



## **METaverse FOR SERVICE QUALITY: A LOOK AT ROLE AND CHALLENGES IN RETAIL FOOD OUTLETS**

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### **Abstract:**

Metaverse is an interesting application of technology wherein the people use virtual reality to interact with people, can conduct or participate in social events, and to run business too. The purpose of this study is to understand the role and challenges of metaverse in improving service quality of retail food outlets. Literature has been collected from various sites, books, thesis, journals and other e-content available on websites. This study has implications for marketers to understand how they can retain the existing customers and attract new customer with the help of metaverse. And what challenges marketers may face while adopting metaverse for improving service quality. The metaverse presents a novel and exciting opportunity for retailers to improve the quality of their customer service; those who are able to successfully implement this opportunity will have an advantage over their competitors

**Key Words:** Metaverse, Service Quality, Virtual Reality, Augmented Reality, Foodverse

### **1. Introduction:**

Metaverse is a developing concept which can be explained as a virtual world with three-dimensional network. It is an interesting yet complex experience which is owned by various technologists and companies wherein the people use virtual reality to interact with people can conduct or participate in social events, and to run business too. The term Metaverse was firstly coined by Neal Stephenson's in one of his novels named Snow Crash. The word Meta become popular when the CEO of Facebook, Mark Zukerberg decided to change Facebook's name as Meta. Augmented Reality is just like a real world where people can explore different places. Another important term is NFTs, Non-Fungible tokens, that can be used as digital money in exchange of virtual benefits availed by users. These are similar to artwork and collectibles, which plays an essential role in smooth working of metaverse. Avatars is yet another term you may come across which is a cartoon like character represents "virtual you". The Virtual Worlds are the most common metaverse setting[1]. The aim of this study is to understand the role and challenges of metaverse in improving service quality of retail food outlets i.e. how the food industry can operate in a virtual environment. Artificial intelligence is drastically changing the way businesses used to engage with the customers by extracting and analyzing tremendous data generated through customer interaction[2] Use of metaverse in food industry may be termed as foodverse which can help brand manager, restaurants owners to interact to their customers that can help in building up of food community that belongs to different countries having different food habits and taste. To create a worldwide reach of food industries digitally, foodverse can be used by the owners to bring people to a digital platform. ORARE, a native token helps the users to transact at farmer's market, participate in governance. The food metaverse was created during lockdown. Supreet Raju is one co-founder. "Food is the language of its own and makes the world a happier place. It is what connects us. The metaverse brings us closer together in a unique way. In it, we can share our culture and our food. A critical review on AI[3] explains the increasing demand towards the AgTech industry using computer vision and AI which might be a path towards sustainable food production to feed the future. Now with the launch of the foodverse, there is no reason why brands and consumers can't come together." With the growth in this sector, users can swap NFTs for real meals and deals. Many food brands are investing in digital world for expanding their market share. Metaverse in food industry is at very early stage but soon a time may come when people, as Avatars can visit restaurants with their friends or family and exchanges NFTs for real meal. "The full vision of the metaverse may be years away, but brands should start experimenting on what their metaverse presence will be now," said Vishal Shah, Meta's Vice President of Metaverse, in a press release. Or people can order in metaverse and get it deliver at their actual home. One Rare is the world's first food metaverse, it has developed the foodverse having numerous zones where users can come across celebrity chefs, virtual restaurants and new food brands. "Pretty much everything you do inside a restaurant you should be able to replicate or enhance in the metaverse," says Bandy. The next generation of diners will be able to walk into a restaurant, choose their preferred table, order food, and pay inside augmented reality worlds akin to that of video games. "Payments will also be easy in the metaverse, with Google Wallet or Apple Pay inbuilt into the experience," he adds. Metaverse become popular during covid-19 pandemic when social gatherings were not

allowed and people were following social distancing. During that period, people could interact in virtual world as avatars with their friends, family using metaverse. With the help of metaverse, food companies can increase their brand awareness and intimacy among people specially with Generation Z who are very much familiar with digital environment and more active internet users. In a recent PwC survey, 66% of executives related to food industries reported that their companies are actively engaged in the metaverse, and 82% said they expect metaverse plans to be part of their business activities within three years.

Those numbers sound high until you think about how many equipment manufacturers started offering virtual reality (VR) and augmented reality (AR) options for service and training during the pandemic. Over the past few years, virtual plant tours, digital twins of equipment, and AR-assisted service calls have become common offerings. They may not have specifically been touted as part of "the metaverse," but they all fit the definition. This trend toward the use of virtual worlds will likely continue as technologies improve and manufacturers start to realize the very tangible bottom-line benefits, such as the money saved from testing a piece of equipment before it's even built. Despite significant opportunities being forecast in the metaverse, several challenging marketing questions remain unanswered [4]

## **2. Objectives of the Study:**

The aim of this study is to understand the role of metaverse in improving service quality of retail food outlet. and To explore the challenges to be faced by the metaverse in its operation/execution

## **3. Review of Literature:**

Chiu et al (2021) ARRAs have emerged as rapidly developing innovative and futuristic retail innovation used in both physical store and online shops to improve the retail settings and customer experience[5]. This study proposed a model to investigate the mediating impact of user satisfaction and their continuance intention between quality perspective and user benefits, Data was collected from Chinese middle class and better-quality standard population. Both factors play a mediating role among all proposed relationships

Bian et al (2022) studied that since Metaverse Period, human output and distribution have evolved. The virtual world's element construction procedure activates the agricultural food industry's technological upgrading and application development. This article offers a Metaverse-based block chain food traceability construction, design, and development scheme and covers the Metaverse application scenario and importance of digital virtual food and agricultural food traceability technology. It explained block chain-based agricultural food traceability and food traceability application and Metaverse smart contract concept. Further, it discussed Food Traceability Technology's Metaverse use, benefits, and future sustainability.

Zheng et al (2022) explained that Expanding cyberspace with a focus on human-in-loop interaction, value definition of digital assets, and real-virtual reflection, the "metaverse" paves the way for the organic merger of man, machine, and material in both physical and digital manufacturing. As a new man-in-the-loop digital twin system of the actual industrial economy, the concept of Industrial Metaverse is offered. It allows for natural interaction between humans and machines, simulation of industrial processes, and the exchange of value in the real world. Key features of Industrial Metaverse, including man-in-the-loop, real-virtual interaction, process assertions, and social networks, are highlighted by drawing parallels to Metaverse and Digital Twin. Natural contact, industrial process simulation, industrial value transaction, large-scale information processing and transmission technologies, etc. are explored as examples of key technologies in the Industrial Metaverse. Finally, the opportunities and threats that Industrial Metaverse faces in technology, industry, and applications are outlined.

Ricci M et al. (2023) studied that design research and teaching are changing. Mixed Reality (MR) and low-cost Head-Mounted Displays (HMDs) are shifting design education towards the Metaverse. Design and instructional approaches must change in this ever-changing environment. Scientific literature cannot contribute to industrial design programme MR technology instruction. Hence, provided a unique laboratory with an integrated multidisciplinary approach that starts from interaction design foundations to teach students how to develop next-generation Metaverse MR interfaces. Information Design, Information Systems, and Virtual Design and Simulation courses use the lab to apply theory. Industrial design students conducted a five-step multidisciplinary process from state-of-the-art study to presenting a group MR user interface design. Consequently, they gave a class case study on a household appliance semester project. Semi-structured questionnaires evaluate teaching methods. Early results indicated student acceptability, efficacy, utility, efficiency, and satisfaction with the laboratory teaching method.

Dubey et al (2022) discussed the usage of NFTs, blockchain technology, and smart contracts are just a few examples of how banks might use Metaverse to enhance their operations. The purpose of the article was to examine the potential of metaverse in the banking industry and comprehend the range of its actual application. This study covered a wide range of subjects, including the definition of the Metaverse and business considerations in banking and financial services. examines the numerous business potential in the customer communication sector, international trade, home loans, digital assets, green loans, and reaching carbon neutrality through Metaverse. In-depth discussion of the role of innovation leaders helps readers comprehend and value innovation in today's technologically swiftly changing world. The paper made the case that banks

should be proactive in promoting Metaverse adoption, supporting circular economy, and minimizing waste by enabling web3.0 technology in the banking industry.

Sundaram et al. (2023) studied that customer satisfaction is defined as exceeding client expectations through a really differentiated experience. Customer satisfaction is not limited to providing high-quality service; it also involves the delivery method and customer experience of the service. With the emergence of the metaverse resulting in "creative disruption," the customer experience will span smoothly between the virtual and physical worlds. As the new playing ground for corporations and consumer involvement, it will revolutionize the customer experience. This will be enhanced by transforming past notifications and transactions into personalized real-time messages. In this chapter, the writers examined how the metaverse will influence customer experience and satisfaction. This chapter highlighted, through a literature review, the key pillars of the metaverse that will influence consumer experience. The report then explored how consumer experience is likely to evolve in the metaverse for important industries such as retail, technology, and banking.

Ahsani V et al (2023) studied metaverse-as-a-service (MaaS) systems' privacy and security, edge computing, and block chain technology foundations. The article began with metaverse wireless security. Finally, it discussed metaverse privacy and security from data-, learning-, and human-centric perspectives. Private and secure approaches for privatising sensitive data properties and protecting distributed metaverse platform machine learning algorithms are discussed. Mobile network operators and metaverse service providers review novel visions and less-investigated approaches to enable safe and private MaaS across the metaverse, from the access layer to client social interactions. Edge computing strengthens metaverse features, as explained later in the article. Moreover, metaverse edge computing difficulties have been examined. The research also examined 10 major MaaS platform issues and how block chain technology addresses them. Finally, content-centric security and zero-trust metaverse are presented together with block chain's unsolved problems to help network designers in the metaverse era.

#### **4. Role of Metaverse in Food Industries:**

- **Virtual Storefront:** Metaverse technology can help retail food outlets to create virtual storefronts, allowing customers to explore products and services in a simulated environment. This can be especially useful for new or small businesses that may not have a physical storefront, allowing them to reach a wider audience and potentially increase sales. Additionally, virtual storefronts can be customized to fit the brand and aesthetic of the business, providing a unique and immersive experience for customers.
- **Personalized Experiences:** By leveraging data and AI, metaverse technology can provide personalized experiences to customers, based on their preferences and behavior, improving service quality. For example, a retail food outlet could use customer data to recommend menu items or promotions that are tailored to individual preferences. This can help to create a more positive and engaging experience for customers, which can lead to increased loyalty and repeat business.
- **Interactive Menu:** A metaverse-based interactive menu can offer customers a more engaging and immersive experience, allowing them to visualize and customize their orders in real-time. This can help to reduce order errors and improve overall customer satisfaction. For example, a customer could use an interactive menu to see how different toppings or ingredients would look on a pizza before ordering.
- **Real-time Inventory Management:** Metaverse technology can help retail food outlets to manage their inventory in real-time, ensuring that products are always available, and reducing the likelihood of stockouts. By using sensors and other IoT devices, businesses can track inventory levels and automatically reorder products when supplies are running low. This can help to reduce waste, improve efficiency, and ensure that customers always have access to the products they want.
- **Augmented Reality (AR) Features:** AR technology can be integrated into the metaverse to enhance the customer experience, such as providing virtual food tastings, and helping customers to visualize how their food will look before they order. This can help to create a more immersive and engaging experience for customers, which can increase customer satisfaction and loyalty. Additionally, AR can be used to provide information about ingredients, nutritional information, and allergy warnings, which can help customers make more informed choices.
- **Enhanced Customer Engagement:** Metaverse technology can help service providers to engage with customers in new and innovative ways, creating more personalized and immersive experiences. For example, a business could use a virtual reality (VR) experience to give customers a behind-the-scenes look at their operations, or use augmented reality (AR) to create interactive product demonstrations.
- **Streamlined Operations:** By leveraging data and AI, metaverse technology can streamline operations, making them more efficient and effective, reducing costs and improving service quality. For example, businesses could use data analytics to optimize supply chains, reduce waste, and improve delivery times. Additionally, AI-powered chatbots can help to reduce wait times and provide instant support to customers.
- **Improved Customer Insights:** Metaverse technology can provide service providers with valuable insights into customer behavior and preferences, helping them to improve their offerings and tailor

their services to meet customer needs. By analysing data from virtual storefronts, social media, and other sources, businesses can gain a deeper understanding of their customers, and use this information to create more personalized and relevant experiences.

- **Increased Accessibility:** Metaverse technology can make services more accessible to a wider range of people, including those with disabilities, by providing virtual and remote access to services. For example, a business could use VR to create a virtual showroom that can be accessed by people with mobility issues, or use AR to provide audio descriptions of products for customers with visual impairments.
- **Improbable and impossible experience:** In metaverse, it is expected that people will get a life-like experiences such as these to the masses in their own environments. With the introduction of metaverse, a lot of things are becoming possible today. People can explore different places and are also able to share their experience with friends and family in real time as if they are present at a same place in a real world. Like in a social gathering where people can interact face-to-face, these gathering can happen in the virtual world with the help of avatars.

## **5. Challenges:**

It is often said that every challenge that one is presented with carries an opportunity in disguise. This also applies in case of metaverse too. Enormous learning experience will help the companies to turn the challenges into great opportunities

- **Usefulness and ease of use:** If a consumer finds something worth paying money, spending their time or interacting with contents, it comes under the category of usefulness whereas ease of use means how easily one can use or understand the way of using a product. Mass adoption of metaverse by the users will frame the future of metaverse. There is no doubt that the metaverse is advanced interactive virtual world but this can hold on only if it can attract mass users Metaverse requires expensive and cumbersome tools which is limited to a small segment of users. As the concept is at emerging stage, later on easy to use and understand technology might come in force till then companies may face this challenge.
- **Maintaining reputation and identity:** This includes the challenge of identifying and embracing of consumers' online demands and adoption of new digital technology without compromising with their value, vision and mission. This means that companies need to cater the demand of its potential and actual consumer in such a manner that is in consistent with the core values of the company and help in achieving the vision and mission of the company. Also, how to adopt the new technology which is easy to use and understand and cost effective. One wrong decision may harm the reputation of the company and can results in heavy losses.
- **Data and Security:** The data available online in the form of personal information, behaviour, etc are exposed to different risk i.e. data theft. Data security and privacy is a matter of concern for both consumers and companies. While using internet, we all are being watched which reflects the personalities one is having, their taste preferences, how people react to some content, etc. Internet stores all type of data and in metaverse this data is exposed not only to different platforms but also to different users which can be misused by cybercriminals. Internet is already tracking user's behaviour and in metaverse this becomes more intense. Hackers can steal users' identity or avatars and could pretend to be the real user damaging the image in virtual or in real world too. The brands may face the challenge of protecting itself from forgery. Bits and byte can be copied with a click of a mouse. Therefore, it is important to build new methods of privacy and data protection. The focus must be on security in metaverse and finding out different ways to identify and verify users identities to reduce cyber crimes

A big challenge for food companies is to install innovative cloud-based platforms or blockchain technology throughout complex supply chains and communicating these efforts to potential consumer in a manner that consumer can understand quickly. The companies must do effort to make people understand what kind of product the company is offering which brings transparency in the supply chain.

- **Currency and payment System:** Metaverse and crypto worlds are entirely different concept. Without crypto world, it is difficult for metaverse to explore its full potential. In metaverse, people from different countries interact with each other therefore it is essential that they all must share a common economy to facilitates online payments and economic transactions using one or more digital currencies. The transaction process becomes more complex without a common digital currency. Therefore, another possible challenge which may be faced by food retailers in metaverse is to build a robust payment system for making and receiving of payments in the virtual world. Online transaction of cash involves high risk. The number of cases relating to internet banking fraud is increasing every-day. Therefore, there is a need to make people aware about online scams and maintaining a system which helps in resist.

- Law and jurisdiction: There is a potential for bullying and harassment in the metaverse like in a real world and any other social media platforms. With the expansion of Internet, an equal revolution has taken place in the legal sphere. The court law cannot enfold all the technology-based scenarios as the pace of technological development is greater than capacity of Parliament to pass legislation. So, the companies must think about the potential problems that an individual might face and also the policies must be framed to address such issues
- Lack of skills and experience: As metaverse is a new concept, it is still evolving. The successful adoption of metaverse depends on skills and confidence of an individual. To use metaverse, individuals and companies must spend more to buy the required technology such as VR headsets. As the technology is new and complex, most of the people don't have the required skills and experience to use it in a right way. There is a need to train the employees to assess skills, as investment in skilled employees gives a competitive advantage to the employer.
- Protecting IP: The importance of intellectual property is becoming essential in metaverse. IP allows the businesses to protect its ideas or innovations. There are different kinds of IP for the protection of different types of inventions. IP, being one of the most important assets of the business needs to be protected for maximizing the potential returns of the business as the protection of IP is a complex task. With new legal challenges, the scope of legal practice area has widened. There is a need to establish clear IP licensing arrangements to remove or to censor infringing content. Also, regulations must clear that who will be responsible for protection of sensitive data available in the virtual world.
- Value to company: Companies must explore how they can invest in metaverse in order to generate value out of it. For example, food chains set up "shops" in metaverse that allows users to order food virtually and get the food deliver to their home in real. It is important for companies to know the potential of metaverse as a tool to achieve its its goals and objectives. The question is why a company should be in metaverse? What purpose does it serve? Is it beneficial for a company to be in metaverse? How metaverse can help in adding value to the company? Etc. There are many such question that a company must consider before making any investment decision related to metaverse. Adoption of metaverse while keeping in mind the purpose it is going to serve is a fundamental, as this will guide in framing the experiences that which further define the relationship between the company and their customers in the metaverse.

## **6. Conclusion:**

The idea of the metaverse possesses a substantial potential for enhancing the level of customer care provided in retail food establishments. The metaverse has the potential to improve consumer engagement and personalization by making available to them a digital environment in which they can have interactions with the company's goods and services. However, the implementation of the metaverse in retail food outlets confronts a number of obstacles, such as the viability of the technology, the expense, and the acceptability of the concept by customers. Retailers will need to make investments in the appropriate infrastructure, work together with providers of technology, and educate customers about the benefits of the metaverse in order to successfully navigate these hurdles. Additionally, shops are obligated to verify that the experience provided by the metaverse is consistent with their brand identity and values and satisfies the requirements imposed by regulatory agencies. The condition of virtual crimes being magnified, of trade-offs in technology, of user privacy, and of anti-social elements dominating the space [12]. Overall, the metaverse presents a novel and exciting opportunity for retailers to improve the quality of their customer service; those who are able to successfully implement this opportunity will have an advantage over their competitors and will be able to forge closer connections with their clientele.

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