AMBALIKA INSTITUTE
OF MANAGEMENT AND TECHNOLOGY

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(WEB 3.0)

> "EVERY INFORMED PERSON NEEDS TO KNOW ABOUT BITCOIN BECAUSE IT MIGHT BE ONE OF THE WORLD'S MOST IMPORTANT DEVELOPMENTS"
>
> LEON LUOW

DEPARTMENTAL MAGAZINE OF DEPARTMENT OF INFORMATION TECHNOLOGY

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EDITORIAL

Dr. Hemlata Pant

Welcome to the latest issue of our magazine, where we explore the exciting world of Web 3.0! With the advent of blockchain technology, decentralized systems, and peer-to-peer networks, the internet is undergoing a profound transformation. Web 3.0 promises to be a more open, secure, and decentralized web that empowers users and eliminates the need for intermediaries.

In this issue, we have covered many aspects of Web 3.0 such as NFTs, Blockchain, metaverse etc.

Whether you're a seasoned blockchain enthusiast or just getting started with Web 3.0, this issue has something for you.

I would also thank all the students (contributers) for putting in their sincere effort in this edition.

Dr. Hemlata Pant

INTRODUCTION

Before introducing web 3.0, we have a question for you. Have you heard this term before? If yes, did you ever wonder which version of web you are currently using? If your answer is again yes, then you will definitely enjoy reading it.

The Web was invented by Tim Berners-Lee at CERN in 1989 and opened to the public in 1991. It was conceived as a "universal linked information system".
The first version of web - Web 1.0 also referred as Syntactic web or read only web is the era (1990–2000) where the role of a user is limited to reading information provided by the content producers. There is no option given for user or consumer to communicate back the information to the content producers. For example, static web pages.

The Web 2.0 also referred as Social Web or read-write web is the era (2000–2010 and continues even now) which facilitates interaction between web users and sites which in-turn allows users to communicate with other users. In this era every user can be a content producers and content are distributed and shared between sites. Some of the famous Web 2.0 applications are Facebook, YouTube, Flickr, Twitter etc. The web technologies like HTML5, CSS3 and JavaScript frameworks like ReactJs, AngularJs, etc., enables startups to innovate new ideas which enables users to contribute more in this Social Web.
Web3 (also known as Web 3.0) is an idea for a new iteration of the World Wide Web which incorporates concepts such as decentralization, blockchain technologies, and token-based economics.

The term "Web3" was coined in 2014 by Ethereum co-founder Gavin Wood, and the idea gained interest in 2021 from cryptocurrency enthusiasts, large technology companies, and venture capital firms. The objective of web 3.0 is to integrate everything on the internet at the data level so that any changes to data inside one platform are reflected concurrently on other platforms.

INTRODUCTION

Unlike the centralized and controlled form of the Web, Web3 is a decentralized and distributed network based on blockchain. As it is developed with blockchain as its fundamental technology, Web3 powers its users by giving full control and ownership of their data. The data stored within the Web3 network is not under any authority or controlling body. Instead, several blockchain nodes are distributed throughout the network, and these nodes keep a copy of all the data to regulate network transparency.

IMPORTANCE & FEATURES

People are now compelled to give their data out by using their Facebook or Google login to access various online services. Individuals will, nonetheless, own their identities in Web 3. Web3 unleashes completely new business models and value chains where centralized middlemen are no longer preferred by taking the place of third parties with the blockchain. In the end, Web3 returns control to the people by removing the intermediaries. In reality, we are already witnessing this with NFTs (non-fungible tokens). Here are some features of web3-

Ownership: In an unprecedented way, Web3 offers users control of their digital assets.

Censorship resistance: Users' data is stored on the blockchain in Web3. They may take their reputation with them when they decide to leave a platform and plug it into a different interface that more closely reflects their ideals.

Decentralized autonomous organizations: In addition to owning their data in Web3, users can also use tokens that function like shares to own the platform collectively. DAOs enable decentralized platform ownership coordination and future platform decision-making.

Digital identity: Traditionally, a person will set up an account for each site he uses. For instance, he will have a Twitter handle, a Facebook account, and a Reddit account. Now the question is, would he want to update his display name or profile picture? Yes! in certain circumstances, social sign-ins are used. However, this brings up an old problem: censorship. These platforms may shut the person out of his whole online existence with a simple click. Worse, in order to make an account, many platforms also ask to trust them with personally identifying information. Web3 overcomes these issues by giving users control over their digital identity. Using a blockchain-based address allows a reliable, censorship-resistant, and anonymous single login across platforms.

Native payments: Web2's payment system is based on banks and financial gateways, which excludes those who do not have bank accounts. Web3 sends money directly to the browser using tokens such as SOL or ETH, eliminating the need for a trusted third party.

NFTs are going to be a game changer for the art world”

Non-Fungible Tokens, or NFTs, have taken the world by storm, making headlines and breaking records in the art and collectibles industry. But what exactly are NFTs and why are they causing such a buzz? In this article, we will dive into the world of NFTs and explore how they are revolutionizing the way we think about art and collectibles.

Do you know what non-fungible tokens are? Let’s try to wrap my head around it.
NFTs are digital tokens that represent a unique asset, whether it be a piece of art, music, video, or any other form of digital media. Unlike cryptocurrencies, which are fungible and can be exchanged for one another, NFTs are non-fungible, meaning that each token is unique and cannot be replicated or replaced.They are created using blockchain technology, which is the same technology that powers cryptocurrencies like Bitcoin and Ethereum. This technology allows for the creation of a decentralized and transparent ledger, which ensures that the ownership and authenticity of each NFT can be verified and traced back to its original creator.

NFTs are known for Revolutionizing the Art and Collectibles Industry , have also become popular due to their potential as a new revenue stream for artists and creators. By selling their work as NFTs, artists can receive a percentage of each subsequent sale, which can lead to significant profits if their work gains in popularity over time.

Ever wondered what future does NFT hold? Well it’s a miracle , The rise of NFTs has sparked a new wave of innovation in the art and collectibles industry. As more artists and creators embrace NFTs, we can expect to see new forms of digital media being created and sold as unique, one-of-a-kind assets.In addition, NFTs have the potential to revolutionize the way we think about ownership and authenticity. By using blockchain technology, NFTs allow for a transparent and decentralized ledger that ensures the authenticity of each asset.

NFTs have the power to democratize art and allow artists to take control of their work

This technology could be applied to other industries, such as real estate and luxury goods, to provide a new level of trust and transparency.

Where did NFTs come from ? Basically, they were first introduced in 2017 on the Ethereum blockchain. The concept of NFTs was developed as a way to create unique digital assets that could be bought, sold, and traded, similar to physical assets such as artwork or collectibles. Since their introduction, NFTs have gained popularity in the art world, as well as in industries such as sports and music. While the concept of digital ownership has been around for years, NFTs have opened up new possibilities for creators and collectors alike, and have sparked a wave of innovation and experimentation in the digital asset space.

NFTs, or non-fungible tokens, have been making waves worldwide in recent months. From breaking records in the art world to gaining popularity in sports and music, NFTs have become a hot topic of conversation among collectors, creators, and investors.One of the most notable developments in the world of NFTs was the record-breaking sale of a digital artwork by Beeple for $69 million in March 2021. This sale put NFTs on the map and sparked a frenzy of interest in the digital art market. Since then, several other digital artworks have sold for millions of dollars, including a collection of NFTs by musician Grimes, which sold for nearly $6 million.

As a conclusion,

NFTs have the potential to revolutionize the way we think about art and collectibles. By providing a new level of ownership and authenticity to digital media, NFTs have opened up new revenue streams for artists and creators and have created a new market for digital art. As the technology behind NFTs continues to evolve, we can expect to see new forms of digital media being created and sold as unique, one-of-a-kind assets.

BLOCKCHAIN

Blockchain is a decentralized, distributed ledger technology that enables the creation of a secure and transparent digital record of transactions. It was first introduced in 2008 with the creation of Bitcoin, a digital currency that relies on blockchain technology to record transactions.

At its core, blockchain is a database that stores information in blocks that are linked together in a chronological and immutable chain. Each block contains a set of transactions that have been verified by a network of computers, called nodes, using complex cryptographic algorithms. Once a block is added to the chain, it cannot be altered or deleted, ensuring the integrity of the data stored in the blockchain.

Awareness of blockchain in today's world

Blockchain technology has gained significant awareness in recent years due to its potential to revolutionize various industries. Blockchain is a decentralized digital ledger that enables secure and transparent transactions without the need for intermediaries such as banks or government institutions.

One of the most well-known applications of blockchain is cryptocurrency, such as Bitcoin and Ethereum. These digital currencies have gained mainstream attention and are increasingly being used as a medium of exchange for goods and services. However, blockchain technology also has potential applications in other industries such as supply chain management, healthcare, real estate, and voting systems.

Many businesses and organizations are exploring the use of blockchain technology to improve their processes, increase transparency, and reduce fraud. Governments are also exploring the use of blockchain for various purposes, including securing voting systems, improving public services, and reducing corruption.

Ongoing features and benefits of blockchain technology

Smart contracts: Smart contracts are self-executing contracts that automatically enforce the terms of an agreement when certain conditions are met.

Decentralized finance (DeFi): DeFi is a new ecosystem of financial applications that are built on blockchain technology, allowing for more open and accessible financial services.

Tokenization: Tokenization allows for the creation of digital assets that can be traded and tracked on the blockchain.

Supply chain management: Blockchain technology can be used to track the movement of goods and ensure the authenticity and quality of products.

The advantages of blockchain technology
Security: Blockchain technology uses advanced cryptographic algorithms to ensure that transactions are secure and cannot be tampered with.

Transparency: All transactions on the blockchain are visible to everyone on the network, ensuring transparency and accountability.

Efficiency: Blockchain technology can streamline processes and reduce the need for intermediaries, leading to faster and more efficient transactions.

Decentralization: Blockchain technology is decentralized, meaning that there is no central authority controlling the network, making it more resilient to attacks and censorship.

METAVERSE

Metaverse, a virtual world where billions of people live, work, shop, learn and interact with each other from anywhere, however far they are.

In today's world, we just have to use computer screens as portals to connect to a worldwide web of information. Digital facsimiles of ourselves, or avatars, move freely from one experience to another, taking our identities and our money with us.

This is known as the metaverse and, hype notwithstanding, it does not exist today.

What are enterprise leaders to make of a fast-evolving, hyped-up concept that could fundamentally change how humans live? TechTarget's in-depth guide to the metaverse breaks down where this nascent technology revolution stands today and where it is headed. Topics include the technologies and platforms that support the metaverse, its benefits and challenges, how to invest in it, its history, why the metaverse is important and its impact on the future of work.

Throughout the guide, there are hyperlinks to in-depth explorations of these and other relevant topics, as well as to definitions of important concepts in the metaverse such as interoperability, digital twins, spatial computing and Web 3.0.

**Importance of metaverse:
"Metaverse" became a household word when Facebook rebranded its corporate identity to Meta in October 2021 and announced plans to invest at least $10 billion in the concept that year. In addition to Meta, tech giants including Google, Microsoft, Nvidia and Qualcomm are also investing billions in the concept. E-commerce is expected to be the dominant engine, with gaming, entertainment, education and marketing in the metaverse also becoming important sectors.

METAVERSE

The combination of uncritical enthusiasm for the metaverse and deep uncertainty about how it will pan out has sparked some backlash. Industry watchers have questioned if the metaverse will ultimately be much different from the digital experiences we have today -- or, if it is, whether the masses will be willing to spend hours a day in a headset navigating digital space.

Some predictionists, however, argue that while it is early days for the metaverse and fundamental technical barriers still exist, the metaverse will happen. And, it will arrive with a big bang.

**Working of metaverse:
Because the metaverse is largely unbuilt, there is little agreement on how it will work.

1. The metaverse remains a domain of niche applications, used by consumers for entertainment and gaming but stopping well short of an all-encompassing virtual reality.
2. The metaverse is controlled by large competing ecosystems -- for example, Apple and Android meta worlds -- with limited interoperability.
3. The metaverse is a dynamic, open and interoperable space, much like the internet but in 3D.

**These technologies will have the biggest impact on metaverse development over the next decade:
1. artificial intelligence
2. internet of things
3. extended reality
4. brain-computer interfaces
5. 3D modeling and reconstruction
6. spatial and edge computing
7. blockchain

**Challenges, pros and cons of Metaverse:

1. misapplication and applicability of current privacy regulations, such as GDPR;
2. intrusive and extensive data collection;
3. issues concerning data rights and ownership;
4. exploitation of minors; and
5. user-to-user privacy.

VISION & MISSION

Vision:

To nurture students to the global standards in quality of education, research and development in information technology by adapting to the rapid technological advancement & infusing moral values.

Mission:

1. To produce technologically competent and ethically responsible graduates.

2. To take up researches in collaboration with professional societies to make the nation as a knowledge power.

3. To nurture extracurricular skills and ethical values in students to meet the challenges of building a strong nation.

PROGRAMME OUTCOMES

PO 1: Engineering knowledge: Ability to perform academic activities and achieve the Expected requirements by conforming to a pre-defined process as set by the institute and University.
PO 2: Problem analysis: Ability to effectively apply knowledge of computing and Mathematics to computer science problems.
PO 3: Design/development of solutions: Ability and skills to effectively use state-of-the-art Techniques and computing tools for analysis, design and implementation of computing Systems which resolve real life problems.
PO 4: Conduct investigations of complex problems: Ability to utilize multi-disciplinary Knowledge across domains to effectively apply computer technology in a global and social environment.
PO 5: Modern tool usage: Ability to efficiently make use of additional training provided Throughout the course, satisfying industry requirements and thereby becoming globally Employable.
PO 6: The engineer and society: Ability to successfully pursue professional development Through lifelong learning.
PO7: Environment and sustainability: Ability to communicate effectively with both Technical and non-technical audiences.
PO 8: Ethics: Ability to become a versatile professional and function effectively as an Individual and as a member.
PO9: Individual and team work: Ability to understand professional, ethical, legal, security, and social issues and responsibilities.
PO 10: Communication: Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.
PO 11: Project management and finance: Demonstrate knowledge and understanding of Engineering and management principles and apply these to one’s own work, as a member and leader in a team. Manage projects in multidisciplinary environments.
PO 12: Life-long learning: Recognize the need for, and have the preparation and ability to Engage in independent and life-long learning in the broadest context of technological Change.

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