

## Financial Chatbots

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### ABSTRACT

A financial AI chatbot is an artificial intelligence-powered virtual assistant designed specifically for the finance industry. It uses natural language processing and machine learning algorithms to interpret user input and provide automated responses. Financial chatbots have emerged as a game-changer for banks, insurance providers, and fintech platforms. They can identify anomalies in transaction patterns and user behavior and send customers real-time fraud alerts. They minimize waiting time and increase customer satisfaction. Chatbots have recently become a popular way to automate customer interactions and improve engagement. They eradicate the need for a large support team and in-house operational resources. They are capable of automating routine queries and letting human agents focus on more technical ones. This paper investigates the impact of chatbots in the financial industry.

**KEYWORDS:** *chatbots, finance, financial chatbots, financial industry, banking, automation.*

### INTRODUCTION

As digital transformation accelerates across the financial sector, more institutions are adopting chatbots to meet rising customer expectations, reduce costs, and improve operational agility. A financial AI chatbot is an AI assistant that answers financial questions. It is an AI-powered virtual assistant designed to interact with customers and provide banking or financial services through conversational interfaces. It leverages technologies like natural language processing (NLP), machine learning, and predictive analytics to understand user queries, provide real-time responses, and automate financial services [1]. Financial chatbots are transforming the way banks and financial institutions engage with their customers by improving response times and reducing the need for human intervention.

### CONCEPT OF CHATBOTS

Chatbots are also known as conversational agents, interactive agents, virtual agents, virtual humans, or virtual assistants. Chatbots, as part of AI devices, are computer programs designed to carry on a dialogue with users using natural languages. Healthcare has become an attractive market for chatbot applications. The main purpose of healthcare chatbots is to help

patients in less time and for less money than it would take to visit a medical professional. Healthcare chatbots have great potential, but they still have a long way to go to win over consumers.

The first chatbot (Eliza) was developed in 1966 by Joseph Weizenbaum for psychiatric patients. Since then, Chatbots have gained popularity in all the domains such as banking, e-commerce, healthcare, education, and smart homes [2]. A chatbot describes a computer system or the situation in which human is chatting with the robot (computer).

Chatbots may be regarded as mimic systems which imitate the conversations between two individuals. They employ different degrees of human-like appearance and behavior, such as facial expressions, compassion, humor, and tone of voice. Thus, chatbots are computer programs with a conversational user interface capable of emulating natural, conversational interpersonal exchange. Fueled by artificial intelligence (AI), chatbots are becoming a viable option for human-machine interaction.

Chatbots can be integrated into various messaging platforms, websites or mobile apps to interact with

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customers and prospects in real time. For example, healthcare chatbot can diagnose the disease and provide basic details about the disease before consulting a doctor. It is designed to reduce the healthcare costs and improve accessibility to medical knowledge. Healthcare chatbots depend on natural language processing (NLP) that helps users to submit their health problem [3]. Figure 1 illustrates a chatbot based on three key structures in AI [4].

There are essentially two types of chatbots: (1) Fixed chatbots: These are programs with fixed information and hence offer limited help; (2) AI-based: These chatbots thrive on dynamic learning and constantly update themselves using various customer interactions. An AI-based chatbot has three domains: databases, natural language processing (NLP), and machine learning (ML). Mostly chatbots are some kind of computer programs that use natural language processing (NLP) for interpreting the user input and generating the corresponding response. In other words, NLP helps users to submit their problem about the health. The aim of the system is to replicate a person's discussion. Chatbots interact with users using natural languages. Chatbot may ask a review of symptoms and relevant information such as past medical or surgical history. It provides response by use of an efficient Graphical User Interface (GUI). The GUI is an artificial creation invented to enable interactions between human and computers. The chatbot system helps users to freely submit their complaints and queries regarding health by voice since customer satisfaction is the major concern for developing this system [4,5]. Figure 2 shows the evolution of chatbots [6].

One may also regard a chatbot as a software system that allows you to simulate real conversations between devices and users by means of a conversational interface [7]. Chatbots use three types of conversation styles [8]: static, semi-automated, and fully-automated conversation dialogue. The static conversation style is rule-based and it is easy to build. Automated refers to the generative-based model, which uses deep learning models to build interaction. This is very complex and requires a lot of training data. The semi-automated automates some parts while the rest is handled by a human. Figure 3 shows that a chatbot is designed to answer questions with proper answers [9], while

Figure 4 provides some examples of what chatbots can do [10].

### FINANCIAL CHATBOTS

In today's fast-paced digital world, financial institutions are under growing pressure to deliver faster, smarter, and more personalized customer

experiences. The financial services industry is evolving rapidly, with AI chatbots in banking playing a crucial role in transforming customer interactions. From banking and insurance to fintech, these intelligent virtual assistants are streamlining operations, enhancing customer engagement, and improving efficiency.

Finance AI chatbots are virtual banking assistants designed specifically for banking, insurance, and investment firms to automate customer interactions, enhance service efficiency, and improve security. They also function as digital financial advisors that provide investment prospect analysis, risk assessment, and portfolio management using live market trend insights. The chatbots work through the combination of natural language processing (NLP), machine learning (ML), and automation to understand and reply to user questions [11].

Time is money, and that is especially true in the world of finance. Finding the right financial chatbot for your needs can be a challenge. Selecting the right finance chatbot is more than just a preference; it can significantly influence your investment outcomes. The AI financial chatbot you select becomes the lens through which you analyze market data and formulate investment strategies. Before deciding on which financial chatbot to deploy, it is crucial to take a step back and assess your investment goals. Understanding your specific needs will guide you towards the tool that aligns best with your objectives based on the chatbot's strengths and weaknesses. Keep in mind that the "best" AI Chatbot is subjective and depends on your unique needs. The right choice ultimately depends on your investment goals, strategy, and level of expertise [12].

### APPLICATIONS OF FINANCIAL CHATBOTS

Chatbots are used in finance for streamlining processes, enhancing security, and improving customer experience in different financial operations. They are now an essential tool in the financial services sector, providing automation, increased security, and intuitive customer interaction. Figure 5 shows use cases of AI chatbots in the financial sector [13]. Common applications of financial chatbots include the following [11,13]:

- *Banking:* Banking has become much more modernized and digitalized in recent years. Bank branches were created to give customers a place near their homes to conduct banking business and receive customer service and support. The ability to ask questions and interact face-to-face with a financial institution has long been a core tenet of relationship banking. Banks and credit unions now use chatbots to offer 24/7 customer support

automation in banking, to manage mundane inquiries, and support transactions, thus enhancing customer satisfaction and operational effectiveness. Chatbots in banking streamline operations, increase customers engagement, and drive digital transformation. They can help automate common customer queries, give customers digitalized services, and lower operational costs. Round-the-clock customer support automation in banking via a virtual assistant ensures clients have access to help at all times, regardless of regular business hours. This ongoing accessibility translates to customer satisfaction and loyalty. Since financial information is sensitive, you must use a secure AI chatbot for banking that complies with industry standards. For example, Bank of America's Erica chatbot demonstrates the real-world impact of an AI financial chatbot. Erica not only provides customers with transaction histories but can also notify users about upcoming bills, remind them of low balances, and offer personalized advice based on their banking behavior. Figure 6 shows chatbots in banking [14].

- *Insurance Companies:* Insurance companies use chatbots to automate processes like policy queries, claims handling, and customer service, cutting down on response times and operational expenses. They employ a virtual assistant for banking, for filing claims, monitoring claim status, and suggesting appropriate policies from customer profiles. This saves paper and increases efficiency.
- *FinTech Companies:* FinTech companies utilize virtual assistants for banking to provide innovative financial products such as personalized micro-investing guidance, automated budget management, and streamlined customer onboarding, ensuring a smooth user experience and standing out in a crowded marketplace. The chatbots also comply with data protection laws and secure processing of user data.
- *Wealth Management Companies:* Investment companies and wealth management advisors use chatbots to provide clients with real-time market insights, portfolio updates, and personalized investment recommendations, enhancing client engagement and service personalization. Chatbots also assist with compliance regarding investment advice and handle sensitive financial data securely.
- *Financial Advice:* The present era demands that people be stable with their financial assets. People need expert advice on their financial health,

which is also easily fulfilled by implementing chatbot in finance industry. They do not just offer clarity to the customers by answering their doubts but also guide them step-by-step to make better decisions for their investment or any other finance-related plans.

- *Eligibility Checks:* Chatbots make loan applications easier by checking documents, determining eligibility, and walking users through approvals. They connect with credit scoring systems to deliver quicker loan decisions.
- *Fraud Prevention:* In the financial sector, fraud prevention is a top priority, and AI chatbots play a crucial role in safeguarding customer accounts. With advanced algorithms, an AI chatbot for finance can continuously monitor account activity and flag any suspicious behavior in real time, offering a layer of protection that enhances data security. With the help of this technological swiftness, the financial industry can reduce fraud cases. It has been noticed that most fraud cases occur due to the loophole created by human error in the process. AI chatbots used within financial services can help prevent these issues by automating the process of identifying the signs of fraudulent activity. In case of any such incident, the bots can immediately send an alert to the company and the customers.
- *Predictive Analytics:* With the use of predictive analytics, the chatbot can provide customized financial guidance and predict customer needs, thus increasing engagement and satisfaction.

## **BENEFITS**

With their capacity to handle large volumes of data, maintain compliance, and offer customized AI solutions, chatbots in financial services have become a vital tool. Chatbots are a great solution to providing an accessible and efficient customer service platform across all industries, especially in financial services. ChatGPT offers investors a preliminary analysis tool without financial commitment. Other benefits of financial chatbots include the following [11,15]:

- *Automation:* Automating repetitive tasks and questions through an AI financial assistant minimizes human agents' workload, resulting in huge cost benefits. This saves time, enabling employees to deal with more complicated cases and ensuring optimal resource utilization. The inclusion of AI-powered chatbots and automation features helps in reducing response times and operational costs.
- *Cost-effectiveness:* The overarching benefit from using chatbots is cost-effectiveness. By handling

high volumes of repetitive queries, chatbots cut down on operational costs. Their ability to process a high volume of requests by dealing with simple inquiries like balance checks, fund transfers, or basic financial queries, allows human customer service agents to focus on the more complicated tasks. Banks and financial platforms can serve more users with fewer agents, lowering expenses without compromising service quality or response speed.

- *24/7 Availability:* Chatbots do not sleep or need rest. They are operational 24/7 and ready to serve customers any time of the day. A financial chatbot offers round-the-clock assistance, allowing users to check balances, track transactions, or ask account-related questions anytime. This ensures users are not limited by business hours and reduces dependency on traditional customer service channels.
- *Improving Customer Service:* In this age, customers expect fast and accurate customer service from the organization. To stand out in the competitive world of finance, providing exceptional customer service is vital for differentiating oneself and fostering strong connections with clients. Unlike traditional customer service methods, which often involve long wait times, an AI chatbot for finance transforms customer service by offering 24/7 support and handling a wide range of tasks instantly. AI chatbots are redefining what customer service can offer in finance.
- *Personalized Advice:* Most customers want businesses to offer personalized interactions. Chatbots are the way to offer customers the personalized experience they expect. While human financial advisors are still essential for complex planning, AI chatbots are increasingly taking on the role of offering general, personalized financial advice. A finance AI chatbot can answer common questions about savings, investments, and personal finances based on the user's specific financial situation. These bots analyze spending patterns, income, and goals to deliver personalized suggestions that help users manage their money more efficiently. Using account history and customer data, the chatbot can provide tailored advice-like spending summaries, savings reminders, or product recommendations.
- *Omnichannel Support:* Chatbots can be deployed across various platforms, including websites and WhatsApp, ensuring consistent customer engagement. Having the potential to work

proficiently across several channels-such as websites, mobile applications, and social networks-provides for a continuous and convenient consumer experience. And so, when looking for a chatbot for financial services, make sure to look for omnichannel capability.

- *Multilingual Support:* The integration of voice recognition and multiple language support makes the chatbot accessible to customers of diverse languages, promoting greater inclusivity and ease of use.
- *Scalability:* A chatbot is capable of handling a large volume of interactions simultaneously, making it suitable for businesses experiencing rapid growth or high customer engagement.

Figure 7 shows some of the benefits of financial chatbots [13].

## CHALLENGES

For investors with limited time, user-friendly interfaces and intuitive navigation become critical. While chatbots can handle routine inquiries and transactions, they are not expected to replace human financial advisors entirely. Chatbots can also raise certain privacy and security risks. At a time where technology is rapidly evolving, institutions must think critically about how to implement these tools ethically and appropriately. Other challenges of financial chatbots include the following [16]:

- *Cost:* Cost is a top consideration when deciding which AI chatbot is right for your business. While finding the best price is important, it is also crucial to determine whether a solution can scale with your business, as you do not want to redo this process again in the future.
- *Data Quality:* Accurate and up-to-date data is essential for making informed decisions. The reliability of the data presented by the tool is crucial. Verify the data sources, timeliness, and accuracy to make informed decisions based on reliable information.
- *Privacy Concerns:* One of the biggest concerns that the financial industry faces is data privacy. Companies must be very careful about their personal and shared data with their customers.
- *Security Concerns:* For financial institutions, the internal data used to train AI is highly sensitive, requiring robust security measures. Make sure the AI tool you are considering has the credentials to meet your security standards.
- *Complexity:* Advanced, financial AI chatbots still struggle to assist with complex issues. However,

by handling routine inquiries, they free up human agents to focus on more difficult client concerns.

- *Integration:* Some AI chatbots struggle to connect with legacy systems, even those specifically designed for financial purposes. Check your potential solution's integration list to see if your tech stack is compatible.
- *Trust:* Unlike other industries, financial institutions have to create an additional layer of trust, security, and transparency with their customers - a critical factor when considering any new customer service tool such as a chatbot.
- *Regulatory Compliance:* The financial industry is counted among those that must be heavily regulated and keep up with the changing standards. Because of strict regulations in banking and finance, it is essential to choose a chatbot that meets the necessary certifications and offers the right tools to ensure compliance. Chatbots help financial institutions maintain compliance with local and international regulations through real-time advisory services on anti-money laundering and other compliance procedures. Chatbots can be used to track transactions for any malicious behavior and make regulatory compliance and GDPR easy by assisting customers with safe procedures.

## CONCLUSION

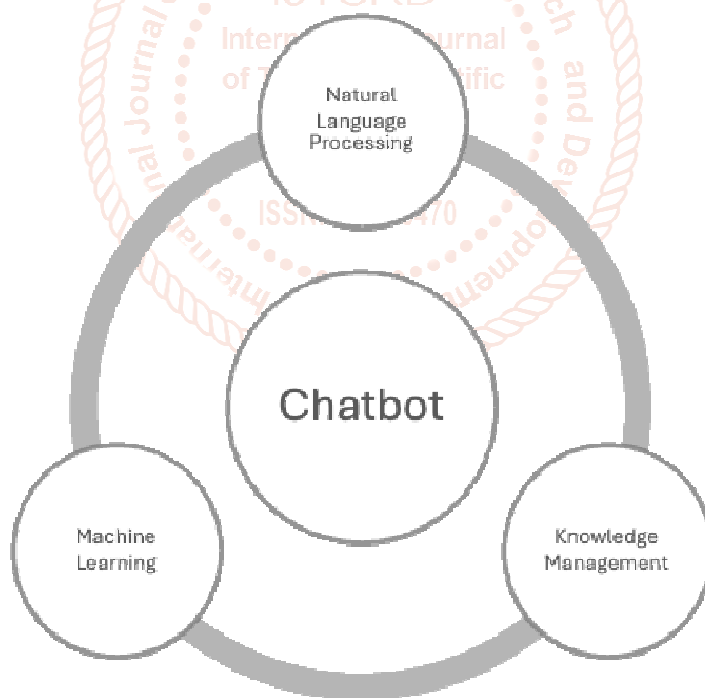
As consumers increasingly have turned to digital solutions for their financial needs, chatbots have become essential tools for improving user experience and streamlining service delivery. AI chatbots are transforming how financial institutions engage with customers, manage risk, and streamline internal processes. They have become indispensable tools for both research and decision-making. Regardless of whether you are a value investor searching for signals of steady revenue growth, or a day trader looking for immediate, real-time updates on market volatility from dozens of articles, AI finance chatbots can be used to deliver customized information based on parameters that matter most to you.

In this age, customers expect fast and accurate customer service from the organization. Chatbots can be the solution for this requirement. They are changing how financial firms operate and interact with their customers. The advanced technologies within AI have become new normal adaptations within the deliveries of financial services. The future of finance is conversational and it is powered by AI. More information about chatbots in finance can be found in the books [17-24].

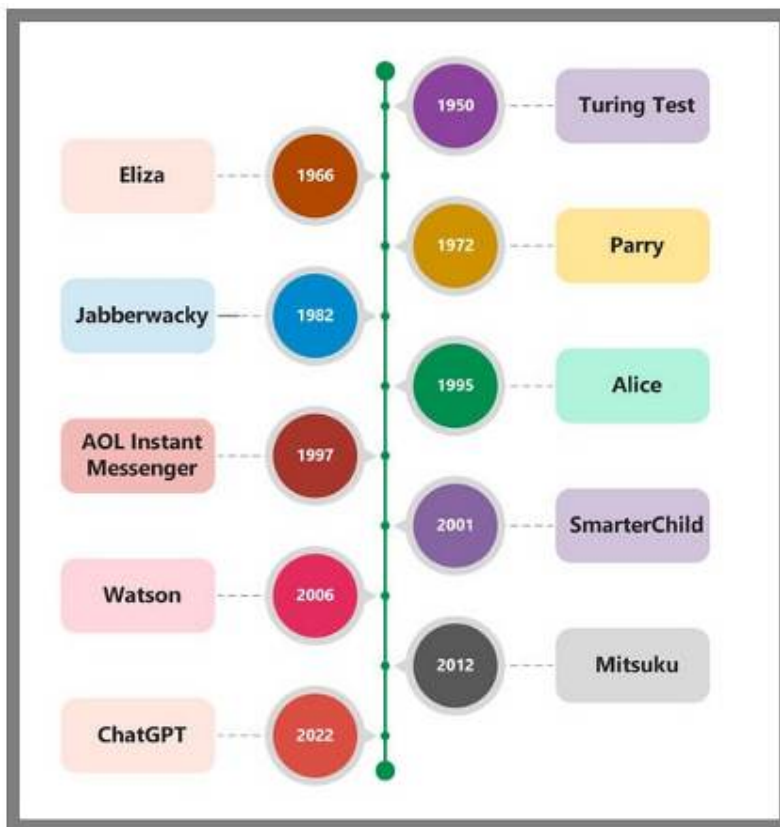
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**Figure 1 A chatbot based on three key structures in AI [4].**



**Figure 2 The evolution of chatbots [6].**



**Figure 3 A chatbot is designed to answers questions with proper answers [9].**

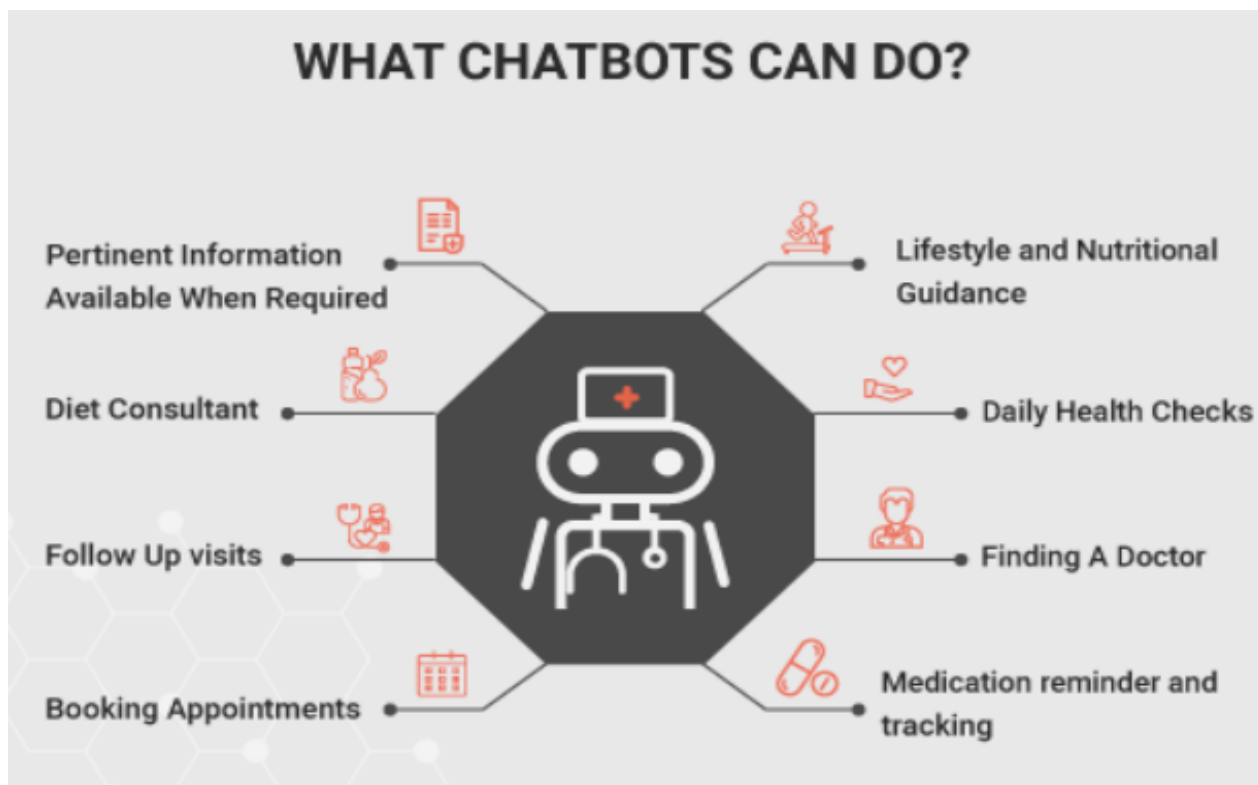


Figure 4 Typical examples of what chatbots can do [10].

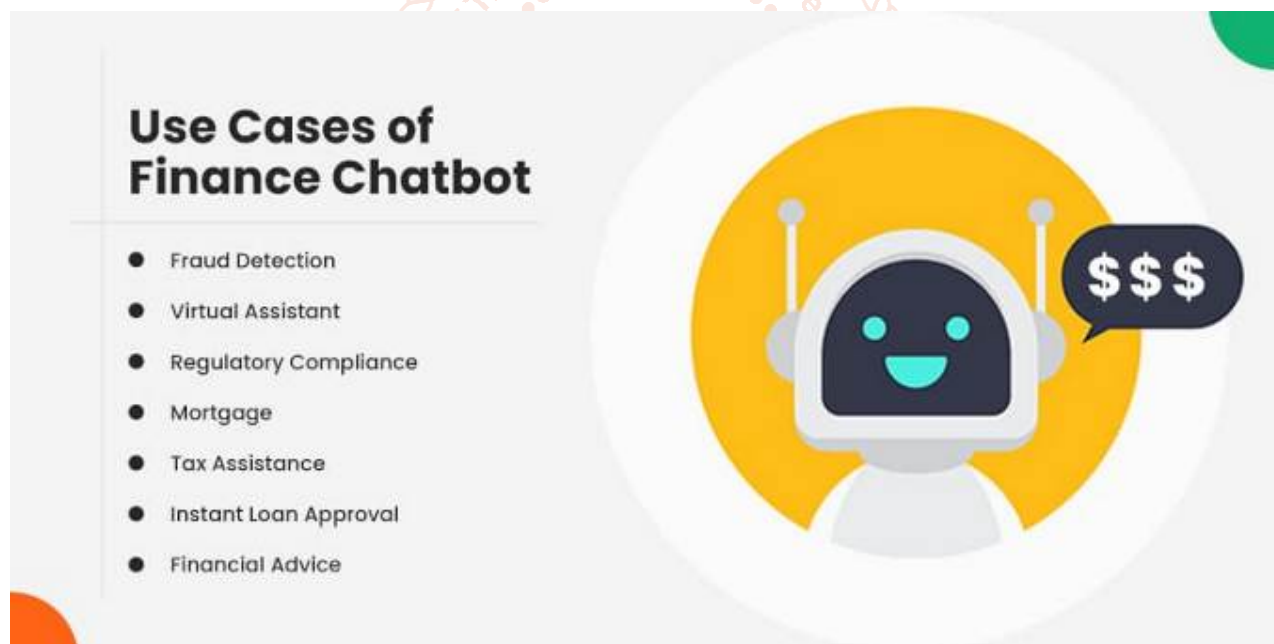


Figure 5 Use cases of AI chatbots in the financial sector [13].



Figure 6 Chatbots in banking [14].

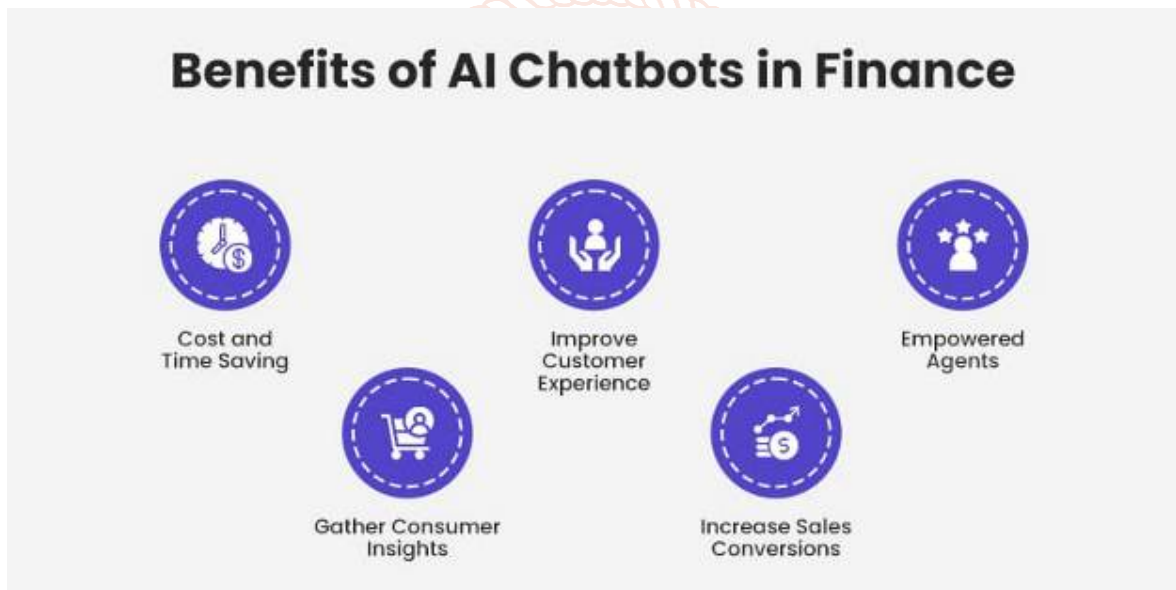


Figure 7 Some benefits of financial chatbots [13].