



The Effect Of Artificial Intelligence On Banking Sector - A Systematic Review

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Abstract: This study explores the impact of Artificial Intelligence (AI) on the banking sector, focusing on its transformative role in enhancing the operational efficiency, customer services, and decision-making processes. AI technologies like machine learning, natural language processing, and robotic process automation, are gradually being integrated into banking operations to streamline tasks, improve risk management, and deliver personalized customer experiences. By analyzing the data collected from banking professionals, the research highlights the benefits and challenges of AI adoption, such as regulatory compliance, data privacy, and workforce adaptation. The findings suggest that while AI significantly enhances job performance and service delivery, successful implementation requires strategic planning, ongoing training, and a robust ethical framework. This study contributes to the understanding of AI's potential in reshaping the future of banking, providing insights for managers and policymakers aiming to leverage these technologies for competitive opportunity.

Keywords: Artificial Intelligence, Banking Sector, Job Performance, Customer Services, Strategic Planning

INTRODUCTION

Artificial Intelligence in Banking refers to the application of various advanced technologies, such as machine learning and data analytics, to automate and enhance the banking processes over several decades; banks have continuously adapted the latest technology innovations to redefine how customers interact with them. Banks introduced ATMs in the 1960s and electronic, card-based payments in the '1970s. The 2000s saw broad adoption of 24/7 online banking, followed by the spread of mobile-based "banking on the go" in the 2010s.ve accelerated during the COVID-19 pandemic, and big-tech companies are looking to enter financial services as the next adjacency.

To compete successfully and thrive, incumbent banks must become "AI-first" institutions, adopting AI technologies as the foundation for new value propositions and distinctive customer experiences. More broadly, disruptive AI technologies can dramatically improve banks' ability to achieve four key outcomes such as: higher profits, at-scale personalization, distinctive omnichannel experiences, and rapid innovation cycles. Artificial intelligence (AI) is revolutionizing the banking industry by enhancing various banking processes. AI is used in banking for intelligent automation, data-driven insights, enhanced customer experiences, risk management, and efficiency effectiveness and cost reduction.AI-powered systems can carry out the tasks which are traditionally carried out by humans, such as data analysis, decision-making, and customer service.

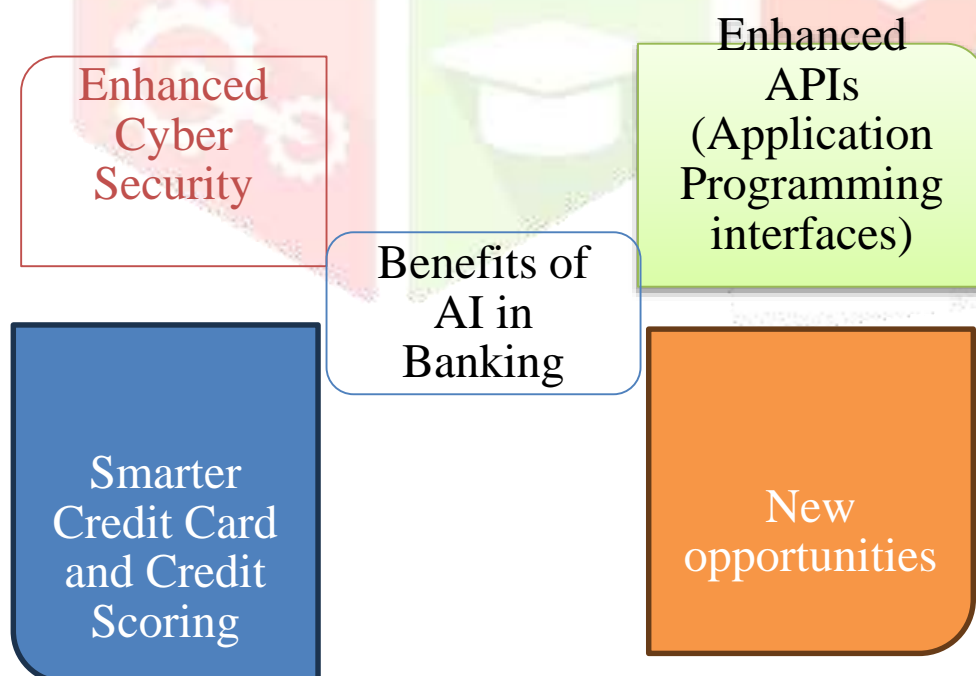
AI plays a crucial role in enhancing customer service, fraud detection and protection, risk management and assessment, credit scoring personalized financial planning; advanced data analytics .Artificial intelligence is transforming the banking industry, with far-reaching implications for traditional banks and neobanks alike. This transition from classic, data-driven AI to advanced, generative AI provides increased efficiency and client engagement never seen before in the banking sector. According to banking report of McKinsey's (2023) generative AI could enhance productivity in the banking sector by up to 5% and reduce global expenditures by up to \$300 billion. But that's not even half of the picture.

LITERATURE REVIEW

Maintaining the best practices for conducting a Systematic Literature Review (SLR) (Khan et al., 2003; Tranfield et al., 2003; Xiao and Watson, 2019), selected the appropriate database and recognizing keywords, based on an in-depth review of the literature. Research papers were extracted from Web of Science (WoS) and Scopus. These databases were selected to complement one another and provide access to scholarly articles (Mongeon and Paul-Hus, 2016); this was also the first step in ensuring the inclusion of high-quality articles (Harzing and Alakangas, 2016). Abusalma (2021) studied the impact of AI—such as Expert Systems and Neural Networks—on job performance in Jordan's banking sector, outcome of a significant enhancement in efficiency and decision-making. Slaby (2020), defines RPA as software that mimics human tasks to automate structured processes efficiently. RPA handles routine tasks, like transferring data to ERP systems, integrating easily with existing software. Rendering to Capgemini (n.d.), RPA licenses can cost significantly less than full-time employees (FTEs), with one robot performing tasks equivalent to two to five humans (Lacity & Willcocks, n.d.). However, not all processes are suitable for RPA. Fung (n.d.) outlines criteria for RPA candidates. Ideal candidates are typically found in back-office areas rather than front-office processes. RPA applications have increased over the last five years in areas such as accounts payable and employee records. Yet, AI adoption in Fintech remains limited, with studies (Milani, 2019; Hu et al., 2019; Manrai & Gupta, 2022) highlighting consumer skepticism and lack of knowledge about AI's benefits (Belanche et al., 2019). Soltani et al. (2019) studied the usage of machine learning to optimize appointment scheduling time, and reduce service time. Mohapatra (2020) characterizes some of the key challenges related to human-machine interactions to allow for the sustainable implementation of AI in banking as more organizations use and accept AI, internal challenges emerge the relationship between humans and AI (Jöhnk et al., 2021). Xu et al. (2020) found that customers prefer humans for high-complexity tasks, the integration of human employees for cases that require physical review is vital, as AI can make mistakes or misevaluate one of the C's of credit (Baiden, 2011). Therefore AI provides a wealth of benefits for customers and organizations.

Jakšič and Marinč's (2019) discussions states that relationship banking still plays a key role in providing a competitive advantage for financial institutions. The integration of AI at this stage can be achieved by enhancing banking channels. For instance, banking institutions can optimize appointment scheduling time and reduce service time through the use of machine learning, as proposed by Soltani et al. (2019).

BENEFITS OF ARTIFICIAL INTELLIGENCE



Enhanced cyber security and fraud detection: AI is more accurate than manual fraud detection methods or rules-based anti-fraud software; improving fraud detection processes Cyber attackers increasingly use AI to create more sophisticated ways to defraud financial institutions. They can use AI-created audio2 (link resides outside ibm.com) to imitate customers, confusing customer service agents. They can use AI to make phishing emails look increasingly legitimate.

As a result, those financial institutions need to use AI algorithms to protect their employees from cyber security threats in real-time, while creating tools to help customers avoid the same tricks. Financial

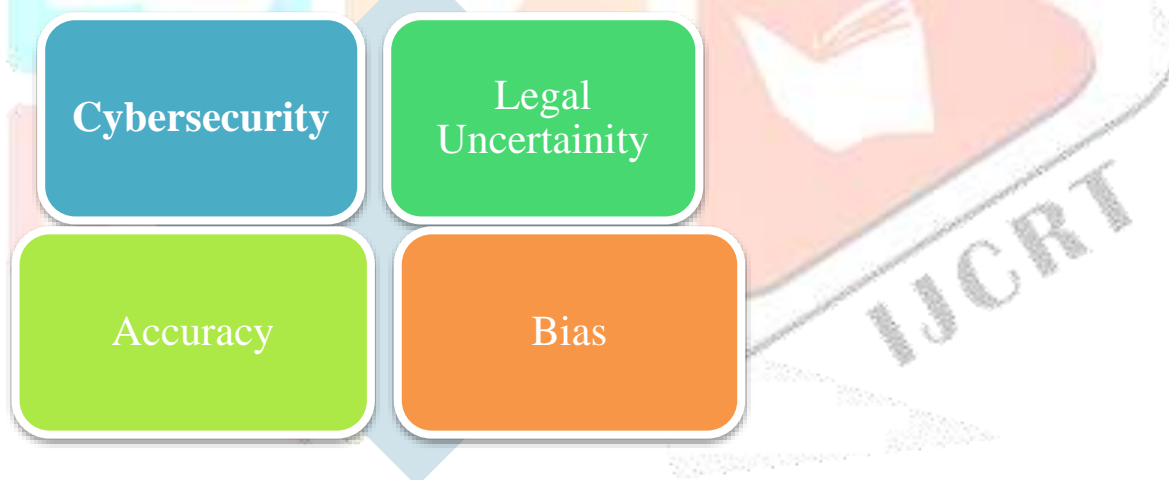
institutions and governmental agencies can also use AI systems to thwart other financial crimes like money laundering or impersonation.

Enhanced APIs (Application Programming Interfaces) leads to banking operations increasingly depend on the use of application programming interfaces (APIs) to enable customers to track their money on various applications. For example, banks must give API permission to third-party budgeting apps so customers can monitor multiple bank accounts. AI enhances API usage by enabling more security measures and automating repetitive tasks, making them more powerful.

New opportunities: They also use AI for predictive analytics to have better insights into their customers. AI-driven predictive analytics can identify new areas of growth for their business and their customers and can better estimate which customers are a churn risk. For example, banks can analyze their customers' habits, such as how often they log in or deposit money, and compare it to other data points to determine whether individual customers might be on the verge of canceling their accounts. Embeddable banking is expected to grow as a service, especially as AI helps retailers and other companies collect and analyze data about potential market opportunities, predict creditworthiness, and better personalize services to customers. The rise of generative AI powered by deep learning means that the investment and banking industries can deploy more sophisticated tools to streamline customer service. AI-powered chat bots and virtual assistants can enhance customer support, helping customers solve small problems on their own

AI can also power budgeting apps that help customers better manage their finances and save more money. Smarter credit card and credit scoring: Determining creditworthiness is a critical banking service activity. Banks need to crunch significant amounts of customer data to make important credit decisions, such as whether they accept a credit card application or approve a credit increase. AI algorithms and machine learning can help financial institutions approve or deny credit cards, credit increases and other customer requests at fast speeds. Gen AI enables banks and financial institutions to automate internal processes as much as possible.

CHALLENGES FACED IN THE INTEGRATION OF AI IN BANKING



Introducing AI in banking without risks and complications is not possible.

Cyber security: Generative AI technology can be used for fraud prevention and compliance management, but it also produces risks. Embedding open AI tools and technologies into banking IT systems creates some security challenges because AI models are especially valuable targets for malicious actors. That's why banks need a holistic AI governance approach that effectively balances innovation and risk management.

Legal uncertainty related to aspects: Generative AI models need training on existing data sets to be effective. There are still some unsolved issues on whether analyzing publicly available data, like news stories and explainer videos, constitutes copyright infringement⁴ (link resides outside ibm.com). One way to avoid this issue is to use AI models that have been trained on data that the bank owns, such as customer service interactions or its own proprietary research.

Difficulties in controlling outcome accuracy: Currently, AI models do not reason or "understand" their outputs. Instead, AI models detect patterns⁵ (link resides outside ibm.com) in the data they're given and generate results. Therefore, the model cannot tell the human employee if the data is incorrect or inaccurate.

Prejudice from model bias: Banks are increasingly investing in environmental, social and governance (ESG) initiatives as a way to demonstrate transparency and accountability for their actions. Since AI models are trained on human-created data, they can inherit some of the biases that influence humans. Banks need to

eliminate bias in how they market products and determine factors like creditworthiness, which historically has negatively affected certain demographics.

DISCUSSIONS

Routine jobs like data entry, account administration, and loan processing can be automated thanks to artificial intelligence. This lowers expenses, expedites processes, and lessens human error. RPA (Robotic Process Automation): Many banks utilize RPA to handle high-volume, repetitive operations like processing transactions or onboarding customers, freeing personnel for more complicated tasks. Predictive maintenance: AI reduces downtime, maximizes resource use, and anticipates possible operational problems before they arise.

Artificial intelligence has made routine tasks like data entry, account management, and loan processing automated. This reduces costs, speeds up procedures, and minimizes human error. RPA (Robotic Process Automation): To free up staff time for more difficult activities, many banks use RPA to undertake repetitive, high-volume tasks like onboarding new customers or processing transactions. AI minimizes downtime, optimizes resource utilization, and foresees potential operational issues before they materialize in predictive maintenance.

Fraud Prevention: By examining transaction patterns and user behavior, AI systems are able to identify suspicious activity in real time. Compared to conventional methods, machine learning models are able to identify possible fraud with greater accuracy by learning from past data. Credit Scoring and Loan Underwriting: By adding non-traditional data, like social media activity and digital footprints, artificial intelligence (AI) improves credit scoring models. As a result, banks are able to offer services to previously neglected segments and make more informed lending decisions. It's real-time risk assessment capabilities enable banks to track exposure and anticipate changes in the market. Predictive analytics techniques, for instance, help reduce risk by predicting changes in stock prices or economic downturns.

Staff Optimization: Banks can operate with fewer human resources, saving on wages and administrative costs, since AI handles numerous back-office duties.

Decreased equipment Costs: Banks can cut operational expenses while boosting scalability by relying less on physical equipment thanks to cloud-based AI technologies.

FINDINGS OF THE STUDY

Many banks, however, have struggled to move from experimentation around select use cases to scaling AI technologies across the organization. Reasons include the lack of a clear strategy for AI, an inflexible and investment-starved technology core, fragmented data assets, and outmoded operating models that hamper collaboration between business and technology teams. Due to processing issues with AI technologies, there is no conclusive evidence of increased efficiency in business operations (Aguirre and Rodriguez, 2017). Instead of improving working conditions, AI utilization is reportedly increasing employee stress (Yang, 2022). Artificial intelligence is already widespread across banking, payments and insurance. Unknowingly algorithms play a major role in making every day decisions regarding our finances it is Observed that the P2P lending has become an alternative to bank lending when it comes to serving infra-marginal bank borrowers (Tang, 2019), and 30% of the rapid growth of shadow banks is attributed to fintech, while the rest is explained by the regulation reform (Buchak et al., 2018). The existing studies apply machine learning techniques to optimize bank lending decisions (Metawa et al., 2017; Jagtiani & Lemieux, 2019)

At present, the technology is most commonly used to market products and to enhance customer service, where AI chatbots have become the first port of call for a growing number of customers.

Financial services organizations are embracing artificial intelligence (AI) for various reasons, such as risk management, customer experience and forecasting the market trends. Henriques et al. (2020) assume different inputs and outputs for different banking studies that focus on distinct bank functions. Bank efficiency is also one of the impactful factors in bank performance assessment (Feng & Wang, 2018). Efficiency is closely related to operational performance as it enables banks to reach critical goals, such as maximizing productivity and lowering costs (Kourtzidis et al., 2019). Except for efficiency estimation at the bank level, DEA models have also been employed to evaluate the performance of bank branches (Paradi et al., 2011), to predict bank efficiency in combination with AI models (Kwon & Lee, 2015), and to assess the influence of environmental variables such as location and government regulations (Bou-Hamad et al., 2017). Artificial intelligence helps the customers to enhance their decision-making about financial matters. They are more likely to stay with banks that use cutting-edge AI technologies to help them better manage their money but because of given extensive industry regulations, banks and other financial services organizations need a comprehensive strategy for approaching AI. Using AI requires a thoughtful framework to mitigate risk and exposure.

The AI-first bank of the future will also enjoy the speed and agility that today characterize digital-native companies. It will innovate rapidly, launching new features in days or weeks instead of months. It will collaborate extensively with partners to deliver new value propositions integrated seamlessly across journeys, technology platforms, and data sets. The role of artificial intelligence is broadly based on its benefits and challenges

SUGGESTIONS

AI plays a crucial role in the success of every business organizations. These insights are aimed at banks that are looking to effectively implement AI in their banking services. Establish AI governance. Effective AI governance ensures transparency, accountability, and ethical use of AI. banks should define governance structures, establish data privacy protocols, and create oversight mechanisms. Banks should customize governance frameworks to align with industry standards, regulatory requirements, and organization's unique needs.

Select impactful AI applications. Not all AI applications yield equal benefits. Banks should focus on identifying high-impact use-cases that directly address business challenges. Assessments should be conducted to pinpoint areas where AI can drive value – whether it's optimizing loan approval processes, enhancing customer experience, or predicting marketing trends.

Build a real AI ecosystem. Banks must emphasize ecosystem thinking, connecting data pipelines, models, and business processes. Banking sectors must center integrating AI seamlessly into existing workflows, fostering collaborations across departments. holistic approach of every banking sector must ensures sustained success beyond individual projects.

Adopt flexible cloud solutions. Cloud platforms offer scalability, cost-effectiveness, and agility. Banks must be capable to choose the right cloud provider and architecture. They must evaluate infrastructure needs, considering factors like data volume, security, and compliance. Research must be carried out by the experts to design solutions that align with AI project's needs and growth trajectory.

Evaluate pilot AI projects. Pilots validate AI concepts before full-scale deployment. emphasize iterative learning and quick feedback loops. pilot project design, data collection, and performance evaluation must be implemented. the main focus should be on actionable insights and continuous improvement. Develop an AI integration hub. Soloed AI models hinder efficiency. strengthen integration hubs that connect disparate systems, enabling seamless data flow. Integration experts must be capable to create robust middleware layers, ensuring smooth communication between AI components and legacy systems. The result is the enhanced operational efficiency. These steps provide a framework for banks to strategically approach AI adoption, ensuring that the technology is not only implemented securely but also aligned with the bank's growth and innovation goals.

PRACTICAL IMPLICATIONS AND FUTURE ASPECTS

As artificial intelligence (AI) penetrates operations, streamlines decision-making, and reinvents every facet of customer interactions across multiple industries, it's also having a transformative impact on banking and finance. The numbers speak for themselves. McKinsey estimates that across the global banking sector, AI and generative AI in particular could add up to \$340 billion or 4.7% of total industry revenues annually.

Generative AI use cases in banking are diverse and impactful, including enhanced customer service, fraud detection, regulatory compliance, and predictive analytics. At the same time, AI solutions often come with privacy risks that companies should take seriously from the outset. Before diving into practical use cases, let's first define AI in banking and financial services. AI in this sector usually refers to the use of advanced algorithms and machine learning techniques to automate processes, boost decision-making accuracy, enrich customer engagement, and refine operational workflows within financial institution

Rajaratnam et al. (2017) evaluate the loan performance and portfolio risks under the Basel II capital requirements and constraints to make optimal decisions on capital regulation;

Generative AI, conversational AI, machine learning, predictive analytics, natural language processing (NLP), robotic process automation (RPA), computer vision. Productizing these technologies and making them part of digital banking solutions unlocks numerous benefits, driving innovation and enhancing efficiency within modern BFSI organizations.

Initially, machine learning and natural language processing were employed to automate routine tasks and enhance back-office operations—this phase saw the development of AI-powered chat bots for customer service, automated document processing for loan approvals, and algorithmic trading systems for financial markets. As AI matured, financial institutions started leveraging more sophisticated AI applications to improve decision-making processes. Advanced predictive analytics and data-driven insights enabled banks to assess credit risk, detect fraudulent activities, and optimize investment strategies.

The adoption of AI in banking accelerated further with the integration of big data analytics and cloud computing technologies. Banks started harnessing vast amounts of data from internal and external sources to gain deeper insights into customer behavior, market trends, and regulatory compliance. AI-driven recommendation engines personalized product offerings, while automated wealth management platforms provided tailored financial advice to clients. Moreover, the rise of regulatory technology (Reg Tech) solutions powered by AI helped banks navigate increasingly complex regulatory landscapes more efficiently. AI algorithms deployed to monitor transactions for compliance violations, ensure data privacy, and enhance cybersecurity measures bolstered customer trust and loyalty as digital banking was gaining traction. AI minimizes operational expenses and frees up human resources to focus on more strategic initiatives.

Faster and more accurate decision-making looking ahead, AI continues to drive innovation in banking, positioning businesses at the forefront of digital transformation and customer-centric financial services. Banks are expected to continue investing in generative AI models and testing them over the next 2-5 years. In the short term, banks will likely focus on incremental innovations—small efficiency gains and improvements based on specific business needs. Employees will maintain an oversight role to ensure accuracy, precision, and compliance as the technology matures. In line with approaching generative AI for innovation, banks are expected to utilize the technology to improve efficiency in existing and older AI applications. Just like that, automating customer-facing processes creates digital data records that generative AI can use to refine services and internal workflows. These records can enhance risk management, automate data collection, and streamline reporting, leading to further digitalization, end-to-end customization, better client segmentation, and retention.

Xing et al. (2020) employed ABM to study the impact of implementing multiple regulations that directly influence the balance sheet concerning the money supply in heterogeneous banking systems. All in all, the development of generative AI capabilities in banks will depend on their scale and investment capacity, ranging from in-house solution development to fine-tuning existing models. But regardless of these constraints, here are some key areas where generative AI could make a significant impact over the next years:

CONCLUSION

Artificial Intelligence is reshaping the banking industry, streamlining processes, and enhancing customer experiences. AI solutions are at the forefront of this transformation, offering practical and innovative solutions to financial services. Artificial Intelligence has made huge advances recently due to more computing power, big data, and better algorithms. AI can now match or beat humans at specific tasks like games, image recognition and language processing. However, AI still lacks general intelligence and common sense. More research is needed for AI to achieve complex reasoning, creativity and social skills. As AI advances, policymakers need to address ethical concerns around risks and benefits to ensure these powerful technologies benefit humanity.

The future of banking lies in AI, leveraging its capabilities for advanced data analytics to combat fraudulent transactions and enhance compliance. AI algorithms enable rapid execution of anti-money laundering activities, condensing tasks that traditionally took hours or days. Moreover, AI empowers banks to efficiently handle massive volumes of data, extracting valuable insights at unprecedented speeds. Features like AI bots, digital payment advisors, and biometric fraud detection mechanisms contribute to delivering higher-quality services to a broader customer base. The cumulative impact of these advancements translates into increased revenue, reduced costs, and a substantial boost in profits.

Artificial Intelligence is a transformative force in the banking industry. From improving customer service with chatbots to safeguarding your finances from fraud, AI is reshaping the way banks operate. As we move forward, the collaboration between AI and block chain technology promises even more exciting developments. So, whether you're checking your account balance, seeking investment advice, or applying for a loan, remember that AI is working behind the scenes to make your banking experience smoother and more secure.

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