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GENERATIVE AI AS A NOVEL PROBLEM SOLVING TOOL FOR INVESTMENT BANKING: AN EXPLORATORY STUDY

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ABSTRACT

The use of AI in the banking industry has been growing rapidly, transforming various aspects of banking operations. The extent of AI adoption in the banking sector is significant and encompasses a wide range of applications. Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think, learn, and perform tasks that typically require human intelligence. The goal of AI is to create systems that can perform tasks that would normally require human intelligence, such as visual perception, speech recognition, decision-making, language translation, and problem-solving.

The extent of AI adoption varies among banks, but the trend is towards increased integration of AI technologies to improve efficiency, customer experience, and decision-making processes. Adoption of AI has helped the banking industry to improve their process and streamline the operations. Customer service time has reduced substantially. Client service processes has improved and the decision making is faster.

Keywords: Artificial Intelligence, Banking Industry, Banking Services, Investment Banking, Machine Learning

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1. INTRODUCTION

Digitalized banking, often referred to as online banking or digital banking, offers a variety of services that leverage digital technology to make financial transactions and management more convenient for users. The use of AI in the banking industry has been growing rapidly, transforming various aspects of banking operations. The extent of AI adoption in the banking sector is significant and encompasses a wide range of applications.

Digitalized banking aims to offer a seamless and efficient user experience, providing these services through web applications, mobile apps, and other digital channels. Keep in mind that the availability of these services may vary among different banks and regions.

Use of AI is done in all the industries like service sector, manufacturing, education sector, health care services, banking & financial services, etc. Ostrom et al. (2019) identifies three different AI services that can be provided; these are titled as AI augmented services, AI supported services and AI performed. Use of AI techniques like face recognition, voice recognition, automated cyber security tools, digital banking services, chatbots for convenience in conversations etc. is increasing in the banking industry. (M Chung et al.2020).

2. FEATURES OF DIGITALIZATION

The specific services can vary depending on the bank and the level of digitalization it has achieved, but common features include:

1. Account Management: facilities of personal account management like: Users can view their account balances in real-time; Access to a detailed record of past transactions and Digital statements are available for download or viewing.
2. Funds Transfer: Move money between different accounts held with the same bank. Send funds to accounts at other banks.
3. Online Bill Payment: Paying bills for services like electricity, water, and internet. Settling credit card bills online.
4. Mobile Check Deposit facility: Users can take photos of their checks using a mobile app for remote deposit. Finding nearby ATMs for cash withdrawals.
5. ATM locater: to locate nearby ATM using Google maps
6. Card Manager: Ability to activate or deactivate debit/credit cards; Users can set spending limits on their cards. Receive notifications for specific transactions or account activities. Alerts when account balance falls below or exceeds a certain threshold.
7. Other Services: Users can apply for loans through the digital platform; Buying and selling stocks and Investing in mutual funds. Online chat support for quick assistance and Digital resources to answer common queries. Sending and receiving money across borders. Providing information and resources to enhance financial knowledge. Integration with digital wallets for convenient transactions. Opening new accounts online without visiting a physical branch. Enhancing security with additional authentication steps; fingerprint or facial recognition for secure logins.

3. ARTIFICIAL INTELLIGENCE (AI)- MEANING

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think, learn, and perform tasks that typically require human intelligence. The goal of AI is to create systems that can perform tasks that would normally require human intelligence, such as visual perception, speech recognition, decision-making, language translation, and problem-solving.

A study on customer experience by Hentzen et al., (2022) suggest that, AI tools like chatbots and voice assistants create a personalized experience for the users whereas AI-driven customer service operates continuously (24/7), boosting customer satisfaction. The authors further suggest that these systems reduce the reliance on extensive call centers and support staff. Another study on *Investment Strategies* by Mogaji & Nguyen, (2022) have similar findings; as per the study AI enables sophisticated analysis of large datasets to create tailored investment portfolios which ease the utility for the customers and also it provides insights and recommendations by analyzing current market trends. This in turn enhances decision-making in financial investments as per the researcher.

Research by Lee, (2020) on Operational Efficiency suggest that AI automates back-office functions, cutting operational costs and increasing efficiency for the organisation and also Machine learning detects inconsistencies in financial reports, reducing human intervention the researcher further states that AI algorithms analyze patterns and detect anomalies in transaction data to identify potential fraudulent activities.

Machine learning models continuously learn and adapt to new fraud patterns. AI-powered chatbots provide real-time customer support, answer queries, and assist with routine tasks. Natural Language Processing (NLP) allows these systems to understand and respond to customer inquiries. AI analyzes customer data to provide personalized recommendations, such as tailored product offerings, investment advice, or financial planning insights based on individual preferences and behaviors. AI models evaluate creditworthiness by analyzing a multitude of data points, including transaction history, social media behavior, and other non-traditional indicators. This assists in more accurate risk assessment and lending decisions. AI-driven algorithms analyze market data and execute trades at high speeds. Machine learning is used to identify patterns and trends, making trading decisions more data-driven.

Table 1 Techniques of AI

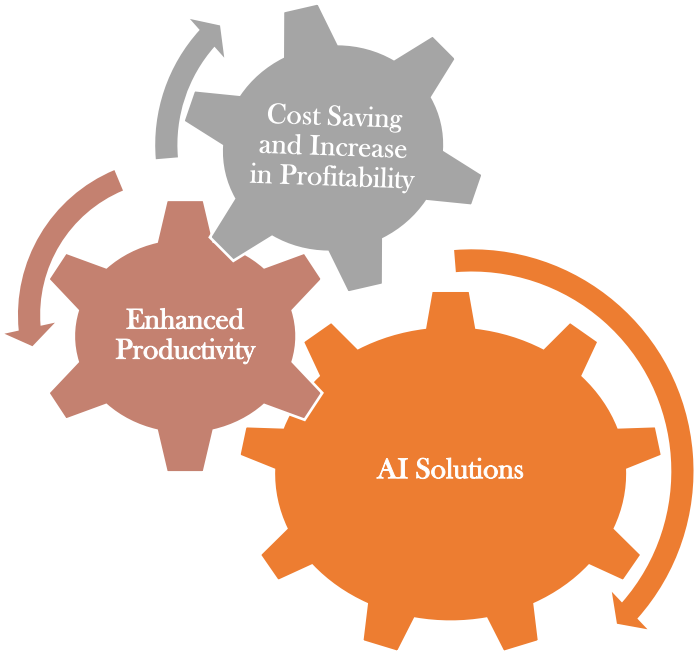
Sr. No.	Techniques	Component
1	Machine Learning	A subset of AI that involves the use of algorithms and statistical models to enable machines to improve their performance on a task through experience (learning) without being explicitly programmed.
2	Deep Learning	A type of machine learning that uses neural networks with many layers (deep neural networks) to model and solve complex problems. Deep learning has been particularly successful in tasks such as image and speech recognition.
3	Natural Language Processing	A branch of AI that focuses on the interaction between computers and humans through natural language. It includes tasks like language translation, sentiment analysis, and chatbot interactions.
4	Computer Vision	The ability of machines to interpret and make decisions based on visual data, such as images or videos. Computer vision is used in applications like facial recognition, object detection, and autonomous vehicles.
5	Expert Systems	AI systems that mimic the decision-making abilities of a human expert in a particular domain. They use knowledge-based rules to solve specific problems.
6	Robotics	The integration of AI with physical machines to enable them to perform tasks autonomously. This is applied in fields such as manufacturing, healthcare, and logistics.

Artificial Intelligence (AI) Powered Investment Banking: AI-powered investment banking refers to the integration of artificial intelligence (AI) technologies in various aspects of investment banking operations to enhance efficiency, decision-making, and overall performance. Artificial Intelligence (AI) is commonly applied in the context of investment banking:

1. ***Algorithmic Trading***: AI algorithms analyze market data, identify patterns, and execute trades at high speeds. Machine learning models can adapt to changing market conditions, making trading decisions based on historical data and real-time information.
2. ***Quantitative Analysis***: AI is used to analyze large datasets and identify quantitative patterns in financial markets. This helps in developing quantitative models for risk assessment, portfolio optimization, and investment strategies.
3. ***Predictive Analysis***: AI models employ predictive analytics to forecast market trends, stock prices, and economic indicators. This information is valuable for making informed investment decisions and managing risks.
4. ***Natural language processing (NLP)***: is used to analyze vast amounts of unstructured data, including news articles, social media, and financial reports. This helps in understanding market sentiment and incorporating qualitative information into investment decisions.
5. ***Risk Management:*** AI plays a crucial role in assessing and managing investment risks. Machine learning algorithms analyze historical data, market trends, and other factors to identify potential risks, enabling more accurate risk assessment and mitigation strategies.
6. ***Portfolio Management***: AI assists in portfolio construction and optimization. It considers various factors, including risk tolerance, investment goals, and market conditions, to create and manage diversified investment portfolios.
7. ***Customer Relationship Management (CRM):*** AI-powered CRM systems can analyze customer data to provide personalized investment recommendations. This enhances the client experience and helps investment bankers tailor their services to individual client needs.
8. ***Initial Public Offerings (IPO) Analysis***: AI can analyze historical data, market conditions, and company performance to assess the potential success of IPOs. This information aids in making investment decisions related to underwriting and participating in IPOs.
9. ***Mergers and Acquisitions Analysis***: AI tools assist in analyzing potential M&A opportunities by evaluating financial statements, market trends, and industry data. This streamlines the due diligence process and improves decision-making.
10. ***Fraud Detection***: AI algorithms contribute to fraud detection by analyzing transaction data for unusual patterns or anomalies. This is essential for maintaining the integrity of financial transactions in investment banking.

11. ***Market Research and Data Analysis***: AI automates market research by analyzing large volumes of data quickly. It helps investment bankers stay informed about market trends, competitor activities, and other relevant information.
12. ***Compliance and Regulatory Reporting:*** AI assists in ensuring compliance with regulatory requirements by automating the analysis of transactions and reporting. This helps investment banks stay in line with industry regulations.

Figure 1 Direct Benefits of Artificial Intelligence in Banking



AI-powered investment banking enables faster, data-driven decision-making, enhances risk management capabilities, and contributes to the development of sophisticated investment strategies. However, it's important to note that while AI can provide valuable insights, human expertise remains crucial in interpreting results, considering qualitative factors, and making strategic decisions.

Robotic Process Automation automates routine and repetitive tasks, improving operational efficiency. This includes data entry, account reconciliation, and other back-office processes. AI-powered voice recognition and biometric technologies enhance security by providing secure and convenient methods for user authentication. AI helps banks navigate complex regulatory environments by automating compliance checks, monitoring transactions for suspicious activities, and ensuring adherence to regulatory requirements.

Banks use AI to analyze customer behavior and preferences, allowing for targeted marketing campaigns. Predictive analytics help identify potential leads and cross-selling opportunities. AI-driven virtual assistants help customers with tasks such as account inquiries, fund transfers, and bill payments through voice or chat interfaces. AI streamlines loan processing by automating document verification, credit scoring, and risk assessment. This reduces the time it takes to approve or deny loan applications. AI is employed to detect and respond to cyber security threats.

4. CONCLUSION

Adoption of AI has helped the banking industry to improve their process and streamline the operations. Customer service time has reduced substantially. Client service processes has improved and the decision making is faster. Banks leverage AI to analyze large volumes of data for strategic decision-making, risk management, and performance optimization. While not strictly AI, blockchain technology is often integrated with AI for enhanced security and transparency in areas such as payment processing and smart contracts. Machine learning algorithms can identify abnormal patterns in network traffic and behavior that may indicate a security breach.

The extent of AI adoption varies among banks, but the trend is towards increased integration of AI technologies to improve efficiency, customer experience, and decision-making processes. As technology continues to advance, the role of AI in the banking industry is likely to expand further. AI is a rapidly evolving field with applications across various industries, including healthcare, finance, education, transportation, and entertainment. While AI systems have shown remarkable progress in specific tasks, achieving a level of general intelligence comparable to human beings remains a complex and ongoing challenge. Ethical considerations and the responsible development and deployment of AI technologies are also important aspects of the field.

Conflicts of Interest

None.

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