

SUPPLY CHAIN TRIBE

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Exploring METAVERSE in SUPPLY CHAIN

New age technological innovations such as metaverse can have a significant impact on senior supply chain leadership decisions because they enable novel planning approaches, quick virtual testing, and accelerated time to market for new products. Owing to its inherent functionality, the metaverse would create a virtual supply chain that would emulate the most minute variables across inventory points, subcontractors, suppliers, products, buffers, customers, ships, and trucks. This would ultimately enable companies to spot potential issues, disruptions, and shortages before they can occur and take corrective action in advance. **Prof. Abhishek Behl (Management Development Institute, Gurgaon, India)** and **Nirma Jayawardena (OP Jindal Global University, India)**, through this article, project the future of metaverse in supply chain and how its potential impact on the same...

METAVERSES are edge technologies that operate from the bottom up. Digital operations enhance physical supply chains digitally, while the metaverse creates a digital world and translates it into a real one. Companies and governments around the world are investing in the metaverse. Industry practitioners and scholars have recently begun to pay attention to the metaverse. According to McKinsey & Company, the metaverse market is expected to generate \$5 trillion in the coming years, involving a variety of products, services, and industries. It is consequently expected that several giants and emerging companies will invest heavily to take advantage of the opportunities presented by this new market. With the help of a three-dimensional (3D) representation and a variety of applications, the metaverse can provide immersive experiences that relate to the physical world. Various technologies are used to support avatars

(i.e., smartphones, tablets, smart glasses, headsets, etc.). These include artificial intelligence (AI), simulations, virtual reality (VR), augmented reality (AR), extended reality (XR), blockchain, and digital twins.

METAVERSE SOLUTIONS FOR SUPPLY CHAIN OPTIMIZATION

A virtual world can be used to observe the movement of goods throughout the entire supply chain. To determine how the supply chain responds and where it breaks down, issues such as weather conditions, component shortages, and transportation disruptions can be introduced. The use of these digital twins can facilitate the identification and testing of improvements at various stages, and when problems arise, the virtual world can be used to evaluate potential solutions. Metaverse solutions are also capable of optimizing peak demand planning. In a virtual environment, you can test



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Metaverse has the potential to integrate the real and virtual worlds, enabling residents to carry out their daily tasks without having to move their bodies. As a result, a great number of businesses have adapted to account for this recently discovered fact. Every individual is represented by a corresponding digital avatar that may be communicated with, managed, guided, and watched over. Companies have the ability to buy and sell products, monitor operations, receive information, adjust projections, and deliver services within the metaverse. As a consequence of this, it becomes a digital imitation of what businesses actually do.

everything from order management to distribution and fulfillment, revealing those areas of the supply chain that require reinforcement during times of increased demand. In the real world, end-to-end supply chain network mapping contributes to the development of a more robust and resilient supply chain. When historical data is unavailable or irrelevant, artificial intelligence can produce synthetic data that can be used to develop forecasts and determine the best course of action.

METaverse-BASED SOLUTIONS FOR THE DESIGN AND LOCATION OF FACILITIES

Commercial and industrial facility managers are increasingly interested in using augmented reality to improve their operations. A digital augmentation lens allows people to see their physical environment through augmented reality. Smartphones use it daily for navigation or Snapchat filters. Commercial and industrial facility managers can take advantage of augmented reality for convenient assessments. Operational

planning and risk assessment can be done with it. Currently, 1 out of 5 facility management professionals use augmented reality for work. AI and IoT sensors could be used in conjunction with these facilities to track the movement of goods throughout the supply chain once these facilities are constructed. By utilizing blockchain technology, they may be able to plan, respond, and implement the best responses in real time with minimal human intervention. As a result of the metaverse, people will have new opportunities to collaborate and exchange ideas with each other. This means, for example, that in the digital arena, there may be a meeting between firms and their suppliers, where they examine and evaluate the facilities together. There is no doubt that the presentation of new ideas and the exchange of comments both contribute to the facilitation of an efficient and timely collaboration.

ENHANCE SUSTAINABILITY WITH METAVERSE SUPPLY CHAINS

Firms and organisations need to be ready to confront a crucial question regarding one of the many business characteristics that characterise the metaverse which is that does metaverse is essential and accountable type of digital technology? This is an undoubtedly serious subject in the context of Industry 5.0, which represents a radical departure from traditional business practises. Industry 5.0 seeks to utilise cutting-edge technical innovations to help businesses become more productive, eco-friendly, and community responsible.





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The literature on digital transformation has exhaustively documented how the implementation of certain digital technologies can have a negative impact on a variety of facets of sustainability. For instance, the deployment of robot's technology can assist manufacturing systems in managing repetitive tasks and helping continuous systems attain economies of scale as well as efficiencies. Every piece of robotics hardware is equipped with sensors, intelligence that enables it to come to its own conclusions autonomously, and the ability to collaborate with humans to enhance production, quality, and lead times. Robotics, on the other hand, can be considered as a danger because it will likely result in different working conditions and remuneration, as well as the possibility of job loss and the requirement for training programmes. Large volumes of data can optimise processes for low scrap, high saturation of manufacturing equipment, minimal waste, and high energy efficiency. Big data manufacturing systems may be capital-intensive and utilise more energy. Big data uses 200 terawatt hours each year in data centres, according to actual research. This is greater than Argentina, Ukraine, and Thailand's energy usage, half of the world's transportation electricity, and 1% of global electricity demand.

THE CULTURE OF THE ORGANIZATION AND THE COMMITMENT OF STAKEHOLDERS

The culture of the organisation plays a crucial influence in digital transformation projects such as the metaverse. It is possible that progress towards the metaverse will be hindered by the data-

driven culture of an organization, the support of upper management, and cross-departmental and cross-functional cooperation. Organizations may also face difficulties due to a lack of knowledge about or exposure to the metaverse. The Metaverse, according to McKinsey & Company, enables levels of collaboration in training and agile virtual prototyping that were previously impossible. Businesses and their suppliers are now able to collaborate on supply chain management because of this lens. The opinion and engagement of customers, sometimes in real time, is becoming more important than it has ever been, thanks to the metaverse. Nevertheless, the management of project stakeholders is most affected by cultural factors. When individuals are forced to interact with international stakeholders, some of them are unable to accept the differences because they carry different views and values than those that are prevalent in their societies.

This is the core cause of the problem. Before making a purchase decision, clients in other industries, such as travel and hospitality, will be presented with opportunities to participate in immersive experiences. In addition, clients can conduct virtual experiments with a variety of resources, services, and products such as rooms, excursions, restaurants, and flights. In addition, companies in a variety of different sectors have already begun implementing metaverse technologies into their operations. For example, companies such as Amazon, Google, Apple, Nvidia, and Tencent, amongst others, are redesigning their goods and the professions associated with them so that they can function in the metaverse.

CONCLUSION

A variety of applications and three-dimensional (3D) representations make up the metaverse. Besides smart devices (such as smartphones, tablets, smart glasses, headsets, etc.), avatars can also be accessed through cutting-edge technologies like artificial intelligence (AI), simulations, virtual reality (VR), augmented reality (AR), extended reality (XR), blockchain, and digital twins. Four aspects have been discussed through this article as; metaverse solutions for supply chain optimization, metaverse-based solutions for the design and location of facilities, enhance sustainability through the use of metaverse supply chains and the culture of the organization and the commitment of stakeholders.

After implementation, the lack of skilled workers has become one of the primary concerns, whereas security was the primary concern before adoption. Strong plans pertaining to human resources, financial costs, supplier relationships, and physical infrastructure should be developed by managers. The technology, known as the metaverse, has the potential to integrate the real and virtual worlds, enabling residents to carry out their daily tasks without having to move their bodies. As a result, a great number of businesses have adapted to account for this recently discovered fact. Every individual is represented by a corresponding digital avatar that may be communicated with, managed, guided, and watched over. Companies have the ability to buy and sell products, monitor operations, receive information, adjust projections, and deliver services within the metaverse. As a consequence of this, it becomes a digital imitation of what businesses actually do.