

# BIG DATA AND METAVERSE REVOLUTIONIZING THE FUTURISTIC FINTECH INDUSTRY

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## **ABSTRACT**

*The Fintech industry is no stranger to transformation and disruption. With the emergence of new technologies such as Big Data and the Metaverse, finance companies are quickly leveraging these technologies to revolutionize the virtual fintech sector. Big data transforms how financial institutions gather, analyze, and utilize data. The sheer amount of data available has opened up countless opportunities for better customer understanding and insight into business operations. Companies can use this data to create predictive models that identify emerging trends in customer behavior, market activity, and other aspects of their business. By utilizing these insights, companies can make smarter decisions about products, services, marketing strategies, and more. The Metaverse is another technology with massive potential for disrupting the Fintech sector. The Metaverse enables businesses to offer virtual goods and services without physical stores or retail outlets. This makes it easier for companies to scale their operations across multiple regions and gives customers more options when choosing a financial service provider. Additionally, using digital currencies like Bitcoin helps reduce transaction costs significantly while increasing security compared to traditional payment methods like credit cards or PayPal.*

## **KEYWORDS**

*Big Data, Metaverse, FinTech, Innovation, Data security*

## **1. INTRODUCTION**

Big Data and Metaverse are two powerful technologies revolutionizing the Fintech Industry. By leveraging the large data sets provided by Big Data and the virtual world created by Metaverse, the Fintech Industry is able to make faster and more informed decisions, resulting in improved efficiency and increased profits [1]. Millions of people worldwide have embraced digital and social media in the past several years, big thanks to the momentum generated by the spread of pandemics. This continuing process has altered how people and organizations operate and interact, with far-reaching consequences for human life worldwide. Many businesses in the financial services industry (BFSI) are beginning to see the value in embracing technological innovations and virtual reality, especially local digital companies like fintech [2]. Due to the metaverse's increased freedom, expansiveness, and potential for direct engagement, businesses in the financial services industry, including fintech, are becoming more open to its possibilities. The metaverse's potential to boost customer involvement beyond brick-and-mortar locations and mobile apps is exciting to these businesses. In this journal, we will explore the benefits of Big Data and Metaverse and how they can be used to revolutionize the Fintech industry.

## 2. LITERATURE REVIEW

### 2.1. Big Data, Metaverse, and How Does it Work?

Big Data is a term used to refer to extremely large data sets which may be structured or unstructured. These data sets are so large that they cannot be processed using traditional data processing applications. Both amorphous and structured forms of big data exist. Information already being managed by the company in spreadsheets and databases is an example of structured data; this information is often numerical in nature [3]. Data not neatly arranged or formatted is said to be unstructured. Information on client requirements can be gleaned from social media data as well. Big Data is often used to analyze trends, track user behavior, and predict future events. Big Data can help companies gain insights into their operations, understand customer needs, and improve their business strategies [4] (see Figure 1).

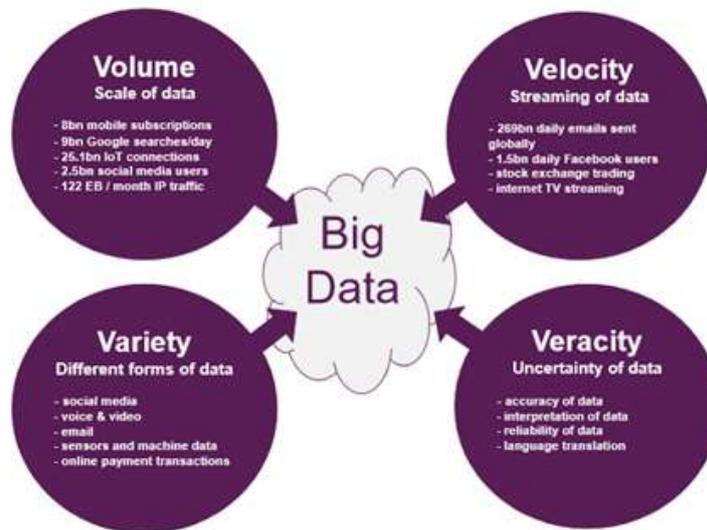


Figure 1. Modern Bigdata and its impact

Metaverse is an open-source technology for creating and running decentralized digital economies. The metaverse is a collection of interconnected, user-created, and persistent digital environments where people can access and interact with various resources and activities. To fully immerse themselves in the metaverse, users can adopt digital avatars, which can be enhanced with virtual reality and augmented reality technology [3]. The platform is a 3D virtual world browser, allowing users easy access to the metaverse by creating their avatars. Anyone can enter the metaverse in this manner, which is one of the best and simplest methods available. Decentral and also provides an online avatar creator for users interested in customizing their online persona. It enables the development of digital assets and smart contracts on a distributed ledger. With Metaverse, users can securely transfer and store digital assets without needing a centralized third party. It is designed to reduce transaction costs and increase security [3].

Big Data and Metaverse are two technologies that offer organizations the opportunity to use data to improve decision-making, gain insights into customer behavior, and create new business models (see Figure 2). Big Data and Metaverse also offer the potential for new applications and services that could disrupt traditional financial services. By leveraging the power of Big Data and Metaverse, organizations can build more efficient, secure, and user-friendly services that will benefit customers and businesses [1].

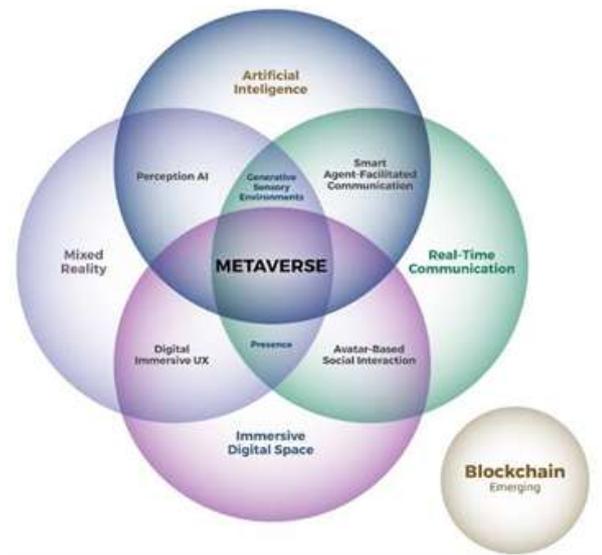


Figure 2. System of Metaverse and how does it work

## 2.2. How can Big Data and Metaverse be used in the Fintech industry?

Big Data and Metaverse are becoming increasingly important tools for the fintech industry. Big Data is a powerful tool that allows companies to collect, process, and analyze large amounts of data quickly and efficiently. This data can then be used to make informed decisions regarding strategies, investments, and customer experience. Metaverse, on the other hand, is an emerging technology that uses blockchain-based applications to store and manage digital assets securely. It enables users to create digital identities, store data, and access services in a secure environment. It also provides a platform for developers to create decentralized applications (dApps) [5].

These two technologies can be used together to revolutionize the fintech industry. By using Big Data, companies can make better-informed decisions about their strategies, investments, and customer experiences. With Metaverse, companies can securely store and manage digital assets in a secure environment and access various services in the Metaverse ecosystem. For example, by combining Big Data and Metaverse, companies can gain valuable insights into customers' spending habits, preferences, and demographics. This data can then be used to create more personalized and tailored services that meet customers' needs. Furthermore, companies can use this data to identify potential areas of improvement to increase customer satisfaction [2].

Additionally, Big Data and Metaverse can be used together to reduce the cost of investing in new technologies. Companies can develop more efficient and cost-effective solutions by leveraging the data collected from the two technologies. For example, by using Big Data and Metaverse together, companies can quickly and accurately identify trends in the market and develop products or services that will meet those needs. Big Data and Metaverse are potent tools that can be used together to revolutionize the fintech industry. Companies can leverage these technologies to gain valuable insights into customer preferences and spending habits and reduce the cost of investing in new technologies. Ultimately, this will improve customer satisfaction and increase efficiency and profitability for the company [6].

### **2.3. Benefits of using Big Data and Metaverse in the Fintech industry**

Big Data and Metaverse have revolutionized the Fintech industry by providing new opportunities to streamline processes and gain insights. By leveraging Big Data and Metaverse, Fintech companies can achieve unprecedented accuracy and efficiency in managing their customers' financial data. Some of the key benefits of using Big Data and Metaverse in the Fintech industry are:

1. **Cost Savings:** Big Data and Metaverse allow Fintech companies to reduce their IT costs by cutting down on manual labor and automating processes. By leveraging the power of Big Data and Metaverse, Fintech companies can reduce the cost of storing and managing customer data and cut back on back-end operations costs[7].
2. **Increased Security:** Big Data and Metaverse provide secure ways for Fintech companies to store and access customer data. Advanced algorithms and encryption techniques help ensure that customer data is safe from external threats [2, 3]. Big Data and Metaverse also help Fintech companies detect suspicious activity on their networks.
3. **Improved Customer Experience:** Big Data and Metaverse help Fintech companies improve their customer experience by providing more accurate and timely insights into their customers' financial needs. By leveraging Big Data and Metaverse, Fintech companies can better understand their customers' spending habits and create more tailored services to meet their customers' needs [2].
4. **Enhanced Regulatory Compliance:** With Big Data and Metaverse, Fintech companies can ensure compliance with government regulations more effectively. By leveraging the power of Big Data and Metaverse, Fintech companies can easily detect suspicious activity on their networks to prevent money laundering or other illegal activities [7].

Overall, Big Data and Metaverse have revolutionized the Fintech industry by providing unprecedented accuracy and efficiency in managing customer data. Big Data and Metaverse have allowed Fintech companies to reduce costs, increase security, improve customer experience, and enhance regulatory compliance [7].

Table 1: Benefits of using Big Data and Metaverse in the Fintech industry

<b>Benefits of using Big Data and Metaverse in the Fintech industry</b>	
<b>Cost Savings</b>	Big Data and Metaverse allow Fintech companies to reduce their IT costs by cutting down on manual labor and automating processes. By leveraging the power of Big Data and Metaverse, Fintech companies can reduce the cost of storing and managing customer data and cut back on back-end operations costs.
<b>Increased Security</b>	Big Data and Metaverse provide secure ways for Fintech companies to store and access customer data. Advanced algorithms and encryption techniques help ensure that customer data is safe from external threats. Big Data and Metaverse also help Fintech companies detect suspicious activity on their networks.
<b>Improved Customer Experience</b>	Big Data and Metaverse help Fintech companies improve their customer experience by providing more accurate and timely insights into their customers' financial needs. By leveraging Big Data and Metaverse, Fintech companies can better understand their customers' spending habits and create more tailored services to meet their customers' needs.
<b>Enhanced Regulatory Compliance</b>	With Big Data and Metaverse, Fintech companies can ensure compliance with government regulations more effectively. By leveraging the power of Big Data and Metaverse, Fintech companies can easily detect any suspicious activity on their networks to prevent money laundering or other illegal activities.

#### 2.4. Case Study: How Big Data and Metaverse can help a Company in the Fintech Industry

One of the best examples of how Big Data and Metaverse can revolutionize the Fintech industry is looking at the case of companies in the finance industry. Financial companies can use Big Data and Metaverse to increase efficiency and improve customer experience. Companies in this financial industry have a primary goal: to provide customers with the most comprehensive financial services possible while simultaneously reducing operational costs. Companies can implement a comprehensive Big Data and Metaverse strategy to do this. This strategy entails collecting data from all of their customer interactions, analyzing it to identify patterns in customer behavior, and then using these patterns to create targeted products and services [8]. For example, by analyzing customer data, Companies can identify which customers have the highest risk for certain types of fraud. Armed with this information, Companies can create an anti-fraud algorithm that automatically detects fraud before it happens and blocks it. This allows the company to significantly reduce the amount of time it takes to detect and stop fraud, saving them both time and money [8].

In addition to reducing fraud, Big Data and Metaverse can allow Fintech Companies to create more personalized products and services tailored to the needs of their customers. By collecting data from customer interactions and using it to develop new services, Companies can be able to provide customers with a better experience and increase customer satisfaction. Finally,

companies can reduce operational costs significantly by leveraging the power of Big Data and Metaverse. This is because Big Data and Metaverse allow them to collect data faster, process it more efficiently, and make decisions more quickly. As a result, Companies can reduce their costs significantly, allowing them to pass these savings on to their customers in the form of lower prices [7].

### **3. FUTURE OF FINTECH USING BIG DATA AND METAVERSE**

Big Data and Metaverse are revolutionizing the fintech industry, enabling companies to access and analyze vast amounts of data quickly and accurately. This technology transforms how financial services are provided and how consumers interact with the services. By leveraging Big Data and Metaverse, companies can identify trends faster and gain deeper insights into customer behavior and preferences [3]. Big Data and Metaverse can help organizations in the fintech sector to understand their customers better, develop new products and services, and streamline operations. For example, these technologies can help companies accurately identify customer profiles and segment them into different target markets. This information can then be used to offer personalized services that meet the specific needs of each segment. Furthermore, Big Data and Metaverse can help companies detect fraud and mitigate risk while improving security[9].

Using Big Data and Metaverse will also allow companies to provide predictive analytics, which can help them forecast future customer trends and demands. With this data, companies can make informed decisions about product development and marketing strategies. Additionally, Big Data and Metaverse can be used to develop more efficient risk management solutions and improve customer experience through better customer service. Big Data and Metaverse can also help companies reduce costs and increase profits by streamlining processes such as authentication and payments. By automating processes such as these, companies will be able to cut down on manual labor costs and increase their efficiency [10].

Financial services providers will increasingly engage with their consumers in the metaverse. Many firms in the banking and fintech industries are evaluating the waters of the metaverse with the help of augmented and virtual reality technologies. There will be a great variety of enterprises to meet the monetary needs of users in the metaverse because it will have its own economy[10]. Companies building virtual assistants and affiliated AI-enabled financial services representatives would also be significant in this world, alongside blockchain and other digital asset players. Companies providing authentication and digital identity services and those involved in financial infrastructure, including data management, will play a vital role in easing the exchange process in this digital setting [4].

Using Big Data and Metaverse in the fintech industry will revolutionize companies' business. With its potential to provide faster, more accurate insights into customer behavior, it can help companies to stay competitive in an ever-changing market. The future of fintech looks bright with Big Data and Metaverse at its helm! Companies should use these technologies to build more resilient systems and ensure maximum return on investments. Moreover, with the emergence of cloud computing, deploying big data applications has become easier than ever before. This will lead to increased scalability and cost savings. Companies should also focus on integrating AI and ML capabilities within their big data applications so they can generate meaningful insights from their data. Blockchain technology is also expected to play a significant role in fintech [8]. It will secure transactions and provide verifiable records for regulatory compliance. Lastly, data-sharing networks will further enhance the capabilities of big data tools, allowing companies to share and store massive volumes of data securely. These advances together can create a powerful suite of tools for financial institutions worldwide [10].

### 3.1. Next-Generation Banking in Metaverse

A forthcoming development will enable the world to use the metaverse's economic potential. A brand-new form of financial technology called a non-fungible token (NFT) is utilized in the metaverse to verify ownership of digital assets. However, the banking sector has always been quick to seize upon emerging trends, and the metaverse, which is today's hot tech topic, is no exception. Generation Z's customers are digital natives, with the internet serving as their first port of call when looking for the goods and services they need [12, 23]. Businesses have a new opportunity to interact with customers thanks to the metaverse—permanent, immersive digital environments that one day could house everything we need to conduct our lives online. Banks have been eager, as usual.

Banks are trying to reduce the gap between real and virtual economies. Building "virtual branches" where they may provide banking products to a new breed of digitally native gen-z consumers or provide customer assistance to current clients is one of the most obvious uses of the metaverse for retail banks [25]. While established gaming platforms with metaverse-like features, like Roblox or Fortnite, garner millions of visitors each month, emerging metaverse platforms like The Sandbox and Decentral and only get a few hundred thousand. Digital natives who wish to work with companies that appreciate and comprehend virtual worlds and gaming-like situations are their target market. HSBC and JP Morgan Chase are two companies that were among the first to launch virtual stores [25, 26]. JP Morgan Chase bought the property in The Sandbox earlier this year and will use it to interact with online sports fans and e-sports enthusiasts (see Figure 3).

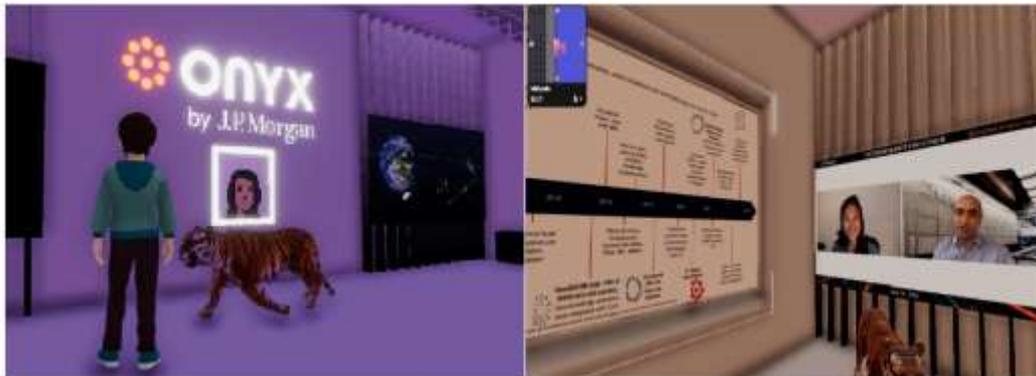


Figure 3. JP Morgan Metaverse Lounge. Source: [27]

### 3.2. Predicting the Future of Banking?

The "bank of the metaverse," Zelf, offers regulated services for transferring cash between the virtual and physical worlds and trading valuable in-game items between players [25, 27]. Is metaverse banking simply another passing trend that will end when users lose interest? Financial institutions may be turning to the metaverse and virtual worlds to stay in touch with customers and offer essential banking services, while traditional bank branches are closing at an unprecedented rate. It's also clear that virtual economies and exchanging virtual goods and services are expanding [26]. As today's younger generation of consumers grows up and wants to bank and engage with financial assistance in environments, they feel comfortable in; it seems likely that virtual environments will provide a familiar platform for them to do just that. However, it's clear that banking and finance feel that they will be an essential part of our lives, and we want to make sure they are a part of it, too.

#### 4. POTENTIAL RISKS OF BIG DATA AND METAVERSE IN FINTECH

Big Data and Metaverse technologies have the potential to revolutionize the financial industry. But, like any new technology, it comes with its own risks. Before investing in these technologies, it is essential to be aware of these potential risks.

- Data security is one of the primary risks of Big Data and Metaverse technologies. These technologies require companies to store large amounts of data on their servers or in the cloud. This data must be secure from hackers who may try to access it for malicious purposes. Companies must ensure that their servers and systems are updated with the latest security protocols and encryptions. Otherwise, their data could be vulnerable to cyber-attacks [9].
- Another potential risk of Big Data and Metaverse technologies is the risk of inaccurate data. Because Big Data involves the analysis of large amounts of data, mistakes can be made due to human error or machine errors. Companies must take extra steps to ensure that their data is accurate and reliable[11].

Finally, there is a risk of data privacy violations. As these technologies become more prevalent, companies must adhere to data privacy laws and regulations, such as GDPR and CCPA. Companies must also ensure that they only collect data necessary for their operations and that all collected data is handled securely and ethically [6,8].

Table 2: Potential Risks of Big Data and Metaverse in the Fintech Industry

Risks of Using Big Data & Metaverse	Explanation
Data Security	These technologies require companies to store large amounts of data on their servers or in the cloud. This data must be secure from hackers who may try to access it for malicious purposes.
Inaccurate Data	Because Big Data involves the analysis of large amounts of data, mistakes can be made due to human error or machine errors. Companies must take extra steps to ensure that their data is accurate and reliable.
Data Privacy Violations	As these technologies become more prevalent, companies must adhere to data privacy laws and regulations, such as GDPR and CCPA.

By taking the necessary steps to mitigate these risks, companies can ensure that they get the most out of their investments in Big Data and Metaverse technologies while keeping their data secure.

#### 5. MATERIALS & METHODS

We completed this project by conducting an extensive review of secondary literature. Scopus, Google Scholar, & Web of Science were picked since they are the three most widely utilized databases. Big data, finance, accounting, management, FinTech, big data, and the metaverse and big data were among the terms we looked for. For our study, we mainly relied on scholarly peer-reviewed journals but also read pieces on the topic from various online sources. Aside from using these tools, we also used standard search engines to learn more. Since there currently needs more

relevant research, we decided against setting any time constraints on the academic literature that would be used. Our study provides valuable data that can be organized in terms of journals and databases, such as the total number of scholarly articles published, broken down by year of publication and subject area; the top countries for research; and the most frequently cited sources, which have been taken into account in several recent studies.

## **6. RESULT SUMMARY**

Big data has far-reaching consequences for the financial sector. One of the fundamental requirements of the study of finance is data processing. As a result, raw data is crucial to the decision-making process. When the benefits of big data in finance are factored in, business data is seen as a plus. Companies rely on processed and organized data to make decisions; unstructured data is useless. To draw inferences from the numbers, accountants use a variety of approaches. Utilizing data analysis allows for many benefits, including a shorter development cycle, lower overall costs, and better outcomes for existing and brand-new products. Combining data with robust analytics gives businesses a solid foundation to build and carry out all the tasks necessary to make the right calls [10].

In the financial sector, emerging big data has been combined with information from corporations. Facilitates integration of ERP with non-traditional data sources. Using big data, giant firms need to change conventional auditing and financial methods. Incorporating big data into audit analysis has also led to advancements in that field. As a result, this has had an impact on the use of behavioral research as well as judgments in auditing. There are significant benefits to be gained from incorporating big data, but there are also new difficulties that accountants must deal with as a result [12].

The financial markets constantly seek restructuring for various activities and operations. This is especially true because technological breakthroughs are generally met with great enthusiasm and adopted with great hope in financial markets. How much information is available and how it is disseminated is largely responsible for the efficiency of financial markets. As a result, social media's impact on the market must be considered. It is arguably the most potent factor influencing the global financial system [10]. Every day, social media platforms generate tens of thousands, if not millions, of pieces of content. Calculating the performance of stock indices; calculating and identifying movement and option pricing; measuring idiosyncratic volatility; and automating trading are just some of the many financial market indicators determined by big data [13, 14].

As the need for banking services in the digital realm grows, more and more digital banks are setting up developments. There is also no reason for concern, even though some experts are perplexed by fintechs' embrace of the metaverse (typically linked with gaming and entertainment-based businesses). Even though traditional banks are losing business to fintech, many of them still hope to offer their clients the kind of individualized service that can only be achieved by direct interaction with real people, and the metaverse can make that a reality [14]. Financial services are primed to benefit significantly from the transformational digitalization that the metaverse is ushering in today. Even if there is much to discover in the metaverse, finance businesses can gain from merging the virtual and physical. The top fintech giants would each create their version of the metaverse, similar to how Coin base established its own NFT market. Trading in NFTs is expected to increase dramatically in the coming days as more people take advantage of their accessibility and ease of use [12, 14, 15].

Like the gaming industry, the financial technology sector is seen as an excellent place to delve into, attributable to the metaverse's boundless potential. In addition, the metaverse provides a

convenient location for tech-enabled businesses to gather in premade social and working hubs [15, 16], like how the metaverse will help companies to expand their networks of partners and customers as the payment environment diversifies and simplifies. The financial technology industry can increase consumer happiness by creating more engaging experiences as the metaverse merges the offline and online worlds. One of the most fruitful results for fintech players might be increased transaction volumes and customer loyalty over time [17, 18].

## **7. IMPLICATIONS OF THE STUDY**

Banks and insurance companies, two of the oldest and most established financial organizations, have had to make significant changes to their operations as FinTech (Financial Technology) has developed. Companies worldwide, retailers, and internet powerhouses all realized they needed to revamp the financial services value chain to succeed. The financial industry's businesses have progressed significantly from the days of "old school" banking to the present day, where they now employ FinTech [19]. People could not have asked for a more promising outlook for the future of finance. Banks and FinTech firms sometimes fight for the same market share as technology becomes increasingly important in the financial sector [20, 21]. Extraordinary discoveries, trends, and technologies that are shaping the future of banking have emerged owing to this ecosystem of co-development and healthy competition. All these benefits are possible with Big Data and Metaverse [22, 23, 24].

## **8. RECOMMENDATIONS**

To maximize the potential of Big Data and Metaverse in the Fintech industry, organizations should focus on leveraging these technologies for the following activities:

- **Make smarter, more informed decisions faster:** Big Data and Metaverse can be used to collect, analyze and visualize vast amounts of data quickly, enabling companies to make better decisions faster.
- **Increase customer satisfaction:** By using Big Data and Metaverse, organizations can gain insights into customer behavior, enabling them to customize products and services more efficiently and effectively, leading to improved customer satisfaction [9].
- **Optimize processes and operations:** Big Data and Metaverse can help organizations automate and optimize processes, resulting in improved efficiency and cost savings [8, 9].
- **Improve fraud detection and prevention:** Organizations can use Big Data and Metaverse to detect fraudulent transactions quickly and accurately, reducing the risk of financial losses.
- **Enhance compliance:** Companies can use Big Data and Metaverse to monitor regulatory changes quickly and ensure compliance with legal requirements [7].

By leveraging the power of Big Data and Metaverse, organizations in the Fintech industry can gain a competitive edge over their peers and remain ahead of the curve in this rapidly changing landscape.

Table 3: Recommendations

Recommendations	Comments
Make smarter, more informed decisions faster.	Big Data and Metaverse can be used to collect, analyze and visualize vast amounts of data quickly, enabling companies to make better decisions faster.
Increase customer satisfaction	By using Big Data and Metaverse, organizations can gain insights into customer behavior, enabling them to customize products and services more efficiently and effectively, leading to improved customer satisfaction.
Optimize processes and operations.	Big Data and Metaverse can help organizations automate and optimize processes, resulting in improved efficiency and cost savings.
Improve fraud detection and prevention.	Organizations can use Big Data and Metaverse to detect fraudulent transactions quickly and accurately, reducing the risk of financial losses.
Enhance compliance	Companies can use Big Data and Metaverse to monitor regulatory changes quickly and ensure compliance with legal requirements.

## 9. CONCLUSION

The banking and insurance sectors are particularly vulnerable to legislative and technological shifts. Separate technical and risk rules will not exist in the future financial industry. Risk management capabilities must be in place from the beginning for FinTechs to grow successfully. This can mold the company and allow for secure, long-term growth while allowing for increased responsiveness to the ever-changing dangers of the market. Risk can be reframed as an opportunity for creativity with the help of this method. Therefore, FinTechs can now work closely with the product and engineering sectors to provide relevant data to influence product development. A FinTech firm that has built-in risk management techniques into its structure can, for instance, factor risks into its product and data models before they are fully developed. Therefore, combining traditional IT services with emerging technologies such as data analytics, artificial intelligence, and machine learning is the best way for sustainability in Industry 4.0.

Both Big Data and the Metaverse offer exciting opportunities for businesses in the Fintech sector to revolutionize their operations. With these technologies becoming increasingly accessible daily, companies can gain a competitive edge by embracing them as soon as possible. By taking advantage of Big Data's powerful insights into customer behavior and utilizing the convenience of the Metaverse's virtual goods and services offerings, companies are trying their best to ensure they remain on the cutting edge of fintech innovation to provide the best customer experience possible.

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