iziar e-magazine

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ABOUT US

In 2008, we started our journey by launching the company's first office in Kochi with an operation team executing industrial automation projects and within one year we opened our first training centre in Kozhikode. By providing the finest service, in a short span we got students from various parts of India and Africa too. As a next step, we expanded our training centres to diverse locations in India, Nigeria, Qatar, UAE, Kenya, and the KSA and now in 2022, we have altogether 18+ branches. IPCS Global, one of the most renowned Core Technical Instruction Providers in the World, has been offering training on numerous programmes that are focused on the future. The programmes that we choose for training segments are influenced by a variety of factors, including the stream's potential growth, the employability of our trainees, the accessibility of various employment markets, and many other aspects. Our current stream list includes I dustrial Automation, Building Management and CCTV Systems, Embedded and Robotics, Internet of Things, Digital Marketing and IT and Software Development. 100% live and interactive classes, global certifications and placements are our major highlights.

Our next step is to expand IPCS to every single continent and to build a career oriented generation that stands with the future. We IPCS always focus on the upcoming trends and updates on every stream to make our students best and hold professional ethics and moral values tightly and never turns our clients unsatisfied. We firmly believe in the virtue of team spirit. All throughout, a culture of professionalism and mutual respect is upheld. Technology is the engine of business success and innovation. We believe that in the current digital world, it is important to understand how they affect our lives. As a part of our Corporate Social Responsibility, Team IPCS gave birth to "Iziar", a magazine that reflects technology trends and current trends in the market related to the same. The main goal is to raise awareness of available technologies and make them accessible wherever you are. It's about technology, inventions, startups, cyberpunk life & much more. Iziar was developed to give you insight into the latest innovations and keep you on top of the latest trends. Technology is like air, You can't live without it. So we welcome you to the technological world of Iziar.

FUTURE TRENDS IN DATA AND TECH

NISHA P KARTHIKEYAN

REGIONAL TECHNICAL HEAD

Big data is demonstrating its benefit to businesses of all sizes and in a variety of sectors. Big data is helping businesses use information more effectively, which has led to improvements in operational efficiency, enhanced visibility into quickly changing environments, and customer-focused product and service optimization.

As a result, big data technologies, methods, and approaches are developing as firms discover new uses for these vast data repositories. For gathering, processing, organising, and analysing the variety of data within an organisation, new methods and systems are always being developed.

Dealing with big data involves more than just managing vast amounts of information that has been saved. One of the numerous "V's" of big data that enterprises must address is volume. In most cases, there is also a sizable variety of data, ranging from huge amounts of unstructured and semistructured data found in files, images, videos, sensors, system logs, text, and documents, including paper ones that are still waiting to be digitised, to structured data stored in databases dispersed throughout the organisation. Further complicating data management, processing, and analysis are the fact that this information is frequently created and modified quickly and has varied degrees of validity.

Big data is assisting enterprises in overcoming these issues in four key ways.

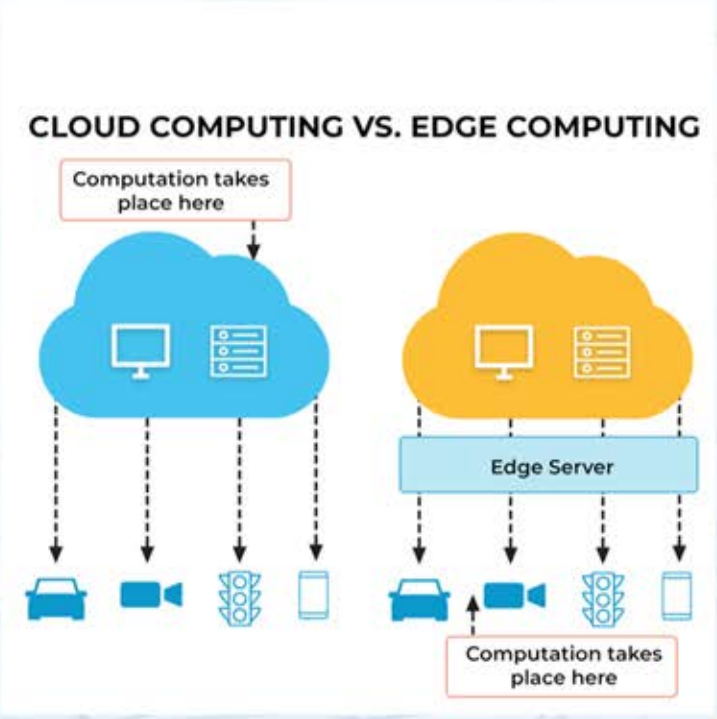
1. The growth of edge computing and improvements in processing are driven by more data and more diverse data

The continued acceleration of data generation may not come as much of a surprise. A large portion of this data is not produced by database transactions but rather originates from other sources including cloud computing, smart devices like smartphones and voice assistants, and video streaming. Because it was previously mainly unprocessed and underutilised by companies, this data, which is largely unstructured, became known as "black data."

So that gets us to the biggest big data trend: The majority of data will continue to come from non-database sources, which will force businesses to reevaluate their requirements for data processing. The demand for big data management is rapidly increasing in a variety of public-sector businesses, including retail, healthcare, banking, insurance, manufacturing, and energy. This demand is being driven in part by voice assistants and IoT devices. Organisations are being forced to consider alternatives to the typical data warehouse in order to handle the surge of data diversity.

Additionally, as industry advancements in processing power have led to the development of increasingly sophisticated devices capable of collecting and storing data on their own without taxing network, storage, and computing infrastructure, the need to handle the data being generated is shifting to the devices themselves. For instance, many duties for remote check deposit and processing can be handled by mobile banking apps without the need to transfer images back and forth to central banking systems.

A survey on 2022 IT spending plans conducted by TechTarget's Enterprise Strategy Group division revealed that advancing the use of next-generation technology, transferring data from legacy systems to modern ones, and improving the ability to handle data where it is generated are the top priorities for organisations to support their data initiatives.

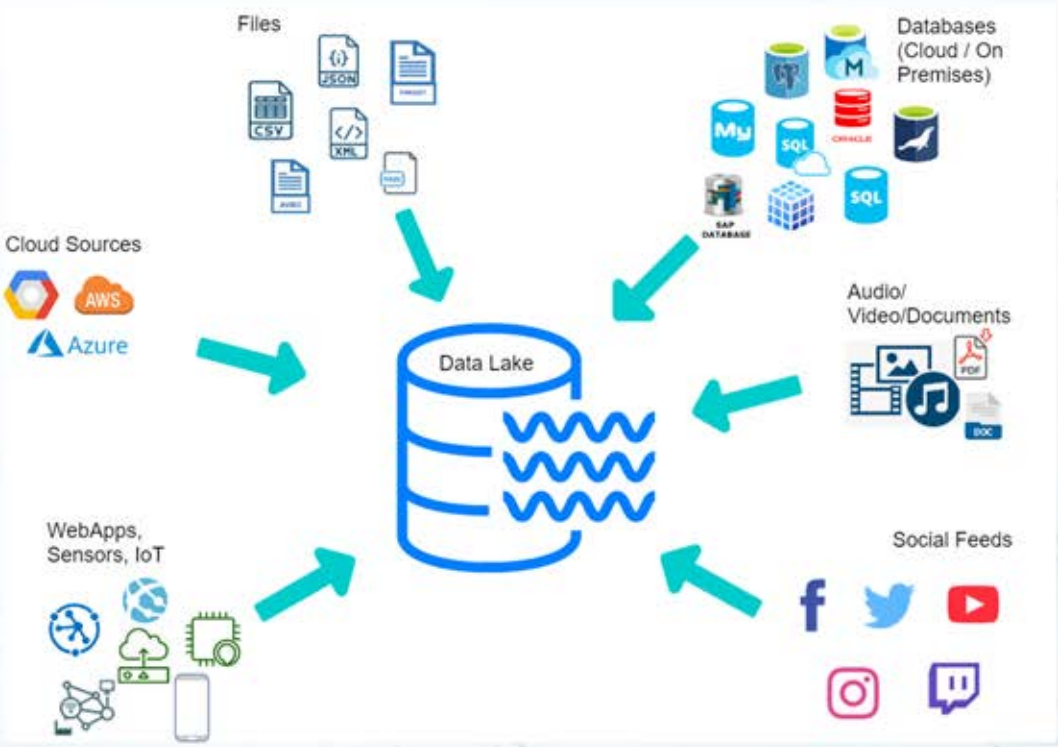


The idea of edge computing, which moves the processing load to the devices themselves before the data is transferred to the servers, embodies the usage of devices for distributed processing.

By minimising the need for data to pass via networks, edge computing improves performance and storage while lowering costs associated with computing and processing, particularly those associated with cloud storage, bandwidth, and processing. Edge computing aids in accelerating data analysis and gives users quicker responses.

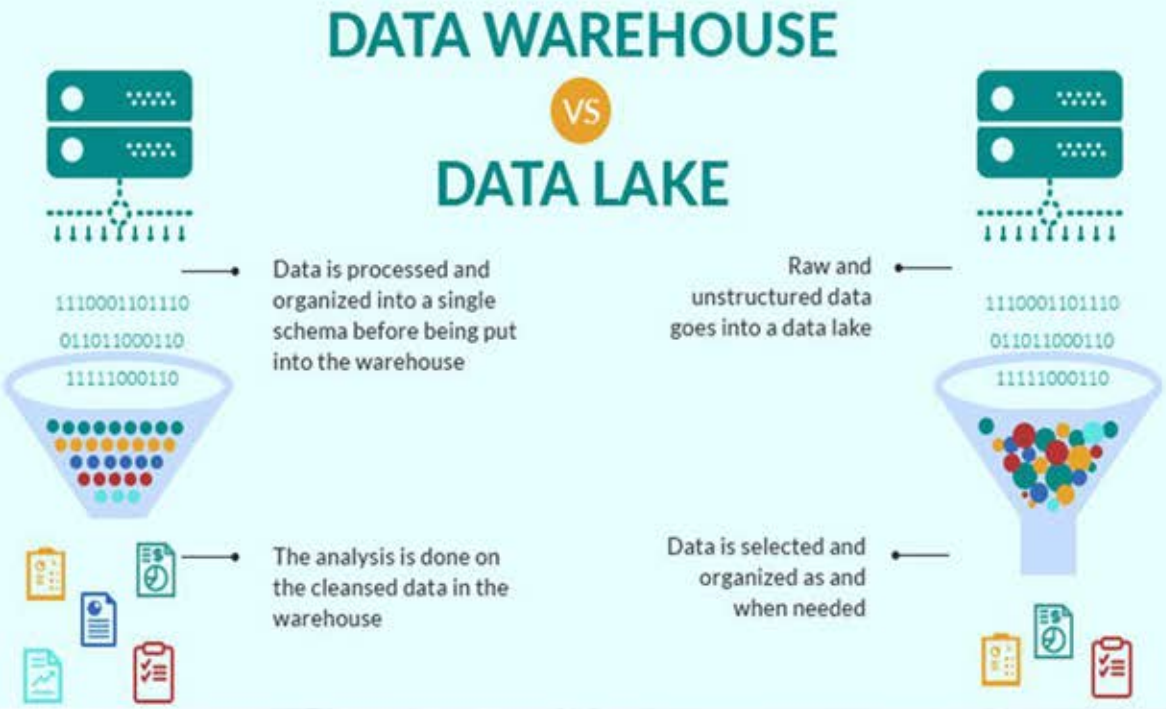
For instance, the fast growing wearables market, which includes Fitbit, Apple Watch, and Google Android devices, is fueling telemedicine growth and enabling healthcare practitioners to acquire crucial patient data in real time. The outputs are applied to numerous big data processing and analytics applications aimed at enhancing patient outcomes.

2. The expansion of data lakes and advancements in cloud and hybrid cloud platforms are driven by the requirement for big data storage.



Organizations are investing more of their resources in storing this data in a variety of cloud-based and hybrid cloud systems that are designed for all the V's of big data in order to deal with the inevitable rise in data generation. In prior decades, businesses were responsible for managing their own storage infrastructure, which produced enormous data centres that businesses had to oversee, secure, and run. Cloud computing has altered that dynamic. Organizations can deal with virtually unlimited amounts of fresh data by delegating responsibility to cloud infrastructure providers like AWS, Google, Microsoft, and IBM, and pay for storage and processing power on demand without having to manage their own substantial and intricate data centres.

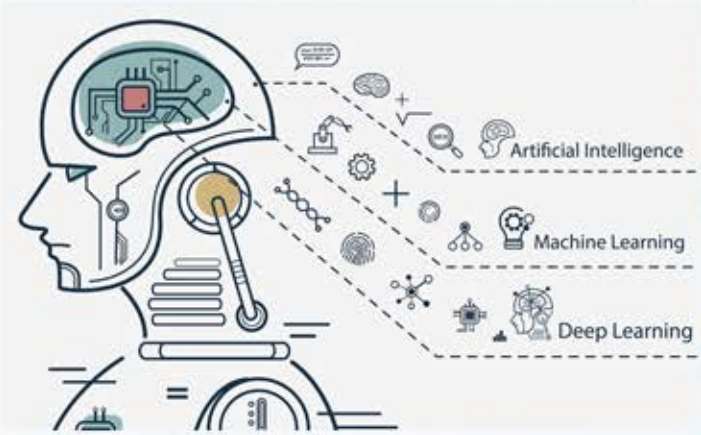
Some sectors face difficulties using cloud infrastructure because of legal or practical restrictions. For instance, there are limitations that hinder the usage of public cloud infrastructure in highly regulated sectors like healthcare, financial services, and government. In order to meet critical infrastructure needs, cloud providers have developed ways to provide infrastructure that is more compliant with regulations over the past ten years. They have also created hybrid approaches that combine elements of third-party cloud systems with on-premises computing and storage. Organizations looking for the financial and technological benefits of cloud computing will undoubtedly see an increase in the expansion of public cloud and hybrid cloud infrastructures.



Enterprises are moving toward new data architectural approaches that enable them to address the diversity, veracity, and volume concerns of big data in addition to advancements in cloud storage and processing. Enterprises are advancing the idea of the data lake rather than attempting to consolidate data storage in a data warehouse that necessitates difficult and time-consuming data extraction, transformation, and loading. Both organised and unstructured data sets are kept in data lakes in their original form. With this strategy, processing and transformation tasks are transferred to end points with distinct data requirements. Additionally, shared services for data processing and analysis may be offered by the data lake.

3. There is a sharp increase in the use of advanced analytics, machine learning, and other AI technologies.

Traditional analytics methods are difficult to automate for large-scale data analysis due to the enormous volume of data being generated. Companies can process petabytes of data quickly thanks to distributed processing technologies, particularly those supported by open source platforms like Hadoop and Spark. They can now more quickly discover trends, identify abnormalities, and make predictions thanks to machine learning and AI technology. By replacing slow reporting tools reliant on data warehouse technology with more intelligent, responsive applications that enable greater visibility into customer behaviour, business processes, and overall operations, businesses are using big data analytics technologies to optimise their business intelligence and analytics initiatives.

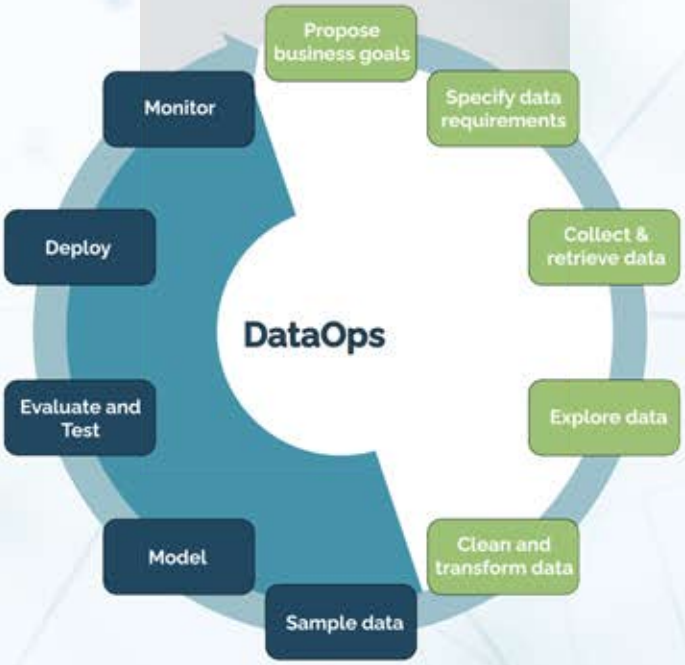


Machine learning and AI systems have made the biggest technological advances in big data analytics. All sizes of businesses employ AI to streamline and enhance their operational procedures. They can more quickly find patterns and abnormalities in massive data sets using machine learning, which enables them to perform predictive analytics and other types of sophisticated data analysis. Systems that can find the best answers in a sea of data are also included These include recognition systems for image, video, and text data; automated information classification; natural language processing capabilities for chatbots; voice and text analysis; autonomous business process automation; high levels of personalization and recommendation; and systems that can find the best answers in a sea of data. In fact, businesses are harnessing their big data environments to deliver deeper customer care through intelligent chatbots and more individualised interactions thanks to AI and machine learning, all without significantly increasing the number of customer support people. These AI-enabled systems are capable of gathering and analysing enormous volumes of data about clients and users, particularly when used in conjunction with a data lake strategy that can combine a variety of data from many sources.

Data visualisation is another area where businesses are observing advances. Data is more easily understood when it is presented visually, such as in charts, graphs, and plots. Even infrequent business users now have access to the potential of AI-enabled analytics thanks to new types of data visualisation. This aids businesses in identifying important insights that might enhance decision-making. Organizational data power and the importance of data-driven decision-making are becoming recognised by businesses. Users of more sophisticated visualisation and analytics tools can even ask queries using natural language, with the system automatically selecting the appropriate query and displaying the results appropriately.

4. Data operations and data governance take centre stage

For many years to come, big data processing, storage, and management will continue to evolve. This innovation is largely driven by technological requirements, but it is also influenced by changes in how we see and interact with data.



The introduction of DataOps, a methodology and practise that emphasises agile, iterative techniques for dealing with the whole lifecycle of data as it flows through the company, is one example of innovation in this field. DataOps methods and frameworks handle organisational demands across the data lifecycle, from generation to archiving, as opposed to approaching data piecemeal with distinct personnel handling data generation, storage, transportation, processing, and management.

Organizations are also grappling with data governance, privacy, and security challenges more and more. Enterprises used to be somewhat relaxed about data privacy and governance issues in the past, but new legislation make them far more accountable for what happens to personal data stored in their systems. Organizations are becoming much more involved in data stewardship and working harder to properly secure and manage data, especially as it crosses international boundaries, as a result of widespread security breaches, declining customer trust in enterprise data-sharing practises, and difficulties managing data over its lifecycle. To ensure that data stays where it should, is secure at rest and in motion, and is adequately tracked throughout its lifecycle, new technologies are being developed Working in the big data industry will be exciting in 2022 and undoubtedly for the foreseeable future thanks to these big data developments as a whole.

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NILIMA SHARMA
ACADEMIC HEAD

MOBILE ROBOTICS

A mobile robotic is an automated device which is able to do locomotion.

Mobile robotics is normally considered to be a subfield of robotics and data engineering.

Mobile robots have the functionality to transport around in their environment and aren't fixed to at least one physical place. Mobile robots may be "independent" (amr - independent cellular robot) which means they may be capable of navigating out of control surroundings without the want for bodily or electro-mechanical guidance devices. Rather, mobile robots can rely on steerage gadgets that allow them to travel a predefined navigation route in fantastically controlled area. By contrast, commercial robots are generally greater-or-much less stationary, including a jointed arm (multi-linked manipulator) and gripper meeting (or end effector), attached to a set surface.

Mobile robots have turn out to be more usual in business and industrial settings. Hospitals have been using autonomous mobile robots to transport materials for many years. Warehouses have set up mobile robot structures to efficaciously circulate materials from stocking shelves to fulfilment zones. Mobile robots are also a main focus of research and almost each main college has one or more labs that concentrate on mobile robotic research. Mobile robots also are found in industrial, military and security settings.

The components of a mobile robotic are a controller, sensors, actuators and power system. The controller is commonly a microprocessor, embedded microcontroller or a personal laptop (computer). The sensors used are structured upon the requirements of the robot. The requirements may be dead reckoning, tactile and proximity sensing, tri-angulation ranging, collision avoidance, role location and different unique packages.

There are distinctive sort of cell robotic navigation

Manual remote or tele-op

A manually tele operated robot is completely under control of a driver with a joystick or different manipulate tool. The device may be plugged immediately into the robotic, may be a Wi-Fi joystick, or can be an accent to a Wi-Fi pc or other controller.

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Guarded tele-op

A guarded tele-op robot has the potential to feel and avoid limitations but will otherwise navigate as like a robot under manual tele-op. Few if any cell robots provide simplest guarded tele-op

Line-following car

A number of earliest automatic guided automobiles (agvs) were line following mobile robots. They might follow a visible line painted or embedded in the ground or ceiling or an electrical twine within the ground.

Autonomously randomized robot

Self-sustaining robots with random movement essentially bounce off partitions, whether those walls are sensed.

Autonomously guided robot

an autonomously guided robotic is aware of at the least some records about where it is and a way to attain diverse goals and or waypoints along the manner. "Localization" or expertise of its current location, is calculated by means of one or extra manner, the use of sensors which include motor encoders, vision, stereopsis, lasers and international positioning systems. Positioning systems often use triangulation, relative function and/or monte-carlo/markov localization

to determine the area and orientation of the platform, from which it is able to plan a course to its next waypoint or intention. It could collect sensor readings which are time- and vicinity-stamped. Such robots are often a part of the wireless organization community, interfaced with different sensing and manage structures inside the building. As an example, the patrolbot safety robotic responds to alarms, operates elevators and notifies the command center when an incident arises. Other autonomously guided robots encompass the speciminder and the tug transport robots for the clinic.

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Sliding Autonomy

greater capable robots integrate a couple of stages of navigation below a gadget referred to as sliding autonomy. Most autonomously guided robots, which includes the helpmate sanatorium robot, additionally provide a manual mode which permits the robotic to be managed via a person. The motivity self-reliant robotic running device, that is used inside the adam, patrolbot, speciminder, mapperbot and some of different robots, offers full sliding autonomy, from guide to guarded to self sufficient modes.

SYNCHRONUS
RELUCTANCE MOTORS TO POWER FUTURE ELECTRIC VEHICLES

D A Anand
TERRITORY TECHNICAL HEAD

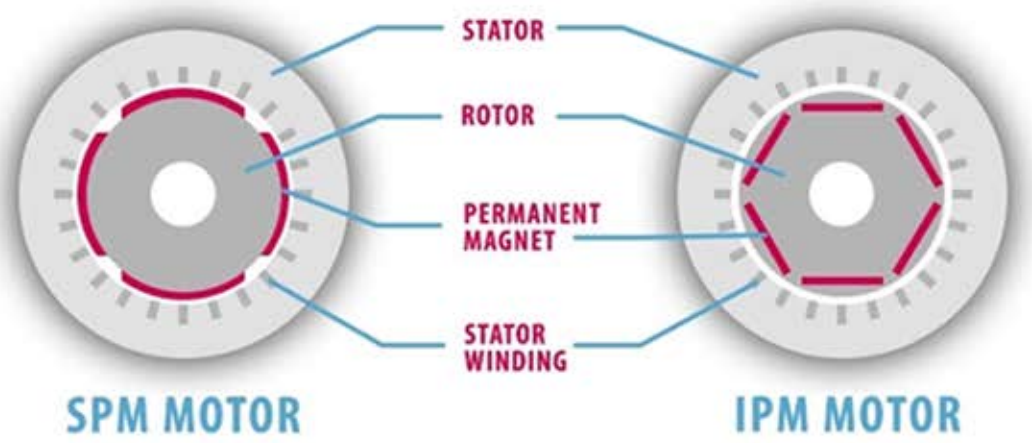
EVs make use of permanent magnet motors for their high torque and efficiency. A permanent magnet (PM) motor is an ac motor that uses magnets embedded into or attached to the surface of the rotor. The materials used are neodymium and iron-boron, which is also called Super-Magnets. This is because of high concentration of magnetic field per sq.cm, their high magnetic field density favours the strength and efficiency.

Due to high magnetic field density, PM allows us to design motor with a one third the size of a motor with the same performance and high efficiency and minimum consumption of electricity to run EV. The estimated magnetic lifespan of a super magnet is around 400 years.

A permanent magnet motor (PM) can be separated into two main categories: Interior Permanent Magnet (IPM) and Surface Permanent Magnet (SPM).

SURFACE PERMANENT MAGNET (SPM) is a type of motor in which permanent magnets are attached to rotor circumference (magnets are fixed to the exterior of the rotor surface), due to this mechanical strength is so weaker than IPM one. Weak mechanical strength limits the motor's maximum safe speed.

ELECTRIC MOTORS



IPM INTERIOR PERMANENT MAGNET (IPM) is a type of motor that has a rotor embedded with permanent magnets (magnet embedded into the rotor itself). This makes IPM motors very mechanically sound, and suitable for operating at very high speeds.

With advantages like near-constant power over a broad speed range and a magnet-retaining design, high-speed performance of IPM motor that gives the cutting edge in vehicle related applications like traction motors, etc.

The IPM motor configuration offers more control over the magnetization. IPM motors produces more or less consistent torque. Using a technique called field weakening. Field weakening is a control strategy which involves tuning the magnetic field of the stator to partially resist the effect of the permanent magnets.

For high-speed applications IPM motor is the best choice. Because we use less magnet material as we get some of the torque from the saliency of the rotor plus and we have the superior control of the magnetization by controlling the current, which allows us to operate IPM very efficiently over very wide speed ranges. IPM motors consumes 30% less power compared to induction electric motors.

Interior Permanent magnet motors with rare-earth magnets are almost globally used for electric vehicles (EVs) and hybrid EVs, thanks to their superior properties, particularly constant power operation and wide speed range. However, due to limited supply or very high cost of rare-earth magnets it can make IPM motors unavailable or too costly. Therefore, synchronous reluctance motors are next alternate candidates for EVs and HEVs for their simple and rugged construction and for hazard-free operations.

What is Reluctance Motor?

A type of electric motor which has a ferromagnetic non-symmetrical rotor which doesn't have any windings in it and it will induce non-permanent magnetic poles. This rotor generates torque using magnetic reluctance. This kind of motor is an individually excited motor.

The different types of Reluctance motor are synchronous reluctance motor, variable reluctance motor, switched reluctance motor & variable stepping reluctance motor.

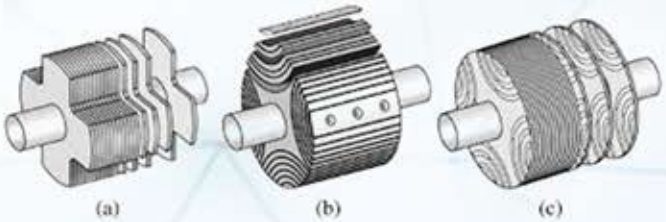
What is Synchronous Reluctance Motor?

At present, this kind of motor is becoming highly regarded by becoming an option for electric and hybrid vehicles thanks to its easy & strong construction. The big advantage of this motor is mainly due to the nonexistence of the losses of rotor cage by allowing a permanent torque which is higher as compared to the torque of an IM (Induction Motor) with the identical size.

The control algorithm of Synchronous reluctance motor is very simple as compared with induction motor based on the field. The precise torque is generated as per load requirement which doesn't get affect due the temperature rise of the rotor. Cost of rotor is comparatively less than induction and permanent magnet rotors

Synchronous Reluctance Motor Construction

The construction of this motor is analogues to the salient pole motor. The rotor in this motor does not have any field winding but the stator has 3- phase symmetrical winding. This winding will induce the rotating magnetic field within the air gap. The reluctance torque is developed when the induced magnetic field within the rotor tries to align with the stator field at the least reluctance point.

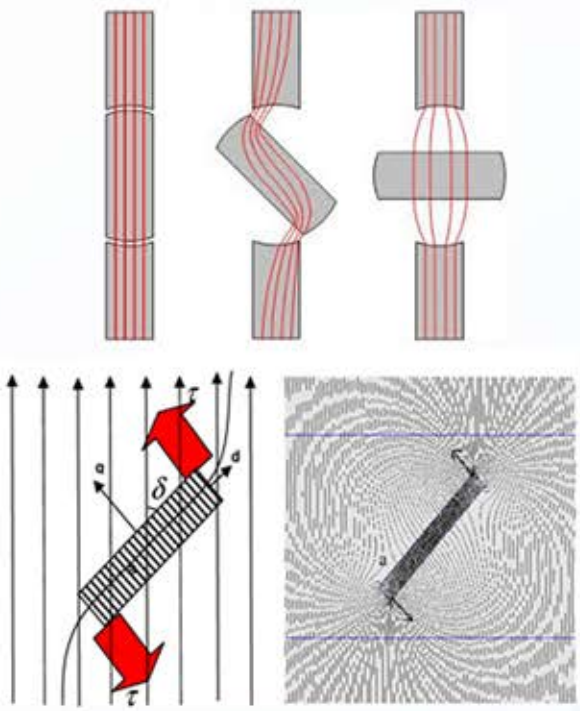


The rotor is made up of a soft magnetic material like laminated Si steel. This material comprises several projections which resembles the same function as salient magnetic poles with magnetic reluctance. In contrast to the stator poles in the motor, the rotor poles are less in numbers, which reduces torque ripple.

Working principle of synchronous reluctance motor

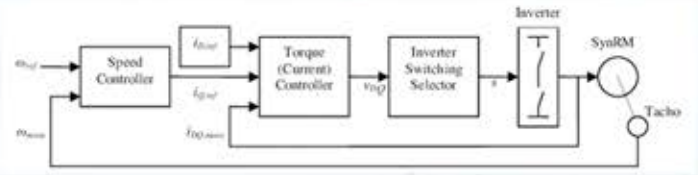
When alternating current is supplied to the stator windings, a rotating magnetic field is generated in the air gap of the motor. Then Torque is created when the rotor tries to establish its mass magnetically conductive axis (d-axis) with a field so as to minimize the reluctance

(magnetic resistance) in the magnetic circuit. The generated torque is directly proportional to the difference between the direct inductance (Ld) and quadrature inductances (Lq).Therefore, the more the difference, the more the torque is generated.



The stator current controls the magnetization thereby creating a torque that tries to reduce field distortion. Here torque is controlled by managing the angle between the current vector of the stator winding and the rotor d-axis in a rotating coordinate system.

The main reason of considering this motor for electric vehicles and traction application is because of simple and robust rotor construction, consisting of sheet electrical steel, without any magnets or short-circuited winding. Therefore no currents in the rotor, so rotor never gets heated up during operation, thereby increasing the service life of the electric motor. Just because there is no winding and magnets on the rotor, the moment of inertia of the rotor is reduced considerably, which permits the motor to accelerate fast and saves energy. To operate this motor we can also use standard PWM AC inverters (variable frequency drive).This motor can withstand extreme high temperatures. The construction of this motor is rugged and simple. In this motor, there is no necessary for field excitation at zero torque hence the losses of electromagnetic spinning are completely removed. This motor can be used within the multi-motor drive to operate several motors synchronously through a common power



It requires synchronization of speed with the o/p frequency of an inverter in both rotor position sensor as well as sensor less control methods.

This motor is best suited for the future by providing a sustainable solution and positive impact on environment because of the nonexistence of permanent magnets and increased efficiency. This motor also reduces the operating costs

HOW WEB SCRAPING HELPS IN SEO

ANAGHA V S

DIGITAL MARKETING ANALYST

Data extraction has become the crucial part of business expansion. Previous routine require manual extraction of data. But now you can easily use automation tools to get or extract the competitor's data. Now, the technologies has changed a lot. Data extraction tools are now available, and these tools can automatically extract business datas of competitors.

What is Web Scraping?

Web Scraping the technique of extracting data from a website. This is involves the collecting and exporting of data in the format that are more useful to users. Mainly the formats are CSV files, Excel and google sheets. Most of the web scraping users are the businesses that need to see competitor's data. They usually retrieve datas that aids the SEO campaigns. Most of the businesses collect the following informations:

Market research and insights

Price intelligence and monitoring

Lead generation

Product details

Sports stats for betting purposes

List of business locations

Content and news monitoring

Web scrapers allow you to discover the gaps and success in your SEO journey. For example, if you are creating content and not ranked on the top pages of search results, then the scraped data can help you to find what were the issues for not to rank and how to develop a successful digital marketing strategy.

How can we use web Scraping to Boost Your SEO Campaigns

Due to the intense competition in SEO, it is important to learn web scraping techniques to boost your seo campaigns. Let us see how to improve the performance using web scraping

1. Collect keyword results

Keywords are the basis of a successful SEO campaigns. Keywords are one of the important factors that determine in which position to rank on search results. By extracting your competitor's keywords you can determine what attracts and distracts traffic from your sites. As a result, the market for SEO software is growing rapidly and the usage of SEO softwares by marketing executives for keyword research is helping them to do their job effortlessly and accurately.

Web scraping also helps in targeting your audience. It helps you to discover personas that competitor might be reaching. By revealing the buyer personas, you will know, if a user searching for keywords like yours will Discover your website list.

2. Extract data for guest blogging opportunities

Guest blogging one of the greatest way to improve your online presence. It's perfect for establishing connections, gaining visibility, and enhancing your search rankings through backlinks. However, it is frequently difficult to find relevant information on some websites.

It can be difficult to find a website with blog layouts identical to your own. You must first search the website for relevant content to your request. The next step is to develop topics that will appeal to their audience.

However, web scraping tools can help you increase your chances of guest posting. You can filter and extract data that is solely pertinent to your campaigns with the aid of automated technologies. You can propose and create content using web scraping techniques that advances your position in search engine results pages (SERPs).

3. Discover your best ranking categories

here are various factors involved in content creation. Although the majority of content development efforts are focused on ranking on the first page of SERPs sometime this does not happen. While some content categories may succeed, others may find it difficult to rank even on the second page of search results.

Run a web scraper on your website to find out which category has the most influence. The tool can help you identify your top-performing categories. You can use a web scraper to categorize and analyze the content based on particular parameters. The tool helps you find your most popular and shared material is what I find most interesting. You can reduce the number of categories on your website using this data. Even better, you can use web scraping technologies to find new categories from a competitor's website that could raise your rating.

4. Get accurate data for your content

Web scraping extracts data directly from the source. This creates the chances that the data will be correct. For example, if you want to compare the pricing of certain products, then data scripting tools deliver fast and accurate results for your campaign. Outstanding content can then be produced using the scraped data. For your blog posts, you can also compile data from websites like Statista to make graphs and charts. This data will raise the quality of your content and raise your ranking on search engine results pages.

Tips for web scraping without getting blocked

While using web scraping technologies, it will help you to grow your SEO efforts and do competitor research. Therefore, consider few points for performing web scraping without running into problems.

1. Consider IP Rotation

The IP address is the first thing websites look at to identify scrapers. Most sites would probably identify and prohibit you if you frequently conduct searches using a regular IP address. Use high-end proxies to guarantee that your IP address is concealed from the general public.

2. Use a headless browser

There is no graphical user interface in a headless browser. It works best when used on websites that are challenging to go around. Use of a headless browser is necessary for websites that identify basic aspects like the execution of Javascript, browser cookies, extensions, or web fonts.

3. Include a web crawler

This is the appropriate tool to use in conjunction with a web scraping API. The Scraping API receives URLs from a web crawler so it understands what to extract.

A web crawler allows you to establish the rules as you go. You have the option to specify what you want scraped and what you want left in. The ability to modify the URLs while the scraping is taking place is much better. In the world of SEO, web scraping is a huge topic. It has been expanding and is anticipated to do so in the upcoming years. Utilize your web scraping abilities because data is a key factor in search engine placement of websites. Spend some time understanding the most effective web scraping techniques.

DIGITAL SUBSTATION

AFNAN

JUNIOR PROJECT ENGINEER

Introduction

The Digital Substation is a term applied to electrical substations where operation is managed between distributed intelligent electronic devices (IEDs) interconnected by communications networks. It is possible by using computing technology in the substation environment.

Substation control room (Station level)

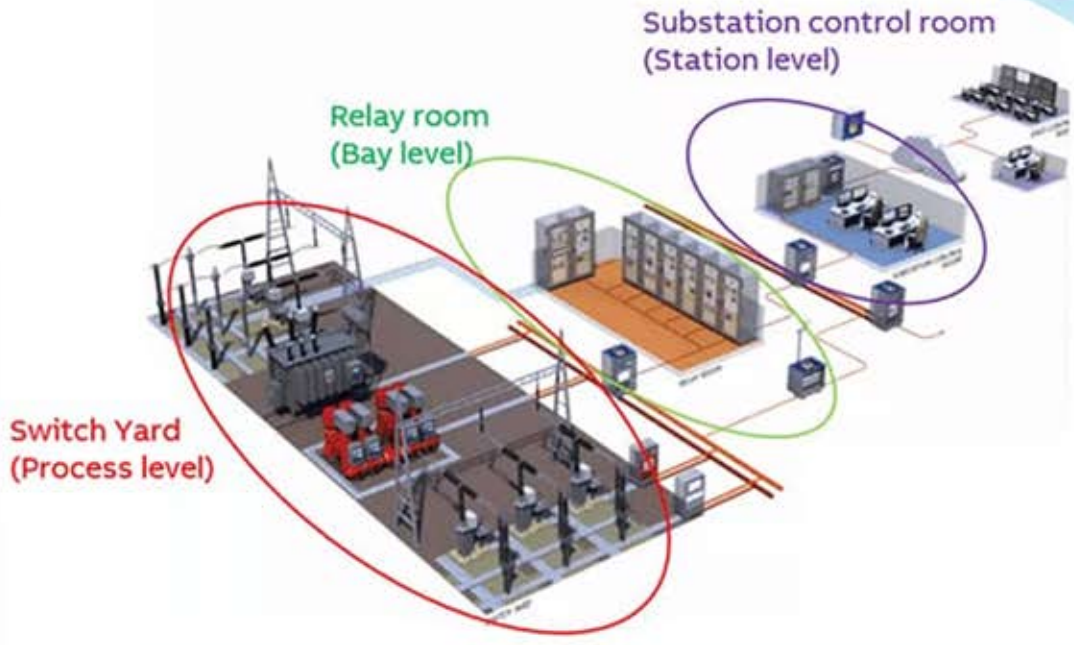
Relay room (Bay level)

Switch Yard (Process level)

Microprocessors were introduced into substation products such as **protection devices** to improve the performance of the main product functions. Features such as improved accuracy and stability were delivered.

Communications ports were also incorporated, but these were more like a developer's debug tool than the sophisticated ones we might recognize today.

Communication facilities developed, however. They were refined to provide connection to SCADA equipment to reduce hardwiring. Communication could provide operators with informative interfaces using software packages running on personal computers. The major benefits are in terms of design and engineering, installation, and o peration. Off-the-shelf solutions can be offered, modifications can be easily accommodated, cabling (and hence costs), are reduced, and embedded diagnostics assure system integrity.

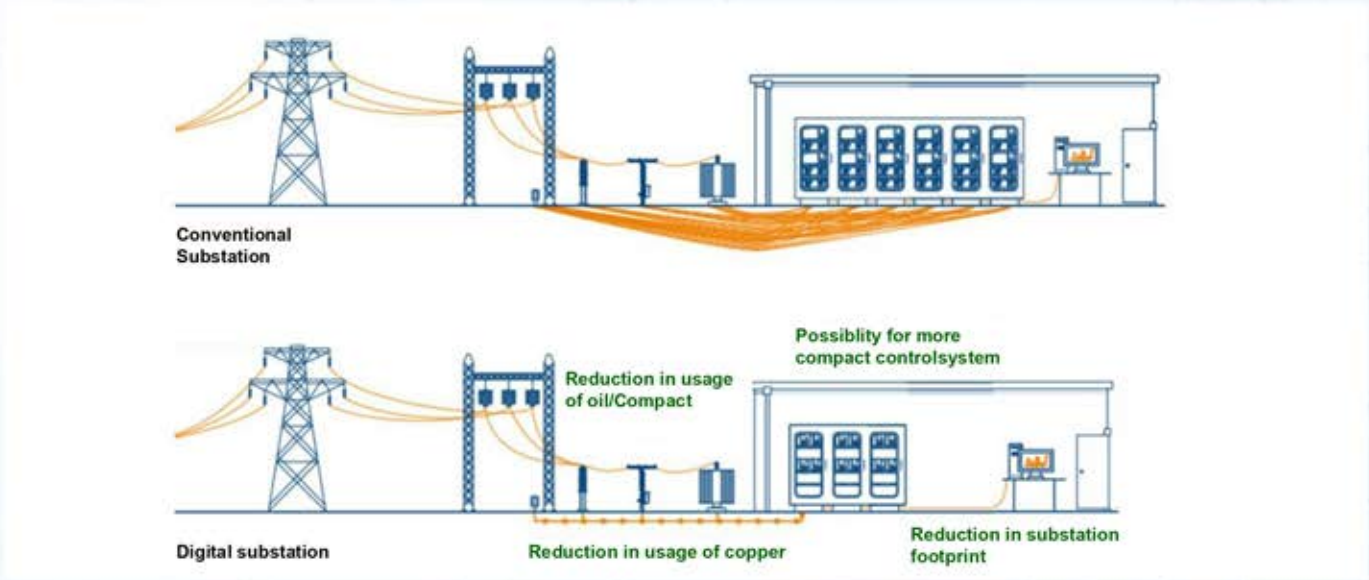


How does a digital substation work?

The digital substation focuses on digitalization of both station level and process level by converting analog measurement data and binary status information into digital data. Digitalization provides a secure and reliable method of data transmission, as well as significantly reduced investment and operating cost

Types of substations

- Step-up Transmission Substation
- Step-down Transmission Substation
- Distribution Substation
- Underground Distribution substation



What is the purpose of substations?

The purpose of a substation is to **step-down** high voltage electricity from the transmission system to lower voltage electricity so it can be easily supplied to homes and businesses in the area through lower voltage distribution lines.

Advantages of the Digital Substation

The digital substation offers numerous advantages over a conventional arrangement.

- Easier and simpler installation (much less wiring)
- Interoperability between manufacturers
- Improved reliability
- Improved measurement accuracy and recording of information
- Improved commissioning and operations
- Easy incorporation of modern electronic CT and VT sensors better EMC performance and isolation of circuits.
- Digital substations enable electric power utilities to increase productivity, reduce footprint, increase functionality, improve the reliability of assets and crucially, improve safety for service personnel.

Six core aspects of a digital substation

- ## Digital Substation Level

The most important components of digital substations are the protection devices systems and the substation automation system. As the connecting link between the primary equipment for instance the switch gear and the grid instrumentation substation automation system and control center system.

- ## Digital Process Level

New technologies like NCITs (non-conventional instruments transformers). Example, are employed in conjunction with merging units and process bus communications technology, which allow the primary values to be digitalized at process level and be communicated within the substation via Ethernet.

- Cyber security

Protects industrial infrastructure and processes from malware and targeted attacks.

- Asset Management

Based on data collected digitally lowers a substations life cycle costs and enhances its availability, safety and security.

- Grid Operation

Unstable conditions in sections of the grid or the entire grid can lead to a complete blackout.

- Integrated Engineering

Integrated engineering is based on the digital data exchange between grid operators and suppliers but as well throughout the supplier process, from systems planning, engineering and parameter zing right through to testing and commissioning.

Summary

A digital substation ensures that it is reliable and before all economically efficient over its entire life cycle by using secondary technology (like digital protection devices, sensors and automation components) as well as Ethernet-based communication technologies and standard communication protocols (like IEC 61850, Goose). Apart from secondary technology, new primary technology developments like non-conventional current and voltage transformers and NCIT for gas and air insulated substations are used to utilize the additional potential of a substation regarding operational efficiency and safety.

A digital substation uses technologies and methods that enable the economically optimal operations of electrical power supply grids (Capex, Opex) and at the same time improve the required system safety. A digital substation is not a static construct that does not change throughout its life cycle. Instead it is an agile component in the electric power supply network that continuously adapts to the requirements and conditions over its entire life cycle. Cyber security is the most prominent aspect in this respect, because the objective is to keep the system with all its products up to date at any time to reduce the risk of outages. The future of digital substations leads to expect that there will be more technologies and developments, for example centralized protection, that allow substations, or rather, digital substations to evolve to make them even more efficient and safe.

YOUTUBE INTRODUCING THE HANDLES FOR THEIR CHANNELS – ITS NEW

K KARTHI

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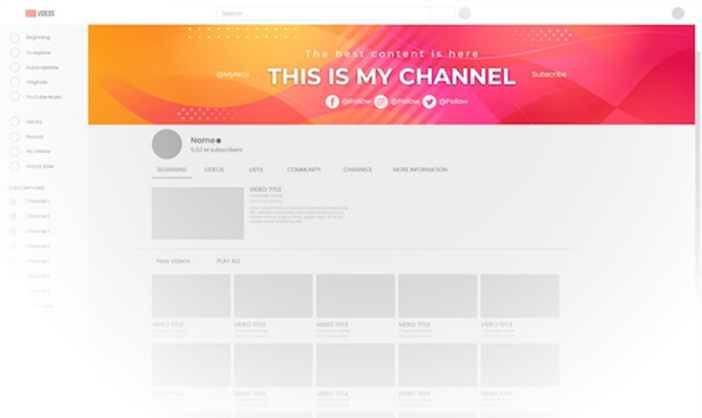
YouTube finally arrives with a YouTube handle for its user. Its a New Way to Find and connect with your YouTube channel. below we are going to discuss, The Ultimate Guide to Social Media Handles and the introduction of YouTube social media handles



Introduction: **What is a Social Media Handle?**

A social media handle is a username or alias that may that an individual on social networking sites such as Facebook, Instagram, Twitter, and Snapchat.

The term "handle" is derived from the word "hand" and refers to how individuals use their hands to perform an action or task.

A social media handle is one that starts with the "@" symbol at the beginning of your username or your brand name. It should be unique from other users. Yet, you can use the same username on different social handles if available.

For Example : @ipcsglobalmadurai

If you need to separate the words, use Underscore between words, but should be small.

For Example : @ipcs_global_madurai

How to Choose the Right Social Media Handle for Your Brand

Choosing the proper social media handle for your brand is very important. It can be a deciding factor for success or failure.

These are some of the factors to consider when choosing the perfect social media handle:

- **What is your brand's name and what does it mean?**
- **What is your target audience?**
- **What are you selling?**
- **How do you want to portray yourself on social media?**

There are some strategies, which help to create a memorable handle name for your profile (this can be tried out for social media)

- Your name or brand name, in the beginning, is a good starting point
- Your niche helps to generate ideas
- Avoid using Numbers in your username handle, This may confuse you when searching by other users
- Use username generator tools
- Don't use communication words in your Handles
- Limit your underscores

What Makes a Good Social Media Handle?

A good social media handle is something that is easy to remember, it's catchy and it should be unique.

Some people use their name, initials, or catchy word as their social media handles.

What's in a good Twitter handle example

A good Twitter handle is something that people can remember and recognize. It should be short, concise, and easy to spell.

- The name should not include any symbols or numbers.
- Meaningful words are better than random words.
- You should not use your full name or any other personal information in your twitter handle.

Other Social Media Handles:

As we discussed, what is social media handle in the previous part, now let us detail, what are the different social media using handles for their users.

What is an Instagram Handle?

An Instagram handle is a username on the popular photo and video-sharing app, Instagram.

It is a unique name that you choose for yourself. It can be your name/nickname / or any other word or phrase related to your brand.

What are the Benefits of a Good Instagram Handle?

- The benefits of a good Instagram handle can be summarized in three categories:

  It is easier to remember.

- It provides an easy-to-read and recognizable name for the account.
- It can be used as a branding tool for your company or personal brand.

YouTube Introducing Handles for their users

YouTube is a video-hosting website that was founded in 2005 and is currently owned by Google. It is free to upload content and use, but charges advertisers to run ads.

Youtube is a favorite choice for many video content creators and users. It's not simply a youtube channel, it's a home base and community for many users.

Once you are eligible to personalize the channel, youtube will notify you through your youtube channel and Emails.

Your handle will be part of the URL. When using this Youtube handle, then you will direct to your channel like the following example

Youtube.com/@examplehandle

Who are eligible to create a Youtube handle?

The Youtube handle is accessible to everyone, anyone has a channel can create a @handle for their YouTube channel and they remove the 100 Subscriber Threshold. This handle can be viewed by the creator as well as the viewers.

Guidelines for Creating a Youtube channel

- Handles can be up to 30 Characters
- Choose the best handle that represents your channel
- Your handle must follow the Youtube Community Guidelines.
- The handle already used by other channels cannot be created by another channel, however, they can personalize and choose the unique handle name for their channel

Where to personalize the handle on Youtube?

Logging into your Youtube channel and go to YouTube studio and you can personalize your URL for the Username of your YouTube channel.

Using the Handle is very easy for the creators to promote their Channel to the maximum

Benefits of Handle in Youtube Channel

- Your handle will be noticed in Youtube shorts
- Identify your channel in a new way
- Easy to find your channel through others
- Connect with others in your community

Conclusion

Youtube currently started to roll out the Handles to users. Once it is rolled out, Your Handle will display in Search results, short tabs, comments, and mentions. In the future, it may show up in many places across YouTube. This is a new option to reach and find users on Youtube.

THE ART OF WRITING AND SOLVING CODES

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What is Cryptography?

Building and evaluating protocols that keep the public or outsiders from reading messages are the focus of cryptography. The word is derived from Kryptos, a concealed word in Greek. It is closely related to encryption, which is the process of converting plain text into ciphertext before sending it and then back again after receiving it. The obscuring of information in photographs using methods like microdots or merging is also covered by cryptography.

Okay!!! Now, we can use an illustration to demonstrate cryptography. Let's examine how cryptography can be used to protect Rosh and Sam's connection.

- To safeguard his message Before sending his communication, Rosh changes its shape from readable to unreadable.
  He now transforms the message into a series of random digits. He then uses a key to encrypt his message, creating what is known as ciphertext in the field of cryptography.
- Rosh uses ciphertext or encryption to send this message via the communication channel so he won't have to worry about anyone intercepting his private communications.

Let's say Eaves finds the message here and manages to change it before Rosh receives it.

Sam would now require a key to unlock the communication and reveal the original plaintext. Sam would have to use the decryption key to change the ciphertext into plain text. He would translate the ciphertext or the numerical value into the equivalent plain text using the key.

What will be revealed after employing the decryption key is the original plaintext message, which is a mistake. This inaccuracy is significant right now. Sam is able to distinguish Rosh's message from the one he received because of this. As a result, we can conclude that encryption is crucial for online communication and information sharing.

Characteristics of Cryptography

1. Confidentiality:

Only the person for whom the information is meant may access it, and no one else may do so.

2. Integrity:

Data cannot be changed while being stored or transferred between a sender and a recipient without the addition of new data

3. Non-repudiation:

The information creator/sender cannot later retract his desire to send information.

4. Authentication:

The sender's and receiver's identities are verified. Additionally, the information's origin and destination are verified.

Types of Cryptography

Symmetric Key Cryptography:

It is an encryption technique where messages are encrypted and decrypted using the same shared key by both the sender and the recipient. Although symmetric key systems are quicker and easier to use, they have the drawback of requiring a secure key exchange between the sender and the receiver. Data Encryption System is the most widely used symmetric key encryption system (DES).

Hash Functions:

This algorithm makes no use of any keys. It is difficult to reconstruct the plain text's contents because a hash value with a fixed length is calculated based on it. Hash functions are widely used in operating systems to secure passwords.

Asymmetric Key Cryptography:

Information is encrypted and decrypted using this system's pair of keys. A private key is needed for decryption, while a public key is utilized for encryption. The private key and the public key are distinct. Even if everyone knows the public key, only the intended recipient has the private key, therefore he alone can decode the message.

Future of Cryptography

Elliptic Curve Cryptography

(ECC) has already been invented but its advantages and disadvantages are not yet fully understood. ECC allows performing encryption and decryption in drastically lesser time, thus allowing a higher amount of data to be passed with equal security. However, as with other methods of encryption, ECC must also be tested and proven secure before it is accepted for governmental, commercial, and private use.

Quantum computation

It is the new phenomenon. While modern computers store data using a binary format called a "bit" in which a "1" or a "0" can be stored; a quantum computer stores data using a quantum superposition of multiple states. These multiple valued states are stored in "quantum bits" or "qubits". This allows the computation of numbers to be several orders of magnitude faster than traditional transistor processors.

To comprehend the power of the quantum computer, consider RSA-640, a number with 193 digits, which can be factored by eighty 2.2GHz computers over the span of 5 months, one quantum computer would factor in less than 17 seconds. Numbers that would typically take billions of years to compute could only take a matter of hours or even minutes with a fully developed quantum computer.

In view of these facts, modern cryptography will have to look for computationally harder problems or devise completely new techniques for archiving the goals presently served by modern cryptography.

As our society transitions to one with more automated information resources, the significance of cryptography as a security measure will only grow. Access control and data security will need to be strengthened in electronic networks used for banking, retail, inventory control, benefit and service delivery, information storage and retrieval, distributed processing, and government applications. By applying cryptography, information security can be simply achieved. Some applications, particularly financial systems, are currently thought to be insecure when using DES. Additionally, several analytical findings show the cipher's theoretical shortcomings. Therefore, it becomes crucial to improve this algorithm by including new levels of security in order to make it useful. Data integrity, authentication, and sensitive data security can all be achieved through the use of cryptography. It must be used correctly, and the right cryptographic algorithm must be applied. Before creating any application, developers must be familiar with the phrases sniffing, spying, and spoofing.In general, one should never deny that concepts like information technology, cryptography, and quantum computers are unavoidable in the present world. Due to its intimate connection to both human and technology advancement, cryptography has one of the longest and most enduring histories of evolution. Cryptography is still adaptable everywhere, despite the fact that humans have always used hidden information, whether to obtain an advantage in battle or to choose the best military tactics in the current world to compete. Positive aspects like the security of communications and the preservation of personal information are just as important as the ability to conceal information and pose threats. Cryptography development is a human capacity that must be improved through time. Egypt is where cryptography's history begins, some 4,000 years ago. The earliest kind of encryption was employed by the Egyptians to communicate with one another: hieroglyphics. Later, in 500 BC, the method was changed by substituting alphabets for the characters in accordance with some well-kept secret. This principle became recognized as the key to unlocking secret codes or messages.

More advanced methods, including the Vigenere cipher and coding devices like the Enigma rotor machine, emerged later, in the 15th century. Later on, cryptography was created. Nowadays, secret passwords and other sensitive information are kept secure online using cryptography. Cybersecurity experts increasingly utilize it to encourage innovation, ciphertext, and other protective measures that compel but also shield corporate and personal data.

Thanks

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