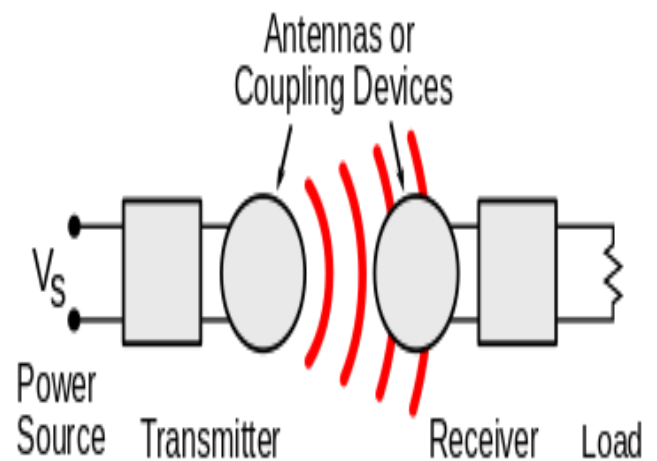
Wireless power transfer is a generic term for a number of different technologies for transmitting energy by means of electromagnetic fields. The technologies differ in the distance over which they can transfer power efficiently, whether the transmitter must be aimed (directed) at the receiver, and in the type of electromagnetic energy they use: time varying electric fields, magnetic fields, radiowaves, microwaves, infrared or visible light waves.

In general a wireless power system consists of a "transmitter" device connected to a source of power such as a mains power line, which converts the power to a time-varying electromagnetic field, and one or more "receiver"

devices which receive the power and convert it back to DC or AC electric current which is used by an electrical load. At the transmitter the input power is converted to an oscillating electromagnetic field by some type of "antenna" device. The word "antenna" is used loosely here; it may be a coil of wire which generates a magnetic field, a metal plate which generates an electric field, an antenna which radiates radio waves, or a laser which generates light. A similar antenna or coupling device at the receiver converts the oscillating fields to an electric current. An important parameter that determines the type of waves is the frequency, which determines the wavelength.

Wireless power uses the same fields and waves as wireless communication devices like radio, another familiar technology that involves electrical energy transmitted without wires by electromagnetic fields, used in cell phones, radio and television broadcasting, and WiFi. In radio communication the goal is the transmission of information, so the amount of power reaching the receiver is not so important, as long as it is sufficient that the information can be received intelligibly. In wireless communication technologies only tiny amounts of power reach the receiver. In contrast, with wireless power transfer the amount of energy received is the important thing, so the efficiency (fraction of transmitted energy that is received) is the more significant parameter. For this reason, wireless power technologies are likely to be more limited by distance than wireless communication technologies.

Wireless power transfer may be used to power up wireless information transmitters or receivers. This type of communication is known as wireless powered communication (WPC). When the harvested power is used to supply the power of wireless information transmitters, the network is known as Simultaneous Wireless Information and Power Transfer (SWIPT) whereas when it is used to supply the power of wireless information receivers, it is known as a Wireless Powered Communication Network (WPCN).

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MAMMOET

As mobile devices make up an ever-increasing share of Internet traffic, cellular networks are reaching their limits. Transferring mobile data over conventional cellular infrastructure requires relatively high amounts of energy. Plus, the radio spectrum over which mobile data is transmitted is narrow. That limits the number of devices that can exchange mobile data at a single time. MAMMOET, a European Commission-sponsored project, aims to enable much more efficient mobile data transfers. Instead of cell towers with one antenna each, stations on the MAMMOET network will feature hundreds of antennas. Researchers say the result will be much less interference on mobile

networks, as well as drastically reduced energy requirements.

MAMMOET promises to be especially important for helping MSPs and their clients to build larger, less expensive networks of mobile devices. These include traditional devices like smartphones and tablets, but also low-power Internet of Things (IoT) sensors and switches.

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AIRBORNE NETWORKS AND TEMPOROSPATIAL SDN

Most networks today even those that deliver in-flight Internet on airplanes are created using fixed transmission stations based on the ground. These networks often lack coverage in areas that are far from stations. They also suffer from a single-point-of-failure problem because if a station in a given area goes down, everyone in that area loses connectivity. Airborne networking offers a solution to this challenge. By basing wireless stations on

aircraft and beaming connections down to earth, airborne networks can deliver much more thorough coverage without single points of failure.

The technology for airborne networks already exists, but researchers at Google are working to make airborne networks faster and more reliable using temporospatial SDN. The technology allows airborne networks to anticipate changes in the location of network stations as they move around the skies.

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NETWORK MONITORING PROTOCOLS

The network discovery and real-time monitoring that occurs as part of the network monitoring process is implemented using a wide variety of protocols. Each protocol comes with its own pros and cons, and most popular network monitoring tools will use multiple protocols.

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Some of the most popular network monitoring protocols

SNMP: The Simple Network Management Protocol, a.k.a. SNMP, is one of the most common network monitoring protocols. SNMP can be used for polling (a monitoring station queries a network device) and notifications (a device sends an SNMP TRAP or INFORM to a monitoring station).

ICMP (ping): The Internet Control Message Protocol (ICMP) is the protocol that the popular ping and traceroute/tracert commands use. Because ping is a great way to determine if a device is up or down and the latency and jitter of network connections, ICMP is often used in network monitoring.

IPMI: Intelligent Platform Management Interface or IPMI allows for monitoring and management of servers independent of the operating system. Network monitoring tools use IMPI to collect data such as CPU and memory utilization from monitored servers.

Flow protocols: The term "flow protocols" actually refers to a number of different protocols that provide data on the flow of network traffic. Flow protocols can be a great way to gain deep insights into how data flows between devices in your network. Popular flow protocols include NetFlow, sFlow, and jFlow.

Syslog: Centralized logging makes network monitoring and incident response much more efficient than analyzing log files on each individual device. The syslog protocol provides a standard for network devices to send logs to a monitoring station. Because syslog messages indicate severity, it becomes easy for administrators to filter and act on the right events.

HTTP(S): Hypertext Transfer Protocol a.k.a. HTTP and its encrypted counterpart HTTPS (the S is for secure) is effectively the language of the web. This makes HTTP(S) a common protocol for monitoring web servers and applications that expose an API (application programming interface) via HTTP(S).

Enterprise network monitoring protocols

Enterprise-grade network monitoring software will offer even more protocols like SSH (secure shell), WMI (Windows Management Instrumentation), LLDP (Link Layer Discovery Protocol), and CDP (Cisco Discovery Protocol) and other tools to further expand your network visibility. For example, port scanning, packet captures, and agents (data collectors installed on network endpoints) are other common tools used in network monitoring.

Which protocols you should use will vary depending upon your network devices and the level of visibility and reporting you want to achieve.

For example, for simple uptime monitoring, ICMP using a continuous ping may be enough. Alternatively, for complete network visibility and network mapping, you may use a combination of agents, pollers (e.g., SNMP and HTTP GETs), flow protocols, and inbound notifications (e.g., SNMP TRAPs and syslog messages).

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AVIATION TECHNOLOGY

Aviation is the activity surrounding mechanical flight and also the aircraft industry. Aviation began within the 18th century with the advent of the hot air balloon, an apparatus capable of atmospheric displacement through levity. A number of the progressions in aviation technology appeared with the controlled glissade flying of Otto Lilienthal in 1896; the big insignificance had come with the event of the primarily powered airplane by the Wright brothers within the early 1900s. The introduction of the jet technologically revolutionized the aviation industry.

Aviation technology is improving at a rapid pace, as many things are possible today that weren't possible some years ago albeit we tried our greatest to make it happen.

The Top 10 Technologies of Aviation Technology

We can see the vast amount of investment in Artificial Intelligence (AI) and Big Data as an encouraging way of developing safety, efficiency, and sustainability. These technologies can further enhance aviation infrastructure and airspace utilization. Here are the top 10 technologies of Aviation Technology with maximum facile information:

1. Blockchain Technology

Blockchain technology is a structure that stores transactional records, also called the block, of the general public in several databases, known as the "Chain" in a network connected through peer-to-peer nodes. Typically, this storage is stated as a "Digital ledger".

Blockchain technology for aviation has been intensely within the spotlight for an extended time. It might be harsh to call it a hype as its a genuinely disruptive force to be reckoned with in aviation and the other industry, especially by intermediaries. Some promising case studies of blockchain technology in the aviation space are**:**

Identity Management: Blockchain technology can take the effort out of identity management. It can revolutionize identity management together with biometrics technology.

Tokenizing Frequent Flyer Programs: Blockchain can turn airline miles into something way more pervasive and valuable outside the defined boundaries of airlines and their limited partners with whom passengers get to spend their miles.

Item Custody-change Tracking: Bags change custody through their journey between airlines, airports, and ground handlers. When something goes wrong with a passenger's bag it's important to possess a log of custody changes to see who is responsible. A semi-private blockchain can cater

for this as an impartial ground for reporting custody modifications throughout the value chain. Encryption and hashing are also necessary to safeguard the data.

Aircraft Parts Custody-change Tracking: Aircraft parts change custody between manufacturers, traders, maintenance service providers, and airlines.

Tokenizing e-tickets: Smart Contracts can facilitate the tokenization of e-tickets and empower the value chain partners for ticket sales and other actions associated with tickets. Imagine if an airline could define the business rules and conditions on how tickets are sold and utilized by its partners through the utilization of smart contracts on a blockchain, empowering partners across the value chain to act on behalf of the airline securely and efficiently. Blockchain technology seems like a powerful addition to aviation technology.

2. Drones

Drones have gained massive popularity among recreational users, and are rapidly becoming more and more affordable. Amazon is leading the drones race and has made some headway. The recent Amazon patent on the use of a flying warehouse shows where things headed. Uber has equally expressed aspirations through their report released some months ago, on the feasibility of ultra-short-haul commercial flights within the urban space. The rise of VTOL (Vertical Take-off and Landing) vehicles offering on-demand flights in urban areas leveraging existing infrastructure (parking rooftops) as vertiports (airports for aircraft that can take-off and land vertically)**.**

3. Augmented Reality (AR)

Both virtual reality and augmented reality are similar within the goal of immersing the user, though both systems to this in several ways. With VR, the user is isolated from the real world and dipped in a world utterly fabricated. With AR, users continue to be in touch with the real world while associating with virtual objects around them. Augmented Reality (AR) is more likely to perceive the airline and airport space.

The hypothetical AR view of a passenger augments information (sensory input, static and dynamic information sources, location, object and context awareness) and functionalities (e.g. buying lounge access by looking at the lounge access button at the top right corner of the view, and blinking twice, which would act as a click of a mouse). The same could be applied on the airport ramp to support ground operations through the use of AR technology.

4. Artificial Intelligence

AI aims to improve efficiencies in the taxing of aircraft, gate allocation, and turnaround activities. It's 24/7 automatic monitoring, and reporting capability will help the airport, airlines, air traffic managers, and ground handlers understand safety-related issues better and thus reduce the number of incidents on the airside. With AI gaining traction, industries are using it to

upgrade customer experience at every touchpoint. From chatbots to voice-based AI tools, there are umpteen use cases of AI utilization.

5. Airline New Distribution Capability

The airline distribution space is continuously making headway towards a more effective and fast model where airlines are up to the mark, travel agents empowered, and the Global Distributions System has given a chance to make new products and services. The New Distribution Capability (NDC) industry program has been the driving force within the last few years, creating the mandatory standards and guidance available to the industry.

6. Indoor Positioning Systems

For an extended time, it seemed impossible to accurately know the situation of moving objects (e.g.People) inside buildings. Global Positioning Systems (GPS) are not suited for indoors because the satellite signals are often not strong enough, and also the accuracy is not sufficient. With the ascension of Beacons technology, airlines, and airports are moving to start applying this technology to provide better-customized assistance to travelers as they travel through the terminal.

MIAMI International airport is already leveraging Beacons in its premises to create a personalized experience for the passengers. The app provides information about the whole airport as passengers navigate through various places at the premises. Further, they also updated relevant information looking on their trip, such as; gate numbers, flight updates, baggage collection details, etc.

7. E-Plane

Electric flight has been around since the 1970s but remained limited to light-weight experimental planes flying short distances and solar-powered aircraft with huge wingspans yet incapable of transporting passengers. But because the warning posed by the climate crisis extends, there has been renewed interest in developing electric passenger aircraft as the mode of reducing emissions and airline operating costs.

Presently, there are about 170 electric aircraft projects underway internationally –up by 50% since April 2018, according to the consulting company Roland Berger. Many of the projects are futuristic designs aimed toward developing urban air taxis, private planes, or aircraft for package shipment. But major firms such as Airbus have also announced plans to electrify their airplane.

8. Robotics

The airline industry is additionally using robotics in assisting with various tasks like customer management, baggage handling, car parking, etc. The introduction of KLM's socially-aware 'Spencer Robot' created tons of buzzes. This robot has been equipped with the potential to handle social situations between people and can 'see' and analyze people nearby along with his sensors. Spencer also can distinguish between individuals, families, and bigger groups, and also learn about and so complies with social rules,

ultimately acting in an exceedingly very human-friendly way.

9. Wearable Technology

Airlines have started to use wearable technology in various ways to do more than improving customer experience on flights. Some of the samples of airlines using wearable technology are:

– Recently Japan Airlines applied Microsoft's HoloLens for training its new crew members and engineers. Using HoloLens, the mechanics trained about engine mechanics akin to the experience they will have operating on an actual plane.

– EasyJet and British Airways are among the airlines that have designed apps for the Apple Watch, allowing passengers to save boarding passes and receive real-time updates on their wrist.

10. AutoPilot

An autopilot maintains the trajectory of an aircraft without continuous manual control by a pilot. Autopilot does not replace human operators. Autopilots in modern aircraft are three-axis and usually divide a flight into the taxi, take off, climb, cruise (level flight), descent, approach, and landing phases. Autopilots exist that automate all of those flight phases except taxi and take off.

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SECURITY IN WIRELESS NETWORKS

Security in wireless networks is the prevention of unauthorized access or data using wireless networks that mainly includes Wi-Fi networks. It is the prevention of unauthorized access or damage to technological media like computers or any data using wireless networks, which include Wi-Fi networks too. The most common type for its example is Wi-Fi security.

Many laptops and computers have wireless cards that are pre-installed. This is beneficial for hackers using wireless networks relatively easy to break into, and even to hack into wired networks as well. As a result, it is very important that enterprises provide strong effective wireless security policies against unauthorized access to important resources.

The risks of users of wireless technology have increased vigorously in recent years, as the service has become more popular with users. There created few dangers when wireless technology was first introduced. Wireless networks were not common in the workplace. However, in recent

years, still, after this huge revolution, there are many security risks associated with the current wireless protocols. The hacking system has become more sophisticated and innovative with wireless access.

Importance of Security in Wireless Networks

Security in wireless networks is important because it is the prevention of unauthorized users from accessing one's wireless network, and prevents stealing the data using your Wi-Fi network.

Wireless networks offer great potential for exploitation for two main reasons, they are:

1. use the airwaves for communication
2. wireless-enabled laptops are ubiquitous

To make the most of their security planning, enterprises need to focus on threats that pose the greatest possible risks. Government organizations should implement a completely wireless security solution to ensure effective wireless threat protection.

Wireless network or WiFi, whenever we hear these, we intend to realize how convenient our life has become.WiFi has made life easy for anyone to use the Internet at any device ranging from Computers, Laptops, Smartphones, and Tablets, etc. from anywhere in the house without managing countless cable bundles.

Nowadays the application of a Wifi connection is not just limited to browsing the internet using any device. Similarly, we can attach a lot of other devices as per our convenience. We can take printouts of any file sitting in a different room or floor of the same house.

Wireless networks surely make our life easy but we need to ensure security as well while using wifi. Because if we are not aware of this security, then there are consequences of facing many difficulties. For example, we have to put a strong and healthy password for our internet connections. Otherwise, neighbors will use the internet connection, consuming our bandwidth at the same time which will make our internet connection slow. The worst part is, cybercriminals can use the internet connection to download or upload illegal files leaving us prone to legal action.

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DIGITAL LEARNING

Still sometimes we hard people talk about and ask why digital learning is important in Education as we are teaching in the traditional way. However, digital learning is changing the formation of education with the passage of time. In this modern world, the term digital learning has become a global phenomenon, which is a great medium for both teachers and students. Learning online through digital tools and the medium has brought a great deal of change in terms of education, especially in the time of crisis that we

are in 2020, it has made our life easier in terms of education.

Digital Learning

Digital learning is known to be any kind of instructional practice that enables students to learn effectively using technology. It ensures the use of a wide range of technology, and digitized learning strategies. Many may think that digital learning is only about taking education online or using digital tools but actually it is not only about that but learning itself. Digital learning is mostly meant to enhance the learning process of learners.

During the process of online learning, you have to have a clear idea of some methods, how it works, how you should take online classes, different kinds of online platforms, and required technologies.

The probable first and foremost responsibility of a learner or a teacher is to be aware of the responsibility of mastering the course materials and methods. Online programs generally come in two forms of programs, one is synchronous programs, where students learn at a specific time with other classmates and the teacher on a fixed schedule. Another is asynchronous programs, that allow students flexibility to listen to their class lectures and homework according to their own schedule. Moreover, online learning accesses you to the mobility of browsing through the upcoming module and missed module, academic reports, doing online assignments and submission online, all kinds of benefits of staying home, and completing your tasks and learning. Though there would be some restrictions in case of browsing through the course materials, such as tests for upcoming units, exam material for the semesters, etc.

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THE COMMON FEATURES OF WIRELESS IN NETWORKING SYSTEM

Wireless in Networking is the combination of radio waves which are used without wire. When two or more computers are connected in such a manner from one computer to another computer this is called networking. We do not need to attach any kind of wire to our system to achieve an internet connection, this is called Wireless Networking. With the help of wireless technology, we can transfer data from one device to another without using this technology. we can establish a network which is more flexible, intangible and easy to access.

Wireless in Networking System

A1Z Technology
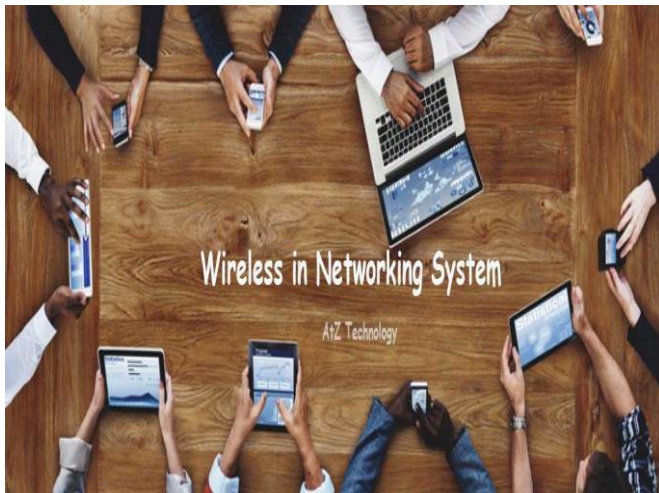
Types of Wireless in Networking

Wireless in networking are divided into four kinds in the base of its capacities. Each of the wireless systems has been working with its design and size. About these kinds of networks are discussed below.

- Wireless LAN
- Wireless MAN
- Wireless WAN
- Wireless PAN

1.Wireless LAN

This is a network where two or more computers are connected that covers only a limited area example school, college, Office. Wi-Fi technology is only used in WLAN which range is about 100 meters. Wi-Fi products which are certified and tested by Wi-Fi alliance. We can see their trademarks in most of the Wi-Fi devices.

2.Wireless MAN

It is collected unit of many WLANs located at various.it uses WIMAX (Worldwide interoperability for Microwaves Access) Speed is Maximum 1 Gaits/sec and IEEE 802.16

3. Wireless WAN h3

WWAN is a very large network which is spread over a very large area. It connects many cities together. Mobile Phone use WWAN is subsided in many generations like 2G,3G and 4G. The Communication system which was used before the emergence of 2G is called 1G used in 1980. This technology is used in most of the analogue devices.

Examples of 2nd generation technologies are:

- GPRS (General Packet Radio Service
- EDGE (Enhanced Data rates for GSM Evolution)

Examples of 3rd generation technologies are

- CDMA(Code Division Multiple Access)
- UMTS(Universal Mobile Telecommunication system)
- HSPA (High-Speed Packet Access)
- HSPA+ (Evolved High-speed Packet Access)

Examples of 4th generation technologies are

- LTE (Long Term Evolution)
- Volte (Voice Over Long term evolution)

4. Wireless PAN

The Wireless Networks that are used in smaller distances are known as WPAN.

Communication between a mobile phone and its Bluetooth headset is a typical example of WPAN. Two kinds of wireless technologies are used for WPAN like bluetooth and infrared data association. It is used to connect devices in personal areas without using cables and use ISM band 2.4 GHz. Range of it 10 to 100 meter.

Types of Wireless in Networking

Wireless network systems have been structured for the fastest facilities. There are 5 types of wireless in networking which are working in a specific stage. These types of wireless in networking are discussed below:

- Wireless Device Roles
- Remote Clients (Station)
- Access Points (Master)
- Ad-Hoc Node (Mesh)
- Quick Activity

1.Wireless Device Roles

There are three major "modes" a Wi-Fi gadget can utilize. These modes characterize the part a Wi-Fi gadget has within the arrange, and systems must be built out of combinations of gadgets working in these diverse modes. How the gadgets are arranged depends on the sorts of associations you need to utilize between parts of the network.

In examining these modes and the illustrations underneath, a few sorts of gadgets are utilized. In expansion to the phones, tablets, and portable workstations you employ in getting to an organization, switches make up the equipment that

runs the arrange. These switches are characterized in Learn Organizing Nuts and bolts, but for the purpose of this document the fast definition of a switch may be arrange gadget that can interface one arrange to another, decide what activity can pass between them, and perform other capacities on a organize, such as doling out IP addresses.

2. Remote Clients (Station)

Wireless clients in a network Devices such as computers, tablets, and phones are common clients on an organization. After you are getting to a remote hotspot or the switch in your domestic or office, your gadget is the client. This client mode is additionally known as "station mode" as well. Some switches can work as clients as well, which permits them to act just like the remote card in a computer, and interface to other get to focuses. This will bridge two Ethernet systems, or interface to more far off APs. A remote client is comparative to an individual within the gathering of people of a play or motion picture.

3. Access Points (Master)

Most remote systems are made utilizing to Focuses gadgets that have and control the remote association for portable workstations, tablets, or savvy phones. In the event that you employ Wi-Fi in your domestic or office, it is most likely through a Get to Point. When a switch is set up as an AP, it is said to be in "Master" or "Infrastructure" mode. An AP is some of the time a stand-alone gadget that bridges between a remote and wired (Ethernet) organization or is a portion of a switch. APS can cover a run of zones with a remote flag, depending

on the control of the gadget and the sort of radio wire.

There are too a few APs that are weatherproof, outlined to be mounted outdoors. A Get to Point is comparative to an individual on organizing, tending to a gathering of people or swarm – they are giving the data for everybody else. Those gathering of people can inquire questions of the individual on the arrange, and get a response.

4. Ad-Hoc Node (Mesh)

A few remote gadgets (tablets, shrewd phones, or remote switches) back a mode called Ad-Hoc. This permits those gadgets to put through together straightforwardly, without a Get to Point in-between controlling the association. This shapes a diverse sort of arrangement in Ad-Hoc mode, all gadgets are capable of sending and getting messages to the other gadgets without anything else in between.

In an Ad-Hoc arrangement, each gadget must be in this part and utilizing the same setup to take an interest. Not all gadgets utilize this mode, and a few have it as a "hidden" feature. Ad-Hoc gadgets are utilized to form Work organize, so when they are in this mode, they are called "Mesh Nodes". An Ad-Hoc or Work hub is comparable to an individual in a bunch or roundtable discourse. They can take up a portion within the discussion, raising their hand when they need to talk so the others will tune in. In the event that someone at the conclusion of the table cannot listen, one of the people in-between can rehash the first mess.

Benefits of Wi-Fi as Wireless in Networking

Wi-Fi Network has some benefits which make our activities easy and shorted. Businesses can involve numerous benefits from a Cisco remote organization, including

Convenience: Get to your organized assets from any area inside your remote network's scope zone or from any Wi-Fi hotspot.

Productivity: Remoteness gets to the Web and to your company's key applications and assets make a difference your staff gets the work done and energizes collaboration.

Easy setup: You do not get to string cables, so the establishment can be fast and fetched effectively.

Expandability: To effortlessly extend remote systems with existing gear, while a wired arrangement might require extra wiring.

Security: Propels in wireless networks give vigorous security protections. Reduced fetched: Since remote systems dispose of or decrease wiring costs, they can fetch less to function.

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CovrrStudio

CovrrStudio is cloud-based video editing software where you can make videos in 3 to 4 simple clicks. It has a lot of pre-made proven templates which are already popular on various platforms.

It gives the flexibility for making a video or videos with the best size with the different social media platforms. Literally, anyone can use it and make video without taking any course for learning this software. It has created like marking styles video editing processes so that you can earn more money and bother the freelancers and business owners to get engaged with the targeted customers.

editing processes so that you can earn more money and bother the freelancers and business owners to get engaged with the targeted customers.

Pros

- Cloud based online video editor
- Easy to create videos
- Have video making tools
- Make any length of video

Cons

- Do Not have motion graphic types of elements
- Sometimes do not add images in the video panel

Features of CovrrStudio

- Able to create ultimate attention-grabbing videos without any hassle or upgrading the software like others.
- Don't need to download and think about your computer space as it is 100% Cloud-based platform, you can anywhere in the world.
- don't need to think about various social media video sizes as it has pre-made and successful campaign video sizes by which you can easily catch the eyeballs of the customers.
- Compared to other cloud-based platforms, it gives you the number of videos creating opportunities and there is no duration of making the video. In addition, creating the video in a fast process.
- The advanced feature is additional customizing and brand look for your own video.
- One can max one's conversion by using the countdown times and progress bars.
- Make the video more engaging and interesting for those who have the option of customizing with creatives through images,

Emojis, Gifs, Shapes and some extra things.

- Easily timeline editor to make videos for adding various elements in different points of the situation.
- Grab or import your video from various sources at fast speed.
- For transcription and automated captions don't need to worry about an extra charge or update the plan.
- Hundred thousands of videos/images footages for free or you can upload your own images and add to the video.
- Have the opportunity to earn money by selling CovrrStudio video for the clients as it has included a commercial license to sell.

Types of Videos with CovrrStudio

- Product Video
- Ecom stores Videos
- Social Ad Videos
- Affiliate Marketing Videos

- Influencer Videos
- Speaker Videos
- Real Estate Videos
- YouTube Videos
- Local Business Videos
- Sales Video
- Tutorial Video
- Image and voice Youtube video
- Quotes types video

ROLE OF TECHNOLOGY IN BUSINESS COMMUNICATION

Technology is applying scientific knowledge which is used to find answers and fix problems and it can be material or immaterial, tools or machines, mental or physical effort in order to achieve correct values. Technology systems in business allow organizations to improve both the performance and overall effectiveness of products, systems and services. An organization uses technology to improve the way they design and manage customer relationships. As technology plays a central role in all aspects of lives, most of us have a common question what is the role of technology in business. The role of technology systems in the business cannot be denied. In business every sector relies on technology in small and big ways.

The role of technology in business

The role of technology in business to drive growth and improve operations along with hundred other reasons. There are some reasons for why

technology in business important and what is the role of technology in business:

- Technology improves Communication
- Technology improves business communication
- Technology increases productivity
- Technology increases efficiency
- New innovations protect important assets
- With technology, there are no limitations
- Plenty of updated resources exist that can improve your business
- Technology saves time and money
- Technology increases the capacity of businesses

Importance of Technology in Business

1. **Technology Improves Communication**

Technology simplifies effective communication and Business involves transportation and more fields internally and externally. Technology has made communication easy and effective. Information tools can increase a company's growth and ability to work with stored data.

2.Technology Improves Business Communication

Technology boosts productivity and business communication. Technology, Information and business communication tools can increase a company's ability to work with stored data.

Technology improves your business communications by giving clients and employees access.

3. Technology Increases the Capacity of Businesses

Technology increases efficiency and reduces lay time in the office. When it comes to information storage and analysis, technology offers substantial advantages for businesses and allows analysts to identify business trends and locate areas.

4. Technology Increases Productivity

Technology improves the collaboration efficiency, communication, project management and productivity of team members. Employees can assign ,manage tasks, store and share files in a secure location and track them to completion.

5. New Innovations Protect Important Assets

Innovation is something new that improves a product or service. Cyber-attacks are growing at an alarming rate and there are some amazing cyber-security defences. New innovations protect important assets and businesses employ security technology to protect those assets.

6. Tons of New Resources Exist that can Improve Your Business

Technology is growing fast and prices are dropping. New innovations are being rolled out constantly. One of the biggest advantages of technology business is there are no limitations and tons of new resources exist that can improve business.

7. Technology Saves Time and Money

We can use technology to save time and improve efficiency of employees as well as can save more money. money. Using technology an employee can focus their time as well as more important duties.it improves productivity.

8. Technology Increases Efficiency

Technology increases the effectiveness of the workers. We can maximize the use of technology by using some techniques. We have to make sure whether we are using the right technology or not. we can also manage passwords effectively, use chrome extensions, organize time with A Calendar App. or take advantage of free applications

9. Technology Keeps Employees Engaged

Technology in business keeps employees engaged in so many different ways. It improves communication and reduces stress. It gives employees flexibility. It saves time and costs by improving relationships and communication.

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GOOD CODING PRACTICES FOR BACKEND DEVELOPERS

Clients often underestimate the work of backend developers, especially those who only get impressed by the frontend part and don't know anything about backend coding. Clients can never get the complexity involves in the backend coding part. Ask a developer, and they will let you know that how sometimes it is difficult to join 4-5 tables in a minimal amount of code, what kind of difficulties they face during the implementation of API, how they need to consider all the scenarios when it comes to making the dynamic URL.

Imagine a scenario you're building an e-commerce site and you need to deal with a complex query where you have to calculate the price for a customer who is going to do some shopping from your website. What will happen if you use = instead of ==. Surely the whole result will be different, a customer may get benefits, or he/she may lose a lot of money. A small mistake on the backend side can generate a lot of bugs and it can cost a lot of money.

Backend development involves dealing with a lot of complex stuff. To make an application more efficient, a developer needs to really focus on the logic and code optimization when they are dealing with the backend part of the application. When the team is very small for a project developers do not focus much on good

coding practices but when the team and application grow it's good to follow the best coding practices throughout the team.

1. Perfect Your Core Skills

This one is the most important skill to adapt when it comes to working on the backend part of the application. You should have at least working knowledge of server-side languages such as <u>Java</u>, <u>Python</u>, <u>PHP</u>, <u>C#</u>, etc. The stronger you're in these languages the easier it will be for you to develop the application.

Also, you should have a strong foundation in SQL or databases. Backend developers deal with a huge amount of data saved in the database. They run multiple queries on it in their day-to-day job. So it's good to have exposure to some databases such as MySQL, SQL Server, MongoDB, and PostgreSQL as a bare minimum requirement. They all have a similar concept of storing the data in rows and columns but there are some differences in all the databases. It's good to have a working knowledge of these databases before you start building an application.

Another important skill for backend developers is the knowledge of JSON and/or XML APIs. A lot of application requires data retrieval in the form of JSON and the connection to an application programming interface (API). The most popular format for data retrieval in API is JSON format and XML. Knowledge of working on API and these formats will make your journey much easier in backend development.

2. Validate Inputs and Handle Errors

If you're writing the backend code for more than a few months then you might have heard the word "Never trust your users" from senior engineers. Being a backend developer make sure that you never trust the data submitted by a user. A hacker may try to penetrate the system when the application goes live on the server. To ensure the security of the system it's good to validate the inputs which are coming to your system.

- **API Gateway:** This can be done via policies, mainly generic validation, schema, format.

- **Microservice:** This involves inspecting the existence of entities. You can use the libraries of your development stack for the input validation in microservice.

Once you're done with the validation of inputs and errors, you need to take the responsibility of handling it properly. You need to do it carefully in microservice/mesh architecture because the components are interconnected in these kinds of systems. If one of the services crashes then the whole system might get affected. And in that case, you may have to do a lot of troubleshooting. You should have knowledge of the HTTP error code which gets generated when something wrong happens on the server. To handle these errors return a response without crashing the service. Proper

input validation and error handling won't make any issue on the server. It will also reduce the need for troubleshooting for your software

3. Follow Separation of Concerns

- How do you organize your code?
- How do you structure your code?
- What do you do for the maintainability of the code?

One of the good answers to the above question is, using the separation of concern in your code. Being a backend developer if you follow this concept in your software architecture then surely you will save a lot of time and effort that you put into the maintainability of your code. Separation of concern divides your whole computer programs into different sections or different modules for the better organization of the code. This increases the readability of the code and it becomes easier for the other developers to collaborate on the application.

You can follow any design pattern to structure your code. A popular one for web applications is the MVC framework. Implementing this good practice in software architecture is really helpful for the entire team. It reduces the learning curve for the code and increases the overall speed and efficiency of the team during the development of the application.

4. Implement Health Check Endpoints and Logging

Health check simply means monitoring the services of your system. We ensure that the database is working and the services are running smoothly in the entire system. It is helpful in resolving the issues in your software if in case a bug or issue is identified. Services of your software may get terminated if the health checks fail. So let's discuss a few approaches to implement some good health checks in your system.

- **TCP health check:** It is a basic health check which ensures that the services are up and running. This health check is done via TCP and it doesn't monitor the service level health. Most of the cloud platforms have their own solution to implement this health check.

- **Service level health check:** Service level health checks are the advanced level of health checks. It validates the intended output and ensures that the services are running smoothly.

- **Logging:** Here we are concerned with the logs actions such as database queries, requests, and responses into a centralized log sink. You can use some logging libraries or log management tools for this purpose.
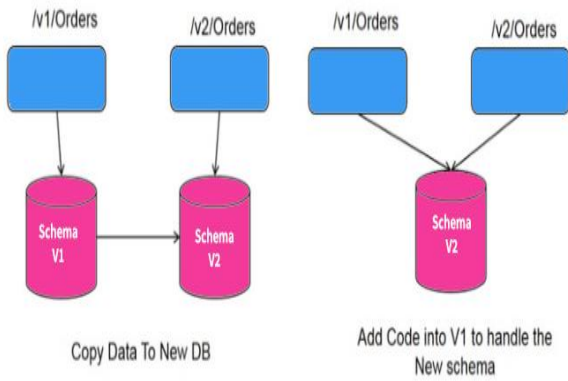
5. Implement Versioning for Your Services

With time your application needs frequent changes. To handle those changes efficiently you need to implement and test the application while the current version is still running in your system. Let's discuss the two ways to version your service.

- **URL:** For example "/users/v2.1/{id}"

- **Header:** included in the header as "X-Version:2.1."

Below is an example of a URL versioning approach.

Copy Data To New DB   Add Code into V1 to handle the New schema

6. Automate Repetitive Task

Scripts are always the same but humans are not…Being a backend developer you might have experienced some repetitive tasks in your day-to-day job. Learn to automate it. Don't waste your time doing the same thing again and again. Automating the things will make your life easier and you won't have to type the same command over and over again.

7. Write Test Cases and Documentation

Before you jump into the actual coding part if you write the test cases then surely it will help you in planning and visualizing the end product. You won't have to make frequent changes in your codebase and that increases the efficiency of your work. Also, test cases will help you to identify the downstream impact of the changes you made in your codebase especially when the application grows.

Test-Driven Development (TDD): This is one of the good approaches to write test cases before you start doing the actual coding. There are so many benefits of TDD but it also has some downside. It can take up a lot of time. If services are critical then elaborate on the test cases.

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COMPARISION OF GI-FI AND LI-FI

Gigabit Fidelity (GI-FI)

It is the absolute first transmitter cum beneficiary installed on a chip. It is manufactured using the CMOS (Complementary metal-oxide-semiconductor) procedure which works at 60 GHz. It will permit video transfer at the pace of 5 gigabits per second which is higher than the present Maximum transfer rate of wireless fidelity, at 10% Of the expense. It was developed at **NICTA (National ICT Australia Ltd)** in Melbourne, Australia. This innovation was decided to be built in the frequency range of 57-64 GHz by the NICTA researchers. In a closed environment, the Accessible 7 GHz of range resulted in a data rate of 5 GHz per second, typically within 10 meters Range. It works with the IEEE 802.15.3C band.

Light Fidelity (LI-FI)

It is a wireless optical networking technology that uses visible light from LED's for data transmission. Li-Fi has created a new revolution in wireless communication. A German Physicist Herald Hass keeps on wowing the world with the revelation of data transfer using light. Li-Fi allows an electronic device for connecting to the internet with no wire. It is more secure than wireless fidelity based on the spread of the signal. Li-Fi uses visible light and communication and it is faster compared to radio-waves which is 250 times faster compared to any other broadband.

Specifications

GI-FI

Specification Authority: NICTA (National ICT Australia Ltd)

Operation: GI-Fi technology transmits the data over the air using the millimeter waves.

Data Transfer Rate: Provides the speed upto 5 Gbps, and more.

Frequency of Operation: Li-Fi can achieve the frequency of operation around 60 GHz.

Coverage Range or Distance: GI-Fi ranges up to 10 meters in particular.

Data Density: GI-Fi works within the very high dense environment.

Security: Data transfer is less secured compared to Li-Fi.

Power Consumption: Power Consumption is less than 2MW (milli watts).

Primary Devices: Mobile phones, home devices, electronics etc..,

LI-FI

Specification Authority: IEEE (Institute of Electrical and Electronics Engineers)

Operation: Li-Fi transmits data using light intensity modulation.

Data Transfer Rate: Provides the speed upto 1 Gbps.

Frequency of Operation: Li-Fi can achieve the frequency of operation upto 50 THz.

Coverage Range or Distance: Li-Fi systems can maximum range up to 100 meters depending upon the light intensity and range of that LED.

Data Density: Li-Fi works with the high density environment.

Security: Li-Fi provides secure data transfer due to the light blocked by the walls.

Power Consumption: Power Consumption is upto 1 MW (milli watts).

Primary Devices: Hospital, vehicle and transportation, aviation etc..,

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# REACTIVE JAVASCRIPT: THE EVOLUTION OF FRONT-END ARCHITECTURE

Improving the client-side web experience means overcoming the challenges of hydration, a fascinating engineering problem being tackled in many different ways.

One of the most dynamic areas in software development today is front-end architecture. Several innovators are pushing the state of the art to devise more powerful ways to build dynamic user interfaces. Much of this work is happening at a furious pace and right out in the open.

What is hydration?

Much of the activity around improving modern front-end architecture is focused on what's called hydration. To understand what hydration is and why it's central to modern front-end architecture, let's get a grip on the high-level concepts at play. To deliver the wonder of reactivity, every framework must handle the three aspects illustrated in the diagram below.
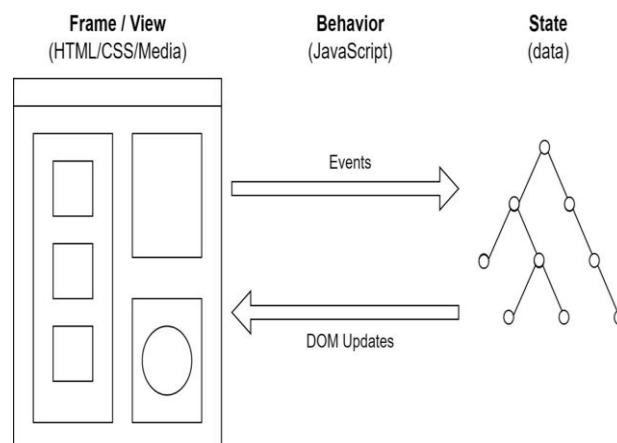
The basic message in the diagram is that the framework is responsible for framing the view, holding the state and managing the interaction between them. The naive or default, approach is to simply take everything the client needs the frame, the reactive code, and the state and send it over. The client (the browser) then does the work of displaying the frame (aka, painting the UI), interpreting the JavaScript, and tying in the state.

This approach has the wonderful benefit of simplicity, both for the code at work and for the human minds trying to understand it. It also has a big downside: The initial page render has to wait on everything and the user has to sit through all of that network and browser churn. Also, unless care is taken, the page will tend to display and then embarrassingly rearrange itself into the final layout.

This inspired developer to try rendering the initial page on the server first *(*server-side rendering or SSR) and send it over. Then, the user has a decent page to look at while the rest of the code and state is sent and bootstrapped. This is a great simplification but that's the basic idea. The

time it takes to get the basic layout in place is called first contentful paint (FCP). The next milestone the page needs to reach is measured by time to interactive (TTI), meaning the time until the user is able to actually use the page.

Limits of server-side rendering

The bottom line is that SSR tends to improve FCP but worsen TTI. Thus the goal has become striking a balance between the two while maximizing them both, while hopefully maintaining a pleasant developer experience (DX).

A variety of approaches have been proposed, adopted, abandoned, modified and combined in this effort to improve hydration. Once one starts looking at the implementation details, one is amazed at how complex it becomes. A balanced enhancement of FCP and TTI with a decent DX? Sounds easy but it isn't.

One reason for the complexity is that we're smack in the middle of sorting through all of the trade-offs; it's an unfolding scene. Once the way forward crystallizes though, we should expect two results from the client architecture that emerges. First, it should create web apps that feel "next generation," in the same way that well-built apps today provide a subtly but clearly better experience than one from a few years ago.

Second and perhaps even more importantly, our improved client architecture should have far reaching consequences beyond better performance. By wading into and resolving the complexity, front-end engineers will arrive at a better model, for both the system and the mind. A better architecture actually represents a more powerful heuristic. This results in follow-on benefits that are often unpredictable. You can see this in action with reactivity itself. Reactivity burst onto the scene because it offered a way to offload state binding from the developer's brain to the framework. But the benefits didn't stop there. The architecture became not only simpler but more consistent. This netted performance and functionality gains across the board.

Because modern JavaScript frameworks incorporate both server and client, the outcomes of these developments may have broad consequences for application architecture in general.

Approaches to improving hydration

The basic trick to improving the hydration situation is to look at things more granularly. By breaking the view, the interactivity and the state into smaller pieces, we can load and activate them stepwise, optimized for FCP and TTI. Here is a tour of some of the approaches.

Avoiding JavaScript entirely

One approach that has been absorbed in best practice is to analyze sites for those pages that don't require JavaScript at all. This relates to the newer notion of multipage apps (MPA). It is a kind of middle ground between single page apps (SPA) and straight-up per-page navigation (default web behavior). The idea here is to find the parts of the app that can be shipped immediately as HTML

plus assets, resulting in the best possible SEO and load times.

The no-JS approach is seen in SvelteKit, for example. This doesn't do anything for those pages that require reactive interaction, of course. Frameworks still must address hydration on those pages that act as SPA.

Front-end architecture evolution

The activity around JavaScript's front-end architecture has created some of the most interesting code work I've ever witnessed. It's a space full of passionate individuals who are exploring new conceptual territory and doing the ground breaking programming to go with it. And they're interacting and sharing their ideas in an open and collaborative way.

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ALGORITHMIC TRADING

The capital market is quite a risky business. To tame the skill of trading, we need to develop an algorithm that simplifies the risk quantum in the financial market. Algo trading is an evolving concept which is already in place at the stock market companies. Let's have a quick look on what is algorithmic trading and what does it do in resolving financial issues.

- Algorithmic trading is an automated trading strategy.

- It is a set of rules for the computer to execute the buy and sell stocks in the Financial Market.

- The trade engine is developed to generate profits at high speed and frequency with at most accuracy.

- Huge Volume of historical data is processed and compared to produce competitive gains.

- The factors influencing the trading algorithm are Time, Price, Volume and the Mathematical Model.

ALGO trading in the Financial Market

- Risk Management is achieved to a greater extent.

- Human error and emotional activity is completely discarded.

- A high volume of data is processed at a faster rate which is not possible for the human trader.

- Achieved at high speed with sharp accuracy.

- Highly efficient in processing the historical data which is backdated for 10 years.

Programming languages for ALGO Trading

The performance of the library functions, the complexity of development, testing and resilient, separation of concerns, widely used, maintenance, density of source code, licensing costs and the overall achievement rate are to be considered while choosing a programming language. A trading engine is a tool that will be updating for every nuance of market changes.

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The programming language which is capable of adapting to various market changes with a rich scientific library will be suited for the trading platform.

The languages such as C++, C#, Julia, Java, Python, R, and MatLab possess high-performance libraries and packages for essential data structure and algorithmic manipulation. C++ loaded with the Standard Template Library, whereas Python comes with NumPy/SciPy and pandas. Usual mathematical functions can be found in these libraries. It is a rare case to write a new computational model.

Thus Algorithmic trading provides a new system of trading which makes the financial markets, being technologically sound with data manipulation and back testing. It is so made possible by creating curative program modules to land in enormous economic gain.

Advantages and Disadvantages of Algorithmic Trading

Advantages

- Best Execution: Trades are often executed at the best possible prices.
- Low Latency: Trade order placement is instant and accurate (there is a high chance of execution at the desired levels). Trades are timed correctly and instantly to avoid significant price changes.
- Reduced transaction costs.

- Simultaneous automated checks on multiple market conditions.
- No Human Error: Reduced risk of manual errors or mistakes when placing trades. Also negates human traders; tendency to be swayed by emotional and psychological factors.
- Backtesting: Algo-trading can be backtested using available historical and real-time data to see if it is a viable trading strategy.

Disadvantages

- Latency: Algorithmic trading relies on fast execution speeds and low latency, which is the delay in the execution of a trade. If a trade is not executed quickly enough, it may result in missed opportunities or losses.
- Black Swan Events: Algorithmic trading relies on historical data and mathematical models to predict future market movements. However, unforeseen market disruptions, known as black swan events, can occur, which can result in losses for algorithmic traders.
- Dependence on Technology: Algorithmic trading relies on technology, including computer programs and high-speed internet connections. If there are technical issues or failures, it can disrupt the trading process and result in losses.
- Market Impact: Large algorithmic trades can have a significant impact on market prices, which can result in losses for

traders who are not able to adjust their trades in response to these changes. Algo trading has also been suspected of increasing market volatility at times, even leading to so-called flash crashes.

- Regulation: Algorithmic trading is subject to various regulatory requirements and oversight, which can be complex and time-consuming to comply with.

- High Capital Costs: The development and implementation of algorithmic trading systems can be costly, and traders may need to pay ongoing fees for software and data feeds.

- Limited Customization: Algorithmic trading systems are based on pre-defined rules and instructions, which can limit the ability of traders to customize their trades to meet their specific needs or preferences.

- Lack of Human Judgment: Algorithmic trading relies on mathematical models and historical data, which means that it does not take into account the subjective and qualitative factors that can influence market movements. This lack of human judgment can be a disadvantage for traders who prefer a more intuitive or instinctive approach to trading.

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PEOPLE OFTEN MISTAKE TECHNOLOGY FOR STATIC PICTURE.IT'S LESS LIKE A PICTURE AND MORE LIKE A MOVIE. IT'S VELOCITY OF TECHNOLOGY INNOVATION THAT MATTERS. IT'S THE ACCELERATION.

-ELON MUSK-