SIES
Graduate School of Technology
RISE WITH EDUCATION

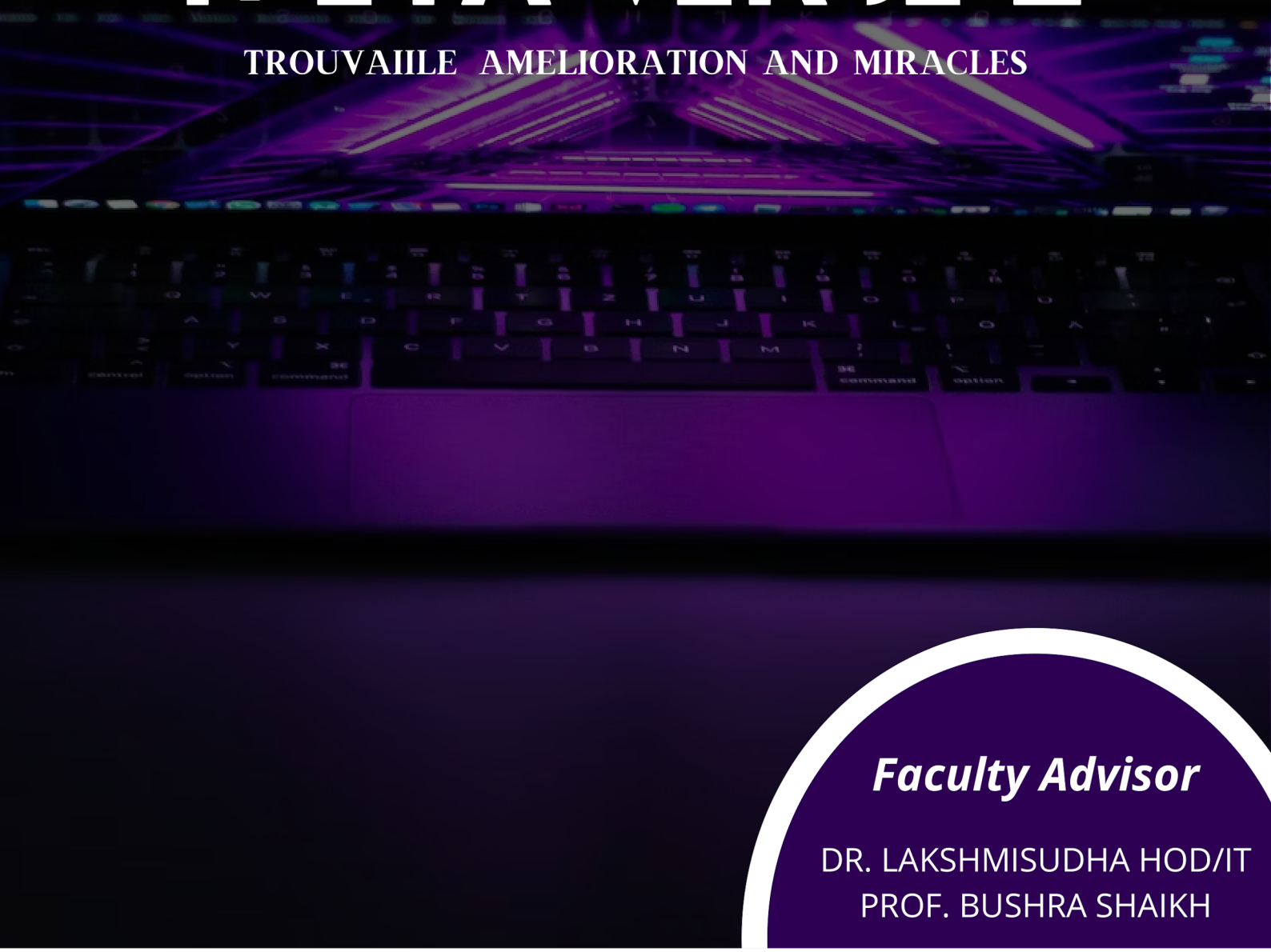
INFORMATION TECHNOLOGY DEPARTMENT

TECHSCIENCE

2022-2023

META VERSE 2

TROUVAIILE AMELIORATION AND MIRACLES



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Department of Information Technology

Vision

To develop IT professionals for accomplishment of industrial & societal needs through quality education.

Mission

- *To impart advanced knowledge and develop skills in Information Technology and allied fields.*
- *To enhance professional competence by inculcating values and ethics. To upgrade technical skills and also encourage research culture.*
- *To extend industry and alumni association for knowledge enhancement.*
- *To nurture entrepreneurial talent and contribute towards socio-economic growth.*

Program Educational Objectives :

Graduates will be able to:

- Compete in professional career with social and ethical responsibilities.
- Pursue higher studies/ research in Engineering & Management. Become Entrepreneurs or software professionals to satisfy the latest industrial requirements.

Program Specific Outcomes:

- *Students should be able to analyze, design and develop technological solution for a given scenario.*
- *Students should be able to involve themselves in life-long learning and cultivate skills for successful career, entrepreneurship and higher stud*

Welcome to the sixth issue of TECHSCIENCE. This term's theme is METAVERSE. Prepare yourself for a perfect fusion of literature, science, and technology.

NOTE TO READERS

Acknowledgement

Hello! Welcome to the 2022-2023 Edition of the TechScience Magazine.
Tech Science is aimed at providing you with news and info related to amazing things happening in our world related to Technology and Science It is an initiative taken by the IT Department of SIES Graduate School of Technology, Nerul, Navi Mumbai. This edition, is an effort of the faculty and students from TE and BE IT!
We're grateful to our HOD, Dr. Lakshmisudha for providing us with the opportunity and initiative and Prof. Bushra Shaikh, for being a constant mentor and guiding us in every step.
We hope you enjoy this edition and feel free to get back to us for any queries, suggestions, feedback, etc.

- Team TechScience

A NOTE BY HOD-IT

It gives me immense pleasure to inform you that the department of Information Technology is bringing out a new version of the Department Magazine TECHSCIENCE. This magazine is a perfect blend of articles related to advanced technologies. I am very happy to convey my congratulations to the team members in bringing out this wonderful magazine.

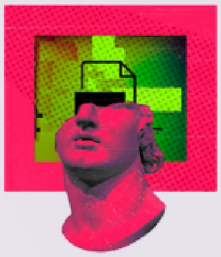
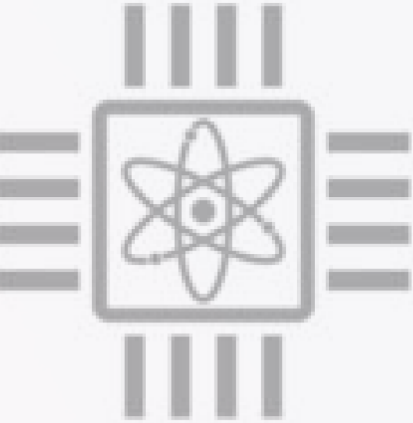


TABLE OF CONTENTS

QUANTUM COMPUTING

IN MEDICAL AND SPACE RESEARCH



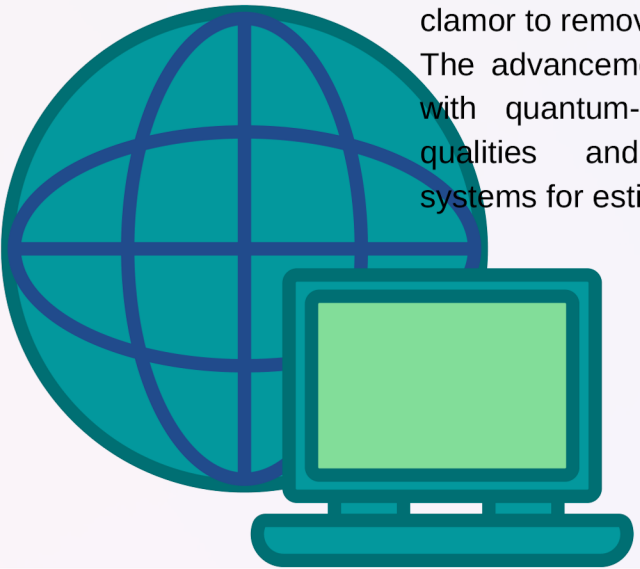
Throughout the long term, space travel has enthralled the personalities of people all around the globe. From needing to visit space actually to considering what else is out there in the universe, each individual has looked vertical with some type of such contemplations. Space investigation has advanced as of late with more privatized brands, like Space X. While the direction of the space investigation industry keeps on changing as innovation propels, the business is hoping to utilize quantum physical science to further develop estimations and exploration .The course of ensnarement works when one photon's quantum state isn't totally autonomous of another photon's quantum state.

Quantum innovation (involving quantum physical science standards in innovation structure), as snared photons and satellites, can make space correspondence simpler and quicker.

Estimating Space

How would we gauge Earth's shape? The investigation of Earth and its properties, like gravity, is known as geodesy. Estimating the world's shape is very difficult, and can be further developed utilizing quantum innovation. In December 2020, NASA proposed involving quantum innovation as quantum sensors, to more readily concentrate on the planet. These quantum sensors would emerge from an interaction known as quantum interferometry. Interferometry, while being a word to dominate a Scrabble match with, is an estimation procedure taking a gander at obstruction on foundation clamor to remove information.

The advancement of new identifiers with quantum-restricted responsive qualities and quantum-improved systems for estimations, metrology, and detecting will permit investigating new material science and actual components and will empower tests that are presently either restrictive or inconceivable on the ground. We will wind up with a considerably more settled image of the basic mainstay of nature." Using further developed sensors can enlighten us really concerning the planets around us.



Quantum in Space Societies

As the prevalence of applying quantum material science to space travel and estimation has risen, so too has the quantity of gatherings intrigued by this point. One such gathering is QTSPACE or Quantum Technologies in Space. Bad habit seat, Dr. Paternoster, made sense of the historical backdrop of QTSpace: "QTSpace is an activity of COST, an European subsidizing association that advances and supports networks tending to explore and development.

MEDICAL

Quantum registering can possibly work on the investigation of clinical pictures, including handling steps, for example, edge discovery and picture coordinating. Medical care associations are supposed to receive impressive business and logical rewards in the time of quantum processing. Notwithstanding the advantages portrayed over, this strong innovation may likewise make different benefits, for example, drawing in ability keen on working with cutting edge innovation. Quantum advantage is probably going to be exclusive, offering advantages to early movers. Quantum figuring can possibly turn into an extraordinary empowering agent for medical services associations in their center mission: economically saving and further developing lives. In this manner, an opportunity to begin with quantum processing is presently.

To begin the excursion and plan for quantum advantage, medical care associations ought to make the accompanying strides:

Draw in quantum champions. Recognize, empower, and recruit quantum champions in your association including both innovation and medical services experts.

Investigate and focus on. Investigate potential quantum use cases and focus on the ones with the biggest effect for your association.

Test. Execute important quantum applications and analysis with genuine quantum PCs.

RESEARCH

Quantum registering has shaken things up across the news over the most recent couple of years - from Google's 53-qubit quantum PC "Sycamore" accomplishing what has been authored quantum matchless quality to multibillion-dollar drives all over the planet to foster quantum advancements for processing and then some. The race is on. Quantum figuring is a trademark "moon-shot" of a second quantum upheaval. Though the primary upheaval empowered lasers and semiconductors in light of rules of quantum mechanics, the second expects to control quantum systems.1,2 Quantum processing utilizes quantum peculiarities to perform calculations. Quantum registering is important for the more extensive area of quantum data innovations, or quantum advances. Quantum advances look to comprehend how quantum peculiarities can be utilized in figuring, correspondence, detecting and metrology to go past what old style frameworks can do. The pursuit was led accepting a restricted information on the subject and interest in research action around potential utilizations of quantum registering. It started with "quantum comput*" to consolidate a free expression with a trump card (*), which obliged word varieties like calculation.

Simultaneous with the quicker speed of examination improvements, accomplishments in quantum figuring as far as number of qubits utilized for calculations arise:

- 2012 - A gathering at University of Bristol calculated the number 21 with Shor's calculation.
- 2017 - D-Wave Systems reported the principal offer of its D-Wave 2000Q quantum PC; it's anything but a broadly useful quantum PC, however can address improvement issues.
- 2020 - Google precisely reproduced the limiting of hydrogen chains and isomerization of diazene utilizing Sycamore.

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NFTS:NON-FUNGIBLE TOKENS

Impact and Interaction with the Metaverse

A never-before-seen snippet from Wong Kar Wai's cinematic and iconic masterpiece: "In the mood for love", recently became the first Asian film to be made into an NFT. It attracted many bids and was sold for a whopping USD 550K. Even the former CEO of Twitter, Jack Dorsey sold his first tweet as an NFT for a massive $2.9 million.
NFTs are almost everywhere: sports, music, art, technology, gaming; nothing seems to escape the craze of NFTs. The popularity and demand for NFTs are exploding. According to data collected by DappRadar, the sales of NFTs climbed up to $25 billion in 2021 from $94.9 million in 2020.

So, what are these NFTs that seem to have taken the entire world by storm?

NFTs or Non-fungible tokens are unique digital assets that represent real-world objects like images, gifs, videos, paintings, in-game items, etc. NFTs are stored on a blockchain and secured by a cryptographic key. They cannot be replicated or destroyed. Each NFT is unique and cannot be interchanged

The value of one NFT cannot be equal to another, making them non-fungible.

Are NFTs the same as crypto-currencies?

NFTs and cryptocurrencies are built on the same blockchain technology and play an important role in the metaverse; they still have tangible differences. NFTs are non-fungible in comparison to cryptocurrencies which are fungible. This means that the value of one cryptocurrency remains the same everywhere and is easily interchangeable. An NFT on the other hand is unique and doesn't hold the same value and hence cannot be interchanged for the other.

How do these NFTs work?

NFTs work on blockchain technology. They are the fundamental economic future from blockchain. The most commonly used blockchain is the Ethereum blockchain. NFTs give users complete ownership rights. As they are non-fungible and unique, they can have only one owner at a time. For minting an NFT, it is first listed on the marketplace and then recorded on a blockchain. The ownership of the NFT can be transferred from one party to another and a transaction fee needs to be paid for the same.

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How are NFT's keys to accessing an Immersive future internet; the metaverse?

Metaverse is an online, virtual, three-dimensional universe that has connected multiple virtual worlds: Virtual Reality(VR), Augmented Reality(AR), Extended Reality(ER), and many more. It is presumed to be the immersive future internet. Socializing in the virtual world from anywhere in the world is possible with the metaverse. The possibilities for the future are endless.

Metaverse has revolutionized the world in a way; an interactive virtual world is no longer a distant dream. NFTs will play a pivotal role in the making of a fitting metaverse. It can lead to a fair economy by making use of Blockchain. The metaverse economy depends on the verification of digital assets like property, art, and images. NFTs enable the authentication of these properties, resources, and even identities.

For example, if a person buys a bag from Louis Vuitton in the metaverse then the NFTs come into play as they confirm the authentication of the ownership of the bag.

Metaverse will make use of premium NFTs to provide the wealthiest communities with expensive and exclusive perks, rewards, and collectibles. Both CryptoPunks collections and Bored Ape Yacht Club administer select users access to premium communities which have password-protected content.

Non-fungible tokens cans access the metaverse. They make use of smart contract functionalities, which allow the network to store information securely and transparently so that it can be accessed when needed. These smart contracts handle the transferability of an NFT and also the authentication of the ownership. They help to create a sound metaverse economy.

NFTs will enable VIP access to the metaverse, it also allows companies to launch branded items like digital clothing, images, and merchandise to make the customer experience more exclusive and effective. NFTs will thus play an important in transforming community, identity, and social experiences in the metaverse.

Metaverse is serving as the harbinger of new possibilities, together with NFTs the world will come even closer; the line between the physical and the virtual world keeps blurring. NFTs are essential to the metaverse and will play a major role in changing the world.

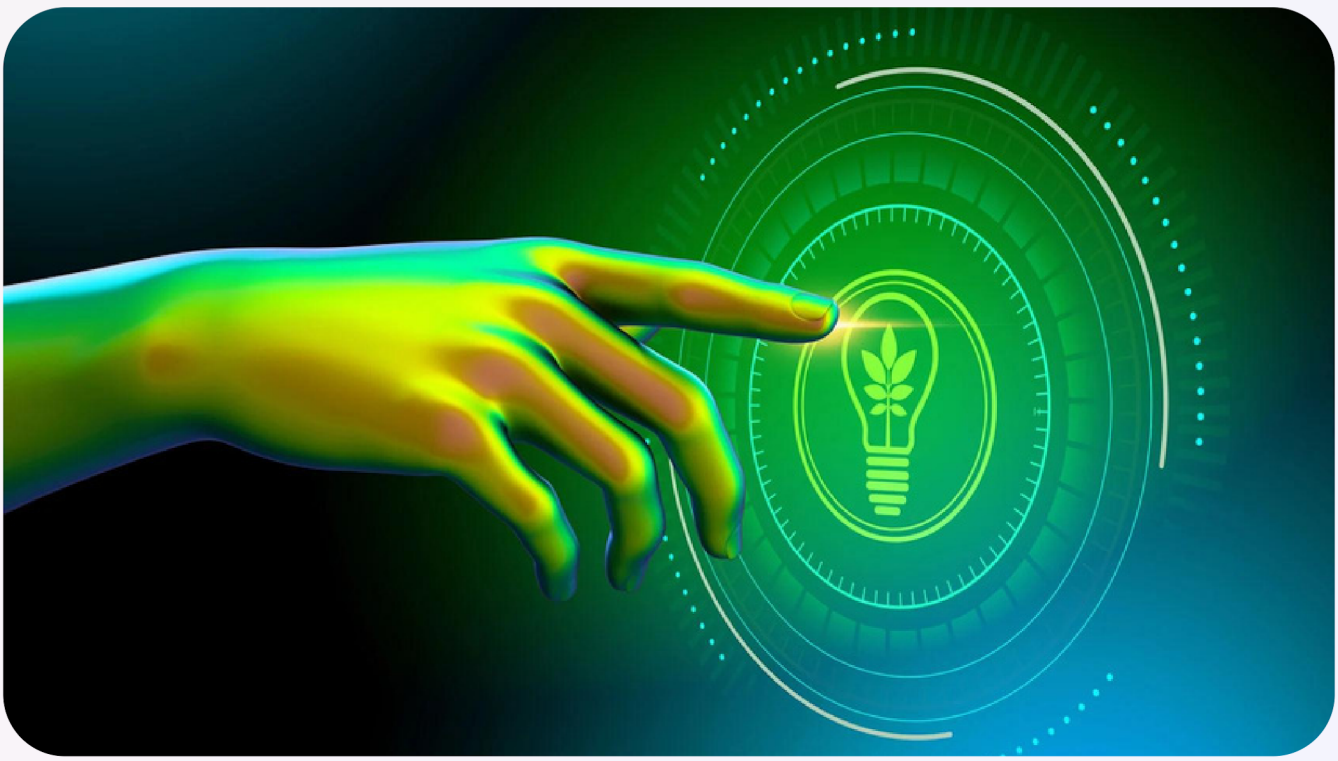
Impact of NFTs on the environment

It is said that metaverse will bring down the total amount that individuals spend on travels around the globe, thereby diminishing the pollution. There are drawbacks to NFTs too. According to a survey by Data Quests, analysts worry that the use of NFTs in the metaverse, Virtual Reality, and the use of AI and cloud services in Data Centers will lead to an increase in greenhouse emissions. It will also require huge amounts of energy to be built and thus has a dire effect on the environment.

A study conducted by the University of Massachusetts, states that “Training a single AI model could emit about 626,000 pounds of carbon dioxide, this is almost five times the lifetime emission of an average car”. Another research by Lancaster University also proves that if about 30 percent of the online gamers moved to cloud platforms for gaming then the number of carbon emissions would rise by 30 percent.

Hence it is important to make NFTs as sustainable as possible. The Data Center has taken several steps to make this possible. Microsoft has committed to completely shifting its Azure cloud platform to renewable energy by 2025.

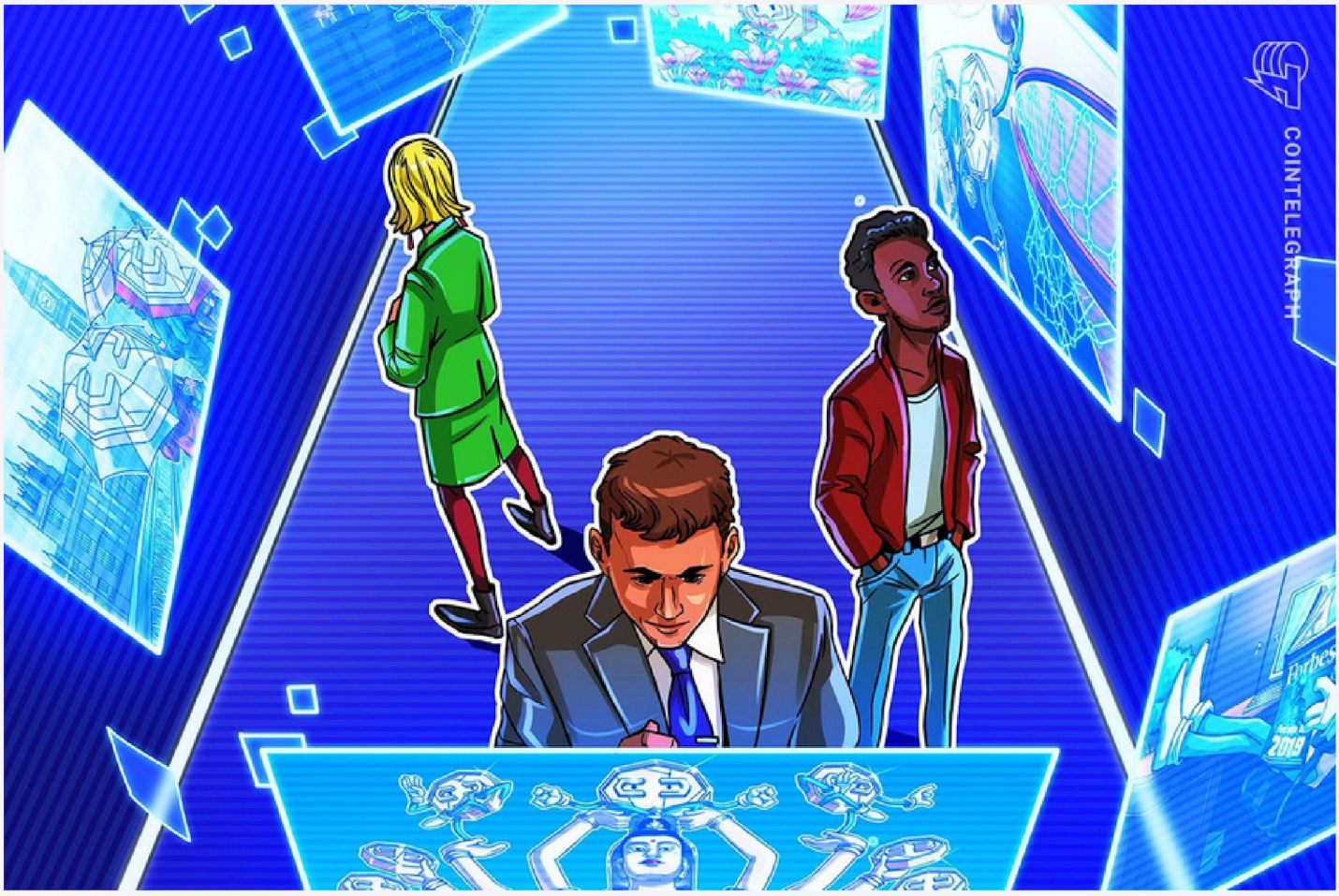
These commitments for the sustainability of the environment will lead to metaverse and NFTs running on sustainable technologies and hence improving their longetivity.



WHAT'S NEXT?

NFTs have gained popularity only recently as of 2021. There is still a lot of skepticism surrounding them and whether they will drive the future economy. According to recent Google trends, the interest in NFTs peaked in January 2022 and has halved since then in March 2022. The jury is still out on NFTs.

Most experts believe in the durability of NFTs and presume they will still be around for years to come, even if interest in them dwindles.



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Designed by - Ramesh Yadavar

We are now in the era of digitalization where almost everything is done online. From ordering food to booking tickets and even shopping, we can do all these things with just a few clicks on our smartphones. With the advancement of technology, we are now seeing a new trend in the way we conduct transactions – Blockchain

Introduction to Blockchain

Blockchain works by creating a digital record of transactions that are then verified and stored on a decentralized network. This network is made up of computers, known as nodes, that work together to validate and store the data. When a transaction is made, it is first verified by the nodes and then added to the blockchain. Once it is added, it cannot be altered or removed. This makes blockchain an incredibly secure and transparent way of conducting transactions.

Blockchain is a powerful technology that makes digital assets exchangeable and indestructible. Cryptography makes it secure and immutable

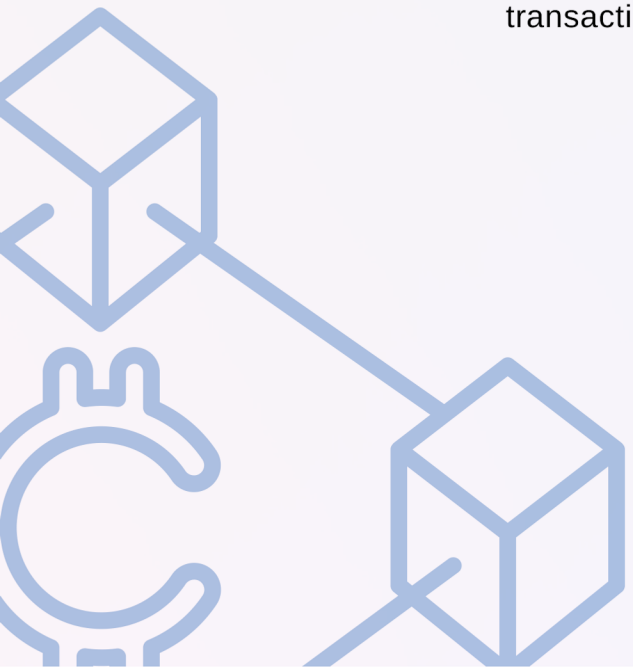
Blockchain technology is a way to spread large amounts of information in a decentralized manner. With no central control or user as the owner, everyone comes together for updates and access. Changes to the document are recorded, making any alterations entirely transparent. Blockchain is advanced, but the analogy to a Google Document illustrates three key concepts of technology. Blockchain can reduce the risk of mistakes and fraud in systems as it has a high level of transparency. Blockchain is able to scale this transparent management process across numerous uses.

Blockchain is made of three types of players: blocks, nodes, and miners.

How blocks can be used to create anything you want?

Every chain consists of multiple blocks and each block has three basic elements:

The data in the block.



A 32-bit whole number is called a nonce. The nonce is randomly generated when a block is created, which in return generates a block header hash. The first block of a blockchain has a nonce that creates the hash. Any changes to a block would require the owner of this block to mine it again, which alters the data forever.

The Mining Process Explained

On the blockchain, every block references its own unique nonce and hash, but also contains the hash of the previous block in the chain. This makes it difficult to mine a block unless one happens to be "lucky".

Miners use software that solves a very complex math problem to find anything called a nonce. When they find it, their block will be added to the blockchain. Blockchain technology is difficult to manipulate because any change will require lots of computing power. When a block is successfully mined, the change is accepted by all of the nodes on the network and the miner is rewarded financially.

Nodes

The most important concept in blockchain technology is decentralization. No single entity can own it since there is no central point at which transactions are conducted and data is stored. Blockchain's nodes consist of any electronic devices that maintain copies of the ledger and keep the network functioning. Every node in the blockchain network has their own copy of the ledger and each new block must be algorithmically approved to be added to it. Blockchain technology is transparent, so anyone can view records. Every participant's transaction data is registered in a unique alphanumeric number called a blockchain ID. The blockchain helps keep a system of checks and balances and creates trust among users. It allows for the scalability of trust through technology.

This distributed ledger technology is programmable, eg. Smart Contracts

Smart contracts are computer protocols that facilitate, verify, or enforce the negotiation or performance of a contract. They can be used to automate many types of transactions, including financial contracts, supply chain management contracts, and even real estate contracts. Smart contracts are stored on a blockchain, which is a distributed database that allows for secure, transparent, and tamper-proof transactions. For example, a smart contract could be used to automatically issue a refund if a product is not delivered on time. Smart contracts can also be used to make sure that two parties agree on the terms of a contract before any money changes hands. This can help to reduce the risk of fraud.

Blockchain’s most well-known use (and maybe most controversial) is in cryptocurrencies.A cryptocurrency can be used as a digital form of cash and can be used to buy goods and services, much like a traditional currency. One difference between cryptocurrencies and traditional currencies is that since cryptocurrency relies on blockchain protocols, it is able to ensure online transactions are always recorded and secured.

As of date, there are roughly 6,700 cryptocurrencies in the world with a total market cap of $1.6 trillion. Bitcoin has a majority of the value and is worth $60,000 for one unit. There are many reasons for this sudden surge in popularity including:

- Cryptocurrency is hard to steal because each one has a unique, identifiable code that is linked to one owner.
- Blockchain transactions can be sent to anyone and everywhere in the world, without needing a currency exchange or interference from the central banks.

Applications of Blockchain

Blockchain technology is often associated with Bitcoin and other cryptocurrencies, but the applications of blockchain extend far beyond cryptocurrency. In fact, blockchain has the potential to revolutionize a wide variety of industries, from banking and finance to healthcare and supply chain management.
Below are some examples of how blockchain is being used or could be used in the future:

Banking and finance: Blockchain can be used to streamline the process of transferring money between institutions. For example, Ripple is a company that uses blockchain to facilitate global payments.

Healthcare: Blockchain could be used to securely store medical records and make them accessible to authorized parties. This would improve patient care by giving doctors quick and easy access to important medical information.

Supply chain management: Blockchain can be used to track the movement of goods through a supply chain. This would allow businesses to identify issues and inefficiencies in their supply chains and make necessary improvements.

These are just a few examples of how blockchain could be used in different industries. It's important to note that blockchain is still a relatively new technology, so its applications are constantly evolving. As more companies explore ways to use blockchain, new and innovative uses for the technology will likely be discovered.

Research in Blockchain

In the past year, blockchain has seen a lot of growth. More and more businesses are beginning to adopt the technology in order to improve their operations. The most notable example is Microsoft, which has started using blockchain to create a digital identity network. This will allow users to securely log in to websites and apps without having to remember multiple passwords. Another company that is using blockchain is IBM, which is working on a project that will help farmers track their food products from farm to table. This will help ensure that the food is safe to eat and that it was produced ethically.
There have been several exciting developments in the world of blockchain recently. One is the launch of the Ethereum 2.0 network, which is designed to be more scalable and efficient than the current Ethereum network. Another is the development of new privacy-focused cryptocurrencies, such as Monero and Zcash. These coins offer increased anonymity for users and are beginning to gain traction among those who value privacy. Finally, there has been increasing interest in using blockchain technology for purposes beyond cryptocurrency, such as supply chain management and data storage. With so much happening in the space, it's an exciting time to be involved in blockchain research!

Future of Blockchain

There's no doubt that blockchain technology is here to stay. With its ability to provide secure, transparent, and tamper-proof transactions, it's poised to revolutionize the way we do business. But what does the future hold for blockchain?

Here are some predictions for the future of blockchain:

1. Blockchain will become more mainstream

As more businesses and industries begin to see the benefits of blockchain, it will become more mainstream. We're already seeing this happen with the increasing number of businesses implementing blockchain technology.

2. More countries will adopt blockchain

So far, only a handful of countries have really embraced blockchain technology. But as more countries see the potential of blockchain, we'll likely see more widespread adoption. This could lead to a new wave of innovation and growth in the global economy.

3. Blockchain will transform the way we interact with the internet

Blockchain has the potential to change the way we interact with the internet. By creating a decentralized internet, where data is stored on a distributed network, we could see greater security and privacy online. This would be a major shift from the current centralized model, where data is stored on servers controlled by a few entities.

CONCLUSION

To conclude, Blockchain is a distributed database that allows for secure, transparent, and tamper-proof transactions. The potential applications of blockchain technology are almost limitless. In the future, blockchain could potentially be used to streamline supply chains, create more efficient financial systems, reduce fraudulent activity and even help to protect the environment.

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5G TECHNOLOGY

How 5G Technology Will Save the World

5G is the 5th-era cellular community. It is an ultra-modern worldwide wireless elegant after 1G, 2G, 3G, and 4G networks. 5G permits a brand-new shape of network designed to connect truly anyone and everything together, including machines, topics, and devices. The 5G wi-fi era is meant to supply better multi-Gbps height facts rates, ultra-low latency, extra reliability, large community capacity, better availability, and a smoother person revel in for an extra-wide variety of users, and Industries.

Along with better height facts quotes, 5G offers tons more community ability via way of means of increasing to a brand-new spectrum, inclusive of mm-Wave. The 5G can also offer a decrease in latency for extra on-the-spot reaction and might offer smoother consumer enjoyment, so facts quotes continue to be continuously excessive even if customers are on the move.

How and when will 5G affect the global economy?

- 5G is using international growth.
- $13.1 trillion in international financial output
- $22.eight million in new jobs created
- $265 billion in international 5G

How fast is 5G?

5G supplies pinnacle statistics expenses of up to twenty Gbps primarily based, totally on IMT2020 requirements. Qualcomm Technologies' flagship 5G solutions, Qualcomm® Snapdragon™ X65, are designed to reap height facts quotes of up to ten Gbps downlink. But 5G is not pretty much speed.

Where is 5G being used?

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

Enhanced mobile broadband

besides improving our smartphones, 5G mobile technology can usher in new immersive experiences such as VR and AR with faster and smoother data rates, lower latency, and cost savings.

Mission-crucial communications

5G can enable new, industry-transforming services with ultra-reliable, available, and low-latency links such as remote control of critical infrastructure, vehicles, and medical procedures.

Massive IoT

5G aims to seamlessly connect large numbers of sensors embedded in virtually everything with the ability to reduce data rates, power, and mobility, providing extremely lightweight and low-cost connectivity solutions.

Is a mobile phone required for 5G

Yes, a new smartphone that supports 5G is required for using the network. 5G supplies pinnacle statistics fees of up to twenty Gbps primarily based on IMT2020 requirements. For example, smartphones powered through the Snapdragon 5G Mobile Platforms are 5G compatible. Numerous new cellular telephones might aid 5G. As the 5G rollout timeline progresses, greater smartphones and service subscriptions are possible, as 5Gas 5G technology and 5G compatible devices become more mainstream.

What's next in 5G?

Through a look at the 5G economy, it is predicted that the entire financial impact of 5G is expected to be about $13.2 million globally by 2035, assisting an extensive variety of sectors and probably allowing as much as $13.1 trillion of products and services. This effect is much more than the preceding community generations. The improvement necessities for the brand new 5G community additionally make bigger past conventional cell community operators to create sectors together with the car industry. They look at the 5G price chain (together with OEMs, carriers, content material creators, app builders, and consumers) and ought to aid as many jobs as 22.3 million. Eight million jobs for individuals in Beijing, China. Many rising and new packages are to be similarly described in the future. Only time will tell what the overall “5G impact” may be on the economy.

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MED-VERSE

Let's explore within you a different world!

An out-of-reach reach dream came true recently as John Hopkins performed its first Augmented-Reality surgery successfully on the 8th of June, 2020. Metaverse has bloomed exponentially amongst people. It has become a more prominent topic of discussion, especially since the day Facebook's name was changed to Meta.

So what is this Immersive New Technology called Metaverse?

Metaverse is an augmented virtual world that is derived from the convergence of virtual and physical space; it also combines the technologies of Virtual reality, Artificial Intelligence with which users can interact within the augmented world, meet each other virtually, and can immerse themselves in performing virtual activities that give authentic experiences.

How can this Metaverse be used in Healthcare?

Often when we talk about the technologies being used in hospitals and healthcare sectors, there is constant evolution because of several new inventions and up-gradations in the existing technologies. There has been a significant transformation from X-rays, and MRIs to robotic and VR surgeries.

How has the pandemic influenced the use of Metaverse in Medical practice?

As we all know the pandemic was a difficult phase for all doctors around the globe and the introduction of the Metaverse in the field of medicine has boomed and overcome many difficulties that were faced during the pandemic. One of which was social distancing during surgery which was next to impossible due to the amenities that were previously available.

It will also provide improved surgical precision, therapeutic usages, and more, all signs pointing to widespread adoption of the **Metaverse as a disruptive transformation in healthcare.**

There is a very common saying *"An apple a day keeps the doctor away"*. But what would you do if the best doctor is far away?

Certain diseases do not have much local expertise. Due to the pandemic, there was a drastic change in lifestyle since the day lockdowns were imposed. A lot of doctors have shifted to the online mode of examining the patients. The process is simple even for the patients as they can get in touch with expert doctors with just one simple click and schedule their appointment.

The Dr. then suggests certain tests to perform and asks patients to get them done. After they receive the reports all they need to do is scan a pdf copy or share the pdf copy with the Dr. they then examine the results and prescribe you medication and treatments.

Due to this, the traveling cost has been reduced and the risk of being affected during covid also came down.

Telemedicine uses certain technologies which are now gaining a lot of popularity

1. Artificial Intelligence

Artificial Intelligence is helping to expand the scope of technology of telemedicine to telepathology, telepsychiatry, teledermatology, etc. AI-driven technologies help aid these necessary care assistive applications and the predictive algorithm which AI uses is enabling a lot more than just the diagnostic needs of patients. AI has helped a lot in reducing the pressure of healthcare professionals by translating the prescriptions automatically to Electronic health records and also help in generating medical reports.

2. Augmented and virtual reality

Telemedicine goes along very well with augmented reality and virtual reality combined to be known as mixed reality. MR technologies let clinicians get real-time information on patients which helps to improve the accuracy that we have for distant diagnosis.

These technologies help manage the workflows in hospitals and encourage productive working within and outside the clinical parameters. AR enhanced tools help in better collaborative diagnosis as there are certain platforms which allow professionals to share 3d images of their cases with their colleagues during virtual consultation.

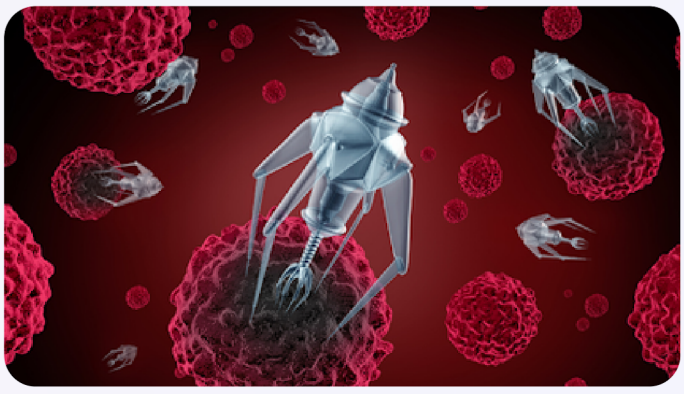
3. Telerobots

Robotics has helped a lot in this field of telemedicine. These telerobots help in making monitoring, diagnosis, and virtual care of patients easier and more accurate. These robots help the healthcare professionals monitor the patients health in real time and can alert them in case of emergency and critical conditions of patients.

4. IoT and nanotechnology

IoT has been a booming industry and has had a huge impact on the healthcare industry by focusing on the way devices, applications and people interact with each other. It has been helped by virtual care networks and access to the patients data in depth in the telemedicine sector.

The advancements in telediagnosis has led to a technology known as nanotechnology which is built up on the basis of IoT. Using nanotechnology certain things are made which can collect information within the body regarding body temperature,collection of secretions and tissue samples and help in collecting images of the afflicted parts inside the human body, like small pills and bandages.



5. 3-D printing

3D printing is one such technology that allows doctors to print out organs that are being sent from distances by the patients. Doctors then with the help of these 3D printed objects can do a detailed and more accurate examination which will help develop precise treatment plans. This technology also permits 3D printing of prostheses for patients without the patients being there physically.

This technology is now being used in healthcare for diagnosis and cure. They include the creation of bones, cartilage, and lung tissue.

Metaverse; an Important Breakthrough in Healthcare

A breakthrough in healthcare was visible during this evolution of the Metaverse. The introduction of the concept of a metaverse in healthcare sectors is known as the Medical Internet of Things (MIoT), which to a larger extent is facilitated by AR and VR glasses. These significant changes can make our lives simpler and affordable to an extent.

The World Health Organization is also using AR to train COVID-19 respondents and mental health experts actively use VR for treating PTSD (post-traumatic stress disorder), and medical schools also use it for education.

In recent practices, technologies such as augmented reality, Virtual Reality, and artificial intelligence are preferred by surgeons.

Many leading hospitals and universities are considering using these technologies during surgery as they provide a 3-Dimensional view of a patient's body, which is beneficial as it provides information about surgeries. Certain norms such as medical simulations are being practiced.

The primary aim is to establish good control and practice for learners to provide proper treatment as there might be certain instances when surgeons might get nervous while operating in the physical world.

WHAT'S NEXT?

Solutions involving VR and AR are already improving patient experiences and outcomes. In a few decades, we will experience simple procedures such as intravenous injections and blood draws that can benefit from technologies like that *Accuvein* which projects a map of a patient's veins onto the skin and will provide information to reduce human errors while giving intravenous injections.

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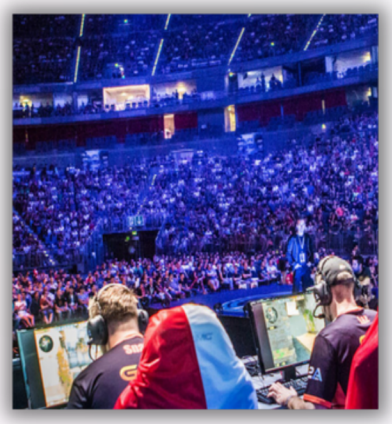
E-SPORTS



The popularity of Electronic Sports (esports) have big staggeringly within the previous couple of years, changing into one amongst the foremost well-liked sorts of digital entertainment. Despite continued growth, definitions and classifications of esports stay elusive, and therefore the industry remains thought-about by several to be in its infancy. Understanding of esports originate from various, generally conflicting fields, that has created fragmented interpretations of its definition, positioning and core elements. This has hindered esports from embrace opportunities afforded by rising digital technologies and progressing as a definite field. the aim of this abstract paper is threefold, to redefine esports, propose a unified framework to capitalize on esports business potential, and encourage a a lot of structured future esports analysis agenda. The projected esports Matrix, presents four distinct realms that distinguish esports; esports as a illustration of current physical sports (sports digitalization), esports as traditional (multi-player) game expertise (competitive multiplayer laptop games), esports that modify existing sports, player rules and setups through digital augmentations (digitally increased sports), and new sorts of esports involving rising technologies like virtual and increased reality (immersive reality sports). The esports Matrix was developed incorporating trade experience so supportive its quality and relevancy to advance abstract and empirical understanding, and significantly, facilitating a a lot of structured approach, to modify businesses to grasp the potential of esports.

It is projected that by 2023, there'll be over forty six million folks look eSports events. Currently, the most approach of viewing your favorite eSports players vie against one another is on streaming platforms like Twitch and YouTube Live. Viewing these events through a screen isn't quite as exciting as being there nose to nose. A metaverse opens a brand new door of chance for the eSports industry. Imagine being in a very virtual audience, at a virtual venue as a member of the audience. You'll be able to feel the electricity of the group and act with alternative recreation enthusiasts, beat a virtual house. With the increase of NFTs and cryptocurrencies, we have a tendency to cannot rule out the likelihood of cryptocurrencies being employed as prizes within the virtual world.

Currently, cryptocurrency is more and more changing into a key a part of the eSports scene. The recreation community has redefined however we have a tendency to play. the standard barriers to vie or be associate degree athlete are foreseeably modified. The technological advancement of sport didn't continually mean more durable competition, it conjointly meant smarter.

The recreation community modified the approach we have a tendency to consume amusement. the necessity for skilled TV broadcast level cameras and instrumentality could be a factor of the past. As we've emotional from radios to televisions, esports opened the world's eyes to the thought of streaming.

Maybe most significantly, the recreation community has altered the approach we have a tendency to act with one another in a very approach that might form the long run of all human connections. it's simple that the esports trade has been growing, they need been growing geometrically year over year, and that they area unit setting out to have a heavy impact on the web and technology as a full, so that they can truly become one among the driving forces behind the metaverse, along side business, commerce, the show business, and more.

This mentality of accessibility, participation, and engagement are going to be one among the underlying themes of the metaverse and the way esports are going to be an enormous participant. it's exclusively attributable to recreation that platforms like Twitch and Discord became family names and area unit famous across the amusement world. Since esports area unit usually portrayed by a really social group sense of community or clanship, it solely is sensible that the micro-communities created by the recreation trade still thrive within the digital metaverse.

There will be a seamless mixing of recreation into social networks and additional, therefore whereas these tiny communities area unit still holding along, they become components of associate degree inherently larger and much additional advanced organism. This creates even additional opportunities for gamification, that starts the cycle afresh and drives additional and additional adoption.

Esports has already redefined the whole recreation landscape by not simply spawning the thought of gamifying things to drive participation and engagement, however by smashing previous barriers to being thought-about associate degree contestant. not does one got to be the quickest or the strongest, currently you don't even got to be able to walk, you'll still vie and be counted among the most effective.

WHAT'S NEXT

It's expected that the esports streaming and recreation business can grow to $3.5 billion by the tip of 2025. As esports continues to become additional relevant, has the streaming TV business taken full advantage of this huge market?

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VIRTUAL CONCERT

A New Approach to Music for Fans

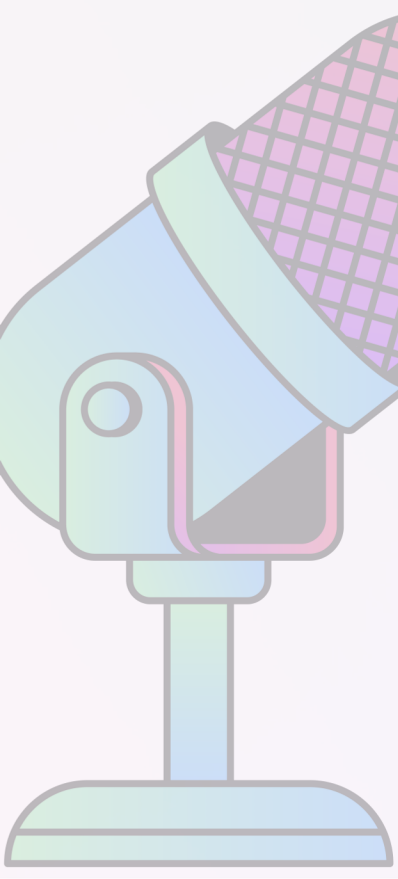
Concerts have always been important to music lovers. Due to the pandemic, virtual concerts became the only source of entertainment for most music enthusiasts. Technology is upgrading gradually, and so is the music industry. But the concept of virtual concerts isn't new.

What is a Virtual Concert?

A virtual concert, commonly referred to as a V-concert or a Virtual-Live, is an event in which the artists are portrayed by virtual avatars. Virtual concerts can take place in real life, with digital projections of the musicians on stage, or in totally digital virtual worlds.

The technology behind Avatars:

Owens' wide-angle pinhole video camera was a perfect fit for virtual concerts. Pinhole video cameras are not only tiny – they are frequently employed in covert surveillance operations since they are difficult to detect – but they also have unlimited fixed focus with the right lens. The camera's wide-angle lens is required to ensure that the user can see enough of himself or herself in the frame. The focal lengths of wide-angle lenses are shorter than those of standard lenses. The focal length is the distance between the lens and the charge-coupled device (CCD), which is a semiconductor image sensor in the camera that makes video pictures by interpreting the intensity of light passing through it.



Where it is achieved?

1. Games:

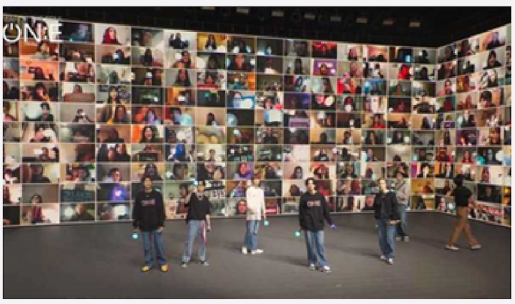
In in-game concerts, celebrities earn a lot of money and notoriety, while well-known online games like "Fortnite" and "Roblox" even have someone as popular as Ariana Grande. Without the regular Fortnite map, this new universe seemed more like being to be taken directly from Ariana's mind than a performance squished inside Fortnite. Giving an artist and their crew creative power in this way helps transform these experiences from something slightly fascinating to one of the finest in-game concerts of all time. Fortnite nailed it again with this, from its theme-park-Esque, mini-game-packed beginning to a dreamy, heavenly interpretation of '7 Rings.'

There are many other In-game concerts like Block By block west in Minecraft, Royal Blood in Roblox, etc.

2. Social Media:

Since its November 2016 release, Instagram Live Stories allows users to stream whatever they want, for as long as they want, while their followers react and vlog spontaneously. The Global Citizen webcast series Together At Home completed full circle on Friday. Chris Martin, who performed the first virtual event in March, ended the series with a roughly 30-minute set of Coldplay hits

3. Live shows from concert venue:



The "Map of the Soul ON: E" event by superstar Korean boy band BTS, which was allegedly seen concurrently by over a million fans globally, was a successful pay-per-view virtual live concert. The concert had 756,000 concurrent viewers from over 107 countries, making it the largest audience for a paid virtual concert. event in March, ended the series with a roughly 30-minute set of Coldplay hits

The First-Ever Indian Metaverse Concert: Daler Mehndi's First Performance

The inaugural Metaverse Concert was a big success, owing to the atmosphere produced by Daler Mehndi's music and style, which garnered 20 million people from all over the world. On the 73rd Republic Day, he was asked to play at the first-ever Indian Metaverse Concert, which honored India's digital debut on the metaverse. Fans chose numerous avatars and dance movements as part of their virtual involvement in the show. It was a historic event that broke records by attracting global audiences, it was seen by more than 20 million people worldwide, and over 200K fans logged on at the same time, forcing the servers to crash. To add to the excitement, he dropped a few NFTs in between acts, which his fans appreciated.

WHAT'S NEXT ?

Marketing techniques will be transformed by hyper-targeted commercials, drone selfies, and phone-free zones at concerts. Technologies like RFID (radio frequency identification) and beacons, which were popular at festivals, will make their way to the club scene. Wearable technologies, virtual reality, and augmented reality will bring new aspects to the fan experience. VR concerts, like video conversations versus in-person meetings, may turn out to be the next best thing. Nonetheless, experts are excited about the prospect of bringing performances to a broader audience with virtual concerts. New technologies will enable venues to save time while better engaging fans, sponsors, and artists.

According to Bloomberg, the revenue of the metaverse will reach $ 800 billion by 2024 compared to $ 500 billion by 2020. The main market for online game makers and gaming hardware is likely to exceed $ 400 billion by 2024, while opportunities for live entertainment and social media make up the rest. Metaverse is the next major technology platform, attracting online game developers, social networks, and technology leaders to capture this growing market.

Few companies today have a real hand in the metaverse. Includes ByteDance, Tencent, Shopify, Zoom, Amazon (Twitch), Alibaba, Roblox, Bilibili, Snapchat, Kuaishou, and Huawei. Apple's outfit also points to the forthcoming AR spectacles. WeChat's ability to handle payments and access multiple services is the beginning of high-metaverse applications. Facebook made a big name change in Meta and invested $ 10 billion in the metaverse by 2021.

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THE ADVERSE- DISADVANTAGES OF METAVERSE

A metaverse is a place where humans interact with each other using their digital avatars. Sounds exciting, doesn't it? All that glitters is not gold though.

A vision that is nothing short of a fairytale, that can be fulfilled someday but not so soon. In a world where technology is rapidly advancing, there are millions of people who still have no access to the larger world. Lack of proper connectivity and communication is a major problem for a lot of people who want to be a part of the concept of metaverse.

One more thing to worry about is how narrow will the difference be between the virtual and the real world. Virtual world addiction might blur people's imagination and change the way people perceive real life relations and communication. A day may also come when people start despising real world involvement and exist solely in the virtual world.

As always, privacy is again a thing to worry about. We've always been protective about our information, be it any digital platform we've used. The thing about metaverse is it is totally virtual and data theft can be a major concern here as well. We may not believe but we all know how easy it is to misplace and misuse any information digitally. This will be something that needs a proper solution.

There maybe a lot of disadvantages of metaverse but the whole idea of it is still quite vast. Everything great comes with a cost and as we evolve, we need to figure out what to do on our own to fulfill the visions that we've seen ourselves.

DID YOU KNOW?

Meta Reality Labs have already started investing as much as $10 billion in the metaverse.

The largest share of the worldwide market of Metaverse as of 2020 is held by North America

A survey found that almost 70% of Americans are not interested in Meta's vision of the metaverse.

Disney is making a theme park on metaverse. It has also filed for a patent in December 2021 for the same.

The Metaverse has no particular date to happen

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THE METAVERSE SEOUL

A New City of Coexistence and an Economic Future

SEOUL is not only known for the “Psy: Gangnam Style” but also for its tech giants: Samsung, LG, and popular car manufacturer: Hyundai Motors. It's fascinating how South Korea is acing in every sector such as entertainment, education, and technology which includes ‘Metaverse’.

At an October conference hosted by the city of Seoul, the mayor (Oh Se-hoon) was wearing a patterned green fit jacket and a dark tie, his hair neatly combed. He attended as his avatar, and the conference was held within the “metaverse,” a communal, virtual space, visible by many as the next frontier of the internet, where users interact using avatars

In “Metaverse Seoul,” according to plans, residents might be capable of making reservations for city-run facilities, riding city excursion buses, visiting re-creations of destroyed historical sites, filing administrative lawsuits with town bureaucrats, and capable of visiting cultural heritage sites all through the city via having access to the metaverse on their cell phones.

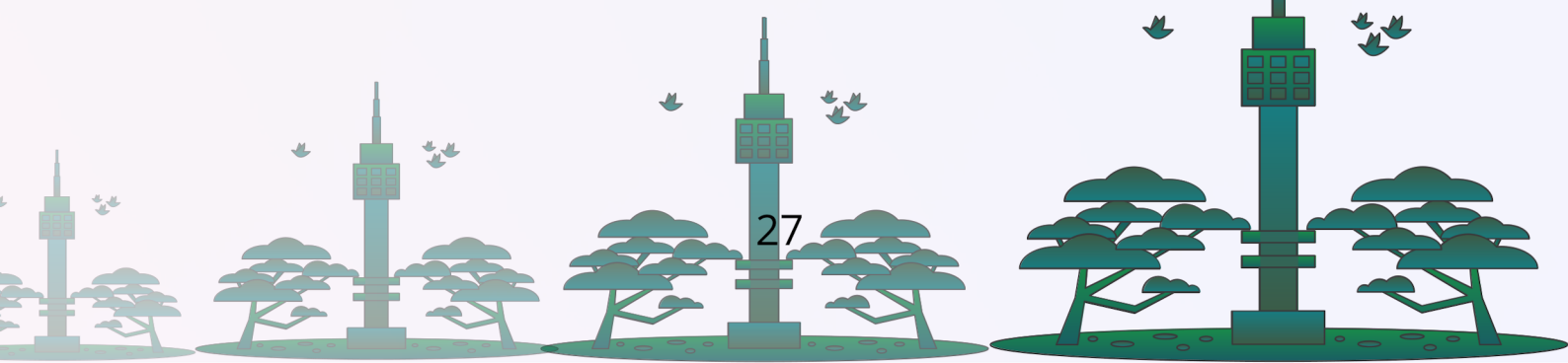
The metaverse refers to a shared 3-D virtual world in which all activities can take place using augmented and virtual reality equipment. those structures have won a reputation in current years as humans have shifted their activities online, particularly amid the COVID-19 pandemic.

The South Korean capital has invested KRW 3.9 billion (approximately 390 crores) into the assignment, as a part of the town’s mayor Oh Se-hoon's Seoul vision 2030 plan. It targets to make Seoul “a city of coexistence, a worldwide leader, a safe city, and a future emotional city,” the mayor said.

The SMG(Seoul Metropolitan Government) will consecutively offer numerous business support facilities and services, including the virtual Mayor’s office, Seoul FinTech Lab, invest Seoul, and Seoul Campus city, on its metaverse platform.

The city introduced in a statement that in 2023 the SMG will open the “Metaverse 120 Centre” (tentatively named), a virtual public service center. The avatar public officials in the metaverse will provide convenient consultations and civil service, which became available only via the civil service center at Seoul city hall.

-Creation of the fifth-largest metaverse market in the world!!



Further, Seoul's principal traveler points of interest, consisting of Gwanghwamun Plaza, Deoksugung Palace, and Namdaemun market, may be introduced via the "virtual visitor sector".

The SMG will also expand services for the socially prone such as safety and convenience content for people with disabilities and the usage of extended reality (XR).

Virtual Seoul:

Virtual Seoul, a brand new platform released by way of the city government on a tourism occasion, shows the augmented reality spaces that Seoul plans to create in its Metaverse Seoul platform. (Seoul city government).

When it was started?

Metaverse Seoul starts began 2021 on New year's Eve while the traditional Bosingak bell-ringing rite can also be hung on the platform for any citizens who want to take part in reality.

When it will be completed?

Seoul's metaverse plan pursuits are to be completed by way of 2026 and will roll out in phases starting the subsequent year. It might first be available on smartphones. ultimately, augmented reality tools, consisting of goggles and controllers, can be used, officials stated.
At the beginning of 2023, Seoul's major cultural fairs may also be held inside the metaverse and open to virtual tourists from overseas, officials said.

The metaverse can create 1.5 million jobs, and the country plans to provide over 40,000 professionals that specialize in the nascent area, the ministry said in January.

The metaverse, however, is normally associated with crypto properties such as NFTs (non-fungible tokens). South Korea currently prohibits the use of any NFTs or token issuance in its gaming — which may additionally pose a threat to its ambitious metaverse plans.

"Seoul will pioneer a new continent called 'Metaverse Seoul' by combining public demand with private technology," Park Jong-soo, Director General of Smart City Policy at the Seoul Metropolitan Government, concluded.

What's Next??

There's a 50 percent risk that machines will outperform human beings in all tasks within 45 years, in line with a survey of greater than 350 artificial intelligence researchers.
AI will master many sports a lot sooner, though. Machines are anticipated to be higher than us at translating languages by using 2024, writing excessive college essays by 2026, riding a truck by means of 2027, running in retail through 2031, writing a bestselling e-book by 2049, and surgical procedure by way of 2053. In truth, all human jobs may be computerized in the next hundred and twenty years.

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QUIZ TIME!

- A _____ is a two-state quantum mechanical system
- A Qubit can be in _____ of both the states at the same time.
- _____ is faster than classical computing
- Full form of NFT is _____.
- _____ is the cause for the main growth in popularity of an NFT.
- Blockchain makes each NFT _____.
- _____ be owned and sold.
- _____ created VR.

ANSWERS

Qubit superposition Quantum-Computing Non-fungible tokens Social Media unique NFT's Ivan Sutherland