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Artificial Intelligence and Metaverse

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Abstract:
The word meta is derived from latin and translates to mean "beyond." Thus, the concept of the Metaverse aims to travel beyond mundanity, to go beyond the boundaries of the present and to impossibly reach beyond the constraints of reality itself. The fundamental concept of the Metaverse was developed and proposed by Neil Stephenson in the year 1992 and is as such a very new possibility. The computational resources for the metaverse now exist in the form of the internet, the cloud and AI. This paper aims to discuss the potential contained in the metaverse and more specifically for AI in the metaverse. As society progresses, so does its Artificial Intelligence and this can have far-reaching impact on the metaverse as a whole. The paper also discusses new applications for the metaverse as well in the field of AI and the world at large.

Keywords: Technology, Benefits, Future Applications

INTRODUCTION:

Imagine a virtual world where billions of people live, work, shop, learn and interact with each other that is all from the comfort of their couches in the physical world.

In this world, the computer screens we use today to connect to a worldwide web of information have become portals to a 3D virtual realm that's palpable like real life, only bigger and better. 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.


WHY IS THE METAVERSE IMPORTANT?

"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 of dollars in the concept.

Today, companies use the term to refer to many different types of enhanced online environments. These range from online video games like Fortnite to fledgling virtual workplaces like Microsoft's Mesh or Meta's Horizon Workrooms to virtual dressing rooms and virtual operating rooms. Rather than a single shared virtual space, the current version of the metaverse is shaping up as a multiverse: a multitude of metaverses with limited interoperability.

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 a digital space.

EVOLUTION OF THE METAVERSE CONCEPT:

A Metaverse is a virtual 3D environment accessible over the internet. Users may engage in collaborative activities and one-on-one conversations with each other or computer-generated avatars. This is a simulated environment where real-world data is exchanged through the internet.

Social networking, online gaming, learning, and professional development are just a few of the many applications of the Metaverses. Both realistic simulations of the actual world and completely fictional universes are possible with their help.

Their ever-changing and growing nature presents infinite opportunities for discovery and engagement. They offer a unique, fully immersive experience unavailable anywhere else online.

ADVANTAGES:

- Metaverse is massively scaled and interoperable network of multiple virtual worlds and can used by unlimited number of users.
- It creates more demand for goods and services and hence helps in creation of jobs for developers, designers and creators.
- Metaverse requires heavy processing and huge demands of data. This creates demand for semiconductors and sensors in headsets such as Ultrasonic sensor, infrared sensor, force sensor, strain sensor, motion sensor etc.
- Individual technologies used in metaverse will become efficient in their own domains. This delivers better results and opportunities for all stakeholders.
- It provides a much-needed boost to e-commerce and the virtual economy. Customers can interact with merchants and merchandise directly. Cryptocurrencies and NFTs will become more popular and their usage will increase.
- Metaverse will upgrade social media platforms such as twitter and instagram.
- Metaverse is compatible with blockchain technology. Hence it can be used for several applications with the help of digital currencies.

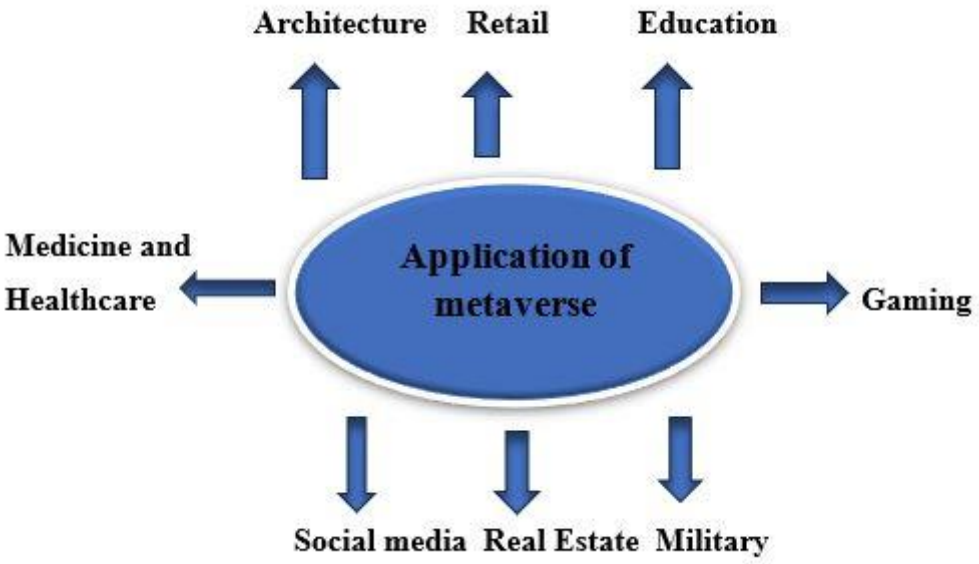
ELEMENTS OF THE METAVERSE

The eight elements that currently form the Metaverse are user interactivity, extended reality, blockchain, artificial intelligence, computing vision, future mobile networks, edge and cloud computing, and the Internet of Things (IoT).

DIMENSIONS OF THE METAVERSE

The five dimensions of the Metaverse that we know today are linearity, context, time, space, and planarity. Is Metaverse 3D or 4D?Currently, the Metaverse is a 3D virtual space that's immersive and shared. It's persistent and presents a 3D virtual world where humans can experience life digitally. However, as the Metaverse progresses and more development takes place, the Metaverse will comprise several dimensions, each one filled with various types of content. Along with the 2D internet and 3D world, the Metaverse may have 4D augmented reality, and even a 5D mixed reality, if that's possible

APPLICATIONS:



1. Gaming

Elements of the metaverse and AR/VR have been used extensively in gaming for decades now. This technology only continues to grow to create games that are more visually appealing to users and allow them to interact with their environments more naturally. The graphics and visuals will only continue to improve in an effort to make it seem like users are in a real-life environment.

The expected growth in this market can't be ignored. The global metaverse gaming market is expected to surpass $660 billion by the end of this decade.

2. Education

With the help of the metaverse and AR/VR, the education system could see some amazing applications in the areas of anatomy, biology, geography and chemistry, among other fields of study. It would also help them learn more effectively by keeping students attention on whichever subject they are covering.

AR and VR are already making their way into the educational landscape with tools such as Google Arts & Cultures. With the help of this Google software, students can take a virtual 3D tour of some of the

world's most well-known museums, enjoy a day at the ballet and even travel abroad without ever leaving the classroom.

3. Retail

The metaverse could be used to promote brands in ways never imagined before. These technologies will allow customers to be engaged on a different level and get a better response rate from potential customers. Retailers can also use booths that provide a virtual reality experience for customers, where they can try on clothing they want to buy without having to buy it first. This is very important to get a better response rate from customers and can also lead to an increase in sales.

Among many remarkable cases we've already seen is Ikea. Customers can virtually "position" furniture in their own area using the Ikea Place app, which uses marketing VR to ensure an item is of proper size, shape and utility for a customer's space. The software automatically scales the item to the size based on the dimensions of the customer's room.

4. Architecture

Architects can use the metaverse and AR/VR to visualize their work in a 3D environment. This would involve creating a virtual world and adding buildings, plants and other natural elements. They can interact with the real world by building objects using this technology, and it would also be easier to show customers what they will build or have built.

Ennead Architects is a New York-based company that uses virtual reality to assist clients with three-dimensional visualization of both space and data. For instance, it used different colored blocks in its virtual reality displays to show which parts of the projected Shanghai Planetarium will receive the most lighting, with redder blocks denoting higher light exposure.

5. Medicine And Healthcare

Doctors can use the metaverse and AR/VR in healthcare by creating 3D clinical applications. They can use this technology to make a patient's experience more interactive. They can then monitor a patient's vital signs in a virtual environment. They can also make tests more user-friendly and provide patients with apps that they can use to monitor their weight, blood pressure, etc.

6. Social Media

The metaverse can also be used to create virtual worlds for the media industry. It can serve as a tool to create virtual sets for filming and provide more realistic scenes for videos. According to Propmodo, "Gaming company Animoca Brands is building a studio backlot in The Sandbox, a metaverse platform, in a partnership with Planet Hollywood."

In the social media realm, we've seen IMVU—an online social network game created in 2004 where players create 3D avatars and interact with each other—grow in popularity. And the company formerly known as Facebook, one of the biggest social media organizations on the planet, changed its name in 2021 to Meta, which is a clear indication of the future of social networks.

7. Real Estate

The next promising entry in metaverse applications list would point towards the real estate sector. Virtual reality is one of the significant technologies for driving experiences in the metaverse. It can offer realistic

and immersive experiences to clients, and this strength can work in favour of metaverse applications in real estate. For example, real estate agents can leverage the power of VR for offering immersive virtual tours of properties to buyers.

In addition, the potential of the metaverse also allows better prospects for integrating different multimedia features in particular VR tours. For instance, VR real estate tours can have ambient music, light, and sound effects alongside narration. All these factors enabled in most popular metaverse applications in real estate can offer an almost real-time experience of the properties.

As a result, real estate marketers could easily boost clients' confidence by allowing them to explore the property in real-time. Clients can be assured about the various criteria before making a purchase, and real estate agents can save a lot of time and money. On top of it, agents can use metaverse examples to their advantage and tailor custom tours according to the taste of clients.

8. Military

Another top entry in the metaverse applications list would take you towards the military sector. The military applications of VR and AR showcase the proven potential of metaverse to support military applications. Tactical Augmented Reality or TAR is one of the notable examples of metaverse technology used in the military. It is almost similar to night-vision goggles, albeit with enhanced capabilities. TAR could easily display the precise location of a soldier alongside the positions of allies and hostiles. As a matter of fact, TAR proves as the ideal substitute for the common handheld GPS gadgets and headsets.

The metaverse examples in the military sector also point towards the Synthetic Training Environment. It is an augmented reality system tailored for offering a realistic training experience for soldiers. The Synthetic Training Environment provides an immersive training experience by simulating physically and psychologically intensive combat settings in virtual environments.

FUTURE OF THE METAVERSE:

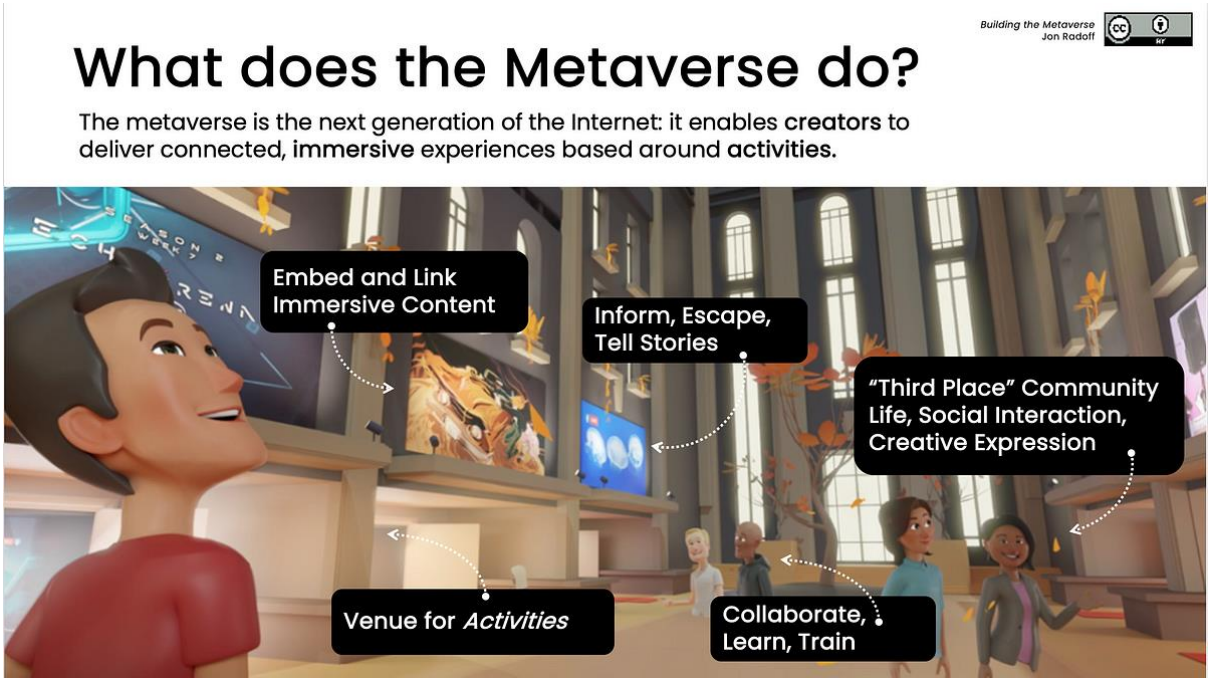
The future of the metaverse is difficult to predict with certainty, as it is a rapidly evolving field that is still in its early stages of development. However, it is clear that the metaverse has the potential to transform many aspects of society and the way we interact with each other and with technology.

One potential scenario for the future of the metaverse is that it becomes a fully immersive virtual environment that is used for a wide range of applications and activities, including work, education, entertainment, and socialising. In this scenario, the metaverse could potentially replace or supplement many of the physical spaces and activities that we currently rely on, such as offices, schools, and even physical stores.

Another possibility is that the metaverse becomes a platform for virtual tourism, allowing people to visit and experience virtual recreations of real-world locations, or even entirely fictional worlds. It could also be used for virtual events and gatherings, such as concerts, conferences, and sporting events. It is also possible that the metaverse will be used to create new forms of entertainment and experiences that are not possible in the physical world, such as virtual reality games and simulations that allow people to experience things that would be impossible or impractical in the real world. Ultimately, the future of the metaverse will depend on how it is adopted and used by the general public, and how it evolves as technology continues to advance.

FUTURE APPLICATIONS:

The Metaverse has a lot of potential uses in the near future. It is a virtual platform which is currently under development. The metaverse aims to be a platform that hosts users in a VR and reality mixed medium. In other words, it attempts to create a hybrid environment in the real world with virtual elements such as avatars and programmable/customizable surroundings. One of the closest comparisons to the metaverse is the hybrid game PokemonGo . This game utilizes the user's location to show Pokemon that can be collected on their phone cameras. The metaverse is different in its sheer size and scope. It can be used as a launchpad for theoretical experiments and simulations. The metaverse can also act as a major networking and social site but with the added sensory experiences. It can be used in the fields of education, theoretical modelling, social exchange and virtual sightseeing for individuals who are unable to travel. It can also act as a go-between for people to engage in sensory experiences such as experiencing life as an ancient roman etc.



BENEFITS OF THE METAVERSE:

There are a number of potential benefits to the development and adoption of the metaverse:

Increased Connectivity: The metaverse allows for real-time communication and interaction between people from different locations, making it easier to connect with others and collaborate on projects.

Virtual Tourism: The metaverse could potentially be used for virtual tourism, allowing people to visit and experience virtual recreations of real-world locations or entirely fictional worlds.

Increased Accessibility: The metaverse allows for the creation of virtual spaces and environments that can be accessed from anywhere with an internet connection, making it easier for people with disabilities or mobility issues to participate in a variety of activities.

Enhanced Education: The metaverse has the potential to revolutionise education, allowing for the creation of immersive virtual classrooms and other learning environments. New Forms of Entertainment: The metaverse could be used to create new forms of entertainment and experiences that are not possible

in the physical world, such as virtual reality games and simulations that allow people to experience things that would be impossible or impractical in the real world.

Improved Efficiency: The metaverse could potentially be used to streamline and improve many business and organisational processes, such as meetings, training, and customer service.

Economic Opportunities: The development of the metaverse could create new economic opportunities for entrepreneurs and developers, as well as for the companies and organisations that are building and promoting the metaverse.

CONCLUSION:

Metaverse will open up new possibilities in technologies and smudge the lines between real and virtual. You can create a virtual avatar of yourself to interact with others in the 3D virtual world. It erases boundaries and provides opportunities for businesses to market their products to the right people. Metaverse has made human interaction easier. It has various applications worldwide .It is under development and will be improved further. Artificial Intelligence is needed in metaverse to help people navigate virtual worlds as well as physical worlds with augmented reality . For example, metaverse built an AI and blockchain to create a digital virtual world where one can navigate safely and freely in social and economic activities that overpasses the limit of real world. most of the metaverse projects limit users to explore, own, and customize things in virtual world.

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