

MODERNIZING THE BANKING INDUSTRY: ARTIFICIAL INTELLIGENCE AS THE KEY TO SUCCESS

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Abstract: *In recent years, the application of Artificial Intelligence (AI) in the banking industry has brought significant improvements and new breakthroughs. AI has been used to optimize processes and enhance service quality, from automating tasks to intelligent data analysis and financial fraud detection. Additionally, AI plays a crucial role in providing personalized services, enhancing risk management, and ensuring information security. The combination of AI and the banking industry has provided better customer experiences and met the increasingly diverse needs of customers. With unlimited potential, AI is changing the way the banking industry operates and bringing numerous benefits and competitiveness to this sector.*

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1. Introduction to Artificial Intelligence

Artificial Intelligence (AI) is a field of research and development in computer science and information technology, focusing on building systems and computer programs that have the ability to learn and perform tasks that previously only humans could do. AI utilizes algorithms and technologies to learn and self-adjust from data, enabling computers to recognize, understand, and respond like humans. AI technology has made significant advancements in recent years and is being widely applied in various fields, including the banking industry.

2. The Role of AI in the banking industry

AI is used to automate processes and enhance work efficiency in the banking industry. For example, intelligent chatbots help reduce waiting time and improve customer experience by interacting and answering queries automatically. AI is also used for data analysis and intelligent decision-making, from predicting consumer behavior to providing personalized financial advice. Additionally, artificial intelligence plays a crucial role in fraud detection and information security. AI has the ability to analyze big data and automatically detect fraudulent activities, helping banks prevent dishonest practices and protect customer information. The combination of AI and the banking industry has brought new conveniences and competitiveness while meeting the increasingly diverse needs of customers.

3. Applications of Artificial Intelligence in the banking industry

Customer service experience

Artificial Intelligence (AI) has brought significant applications in improving the customer service experience in the banking industry. One of them is intelligent chatbots, which allow customers to receive fast and accurate automated responses and advice. Chatbots enable account inquiries, balance checks, bill payments, and information about banking products and services. This is a convenient and continuous communication channel that saves time and increases convenience in interacting with the bank. Bank of America has deployed Erica, an AI-powered virtual assistant, to provide services and support to customers. Erica has the ability to answer questions, provide information about accounts and banking transactions, as well as assist in budget management and offer suggestions for savings and investments. Customers can access Erica through mobile applications or supported virtual assistant devices. The implementation of Erica has enhanced the quality of service and interaction with customers, providing a personalized experience and better convenience.

Big data collection and analysis

Artificial Intelligence (AI) has widespread applications in big data collection and analysis. AI

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systems automatically gather data from various sources such as websites, social media, emails, and others. The AI then processes and preprocesses the data to eliminate noise and standardize it. The AI system also analyzes big data to identify patterns, trends, and important insights. Additionally, AI predicts and forecasts events and outcomes based on historical data. Finally, AI optimizes processes and makes intelligent decisions based on big data. BIDV Bank has made a significant advancement in enhancing data storage and processing capabilities by implementing Oracle's Hadoop big data infrastructure. Hadoop is an open-source platform that enables processing and storing large datasets, providing analytical capabilities and flexible scalability. This deployment allows BIDV to collect, store, and analyze data from various sources, giving the bank a comprehensive view of customers and the market.

Asset management and investment portfolio management

In today's banking industry, there is a growing application of Artificial Intelligence (AI) in making investment decisions and supporting research in the field of investment banking. Financial service companies also provide robo-advisors to help customers manage their funds more securely. Customer information and needs are automatically collected through chatbots. These robots provide investment advice and are readily available to assist customers. With AI, banks reduce risks, save costs, increase profits, and protect customer rights. For example, banks such as UBS (Switzerland) and ING (Netherlands) have used AI systems to monitor the market for untapped investment opportunities and notify their trading systems and algorithms.

Enhancing transaction quality

Thanks to its ability to analyze and process data accurately and quickly, AI helps increase the accuracy and efficiency of transactions. AI systems automate transaction processes, reducing errors and increasing order matching. Additionally, AI is also used to detect and prevent fraud and risks in transactions, ensuring security and reliability for all parties involved. As a result, transaction quality is improved, providing satisfaction and meeting the needs of customers in the best possible way. ICICI Bank is the largest private sector bank in

India with a network of 4,867 branches and 14,367 ATMs nationwide. The bank faced challenges in processing customers' daily emails and routing emails to the appropriate department for processing. After analyzing the customer's workflow and requirements in detail, Datamatics proposed a TruAI solution based on Artificial Intelligence (AI) to automate various stages of processing these requests.

Enhancing risk management and information security

AI analyzes and processes big data, helping to detect and prevent security threats. It automatically identifies patterns and abnormal behaviors, alerting and preventing cyber-attacks, viruses, or fraudulent activities. AI provides secure encryption and decryption of information, ensuring the security of critical data. It also continuously checks the security system, detects vulnerabilities, and provides solutions to enhance the security and reliability of the information system. Visa utilizes Artificial Intelligence (AI) to combat financial information attacks. They employ Visa Account Attack Intelligence (VAAI) to identify and assess transactions that do not use physical cards on the VisaNet server system. VAAI detects data patterns that are difficult for humans to recognize, such as mass payment account attacks based on predictive scenarios. This tool helps Visa eliminate inaccurate information and quickly identify complex attacks while evaluating the impact of new attacks.

Fraud Detection and Anti-Money Laundering

AI systems detect fraud patterns and provide immediate alerts when violations occur, helping banks mitigate risks and protect customer rights. NatWest Group, a major bank in the UK, uses Nuance's voice biometrics technology to detect fraud in call centers and organized criminal activities across customer interaction channels. HSBC collaborates with Quantexa to deploy Artificial Intelligence (AI) software to prevent money laundering. By analyzing data from internal, public sources, and customer network transactions, HSBC identifies suspicious activities and mitigates money laundering risks. HSBC has also established a joint venture with Ayasdi, an AI startup, to automate the anti-money laundering investigation process, reducing the number of staff involved. Previously, anti-money laundering investigations required

thousands of people, but with the support of AI, this process is automated and more efficient.

Detecting fraudulent websites

AI has the ability to analyze and identify fraudulent websites. By processing data and applying classification algorithms, AI can detect patterns and characteristics of fraudulent websites. This helps users and organizations avoid contact and risks from unreliable websites, protecting personal information and online assets. Wells Fargo, a US bank, has deployed AI technology to assess the credibility of websites that customers access. The AI system automatically checks the URL, SSL certificates, content, and other characteristics to determine the accuracy of the website. If the system detects suspicious signs, it alerts the user and provides detailed information about the fraud risk. This helps users avoid contact with fraudulent websites and protect their personal information and assets.

Credit scoring

Artificial Intelligence (AI) can assist in credit scoring for individuals and businesses. AI utilizes data analysis algorithms to evaluate financial information, credit history, and other factors to determine the risk level and repayment ability of customers. Automating the credit scoring process helps AI make accurate and efficient decisions regarding credit approval and setting appropriate interest rates. This enables financial institutions to make quick and reliable decisions regarding credit services and credit risk management.

Capital One, a leading bank, has implemented Artificial Intelligence (AI) technology to automatically analyze and evaluate customer's financial information. Capital One's AI system uses data analysis algorithms to examine income, credit history, account quantity, and previous loans. By automatically analyzing and evaluating this information, Capital One's AI system generates a credit score for each customer. This credit score is used to decide on credit approval, interest rates, and loan terms provided by the bank.

Implementing AI technology helps Capital One increase accuracy and efficiency in assessing customers' repayment ability and credit risk. Additionally, automating the process of analyzing and evaluating financial information saves time and optimizes the loan application process.

4. Conclusion

AI is having a significant impact on the banking industry. This technology has brought many benefits and new opportunities for financial institutions, enhancing efficiency, improving customer experience, and better risk management. However, implementing AI in banking requires not only financial and technological investments but also careful consideration and leadership. Implementing AI in banking is not simply about adopting new technology. Banks need to invest heavily in infrastructure and human resources to successfully deploy AI. This requires financial capabilities to invest in the necessary hardware and software systems, as well as training and hiring employees with knowledge and skills in AI. Additionally, data security is a crucial factor that needs to be carefully considered. With the use of AI, banks will collect and process large amounts of customers' personal data, thus strong security measures are needed to ensure the safety and protection of customers' personal information.

Furthermore, deploying AI in banking also poses challenges regarding transparency and accountability. AI algorithms can be complex and difficult to understand, requiring clear and transparent explanations for customers to comprehend and trust the bank's decisions. Bank leadership needs to ensure that the processes and algorithms used in the AI system are fair and do not harm customers.

To successfully implement AI in banking, leadership needs to have a clear roadmap and appropriate strategy. They need to assess the organization's skills and financial capabilities to ensure they can invest in and maintain an AI system. Additionally, leadership needs to enhance their knowledge and application capabilities in managing AI technology. This can be achieved through employee training and organizing update sessions on AI to disseminate and create awareness of technological transformation within the organization.

References:

- <https://fili.vn/2022/02/ngan-hang-viet-trong-ky-nguyen-ai-757-921900.htm>.
 - <https://som.edu.vn/ung-dung-cua-tri-tue-nhan-tao-ai-trong-nganh-ngan-hang/>.
 - <https://tapchitaichinh.vn/ung-dung-tri-tue-nhan-tao-trong-linh-vuc-ngan-hang.html>.
 - <https://www.linkedin.com/pulse/ung-dung-tri-tue-nhan-tao-trong-bao-mat-thong-tin-tai-chinh-yphhe>.
- Báo cáo "Ứng dụng trí tuệ nhân tạo" trong ngành Ngân Hàng - Bảo Hiểm - Chứng Khoán và Đầu Tư Tài Chính.