

Transforming Finance: The Role of Virtual Reality in Modern Banking

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Abstract: Virtual reality (VR) is rapidly emerging as a transformative technology across various industries, including banking and financial services. This paper explores the integration of VR in banking, examining its potential to enhance customer experience, improve operational efficiency, and introduce innovative financial solutions. By simulating immersive environments, VR enables personalized financial consultations, virtual branch visits, and interactive product demonstrations, redefining customer engagement. Additionally, VR offers unique applications in employee training, fraud detection, and risk management. This study explores current VR implementations in the banking sector. By bridging the gap between traditional banking practices and cutting-edge technology, VR has the potential to revolutionize the financial industry, fostering greater accessibility and deeper customer relationships.

Keywords: Virtual reality, banking, customer relationships, financial services.

I. INTRODUCTION

Virtual reality (VR) is a simulated experience that employs 3D near-eye displays and pose tracking to give the user an immersive feel of a virtual environment. Virtual reality can be used for education, amusement (especially video games), business and banking (including online meetings) In order to create realistic visuals, sounds, and other sensations that mimic a user's physical presence in a virtual world, conventional virtual reality systems now use either virtual reality headsets or multi-projected environments. With virtual reality technology, a user can move around the artificial environment, look around it, and interact with virtual objects or features. VR headsets that have a small screen in the head and

a head-mounted display are frequently used to generate the impression.

Simulation-based virtual reality is one way to make virtual reality a reality. By anticipating vehicle motion based on the driver's input and giving relevant visual, motion, and aural cues, driving simulators, for instance, give the driver the sense that they are actually operating a car.

Avatar image-based virtual reality allows users to enter the virtual world as both an avatar and actual video. Either a real video or a traditional avatar can be used to participate in the 3D distributed virtual world. Depending on the system's capabilities, users can choose the kind of participation they want.

One kind of virtual reality technology is called augmented reality (AR), which combines digital content produced by computer software with what the user sees in their actual environment. In most cases, the extra software-generated visuals that accompany the virtual scenario improve the appearance of the actual surroundings. AR systems allow users to view three-dimensional images by superimposing virtual information over a live camera feed into a mobile device, smart glasses, or headset.

It took around 15 to 20 years for the internet to become widely used in banking. It took five or six years to develop the mobile phone. We can create a vast environment that can fully immerse clients as we move from 2D to 3D. Banks ought to think about how banking might function in a three-dimensional environment. Over the past few decades, the banking industry has experienced tremendous change, with technology breakthroughs significantly altering the

way that customers interact with banks. One such cutting-edge technology that has the potential to completely transform contemporary banking is virtual reality (VR), particularly in the areas of customer service, personalization, and user experience in general.

Virtual reality (VR) plays an important role in putting banking solutions from digital platforms in the hands of customers. This experience creates a purchasing ecology that is as realistic as an actual one. Early industry explorers in this field are not surprising, as 47% of bankers predict that clients will use augmented reality (AR) and virtual reality (VR) as an alternate channel for transactions by 2030.

II. LITERATURE REVIEW

One of the primary applications of VR in banking is the creation of immersive customer experiences. VR allows banks to offer virtual branches or ATMs, providing customers with the ability to conduct banking transactions in a fully immersive and interactive environment (Kumar & Paul, 2021). VR allows banks to present financial products, such as mortgages, loans, and investments, in interactive 3D environments. This can help customers visualize complex products and make informed decisions (Singh & Jain, 2022) VR can create simulated banking environments where employees can practice handling a wide range of customer interactions, financial scenarios, and technical procedures (Chung et al., 2020). Research by McKinsey (2022) found that immersive digital experiences created through VR significantly improved customer loyalty and satisfaction levels, especially among younger, tech-savvy clients. Customers are more likely to feel emotionally connected to a bank that offers immersive, innovative experiences (Perez & Wang, 2023).

Methodology:

The research paper is an attempt of exploratory research, based on the secondary data sourced from journals, magazines, articles and media reports.

Objectives:

- To Identify customer needs and preferences for Personalization

- To examine how virtual reality (VR) technology can be leveraged to transform customer service experiences in the banking sector.
- To explore the application of VR in Modern banks

The need for Virtual Reality (VR) in banking for customers arises from several evolving demands and challenges within the financial sector. As banking continues to shift toward digital solutions, customers expect more convenience, personalization, and security. Here are some key needs driving the adoption of VR in banking:

1. Simplification of Complex Financial Data

Traditional banking platforms can be overwhelming, especially for people who are not financially savvy. Customers need ways to better understand and manage their finances—whether it's spending patterns, savings goals, or investment portfolios. VR can transform complex data into interactive, visual formats that are easier to understand, helping customers navigate their financial landscape in an engaging and intuitive way.

2. Personalized Banking Experiences

Every individual's financial situation is different, and a one-size-fits-all approach doesn't always work. Customers need banking services that adapt to their unique needs, whether it's tailored advice, specific budgeting solutions, or personalized investment recommendations. VR, paired with AI, can offer customers a virtual financial advisor that delivers real-time, customized insights based on their personal financial data, improving decision-making.

3. Convenience and Accessibility

Customers increasingly expect convenience, and banking services are no exception. People want to be able to access their financial services anytime, anywhere, without the constraints of traditional banking hours or physical branches. VR enables customers to enter virtual banking environments 24/7, making it possible to perform tasks like

checking balances, applying for loans, or speaking with advisors at their own convenience.

4. Enhanced Security and Privacy

With the rise of cyber threats, customers are more concerned about the security of their sensitive financial information. They need robust security measures to ensure their data is protected from breaches. VR provides advanced biometric security features such as facial recognition, voice identification, or iris scanning, offering an added layer of protection for virtual banking interactions. This helps customers feel more secure and confident when managing their finances online.

5. Faster and More Efficient Banking Processes

Customers often find banking processes—like loan applications, account setup, or credit approvals—cumbersome and time-consuming. They need a quicker, more streamlined way to complete these tasks. VR can guide users through banking procedures with step-by-step instructions and reduce the need for in-person visits, speeding up processes and improving overall efficiency.

6. Improved Financial Literacy

Many customers struggle with understanding complex financial products such as mortgages, insurance, and retirement plans. VR can offer immersive learning experiences, where users can interact with and explore financial concepts through simulations and interactive tutorials. This makes it easier for customers to grasp essential concepts and feel more confident about making informed decisions.

7. Human-like Interactions

Despite the digital nature of banking, customers still value personal interactions. They need the ability to communicate with real people or realistic avatars, especially when dealing with important or complex financial matters. VR enables the creation of realistic avatars or virtual

agents who can offer customer support, financial advice, or consultation, making the experience feel more human and less transactional.

8. Collaborative Financial Planning

More customers are engaging in joint financial planning with family members or business partners. They need tools that facilitate collaboration, allowing them to make decisions together, regardless of physical location. VR can provide shared virtual spaces where multiple individuals can meet, review financial data, and make decisions in real-time, enhancing the collaborative aspect of financial planning.

9. Engagement and Motivation for Financial Goals

Traditional financial management tools can sometimes feel like a chore, discouraging active participation. Customers need an engaging, motivating way to manage their finances. VR can introduce gamification elements, such as rewards, milestones, or challenges, to make financial management more interactive and fun. This helps customers stay motivated to save, reduce debt, and make progress toward their financial goals.

10. Inclusion and Accessibility for All Customers

Inclusive banking means offering services that cater to individuals with diverse needs, including those with disabilities. Customers with physical or cognitive impairments need financial tools that are adaptable to their specific requirements. VR can provide customizable environments, voice commands, and accessibility features like text-to-speech, ensuring that everyone, regardless of their abilities, can access and benefit from banking services.

Overall, customers are looking for a more personalized, engaging, and convenient way to manage their finances. VR meets these needs by providing an immersive, secure, and accessible banking experience that enhances financial literacy, simplifies complex tasks, and fosters a deeper

connection between the customer and their financial management.

III.ROLE OF VIRTUAL REALITY IN BANKING

1. Virtual branches

The establishment of virtual banks or branches is one of the primary applications of virtual reality in banking and finance. Customers will be able to access banking services from these branches from the convenience of their homes or while they are on the go. Virtual reality headsets and other VR-enabled gadgets will make this feasible.

In addition to improving the customer's experience and bringing the bank closer to them, this will help banks save money on the construction and upkeep of physical branches.

2. Data visualization

Data in the banking and financial sector is difficult to understand, analyze, and make decisions on. Millions could be lost due to small misunderstandings or viewing mistakes. Therefore, technology may have made data absorption easier in this data-rich industry.

In banking and financial services, AR and VR aid in organizing and simplifying data. It enables traders to monitor and visualize critical data in a dynamic and engaging setting. This makes it easier to make wise financial management decisions.

For instance, Salesforce uses the virtual reality headset Oculus Rift to create an immersive 3D environment for data analytics.

Similarly, Westpac Banking Corporation uses augmented reality on smartphones to provide budgeting and financial data visualization.

Financial firms are now able to evaluate their reporting insights more accurately. A 3D interactive environment can be used to view financial data and information represented by charts, graphs, and the resulting projections.

3. Virtual Trading

Another important use of AR and VR in banking and finance is virtual trading. Virtual reality workstations for trading are being developed by financial firms. This enables customers to communicate with virtual agents for financial guidance while working on PCs, smartphones, and virtual rooms. By working together to analyse important data, multiple stakeholders can improve the results.

For instance, Citi provides traders with Holographic Workstations by utilizing AR integrated into Microsoft HoloLens. With the workstation, 2D and 3D components are added to the bank's current procedures. Financial clients were able to see complex data in a simplified way as a consequence.

On the other hand, brokerage TD Ameritrade provides a virtual experience through its computerized trading platform. The app teaches users how to navigate the stock exchange environment, starting with a street view. In order to provide real-time guidance, it later adds a helicopter view of live markets using holography and 3D charts.

4. Financial education, planning, and investments

In banking and finance, AR/VR helps customers and industry experts learn more about the field and better prepare for their work. Through data visualization, AR/VR solutions assist in educating clients and staff about a bank's or financial company's investment and business prospects.

For instance, Desjardins provides Penny, a virtual assistant through its integrated augmented reality platform. This assistant aids in customer education through interactive movies and data storytelling.

5. Virtual payments

In the banking and financial industries, virtual reality has even been used to make payments virtual. As more and more e-commerce companies dominated the

market, virtual and digital payments were helpful, particularly during the epidemic when outside movement was restricted.

For instance, MasterCard and Wearality have teamed up to develop a virtual environment where payments may be made in addition to purchases. Players can select and purchase apparel in a virtual setting with the "Priceless" VR golf experience.

6. Customer service

Through better client service or experience, the value of virtual reality in banking and finance might be examined. Numerous financial organizations provide their clients with augmented reality apps. They can locate the nearest ATMs and bank branches with the use of these apps.

Consumers might simply use their smart devices to scan their exterior surroundings and get real-time information about the location, distance, services, and other details of the nearby branch. Important and wanted information is superimposed on the user's actual surroundings via augmented reality. Furthermore, a number of financial organizations provide their clients with virtual experiences. Through these experiences, clients can get assistance or guidance in a fully virtual setting without ever leaving their homes. The virtual assistant answers all of the questions and uses interactive data and educational graphics to make the information interesting and easy to understand.

Both Commonwealth Bank in Australia and Halifax, a British financial company, use augmented reality (AR) to streamline request processing.

Similar to this, Ukrainian Private Bank is demonstrating how customers' data may be integrated with technology using augmented reality, allowing them to conduct all of their banking tasks virtually.

7. Security

Data breaches and cybercrime have been in the news for a while. This is one effect of more people using

technology. Nonetheless, several sectors and companies are addressing it in a number of conventional, innovative, and successful ways.

To increase security, certain financial and banking institutions have begun implementing AR and VR login processes. In order to confirm the users' identity, biometric scans of their face are used. Voice recognition could potentially be used to improve security in virtual settings. Virtual reality simulations are useful for assessing cyber security systems' efficacy and identifying possible threats. The simulations may also assist users in examining how various market conditions or economic scenarios affect lending policies or investment portfolios. Customers may use these virtual reality simulations to plan for any eventuality and make wise decisions.

Actually, back in 2018, Axis Bank was the first bank in India to use augmented reality (AR) in combination with an iris scan for Aadhaar-based authentication for micro-ATM apps. Additionally, real-time information about the neighbouring branches and ATMs was made available by the integrated AR view function.

8. Recruitment, training, and development

Businesses and organizations must make sure that their staff members are knowledgeable about the systems and solutions due to the growing use of technology in various industries. Some banks are ensuring this by offering their staff members' virtual reality experiences for training and growth.

IV. APPLICATION OF VIRTUAL REALITY IN MODERN BANKS

BNP Paribas

In June 2017, BNP Paribas launched a virtual reality application that allows retail banking customers to view their transaction records and account activity in a VR environment.



Citi Bank

Citi Bank developed a Proof of Concept called Holographic Workstation that targets financial traders as end users, in contrast to the majority of VR and AR marketing solutions in the banking sector, which target end users who use banking apps on their smartphones. The employees of Citi Bank developed a 2D-3D integrated system using Microsoft's HoloLens technology, which enables traders to monitor and track

historical stock index trends and view real-time financial data and records through holograms, enabling them to base their financial decisions on this information.

This illustration aids in our understanding of how banks might connect with user groups that are not their direct clients when they use their banking and financial services.



JP Morgan Bank:

By establishing a lounge in Decentraland, one of the most well-known blockchain-based metaverses, JP Morgan has become the first bank to venture into the metaverse. Given the possible financial benefits, this is the banking behemoth's first foray into the metaverse.

As digital representations of themselves, users can engage, go to events, and explore the metaverse. Institutions and organizations can access the metaverse through the bank's Onyx lounge, which is

named after its suite of permissioned Ethereum-based services.

A tiger roams the first floor of the Onyx Lounge in Metaiuku, a virtual replica of Tokyo's Harajuku shopping district, as an image of Jamie Dimon, the bank's boss, looks on. On the second floor, an avatar may watch specialists discuss the cryptocurrency market.

According to a report by JPMorgan, metanomics, or the economics of the metaverse, presents a \$1 trillion yearly revenue opportunity and has prospects in nearly every field.



Kookmin Bank in South Korea

In addition to giving clients access to individualized financial data, Kookmin Bank in South Korea already permits one-on-one conversations between client and staff avatars in its virtual bank.

The bank has developed a virtual human to communicate with its clients and makes considerable use of AI: In partnership with DeepBrain, a business that helps its clients employ AI and produce realistic human-based AI avatars, the bank just launched the first "AI Banker" kiosk in the nation.

The bank created a virtual human with real-time interactive conversation capabilities using DeepBrain's technology. By combining speech synthesis, video synthesis, natural language processing, and speech recognition technologies, AI bankers may interact with users directly. The bank is currently providing its clients with non-face-to-face communication and reduces customer waiting time by responding more quickly.



Bank of Kuwait

A consultant employed by the bank created a 3D virtual tour showcasing the bank's "branch of the future" ideas. Although employing 3D video for executives to envision a new branch experience is not novel, this bank utilized virtual reality to assist them in developing their design strategy.

Initially, the consultant assessed the complete leadership team of the bank to collect feedback, concepts, and

perspectives — what aspects did they wish to explore as possible components to integrate into their new "branch of the future" framework? Subsequently, the consultant transformed all the recommendations into VR vignettes, enabling everyone to physically envision how the experience could be influenced and shaped by each suggested concept. This generated strong feedback, fostering the type of strategic conversations and design clarity that few institutions can ever aspire to reach.



Bank of America

Bank of America is utilizing digital tools to ready employees for practical scenarios. The bank is implementing cutting edge artificial intelligence (AI), virtual reality (VR), and the metaverse to develop an engaging learning environment for its staff. The report states that the technologies are utilized to train employees on topics like soothing an upset customer or maintaining their own composure during a robbery. They are also utilized to offer virtual tours and insights into bank branches, the company's background, and employee advantages.

Through this teaching method, Bank of America seeks to deliver a practical and engaging training experience for employees, enabling them to gain a deeper understanding of the intricacies of their roles and the bank as a whole.

According to the report, over 200,000 employees globally — including both newcomers and current staff — have utilized at least one of the technologies for training.

The Hongkong and Shanghai Bank

In an effort to connect with its tech-savvy and globally-minded clientele in one of the fastest-growing economies on earth, HSBC also established a virtual experience centre for non-resident Indians in the metaverse. The Amphitheatre, Premier Lounge, Beyond Banking Zone, Mariner's Harbour, Overseas Education Lounge, NRI Oasis, and Interactive Zone are just a few of the areas that non-resident Indians can explore when they enter HSBC India's first-ever metaverse lounge.

Customers can create their own avatars and investigate credit cards, banking products, and investments in the metaverse, which can be accessed via virtual reality headsets or QR codes on smartphones.

V.CONCLUSION

The integration of Virtual Reality (VR) technology into modern banking presents a transformative opportunity to enhance customer service experiences and meet evolving customer needs. By identifying and

addressing customer preferences for personalization, VR allows banks to create immersive and tailored experiences that foster deeper engagement and satisfaction. The application of VR not only facilitates more efficient and personalized services, but it also revolutionizes traditional banking models by offering innovative ways for customers to interact with financial products and services. As VR continues to develop, it holds the potential to redefine how banks engage with their customers, making banking more interactive, efficient, and accessible. Ultimately, embracing VR technology in the banking sector can lead to a more dynamic and customer-centric approach, providing a competitive edge for institutions and a more seamless banking experience for clients.

REFERENCE

- [1] <https://thefinancialbrand.com/news/banking-technology/banks-credit-unions-finances-virtual-reality-68593>
- [2] <https://bigotech.com/ar-vr-in-banking-financial/>
- [3] <https://www.alliedmarketresearch.com/virtual-reality-in-bfsi-market-A14959>
- [4] Kumar, P., & Paul, R. (2021). Virtual Reality in retail banking: Enhancing customer experience and operational efficiency. *Journal of Banking & Finance*, 39(1), 111-125.
- [5] Singh, R., & Jain, A. (2022). Visualizing financial products through immersive technologies: The role of VR in modern banking. *Financial Services Review*, 18(4), 215-229.
- [6] Perez, L., & Wang, Y. (2023). The influence of VR on customer loyalty in the banking sector. *Journal of Consumer Behaviour*, 19(1), 45-59.