



# iziar

e-magazine

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# EVERYTHING ABOUT ELECTRIC VEHICLE

## THE EVOLVING LANDSCAPE OF SEO



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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 Industrial 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.

# Advancements in Bioinformatics Instrumentation: **Unlocking the Secrets of Life**



**GITHEESH SB**  
Project Engineer

The field of bioinformatics, a multidisciplinary field that envelops science, software engineering, and data innovation, assumes a significant part in our journey to unwind the secrets of life. With the remarkable development of natural information, the requirement for cutting edge bioinformatics instrumentation has never been more basic. In this article, we will investigate the meaning of bioinformatics instrumentation, its development, and the way that it engages researchers to more readily comprehend and control organic frameworks.



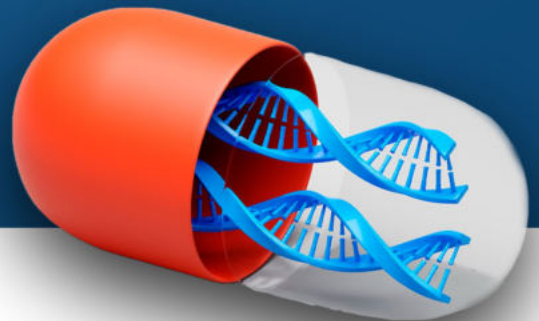




# The Requirement for Bioinformatics Instrumentation:

Bioinformatics is turning out to be progressively critical to analysts and researchers as how much natural information develops. The field of bioinformatics gives the important instruments to information the executives, examination, and translation, from sequencing the human genome to concentrating on the intricacies of biological systems. Because of state of the art innovative headways, bioinformatics instrumentation is at the focal point of these undertakings, giving specialists the capacity to process, store, and dissect a lot of natural data.

## Genomic sequencing: The Genomic Upheaval



Genomic research is one of the most noticeable uses of bioinformatics instrumentation. Lately, progresses in instrumentation have upset genomic sequencing, the most common way of deciding the request for DNA nucleotides in a creature's genome. Cutting edge sequencing (NGS) has sped up genomic research using high-throughput sequencing advancements. Instruments like Illumina sequencers and Oxford Nanopore Innovations' Fluncky have made it conceivable to succession whole genomes quickly and cost-actually. Bioinformatics instruments then become possibly the most important factor for gathering, explaining, and examining these arrangements.

With bioinformatics programming and calculations, scientists can distinguish qualities, administrative components, and underlying varieties inside genomes. This has sweeping ramifications for customized medication, hereditary illness research, and the investigation of developmental science.

# Proteomics: Looking into the Universe of Proteins

Proteomics, the investigation of proteins and their capabilities, is another area where bioinformatics instrumentation is crucial. A principal device in proteomics is mass spectrometry, a strategy that decides the mass-to-charge proportion of particles. Combined with bioinformatics, it empowers the recognizable proof of proteins in complex blends, the measurement of their overflow, and the investigation of post-translational adjustments. This data is significant for figuring out infections, drug revelation, and the working of cell pathways.

## Primary Science: Disclosing the Three-Layered World

The investigation of protein structures is significant for figuring out their capabilities and cooperations. X-beam crystallography, atomic attractive reverberation (NMR) spectroscopy, and cryo-electron microscopy are fundamental procedures in primary science. Bioinformatics devices aid the translation of the unpredictable information created by these techniques. They help analysts picture and dissect protein structures, anticipate ligand-restricting locales, and configuration medicates that can target explicit proteins with high accuracy.



# Metagenomics: Investigating Microbial Universes



Metagenomics is a somewhat new field that spotlights on dissecting hereditary material from ecological examples. This approach permits researchers to concentrate on whole microbial networks without the requirement for culture or separation. Bioinformatics instrumentation and programming are essential for handling metagenomic information, empowering the recognizable proof of species, practical qualities, and biological connections inside these intricate environments. Metagenomics is essential to ecological examinations, the human microbiome undertaking, and figuring out the job of microorganisms in wellbeing and sickness.

## Difficulties and Valuable open doors

While bioinformatics instrumentation has essentially progressed the field of life sciences, it additionally presents difficulties. The sheer volume of organic information, the requirement for information normalization, and the interest for superior execution registering assets all posture critical obstacles. Moreover, as new innovations arise, bioinformatics apparatuses should consistently advance to stay aware of information created from different sources.

In this scene, there are promising open doors for additional advancement in bioinformatics instrumentation



**1. Coordination of Computerized reasoning (simulated intelligence):** Artificial intelligence and AI are progressively incorporated into bioinformatics instruments. They upgrade the exactness of information examination, foresee protein designs, and aid drug revelation. Later on, computer based intelligence is probably going to assume a more huge part in design acknowledgment and information translation.

**2. Distributed computing:** Cloud-based bioinformatics stages are turning out to be more well known. They offer versatile and practical answers for information capacity, examination, and coordinated effort. Analysts can get to strong computational assets without the requirement for broad on location foundation.

**3. Customized Medication:** Bioinformatics is at the front of customized medication, fitting medicines and intercessions to a person's hereditary cosmetics. As bioinformatics instrumentation turns out to be more exact, the commitment of customized medical services is reachable

**4. Multi-omics Coordination:** The mix of genomics, transcriptomics, proteomics, and metabolomics information is a prospering region. Bioinformatics instruments that can blend these multi-omics datasets hold extraordinary potential for understanding complex natural frameworks exhaustively

Bioinformatics instrumentation is the foundation of current natural exploration, empowering researchers to remove significance from the torrential slide of organic information produced by different innovations. It assumes a critical part in genomics, proteomics, primary science, and metagenomics, among different regions. As the field of bioinformatics keeps on developing, it presents the two difficulties and valuable open doors, with the joining of simulated intelligence, distributed computing, customized medication, and multi-omics research not too far off.

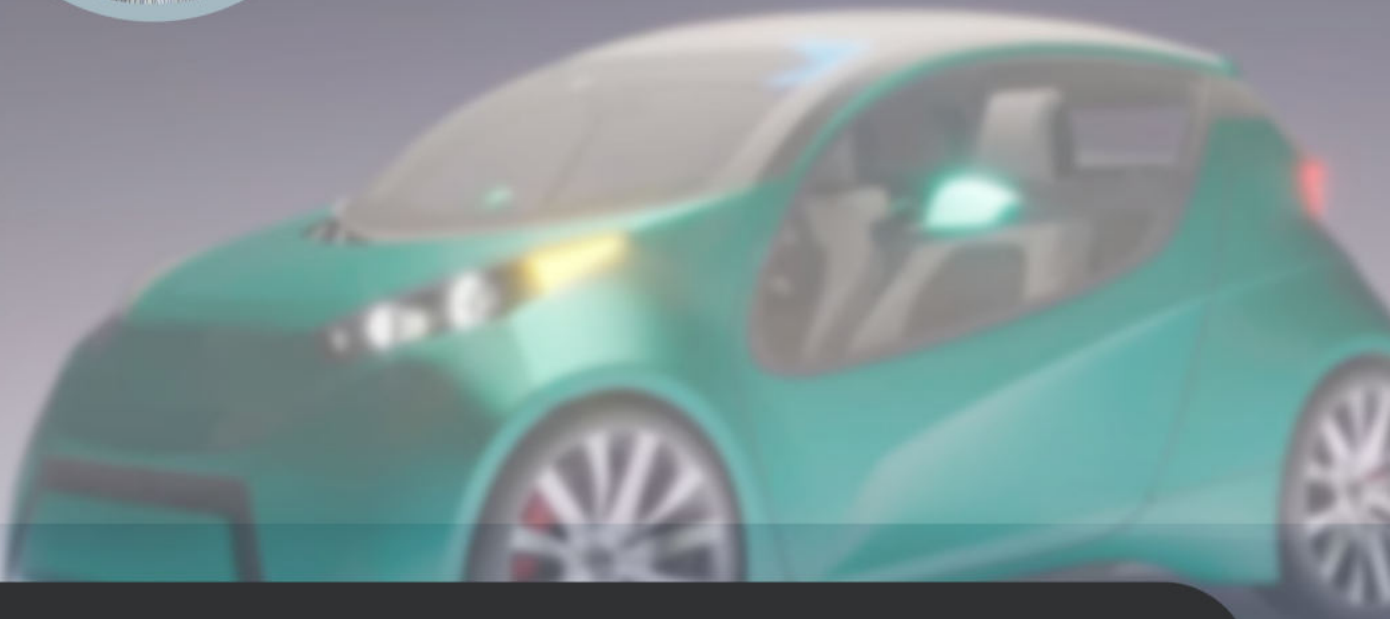
In 2023 and then some, we can anticipate that bioinformatics instrumentation should turn out to be significantly more modern, working with forward leaps in science, medication, and ecological science. As specialists and technologists work inseparably, the privileged insights of life will keep on unfurling, prompting a superior comprehension of the regular world and further developed medical services results for all.



# ELECTRIC VEHICLE



**NOWFAL IBRAHIM**  
Regional Technical Head



## INTRODUCTION

An electric vehicle, or EV, is a vehicle that operates on electricity and is usually powered by rechargeable batteries. Electric vehicles, or EVs, are preferred by environmentally conscious consumers due to their zero tailpipe emissions and improved fuel efficiency, unlike traditional gasoline-powered vehicles. EVs such as BEVs and PHEVs are examples of electric vehicles.



## Electric vehicles Innovations:

### 1. Battery Innovation:

EVs utilize high-limit battery-powered batteries to store electrical energy. Lithium-particle batteries are the most well-known type utilized in EVs.

### 2. Electric Motors:

EVs utilize electric engines to change over put away energy into movement. The engine is fuelled by the battery and drives the wheels of the vehicle.

### 3. Charging Foundation:

EVs need a charging framework for re-energizing the batteries. There are different kinds of charging stations including AC Level 1, AC Level 2, and DC quick charging.

### 4. Power Electronics:

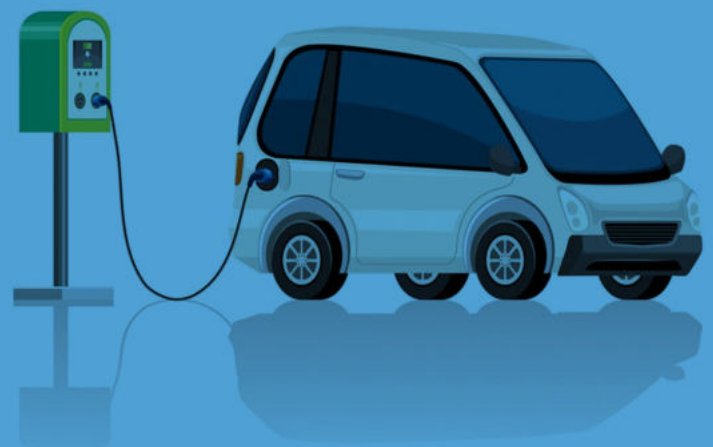
EVs use power electronics to control the flow of electrical energy from the battery to the motor. This incorporates parts like the inverter, battery and on-board charger.

### 5. Vehicle Control Frameworks:

A locally available PC framework oversees different elements of the EV including battery the board, engine control, and charging.

### 6. Thermal Management Systems:

To guarantee ideal execution and life span of the battery, an EV might have a warm administration framework to control the temperature of the battery.





# Automation in Electric vehicle.

Automation in electric vehicles alludes to the utilization of different trend setting innovations, like sensors, calculations, and programming, to work on the presentation and productivity of the vehicle. Some of the key automation technologies used in electric vehicles includes::

## Drive-by-wire systems:

These systems utilize electronic controls to supplant mechanical parts in the customary power train, for example, gas pedal pedals and controlling segments, bringing about superior productivity and responsiveness.

## Battery management systems:

These systems enhance battery execution and broaden battery duration by overseeing charging and releasing cycles, temperature control, and different variables...

## Vehicle control systems:

These systems use calculations and sensors to control the power train, suspension, and different frameworks, further developing vehicle execution and wellbeing.

## Autonomous driving systems:

These systems utilize a mix of cameras, radars, and sensors to empower a vehicle to drive itself, decreasing the requirement for human information.

## Over-the-air updates:

Electric vehicles can get programming refreshes from a distance, permitting the vehicle to be refreshed with new highlights and capacities without the requirement for actual upkeep. These mechanization advances in electric vehicles work on the driving experience as well as increment the proficiency, security, and dependability of the vehicle.

## Future of electric vehicles

The fate of electric vehicles (EVs) looks encouraging, as they are turning out to be progressively well known because of various variables, including further developed execution, lower working expenses, and a developing consciousness of the ecological effect of customary gas controlled vehicles. A portion of the critical patterns and improvements forming the future of EVs include:





1. **More extensive reception:** As additional customers become mindful of the advantages of EVs and as the charging foundation improves, almost certainly, more individuals will begin to embrace EVs

2. **Further developed execution:** Advances in battery innovation, engine plan, and other key parts are supposed to bring about EVs with longer driving reaches, quicker charging times, and further developed execution.

3. **Expanded contest:** The EV market is supposed to turn out to be progressively serious, as new players enter the market and laid out automakers put resources into EV innovation.

4. **Government support:** Legislatures all over the planet are giving impetuses and appropriations to empower the reception of EVs, which will probably go on from here on out.

5. **Venture into new business sectors:** At present, most of EVs are sold in a couple of key business sectors, however as the market keeps on developing, all things considered, EVs will turn out to be all the more broadly accessible in new locales and nations.

In general, the eventual fate of EVs looks splendid, and almost certainly, they will assume an undeniably significant part in the worldwide transportation blend before very long.

## Advantages of electric vehicles over other customary vehicles.

1. **Harmless to the ecosystem:** EVs produce less ozone depleting substance outflows than conventional fuel controlled vehicles, assisting with decreasing air contamination and relieve environmental change.

2. **Lower working expenses:** The expense of power to control an EV is regularly lower than the expense of fuel, prompting lower generally speaking working expenses.

3. **Further developed eco-friendliness:** EVs are regularly more energy-productive than conventional gas controlled vehicles, prompting further developed mileage.

4. **Tranquil and smooth driving experience:** The electric engine in an EV gives smooth, calm speed increase and driving experience.

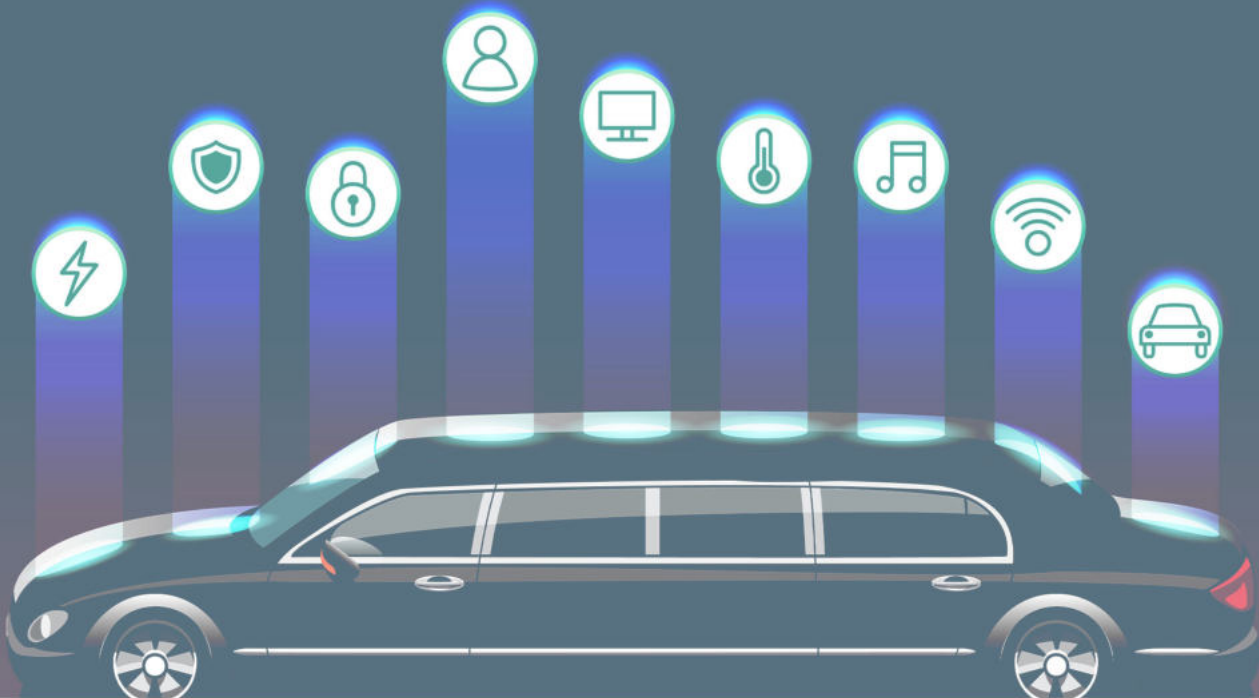
6. **Government motivating forces:** In numerous nations, state run administrations offer tax reductions, discounts, and different motivators to support the reception of EVs, making them more reasonable to buyers.



# Important points Prior to Purchasing Electric vehicles.

Here are a portion of the critical variables to consider prior to purchasing an electric vehicle (EV):

- 1. Range:** The distance an electric vehicle can go on a solitary charge.
- 2. Charging foundation:** Accessibility of charging stations and the time it takes to charge the vehicle.
- 3. Battery duration and substitution cost:** The life expectancy of an electric vehicle's battery and the expense of supplanting it.
- 4. Support costs:** The expense of keeping an electric vehicle contrasted with a conventional gas fuelled vehicle.
- 5. Driving propensities:** You're everyday driving distance and how frequently you should charge your vehicle.
- 6. Absolute expense of proprietorship:** The forthright expense of the vehicle, fuel expenses, support, and different costs.
- 7. Accessible motivating forces:** Government and producer impetuses that can lessen the expense of buying an electric vehicle.
- 8. Exchange esteem:** The resale worth of the electric vehicle contrasted with customary gas fueled vehicles.
- 9. Way of life and requirements:** The size and highlights of the electric vehicle that fit you're driving necessities and way of life
- 10. Running expenses:** The running expenses of an EV, like power and support, are ordinarily lower than those of a customary gas fuelled vehicle. Consider the expense of power in your space and any administration motivations that might be accessible.
- 11. Charging time:** Consider the time it takes to charge the battery of your EV, as well as the accessibility of quick charging stations in your space.



# HARNESSING THE POTENTIAL OF ARDUINO FOR HOME OR OFFICE AUTOMATION



**ATHIRA.G**  
PROJECT ENGINEER

## INTRODUCTION

It is possible to decrease the amount of work performed by humans by automating their environment. There has been significant development in the area of an individual's routine tasks and those can be automated. Nowadays, most people are glued to their smart phones and smart devices throughout the day. In addition, these devices can be controlled by a Bluetooth Android-based smart phone interfaced Arduino that is capable of controlling a number of appliances such as lights, fans, bulbs, and many others through an on/off relay.



## CONCEPT

Home or office automation using Arduino aims at Bluetooth control of home appliances using our mobile phone having an Android platform. Alternatively, home automation controls the household environment through the use of simple components, whereas office automation controls the work environment by enabling the activation of various electrical appliances. Thus it is very helpful for elders, handicapped people, workers, patients in bed etc. They can control bulbs, fans and other appliances using Bluetooth control via our mobile phone. The main advantage is that they don't need to go near the switch board to turn off or turn on purpose.

## ARDUINO UNO

Arduino is a tool for controlling more of the physical world than your computer. It's an open-source computing platform based on a simple ATMEGA328P microcontroller IC, and a development environment for writing software for the board. The Arduino Uno is a microcontroller board on the basis of ATmega328. It has 14 digital input/output pins (of which 6 we can use as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything that supports the microcontroller; simply connect it to a computer with a USB cable and upload a code and use it.



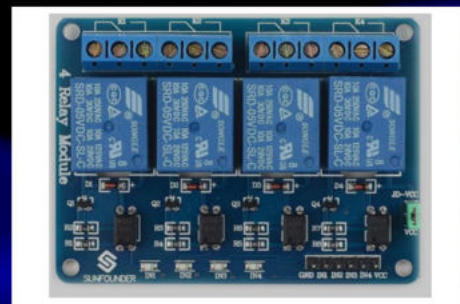
## BLUETOOTH MODULE

When it comes to electronics and communication, wireless communication is rapidly replacing wired connections. Designed to replace cable connections, the HC-05 uses serial communication to communicate with electronics. Using these features we can make serial connections with other Bluetooth enabled devices like mobile phones, tablets and laptops. The module runs on power from 3.3V to 6V. Usually, it is used to connect small devices like mobile phones using a short-range wireless connection to exchange files.

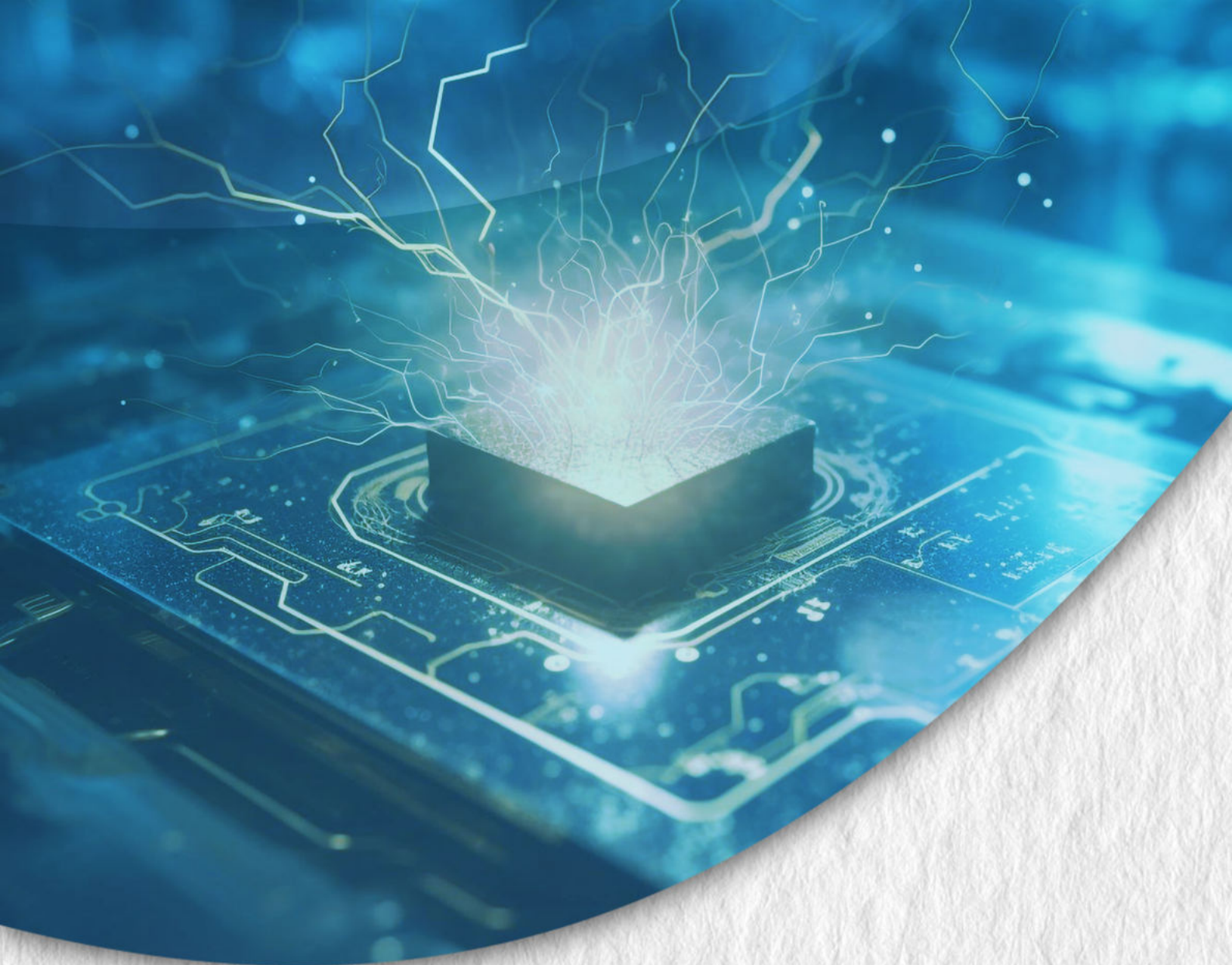


## RELAY

A relay is an electrical switch button that uses electromagnet power to move the switch from off to on position without touching. It needs a small amount of power to turn on but it can control something that draws much more power. Different relay configurations are available like SPST, SPDT, DPDT, which have various numbers of changeover contact surfaces. By using the proper combination of contactors, the electrical circuit can be switched on and off using an Arduino.







## CONCLUSION

The proposed system describes Bluetooth communication as an application layer for gateway between the user and office appliances. Any Android based smart phone with built in support for Bluetooth can be used to access and control devices at home. The need for this is to create a device which saves electricity and improves human life style.



# AVIATION AND VESSEL SUPPLY : A COMPREHENSIVE OVERVIEW



**CLEMENT PAUL**  
Embedded Engineer

## INTRODUCTION:

In the dynamic realm of modern transportation, the need for a steadfast power supply in planes and ships transcends mere functionality; it is the lifeblood of progress. Empowering propulsion, navigation, safety, and sophisticated systems, this vital energy source propels not just vessels but the very aspirations of high-ranking officials steering us towards a future uncharted.

In the commanding domains of aerial and maritime travel, the significance of an unwavering power supply extends beyond the mundane; it is the pulsating force propelling us into a future defined by efficiency and innovation. High-ranking officials overseeing these vast enterprises recognize that resilient power infrastructure is not merely a technical prerequisite but a cornerstone of progress.

For aircraft, this vital energy source fuels not only engines but also an intricate network of avionics, ensuring seamless communication, precise navigation, and the safety of passengers and cargo. In the ethereal dance through the skies, electrical power becomes the unseen conductor orchestrating the symphony of flight.

# POWER IN SHIPS OR VESSELS:

Onboard power is generated using a prime mover and alternator that work together. For this purpose, an alternator is used on board the ship.

This generator is based on the principle that a change in the magnetic field around a conductor induces a current in the conductor.

Onboard distribution system consists of different components for distribution and safe operation of the system. They are:

- Ship Generator consisting of prime mover and alternator the main switch board which is a metal enclosure takes power from the diesel generator and supplies it to different machinery.
- Bus Bars act as a carrier and allow the transfer of load from one point to another. Circuit breakers that act as a switch and in unsafe conditions can be tripped to avoid breakdowns and accidents. Fuses as safety devices for machinery.
- When powering lighting systems, step-down transformers are used in the power distribution system.
- In a power distribution system, the voltage at which the system works is usually 440v.
- There are some large installations where the voltage is as high as 6600v.
- Power is supplied through circuit breakers to large auxiliary machinery at high voltage.
- For smaller supply fuse and miniature circuit breakers are used.
- The distribution system is three wires and can be neutrally insulated or earthed.
- An insulated system is preferred as compared to an earthed system because during an earth fault essential machinery such as steering gear can be lost.





This allows normal industrial equipment to be used on board ship after being “marinized”, where necessary, to withstand the rigor of a sea-life (e.g. it must withstand the vibration, humidity, high temperature / ozone, sea-water, etc. encountered in various parts of the ship).

The majority of ships have a 3-phase d. c., 3-wire, 440 V insulated-neutral systems. This means that the neutral point of star-connected generators is not earthed to the ship’s hull. For continental European vessels, a 380 V, 3-phase system is common. Vessels with very large electrical loads are equipped with generators operating at high voltage (HV) of 3.3 kV, 6.6 kV and 11 kV.

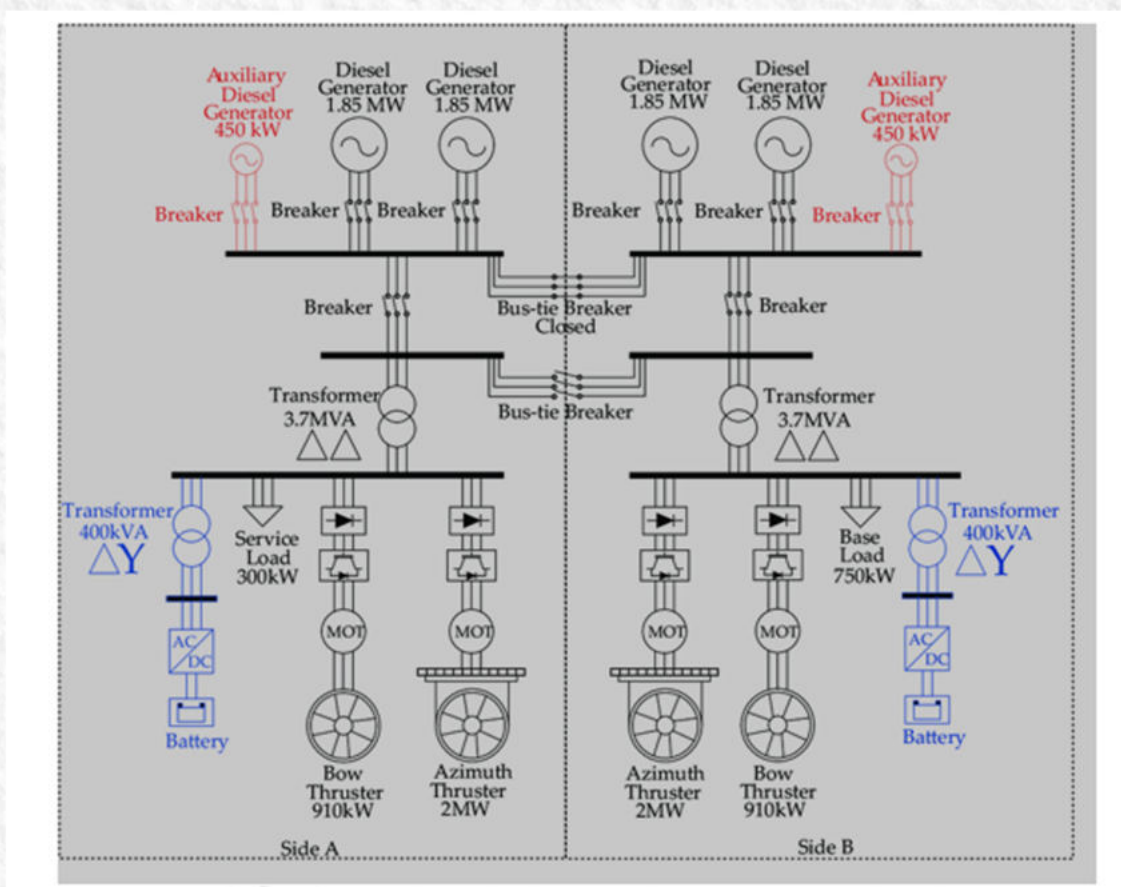
Such high voltages are economically necessary in high power systems to reduce the magnitude of currents and the size of required conductors and devices.

As ships increase in size and complexity, operating at such high voltages is becoming more common.

For example, large cruise ships and large ships. Offshore oil and gas production platforms operate at up to 13.8 kV and equipment weight reduction is critical.

In such high voltage distribution systems, the star point is usually grounded to the hull via a resistor or grounding transformer.

Preferential load shedding, generator scheduling, and load balancing are typically part of an overall energy management system “PMS”.



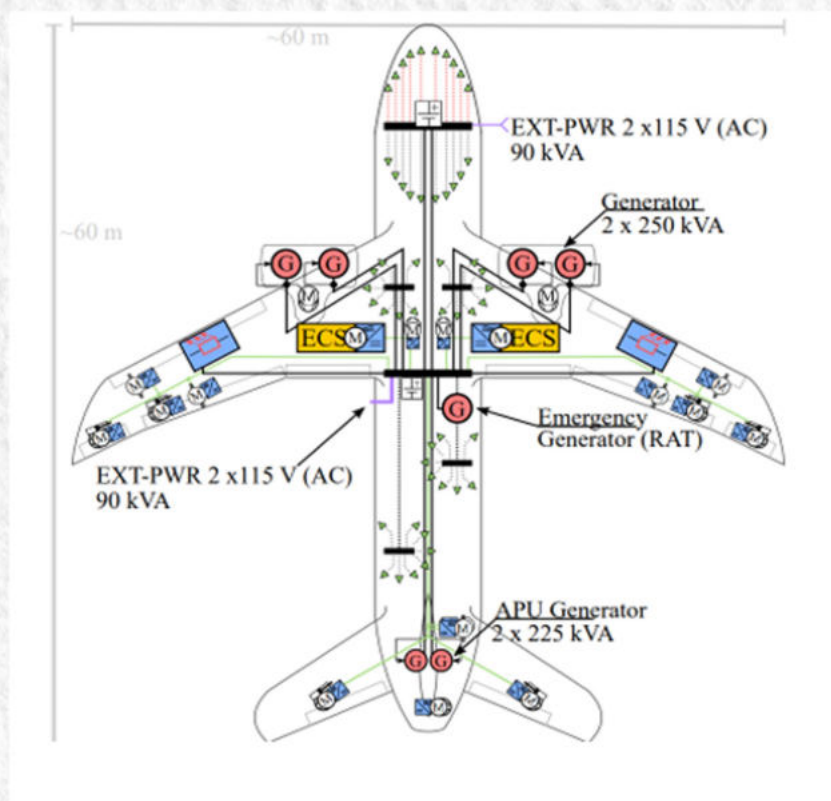


## POWER SUPPLY IN AIRCRAFTS:

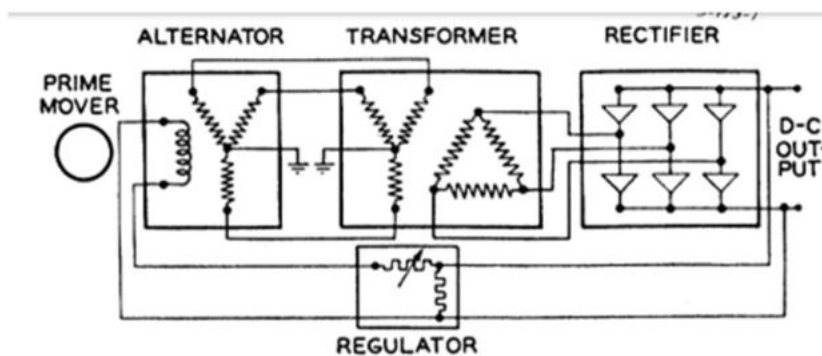
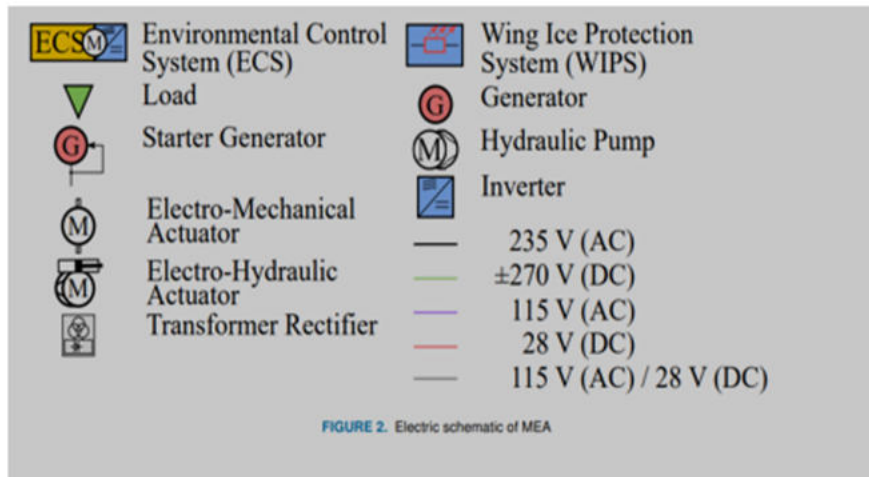
Electrical energy supply systems are one of the most important research areas in the field of sustainable and energy efficient aviation, especially for fully electric aircraft. This paper discusses the history of electrification, and current trends with a broad overview of research activities, the state of the art of electrification, and an initial proposal for a short-range aircraft. Outline the mission profile, power source, power distribution system approach, and required electrical loads. Aspects and issues of current research are discussed, including voltage levels, semiconductor technology, topology, and reliability. Because of the importance of safety possible circuit breakers for the proposed concept are also presented and compared, leading to an initial proposal. Additionally, a very broad review of the literature and a state-of-the-art discussion of the wiring harness are given, showing that this topic comes with a high number of aspects and requirements:

## ELECTRICAL POWER SUPPLY:

Because the electrical system power has increased dramatically by replacing the bleed air, the effective alternating voltage of the three-phase system is increased to 235 V (typically 115 V). Fig. 2 shows a distributed redundant electrical power system, which is centralized in a typical aircraft. For compatibility reasons, the voltage level 115 V AC and 28 V DC is used, since many components are designed for this voltage level and many airports provide this external power supply. The DC voltage of  $\pm 270$  V is mostly generated by passive three-phase bridge rectifiers (so-called Auto Transformer Rectifier) and is used to supply components with high electrical power, such as the compressors for the ECS. One of MEA's research projects is to increase the voltage of the power system to 540 V DC. Standards such as MIL-STD-704F must be adapted. Arcing represents a major risk under such harsh environmental conditions. A further challenge is the increasing demand for power and the associated power generation.







Block diagram of aircraft electric plant of 800- ampere 30-volt d-c rating

In summary, the essential role of robust power sources in air and maritime transport is critical to global connectivity. As senior officials debate the future of international transportation, it is paramount to recognize the fundamental role of power in ensuring the continued efficiency, safety, and progress of global aviation and maritime endeavors.

# THE EVOLVING LANDSCAPE OF **SEO**



**Malavika**  
DM Analyst

## **Search Engine Optimization (SEO)**

is a dynamic field that's in a constant state of evolution. As we step into 2023, the digital marketing landscape is witnessing new trends and challenges in SEO. Staying on top of these developments is essential for any business aiming to maintain a competitive edge in the online world. In this article, we'll explore the latest trends and best practices in SEO for 2023, covering algorithm updates, on-page and off-page optimization, and the growing importance of voice search and mobile SEO.





## ALGORITHM UPDATES: ADAPTING TO GOOGLE'S CHANGES

Google, being the dominant search engine, continues to refine its algorithms to deliver more accurate and relevant search results. This means that SEO professionals must remain agile and adapt to these changes to maintain or improve their search rankings. In 2023, there are several key considerations:

### 1. Core Web Vitals:

Google's page experience update, which began rolling out in 2021, is still a significant factor. It focuses on user experience metrics like page loading speed, interactivity, and visual stability. For SEO to be successful, these factors must be optimized.

In recent years, Google has placed a growing emphasis on user experience as a ranking factor. Core Web Vitals are a set of specific metrics that Google uses to evaluate the quality of the user experience on a website. These metrics focus on three key aspects:

- **Loading Performance (Largest Contentful Paint - LCP)**

FID measures the time it takes for a web page to become interactive, allowing users to interact with elements like buttons or forms. Less than 100 milliseconds is a great FID score. Reducing third-party scripts and optimizing code can help improve FID.

- **Interactivity (First Input Delay - FID)**

LCP measures how quickly the main content of a web page loads. For a good user experience, it should occur within the first 2.5 seconds of the page starting to load. To improve LCP, optimize images, and use efficient coding practices.

- **Visual Stability (Cumulative Layout Shift - CLS)**

CLS evaluates how stable a web page's layout is during loading. A good CLS score is 0.1 or less. Avoid sudden layout shifts caused by elements shifting or moving unexpectedly on the page. Optimizing these factors is essential not only for SEO but also for providing a better user experience. When users can access content quickly and interact with it smoothly, they are more likely to engage with your site, stay longer,

#### A. BERT and Natural Language Processing:

With the Bidirectional Encoder Representations from Transformers (BERT) update, Google is better understanding the context and nuances of search queries. Content needs to be more conversational, addressing user intent effectively.

#### B. Privacy and Security:

User privacy is a growing concern. Implementing HTTPS, ensuring data security, and respecting user privacy preferences are essential.

## ON-PAGE AND OFF-PAGE OPTIMIZATION: QUALITY OVER QUANTITY

#### BERT and Natural Language Processing:

On-page optimization involves optimizing elements on your website to enhance its visibility and relevance to search engines. In the past, the focus may have been on keyword stuffing and creating a high volume of content. However, in today's SEO landscape, quality takes precedence:

- **Interactivity (First Input Delay - FID)**

Instead of creating numerous pages with thin content, prioritize creating high-quality, valuable content. Content should be informative, relevant, and address the user's intent. Google's emphasis on E-A-T (Expertise, Authoritativeness, Trustworthiness) highlights the importance of quality content.

- **Keyword Optimization:**

Rather than overloading your content with keywords, focus on strategic and natural placement. Use relevant keywords that align with user queries, and consider semantic search to capture a broader range of related terms.



#### • User Experience:

Search engines reward websites that offer a positive user experience. Ensure your website is mobile-friendly, has a clear and logical structure, and provides a seamless navigation experience. Page speed, as part of Core Web Vitals, is also a critical factor.

#### • Meta Tags and Descriptions:

Create captivating meta descriptions and titles that accurately reflect your information. These snippets not only impact search rankings but also influence click-through rates.

#### OFF-PAGE OPTIMIZATION: BUILDING A QUALITY BACKLINK PROFILE

Off-page optimization consists of activities you take off of your website to increase its authority and visibility. In the past, the quantity of backlinks may have been a primary focus. However, the quality of backlinks is now paramount:

##### • Earned Backlinks:

Instead of pursuing a large number of low-quality backlinks, concentrate on earning high-quality, relevant backlinks from authoritative websites.

##### • Link Diversity:

Diversify your link profile by obtaining links from a variety of reputable sources. Natural link-building methods, such as guest posting, influencer collaborations, and creating shareable content, contribute to a healthier link profile.

##### • Relevance and Authority:

Prioritize links from websites that are relevant to your industry or niche. Links from authoritative sources carry more weight in search engine algorithms.

##### • Social Signals:

While the direct impact of social signals on SEO may vary, maintaining an active and engaged social media presence can indirectly contribute to your website's visibility and brand authority.

#### • Why Quality Matters More Than Quantity

##### • User Trust and Credibility:

High-quality content and reputable backlinks contribute to building trust and credibility with your audience. Users are more likely to engage with and trust content that provides genuine value.

##### • Algorithmic Changes:

Search engine algorithms, especially Google's, have become more sophisticated in evaluating content and backlinks. Quality signals are given more weight, and attempts to manipulate rankings with quantity-focused strategies can lead to penalties.

##### • Long-Term Success:

Pursuing a strategy of quality over quantity sets the foundation for long-term success. While quick gains might be possible with quantity, they are often short-lived and can be detrimental in the long run.

In conclusion, both on-page and off-page optimization strategies should prioritize quality to align with the evolving standards of search engines and user expectations. By focusing on providing value, a positive user experience, and building a strong, authoritative online presence, businesses can position themselves for sustained SEO success.



## VOICE SEARCH AND MOBILE SEO: **THE FUTURE IS MOBILE**

Voice search and mobile devices are integral to the future of SEO. With the proliferation of smart phones and smart speakers, optimizing for voice search and mobile is more critical than ever.

- **Voice Search Optimization:**

Focus on long-tail keywords and conversational queries. Optimize your content for voice by providing concise, direct answers to common questions.

- **Mobile-First Approach:**

Ensure that your website is mobile-responsive, loads quickly on mobile devices, and offers an excellent user experience. Mobile-friendliness is a significant factor in search rankings.

- **Local SEO:**

With more people using mobile devices to search for local businesses and services, optimizing for local SEO is essential. Take control of your Google My Business listing, make it better, and promote client testimonials.

In conclusion, SEO in 2023 is all about adaptability, quality, and user-centric strategies. Keeping up with algorithm updates, delivering valuable content, and optimizing for voice search and mobile devices are key to success. As SEO continues to evolve, staying informed and implementing the latest best practices will be the foundation of a successful digital marketing strategy in the coming year.

# LET'S DIVE INTO THE DIGITAL WORLD: **YOU'RE FRIENDLY GUIDE TO DIGITAL MARKETING**



**OMKAR BHILARE**  
DM ANALYST

Hey buddy!

Are you curious about this whole digital marketing scene?  
Trust me; it's like adding a pinch of masala to your business recipe.  
Digital marketing is like the secret ingredient that makes your business  
stands out in the very bad world of the internet.

”



## THE REAL POWERHOUS OF DIGITAL WORLD

Please try to imagine. Is your company hosting parties and digital marketing?

You're the cool friend who invites everyone!

It's important to promote your brand, sell your products, and make connections, all done online.

It's the excitement of social media, the magic of SEO, and the art of creating memorable content.

## MAGIC OF SOCIAL MEDIA

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It's the excitement of social media, the magic of SEO, and the art of creating memorable content.

## SEO – THE SHOP OF YOUR BUSINESS

The simple logic of SEO – “What catches your eye makes you buy!

” Just like finding the perfect stall in a crowded market, SEO can help your business stand out from the online crowd.

It means appearing high in search engine results.

Let's be honest: who scrolls through multiple pages on Google?



## CONTENT CREATION – WORLD OF DIGITAL STORIES

Content is the soul of digital marketing.

It's not just about writing.

It's about the story. Just like telling your friends about your favorite movie scene, content creation is about creating engaging blogs, videos, and even memes that make people say "wow! "This is something else".

## Email Marketing – **Makes New Relations**

Email marketing is like writing a heartfelt letter to a friend. It's personal and direct. You can also engage with your audience personally, share updates and offers, and ask for feedback. After all, building relationships takes time, right?



## **INFLUENCER MARKETING – STARS OF DIGITAL WORLD**

Influencers are like celebrities in the digital world. They have their own fan base and appeal. Working with them is like having a celebrity endorse your brand. Just like meeting your favorite Bollywood stars, it's all about connecting with your followers and winning their hearts.

## **ANALYTICS – MAGIC OF DIGITS**

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## **MOBILE MARKETING – REACH EVERY CORNER**

Mobile phones have become an extension of us. Mobile marketing allows you to reach people on their phones wherever they are. It's like sending an invitation to everyone, no matter where you are, to get coffee. Whether you use the app, SMS, or mobile-friendly website, you're always just a tap away.

## **MOBILE MARKETING – REACH EVERY CORNER**

Paid advertising is like putting up a billboard in your busiest market. You pay to stand out. These include Google Ads, Facebook Ads, and sponsored posts that appear on Instagram. It's like shouting to the world, "Hey, I'm here and I have something great to offer!"



## **CUSTOMER ENGAGEMENT – MAINTAIN THE BOND**

Connecting with your customers is like maintaining a good friendship. They respond to comments, answer questions, and value feedback. It's about making them feel heard and valued, just like listening to a friend's rants and raves.

## **MAGIC OF E-COMMERCE**

Online sales are like a 24/7 store. E-commerce platforms allow you to sell products to anyone, anytime, anywhere. It's like having a virtual storefront that stays open even when you're catching up on your beauty sleep.

## **MAGIC OF DIGITAL MARKETING**

Imagine a magician performing a trick. Digital marketing is similar, but for your business. Attract prospects, convert them into customers, and keep them coming back again and again. These are the wheels that keep your business running, growing, and evolving.

## **THE FUTURE OF DIGITAL MARKETING**

Digital marketing is like a chameleon, its colors constantly changing. It's important to stay up to date with the latest trends and technology. With the rise of AI, voice search, and augmented reality, the future is about staying current and innovative.

In the end...

That's all about digital marketing, my friends! It's like learning a new dance.

Once you clear the steps, the dance floor is yours. Jump in, experiment, and enjoy the journey. Just like you and I talk about our favorite topics and mix in some ingredients, remember that digital marketing is about connecting with people.

Come on; let's bring our unique taste to the digital world! I hope this inspires you on your journey into the world of digital marketing.



# UNLOCKING THE POTENTIAL OF H<sub>2</sub>O GENERATION FROM AIR



**MR YASH RAVI JOIODE**  
**BMS TRAINER**

**C**limatic conditions, Global warming and the need for safe water consumption worldwide to address the problem of freshwater scarcities, this study examines the potential of air to water generation. As reported by the World Health Organization, one-third of the world's population does not have access to clean drinking water, and climate change has resulted in significant changes in the weather conditions, changing to warm, wet and dry conditions.

Climatic changes are described as global warming which is the ongoing increasing temperature of the earth and its effects on climate. Currently the rise in global average temperature is rapid than previous and fossil fuel burning is the primary cause. Fossil fuel, deforestation, and industrial emissions add to greenhouse gases that consist of carbon dioxide and methane.

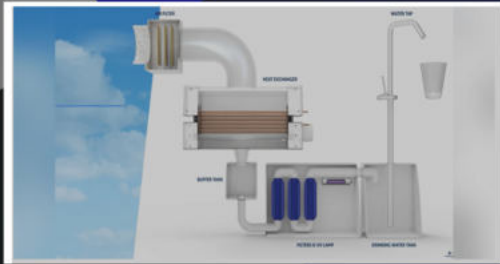
The greenhouse gases absorb the heat radiated after the sun warms the earth. These gases trap more heat in the Earth's lower atmosphere, causing global warming. Water shortages occur when there is no rain for a prolonged period of time. Droughts can last for days, months, or years and can have major impacts on ecosystems and agriculture.

Droughts are a recurring feature of the climate in most parts of the world. These include Central America, the Amazon, western and southern Africa, the Mediterranean, and southwestern Australia. As temperatures rise, evaporation increases, and as a result of climate change, evaporation is becoming more extreme and difficult to predict. Billions of people lack access to clean drinking water. The population affected by water scarcity will increase by 15% of the world population in the 20th century to 3.8 billion people, and in the 21st century by 60%.

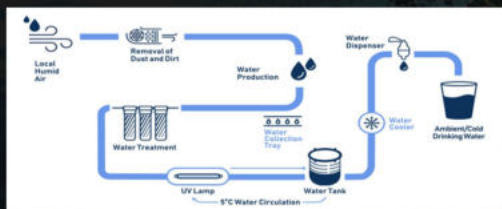


# AIR TO H2O GENERATION SYSTEM WORKING

The humidity that is present in the air is extracted by the condensation process and brought in contact with cold surfaces to produce fresh water while filters made up of minerals make water safe for consumption. The warm and humid environment is perfect. As the humid air flows from the condensation unit the water gets collected in storage tanks.



Thereafter, ozone purification is carried out to eliminate contamination and impurities. The system will comprise of a compressor which would circulate the refrigerant around the system. The refrigerant passes through the condenser and then towards the evaporator coil which cools the surrounding air. As the air temperature reaches dew point, water condenses in the collector.



The blower fan will push filtered air over the coil. Filtration systems will keep the water pure thus reducing the risk of microorganisms present in the air. The rate of water production will depend on atmospheric temperatures, humidity level, volume of air that passes over the coil and the H2O generator's capacity to cool the coil. The generator system will be more efficient when relative humidity and atmospheric temperature rise. The generator system won't work efficiently when atmospheric temperature and relative humidity decrease. In order to increase the relative humidity, an evaporator cooler with a brackish water supply can be used. To lower the air temperature, the semi-conducting materials will offer condensation in which one side of the semi-conducting material heats while the other side cools so the air is forced over the cooling fans. In this way, the temperature can be lowered.

The absorption refrigeration can be powered by solar means, which could prove economical efficient and more sustainable in application. Further heat can be used for pumping the collected water to storage. The system will filter and dehumidify the atmospheric air. In other ways, the Air to H2O Generation system can also use a hygroscopic technique i.e., absorbing water vapor present in the air through an absorption process.



Water production rates are highly dependent upon the air temperature and the amount of water vapor present in the air. The most commonly used AWG systems employ condenser and cooling coil technology to pull moisture from the air in the same way a household dehumidifier does. Although significant quantities of energy can be required to operate these condensers and fan systems, recent technological advancements have substantially improved the energy-water ratio increasing the feasibility of using these systems to help augment the Nation's drinking water resources.

## FUTURE APPLICATIONS

Innovation in air to water generators will enhance efficiency in water generation from air and integration with renewable energy sources like solar power and improvements in the purification and filtration process will make the future more accessible. Further development and advancement will lead to energy efficient and cost efficient units expanding the potential user base in the market.



# AUTOMATION TESTING: A COMPREHENSIVE OVERVIEW



**D A ANAND**  
Territory Technical  
Head



## INTRODUCTION

Nobody wants to find errors or bugs in their software, especially customers. That's why testing is an essential part of the SDLC process. It ensures that your software looks and works as it should and that your customers are happy. There are two ways to test your software: automated and manual.



## MANUAL TESTING

Manual testing involves testing your software's functionality manually. The tester enters your software and clicks through it just like a regular user would. They also record their results. They check for errors in log files and external services, as well as databases. It takes a lot of physical effort and time to make sure that your software code does what you want it to do, but after a while, it gets repetitive and tedious. The advantage of manual testing is that the tester's human reasoning can provide insights that test automation might not be able to.

## AUTOMATED TESTING

Automated software testing is a way of automating the process of verifying the performance of software and making sure that it meets the requirements before it is put into production.

It allows companies to do certain software tests faster without the need for human testers. It is best for large or repeated test cases. It uses script sequences that a test tool runs. The test tool tests the software, reports the results, and compares the results to previous test runs.

It is possible to write automated test scripts once and use them repeatedly. Organizations can use automated testing for a variety of purposes, such as unit testing, API testing, and regression testing.

One of the main advantages of automating software testing is that a lot of manual work is condensed into a single set of scripts. If unit testing takes up a lot of the QA team's time, this should be considered a good workhorse for automation.



# How does automated testing work?

The automated testing process typically follows the following series of

## Select the test tool.

This depends on the type of tests being performed and whether the tool in question supports the platform on which the software is being developed.

## Define the scope of automation.

This means how much of your software testing will be automated.

## Planning, Designing and Development.

This step includes planning your automation strategy and developing test scripts.

## Run the test.

Software is tested using automated scripts. Testing tools must also collect data and provide detailed test reports.

## Tests that are normally automated include the following:

- Acceptance tests
  - API tests
- Integration tests
- Regression tests
  - Smoke tests
  - System tests
  - Unit tests
- User interface (UI) tests



Organizations implement test automation in frameworks with common practices, test tools, and standards. Data-driven and keyword-driven test automation frameworks are widely used, as are linear scripting and modular testing frameworks. Linear scripting frameworks are suitable for small applications because they allow you to use test scripts with little planning, but they do not support reusable scripts.

In a modular testing framework, software testers write scripts as small, independent tests to reduce redundancy. However, this process typically takes some time to set up. Data-driven frameworks allow software testers to write scripts that work on multiple data sets and cover a wider range with fewer tests than with modular options. Keyword-driven testing frameworks use a table format to define keywords for each feature and execution method.

Even software testers without extensive programming knowledge can use keywords to create test scripts. A hybrid-driven framework combines two or more practices to get the best of both worlds.

Open source test automation tools and frameworks include Selenium, Robotium, and Cypress. Selenium can automate and run test parameters in multiple web browsers and in various programming languages such as C#, Java, and Python.

Robotium helps testers create automated user acceptance tests, functional tests, and system tests for Android devices. Cypress covers end-to-end, integration, and unit testing, all within the browser. Cypress allows you to access the distributed object model in your browser and provides a debugger for further testing.



## BENEFITS OF AUTOMATED TESTING

Automated testing can boost a QA team's efficiency. Benefits of automating the testing process include the following:

- Better reporting capabilities.
- More frequent tests.
- Enhanced resource efficiency.
- Faster than manual testing and has a faster feedback cycle
- Higher accuracy.
- Improved bug detection.
- Improved return on investment from manual testing.
- Increased coverage.
- Reusable test scripts.
- Scalability.

However, automation is not ideal for all types of software testing. For example, exploratory testing and visual regression testing are ideally performed manually.

However, potentially repetitive tests, such as integration tests, performance tests, and unit tests, are best suited to automation. Software testers who run these tests manually are likely to make errors, especially when the application contains thousands of lines of code or requires a large number of iterative tests.

Automation allows QA teams to avoid these human errors and complete checks faster than performing checks in person. Some test automation tools have reporting capabilities that log each test script and display the status of each test to the user.

Testers can compare results with other reports to assess how the software performs relative to expectations and requirements. Overall, automated testing allows employees to avoid manual testing when possible and instead focus on other project priorities.

QA teams can reuse automated test scripts to ensure that all tests run the same way every time. Additionally, automated testing allows teams to quickly find bugs in the early stages of development, reducing workload and project costs.



## GETTING STARTED WITH AUTOMATED TESTING

The first step to implement automation testing is selecting the right automation solution for your business. This will vary depending on your team size, experience level, and requirements

### OTHER FACTORS TO CONSIDER WHEN CHOOSING A TOOL INCLUDE:

- Budget
- Application type
- Development model
- Learning curve and ease of use
- Test maintenance and reusability
- Support for integrations
- Support and documentation
- Reporting capabilities





# EFFECTIVE LOCAL SEO STRATEGIES FOR SMALL BUSINESSES

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**Sumayya Beegam J N**  
DM Analyst

The success of a small business is increasingly dependent on the strength of its online presence in today's digital age. Businesses can connect with local audiences through local search engine optimization (SEO).

By optimizing your online presence for local searches, you can increase visibility, attract nearby customers, and ultimately increase sales. In this blog post, we'll explore some effective local SEO strategies customized for small businesses. Local SEO is a powerful tool for small businesses looking to connect with local audiences.

By implementing these strategies, you can increase your online visibility, attract nearby customers, and build a strong digital presence in your community. Remember, consistency is the key. So, monitor and update your local SEO efforts regularly to stay ahead in the competitive local market.

# OPTIMIZE YOUR GOOGLE MY BUSINESS (GMB) LISTING **SEO**

One of the first steps in local search engine optimization is to obtain and optimize your Google My Business listing. Make sure your business information, such as name, address, phone number, and business hours, is accurate and up-to-date.

Add a compelling business description, high-quality images, and choose relevant categories to increase your visibility in local searches. Encourage satisfied customers to leave positive reviews. Rankings in local search results can be significantly impacted by positive reviews.

**START**

## LOCAL FOCUS KEYWORD RESEARCH

Identify the keywords that potential customers in your area are likely to use when searching for your products and services. Include location-specific keywords in your website content, Meta description, and headings. This helps search engines understand the geographical relevance of your business and increases your chances of appearing in local search results.

## CREATE LOCATION-SPECIFIC CONTENT

Create content that resonates with local audiences. Create blog posts, articles, or landing pages that highlight local events, news, and community activities. This not only shows her connection to the community, but also provides valuable information that can attract local visitors to her website.



## LOCAL LINK BUILDING

Building high-quality local backlinks can have a huge impact on your local SEO efforts. Look for opportunities to collaborate with local businesses, organizations, and community sites. This may include sponsorships, partnerships, or participation in local events.

The more reputable local websites link to your website, the more search engines will recognize your business as a reliable and authoritative source of information in the local context.

## MOBILE OPTIMIZATION

Mobile devices are often used to conduct local searches. In this regard, it is essential that your website is mobile-friendly. Your local search rankings will improve if your site is mobile-friendly. Google prioritizes mobile-friendly sites in search results. Test your website's mobile responsiveness and make any necessary adjustments to improve the overall user experience for your mobile visitors.

## CONSISTENT NAP CITATIONS

NAP (name, address, phone number) consistency is important for local SEO. Make sure your business information is consistent across all online platforms, directories, and social media profiles. It is possible for search engines and potential customers to be confused by inconsistent information, which will adversely affect local search rankings.

## LOCAL SCHEMA MARKUP

By implementing local schema markup on your website, you can give search engines more information about your business, such as your location, business hours, and customer reviews. By using structured data markup, you can enhance your business' visibility in local search results and improve the likelihood that you will appear in rich snippets.

## UTILIZE LOCAL ONLINE DIRECTORIES

List your business in relevant local directories and review sites. Please ensure that the information on these platforms is accurate and consistent. Popular directories include Yelp, the Yellow Pages, and Bing Places. As a result of these listings, you not only receive valuable backlinks, but you also increase your chances of appearing in local search results.

# THANKS

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