Journal of Ecohumanism
2025
Volume: 4, No: 2 , pp. 2596 – 2609
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6672

Enhancing Regulatory Compliance in the Modern Banking Sector: Leveraging Advanced IT Solutions, Robotization, and AI

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Abstract

In the current financial landscape, preventing banking fraud and managing risk are crucial, and integrating Artificial Intelligence (AI) offers a viable path for breakthroughs and maintaining regulatory compliance in these areas. This study explores the various ways that AI can be used to identify, stop, and handle fraud in the banking industry. The primary objective of this study was to assess how the banking industry's digitalization necessitates the use of AI to manage customer complaints and inquiries, ensure compliance with banking rules and regulations, and address other issues, either entirely or in conjunction with human interaction. Graph analytics offers a distinct perspective by visualizing transactional relationships, potentially highlighting suspicious activities such as rapid fund transfers that may indicate money laundering. Deep learning, specifically neural networks, is one of the noteworthy methodologies that, when trained on historical fraud data, can discern intricate patterns and predict fraudulent transactions with remarkable precision. Further, Natural Language Processing (NLP) can be utilized to enhance Know Your Customer (KYC) processes. It examines identity verification, risk management, and encryption best practices to strengthen digital infrastructures against violating compliance and unwanted access. It looks at new developments in the field of regulatory technology (Reg-Tech), including the use of artificial intelligence and advanced analytics to improve the capacity for compliance enforcement and monitoring. Technology's sustainability should be seriously investigated, as it is displacing humans and the personal touch that goes along with it. The financial services industry thrives on customization and customer satisfaction, so this is a significant question to ask beyond the ethical neutrality of technology and its attendant threats like cybercrimes and macro-financial risks. The results, which concluded a thorough literature analysis and interview responses, identify three factors: the goals of Cognitive AI, Environmental, Social, and Governance (ESG) and the complexity of putting the RPA solution into practice) essential for putting RPA into the banking industry in a sustainable manner. Through the examination of transaction locations and user interaction patterns, respectively, behavioral biometrics and geographic analysis further strengthen security's versatility is one of its main advantages.

Keywords: *Regulatory Compliance, Artificial Intelligent (AI), Scam & Fraud Detection, Risk Management, Reg-Tech, etc.*

Introduction

The regulatory compliance of the banking system varies varying country to country. Operating in various local credit markets, the majority of banks structure their lending operations through a network of geographically distributed branches. The ability to sense, grasp, analyze, and infer rationally to solve issues or come to logical conclusions, and then learn from experience to grow and change, is known as natural intelligence in humans(Laith T Khrais, 2021). Typically, a local branch manager (henceforth LBM) oversees them and is vital in the collection of details regarding possible borrowers, especially those who own small and medium-sized businesses. According to Lui, A., & Lamb, G. W. (2018), using AI presents several difficulties that could erode consumers' faith. This piece highlights the fact that certain racial and gender groups are discriminated against by the biased AI algorithms employed in banking (Lee & Lee, 2020). The LBM develops contacts with the most promising potential borrowers in the market, assesses applicants, and obtains pertinent information about the creditworthiness of the organizations through in-person

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meetings with the managers of the businesses and the local community. The cost and scope of AI channel strategy initiatives in the financial services sector are examined by Khrais (2013). Certain decision-making rights should be given to the LBMs, especially when it comes to small businesses, as the effectiveness of the decision-making process depends on the person making the decisions having access to the knowledge that is important to those decisions and because information transmission can be expensive.

The increasing use of AI in the banking and financial services sector is highlighted by Ludwig, E.(2018). He explains how AI helps with consumer data analysis so that loanable mount and credit cores may be determined. Additionally, he suggests revising laws to stop the improper use of AI(Mytnyk et al., 2023). Principal-agent models emphasize that delegation, however, increases agency costs because the LBM may pursue personal interests that may conflict with the bank's goal of maximizing profits. Naturally, the trade-off between agency expenses and information transfer costs inside the company determines the ideal level of this. Nunn Robin. Financial institutions should better balance AI applications with their algorithmic bias against minorities, according to a 2018 article that examines the possibility of bias in AI people. More diversity in the workplace, according to him, can lessen the prejudices present in AI applications (Muthu Kumaran et al., 2022).

For this purpose, some problems are found in analog banking systems. There are management risks, regulatory compliance, violation of banking rules, and regulation fraud in the banking system. In his comprehensive discussion of ethical concerns with AI, Satell, G. (2016) highlights the necessity of creating a moral learning environment, recognizing prejudice in algorithms, looking into moral conundrums, and raising moral norms (Riikkinen et al., 2018). As financial institutions across the globe persist in utilizing digital technology, online banking has surfaced as a revolutionary phenomenon, revolutionizing how individuals and enterprises interact with financial services. Guy A. Messick (2017) explores the application of artificial intelligence in business and talks about how it's integrated into the financial services industry's digital ecosystem development and offering customers specialized guidance and services (Thisarani & Fernando, 2021).

Nowadays, AI is fast changing the banking sector and influencing how financial services will develop in the future. Within the ever-changing world of modern finance, the combination of digital innovation and sustainability has thrust the banking industry into previously unexplored domains (Ho & Chow, 2024). Machine learning algorithms and increased computing power are enabling banks to automate repetitive processes, enhance customer satisfaction, and make smarter judgments. The banking industry has benefited greatly from the use of AI technology, which has led to numerous prospects for innovation and improvement. The financial services industry's use of AI to combat cybercrime, improve client experience, and reduce the probability of the possible role of AI in the rise in cyber-attacks (Bagana et al., 2021). AI integration in banking can completely transform financial services by increasing transaction speed and accuracy, lowering fraud risk, and offering clients more individualized care. AI integration in banking can completely transform financial services by increasing transaction speed and accuracy, lowering fraud risk, and offering clients more individualized care. As AI develops more, it will probably become more significant in determining how the financial sector develops in the future. The conversation surrounding sustainable finance has historically revolved around moral investments, corporate social responsibility, and eco-friendly banking practices. The study will aid in the creation of the Bank for Tomorrow's roadmap by examining the function of AI in the banking industry.

To investigate the current adoption and development stages of AI in the banking sector. To investigate how employment in the banking sector is being impacted by AI and the efforts being made to mitigate the adverse effects on workers' IP addresses and mobile device IDs, whose classification as personal data under the Data Protection Directive was previously debatable, are now categorically identified as such. Genetic and biometric information is included in "Sensitive Personal Data". To assess the impact of cooperation between banks and AI companies on the development and use of AI solutions in the banking sector. To investigate the banking industry's use of AI and its advantages, limitations, and disadvantages. Automating and improving a variety of compliance procedures is part of using AI and robotics to digital banking regulatory compliance through modern IT solutions. Here are some ways to make use of these technologies.

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Literature Review

According to Forrester Research Inc.'s 2017 E-book AI with the Human Touch (White Paper), AI is capable of handling monotonous, repetitive tasks, however, it cannot take the place of personal touch. The study looks at how improving customer experience with AI and human touch may be done (Aljarbouh, 2019). As more institutions work to enhance current systems, artificial intelligence's rise in popularity is causing significant disruption in the financial services industry. Procedures by implementing changes made possible by AI-powered technologies. AI is starting to have the most revolutionary impact on banking following the turbulent realignment of the financial services industry equations under Fin-Tech, and it is anticipated to irreversibly alter the sector's dynamics in the future. To ensure that new concepts are discovered, developed, and marketed ahead of the competition, the Fin-Tech industry is closely collaborating with AI elements (Liang et al., 2023). When it comes to gathering and evaluating data to find patterns and create more precise forecasts for the future, AI is thought to be able to replicate and frequently surpass human ability. Increase the effectiveness of banks from the front desk to the back office.

A recent PWC report states that AI might account for over $16 trillion of the world economy by 2030. It is estimated that over $5 billion has been invested globally in AI applications (Jahandari & Materassi, 2017). By 2030, the banking sector is expected to save $1 trillion thanks to the use of AI, mostly as a result of branch closures (Vijai & Nivetha, 2020). Knowing which assets and securities will give the maximum returns and being able to advise clients on the risk-return trade-off are key responsibilities of wealth and portfolio management services and have given financial services firms a competitive edge by helping them to provide precise and tailored advice to their affluent clientele. With more than $6 trillion in assets under management (AUM), BlackRock, the largest investment organization in the world, has a dedicated AI lab to support its business needs. Several more multinational corporations are implementing AI to enhance their forecasting and provide value to their clientele. Bank Suisse UBS just added two additional AI tools to its trading floor makeover. Trading patterns are found by examining terabytes of market data. Data, after which it creates and suggests trading plans to the bank's customers to increase profits. The second one talks about its clients' preferences for post-trade allocation. Banks are utilizing AI assistants and other pertinent apps, such as Revolut's, to offer consumers fast assistance through smart chat technologies like natural language processing (NLP).

The Royal Bank of Scotland introduced Luvo, an AI assistant, in 2016. Luvo answers general client inquiries and transfers them to human staff when needed. Such robot advisors are revolutionizing the pleasure and experience of customers. In partnership with Fin-Tech firms, four prominent commercial banks in India are leveraging AI through Chatbots to enhance customer experience, boost productivity, and cut expenses. There are several uses for AI in the data-driven insurance sector. When insurance firms underwrite a policy or settle a claim, they must be aware of as much information as possible about the customer's background, health, way of life, personality, etc., and the specifics of the incident that the claim is made against, which can be better collected by AI algorithms. An insurance claim can be resolved in less than three seconds by utilizing AI software, as some US startups have done, by handling several back-end tasks and checks concurrently with client interactions. AI is poised to significantly alter the insurance sector. Numerous banking tasks, such as processing deposits and withdrawals, creating statements, clearing checks, billing, and so forth, are repetitive and have boring front and middle office work executing. AI tools like RPA are better suited to carry them out to save money, increase productivity, and enhance time management. Robotics technology is progressively mimicking human intelligence and skills, from industrial robots to self-driving automobiles. This might be a game changer for the financial services sector. Investment in the robotics industry is rapidly increasing.

The amount of funding agreements in robotics globally nearly doubled from $273 million in 2014 to $587 million in 2015, according to CB Insights. Compared to 2014, when investment growth was only 55%, it was 115% in 2015 (R & Ravi, 2021). Due to minimal or nonexistent credit histories, millions of financially excluded people and small and medium-sized enterprises are unable to obtain bank credit. It's difficult for banks to lend to such customers due to a lack of sufficient credit history. To make loan judgments in these situations, new Fin-Tech businesses are employing AI to gather and interpret alternative data, such as

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location, work history, age, spending patterns, educational background, police record, social media, and other digital footprint. A type of artificial intelligence known as predictive analysis AI can be used to determine credit scores, stop problematic loans, and get insight into a customer's credit requirements and future purchase intentions. AI machines are thought to be highly interchangeable with workers in any industry. Given that AI both digitizes and automates repetitive back office tasks and front office, employment will be lost as a result of the current skills becoming obsolete. (Duracz et al., 2020) However, another group of academics thinks AI will increase employment and draw people closer to technology. It will assist people in shifting their attention from monotonous, mechanical jobs to more productive ones (Thisarani & Fernando, 2021). If evolution becomes misguided, either by accident or intentionally, and goodness gives way to malevolence, the result could be disastrous rather than beneficial. That is also uncontrollable. Hackers may use artificial intelligence (AI) to automate hacking attempts; phishing scams could get worse and occur more frequently; ransom-ware attacks could get easier to carry out because hackers could use chat-bots to target more people; and the dissemination of false information and inflammatory propaganda could get worse (Aljarbouh et al., 2022). By enabling user authentication, strong password protection, intercepting phishing and spam attempts, and identifying false news, artificial intelligence has significantly improved cyber security and stepped up the fight against cybercrime overall. The fact that the tool being used to combat cybercrime might also be used to commit the same crime raises concerns because it will make it harder to identify and investigate. This is the opposite of AI's potential. Large-scale, highly focused, and sophisticated hacking and cyber-attacks on databases can be designed with the help of AI (Bagana et al., 2021). Additionally, while AI is thought to increase productivity by processing vast amounts of data that would otherwise be unmanageable, it is not a trustworthy security. The solution is best handled by people, namely cyber security and IT specialists, who are aware of legal compliance concerns and capable of providing workable, practical solutions. For risk assessments, policy formation, and responding to cyber-attacks, they are best equipped. In actuality, AI-enabled cyber-security solutions fall short and are unable to take the place of human specialists in safeguarding data, networks, and cyber-attacks. Hugh Thompson, the Chief Technology Officer of Symantec Corp., highlighted the importance of human intervention in cyber-security despite the industry's widespread push toward automation and artificial intelligence (Chavez et al., 2019).

Methodology

This study is used in conjunction with a qualitative research methodology. To obtain and evaluate data, a thorough search of pertinent papers was carried out on databases like Google Scholar, Web of Science, MEDLINE, and Scopus. Furthermore, data was gathered from a variety of sources such as government statistics, novels, and newspapers. The rapid growth of robotic process automation (RPA) in recent times can be ascribed to businesses' desire to improve customer satisfaction and optimize internal operations. According to Gartner, Inc.'s most recent forecast, PRA software sales are expected to reach $1.89 billion in 2025, representing a 19.5% growth rate from the previous year. Despite the COVID-19 pandemic's effects, Gartner's forecasts (Singh & Agarwal, 2019) indicate that the RPA industry will increase at a considerable rate in the double digits by 2024. The market size for the PRA (Public Relations Agency) sector is shown in Figure 1 broken down by region.

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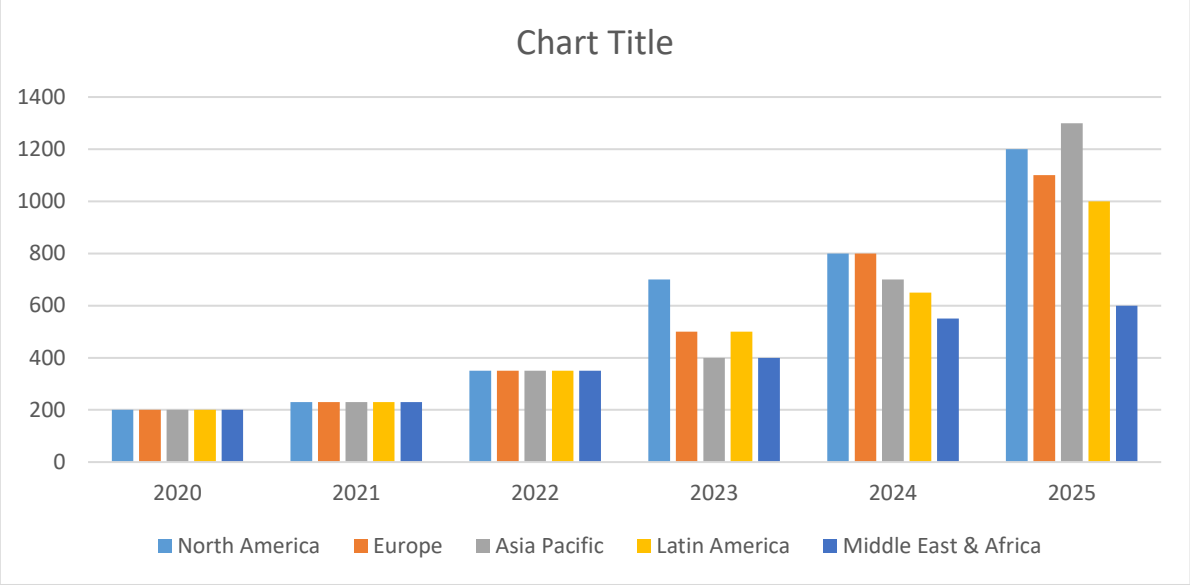

Figure 1. Global RPA Software Revenue

RPA is used in a variety of industries, including banking and utility companies. At the moment, this phenomenon is primarily observed in the back-office and intermediate sectors of numerous industries, such as manufacturing, SCM, retail, customer service, finance, and human resources. Numerous categories comprise the application criteria, such as analysis, customer support, data transmission, reporting and administration, and other elements. The article offers a succinct synopsis of the procedure within a well-known industry that is now experiencing positive results from implementing RPA. Table 1 shows the RPA adoption rates by segment for many different sectors.

Table 1. The Utilization of RPA across Several Industry Sectors

Telecom	Insurance	Banking	Retail
Simple query forwarding	Regulatory Compliance	Validating and processing	Inventory monitoring
Report generation	Premium renewals	Account Closure	Online sales
Porting customer numbers	Form Registration	Same day funds transfers	Supply chain managemen
Customer dispute resolution	Responding to customer queries	Trade execution	Trade promotions
SIM swapping	Appeals processing	Loan processing	Automated returns
Credit checks	Claims processing	Know Your Customer (KYC)	Product categorization

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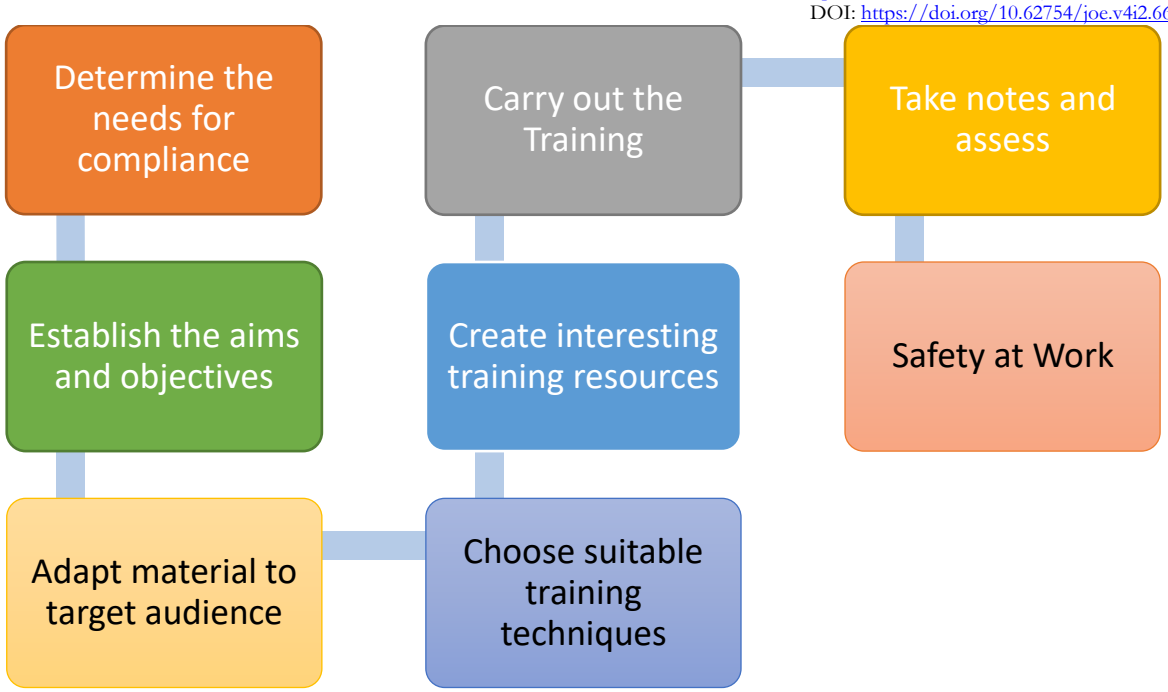

Figure 2. Key Step to the Training Process

Intelligent Document Processing: Employ AI to handle and examine contracts and papers about compliance, gathering pertinent data and guaranteeing that legal criteria are met. Use blockchain-based smart contracts to automatically enforce laws and regulations about compliance showed in Figure 2.

Regulatory Sandboxes: Testing New Solutions: Before a full-scale rollout, test new financial goods and services in a controlled environment using artificial intelligence (AI) and robots to ensure compliance. AI-Simulated Compliance Scenarios: Evaluate the effects of new legislation on banking operations and simulate different compliance scenarios.

Analytics and Insights from Data: Predictive Analytics: Make use of predictive analytics to anticipate and proactively handle possible compliance risks. Sentiment Analysis: Apply AI to social media interactions and consumer reviews to get an understanding of the public's perceptions of regulatory processes and compliance-related problems. Financial services companies are increasingly using software-based robots. With the use of artificial intelligence, these robots are capable of intelligently delivering services and automating human interactions and tasks. The fintech robots are utilized in digital advising solutions to automate investment decisions. Lending guidance, devoid of human involvement. There are several applications for the financial advice function in investment advisory, crowdsourcing, and peer-to-peer lending. Automating repetitive and routine processes with computer programs is known as robotic process automation or RPA. RPA can be utilized in the banking sector to automate a variety of tasks, including chat-bots, complaints, service requests, data entry, and more. Uploading data, reconciling accounts, shutting accounts each month, and verifying compliance.

RPA, for instance, can be used to automatically extract data from documents and insert it into the bank's systems, including invoices, drafts, and checks. This can cut down on mistakes while also saving time and effort. Additionally, Know Your Customer and anti-money laundering requirements can be automatically monitored for compliance with RPA. Banks can lower expenses, increase operational effectiveness, and enhance customer satisfaction by implementing RPA. For banks and other financial institutions, RPA is a virtual, effective workforce that can cut expenses by 80% and the amount of time needed to complete rule-based tasks by 90% (Kalra, 2019). According to one study, banks are ahead of other industries in using RPA (Pramod, 2021). According to one study, robotic process automation (RPA) is a new technology that

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will help the banking industry (Vijai et al., 2020). Professor Leslie Willcocks of the London School of Economics spoke with McKinsey in 2017 about management's projected benefits in terms of return on investment ranging from 30% to 200% in the first year alone, based on 16 case studies. Planning for a medium- to long-term return on investment is advised by Professor Leslie rather than focusing on immediate gains. Processes like customer queries, which require a lot of labor and can be repetitive, can yield significant benefits by freeing up and repurposing people. Although precise savings are typically not disclosed, several reports claim that using RPA robots—which operate continuously throughout the year—can save millions of US dollars plotted in Figure 3 and Figure 4.

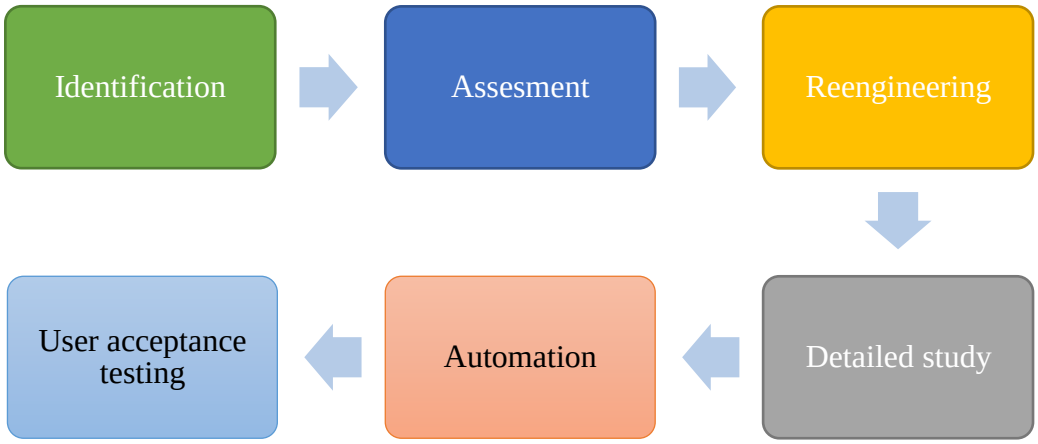

Figure 3: Model for RPA Development

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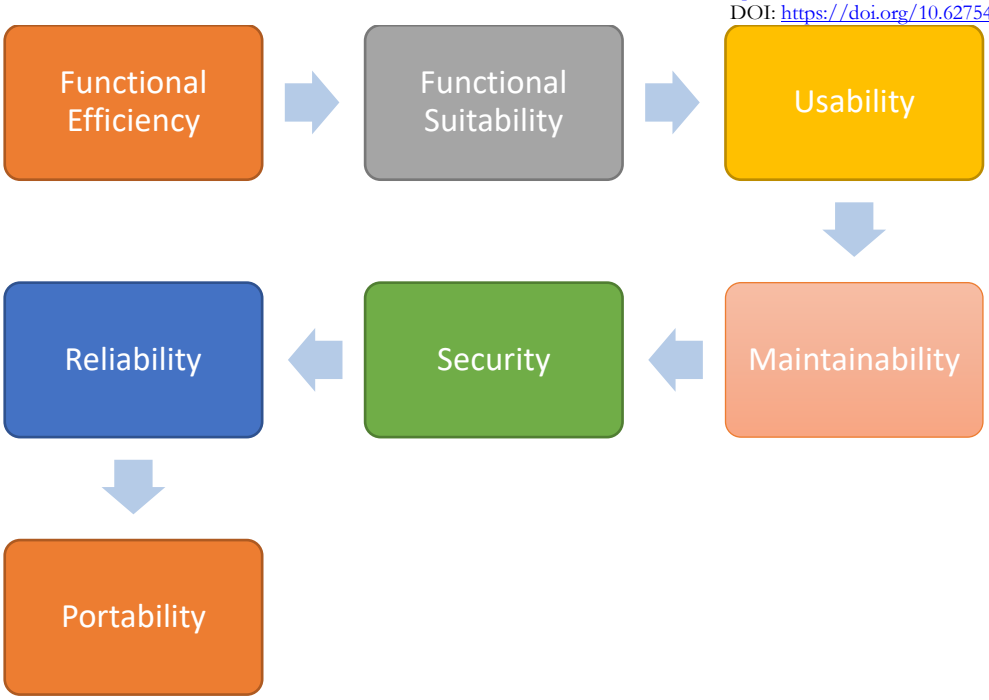

Figure 4: RPA Tools Assessment

The introduction of online banking has completely changed how people and companies deal with financial institutions(L. T. Khrais, 2019). The days of standing in line at physical branches are long gone, and in their place, clients may now conveniently access a variety of banking services available to them at all times, wherever, and anytime via an internet connection(R. Hernández-Murillo, 2010). This fundamental shift in banking procedures lowers transaction costs for banks and their consumers while also improving customer comfort, which promotes greater effectiveness in the distribution of monetary resources(Khrais, 2012). Furthermore, internet banking has become a potent instrument for advancing financial inclusion, especially in underserved or isolated areas with sparse traditional banking infrastructure(K. B. Yap, 2010). Internet banking has significant consequences not only for individual customers but also for the larger economy. Internet banking has also fueled the development of fin-tech companies and cutting-edge financial solutions, upending established banking practices and boosting rivalry in the industry(H. A. Riyadh, 2023). Potentially, online banking comes with several hazards and difficulties that need to be properly handled(Ioannou, 2006). In an era of growing digital interconnection, security issues, such as the possibility of cyber-attacks and data breaches, are significant(T. A. Azizi, 2022). The emergence of the internet signaled the start of a new era in which communication and information flowed beyond geographic boundaries. Even the most traditional banking sector was not immune to the revolutionary ability of digital technology. Online banking, also referred to as Internet banking, is a paradigm shift in the way financial services are provided. This inclusivity supports more general socioeconomic objectives by giving people who were previously shut out of traditional banking systems the chance to engage with the official financial industry. As we explore the goals are dual and should be considered the driving forces for the development of online banking. First and foremost, it's critical to understand the complex interactions between technology, consumer behavior, and market forces that have fueled the adoption of digital banking on a large scale(M. Audi, 2022). Furthermore, comprehending these motivating factors establishes the foundation for projecting future patterns, and empowering interested parties to maneuver through the changing financial services environment. The development of strong and safe digital platforms in conjunction with the widespread availability of high-speed internet connectivity has made it possible for banks to provide a wide range of online services innovations like banking apps for smartphones, In addition to improving the user experience, biometric authentication, and chat-bots powered by artificial intelligence have broadened the reach and extent of banking services beyond conventional limitations(L. T. Khrais, 2021).

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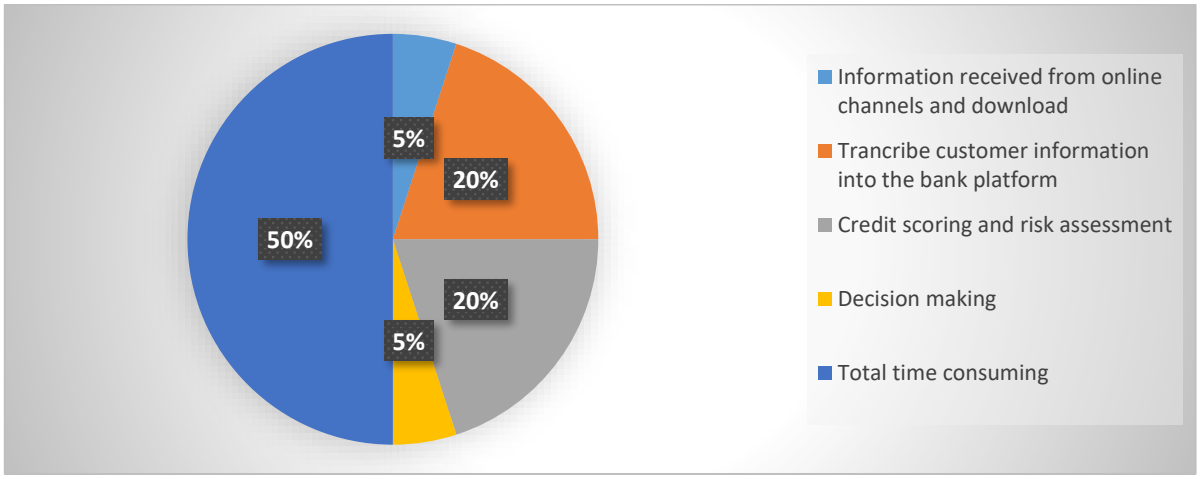
Results and Discussions

AI is being used by banks to streamline client verification, replace human employees with voice assistants and chatbots, enhance customer service, and offer tailored suggestions. By 2023, AI has a significant chance of saving banks $447 billion in expenses. Banks are utilizing AI to do the legally mandated "know-your-customer" checks to better prevent payment fraud and enhance anti-money laundering procedures. Because workers in the banking industry will need to learn new skills to work with AI-powered systems, AI may push them to upskill. The emergence of new professions in the banking industry, including robotics experts, data scientists, and AI engineers has the potential to guarantee that banks fulfill the specific requirements of each customer while adhering to privacy and data protection laws. Automation expedites compliance inspections, resulting in quicker service delivery and customer onboarding. Banks are able to optimize compliance efforts through more efficient resource allocation. Enhanced adherence lowers the risk of facing fines and penalties from regulations. By automating compliance processes, huge compliance teams are not as necessary, which lowers management costs. Problem Identification and Motivation: In this first step, the research problem is identified and specified, along with an explanation that explains why it exists. Our goal is to clarify how RPA can benefit from a continuous process improvement approach and what effects this will have. Outlining the Goals of a Solution: The research's objectives are determined in the second phase. These are deduced from the problem definition in conjunction with the understanding of what is practical and doable; the goal of this study is to determine how much more effective and efficient Lean RPA is in comparison to a typical RPA project.

According to Mingsheng Banks' 2020 annual report, the bank has issued 61.67 million credit cards in total. The number of credit cards that were issued in 2020 was 4.21 million. At the front desk, in-person applications account for about 70% of newly issued credit cards; the remainder are obtained via platforms such as mobile phones. Approximately 2.95 million credit cards were manually issued in 2020 procedures. The bank can accomplish automated application validation and approval in 7 minutes by utilizing RPA in conjunction with Artificial Intelligence (AI) technology, as demonstrated by the computations displayed in Figure 5. Compared to human staff involvement, automated processes have the potential to save 43 minutes for each application in terms of time. Here first one is done manually and the second one is with (AI + RPA)



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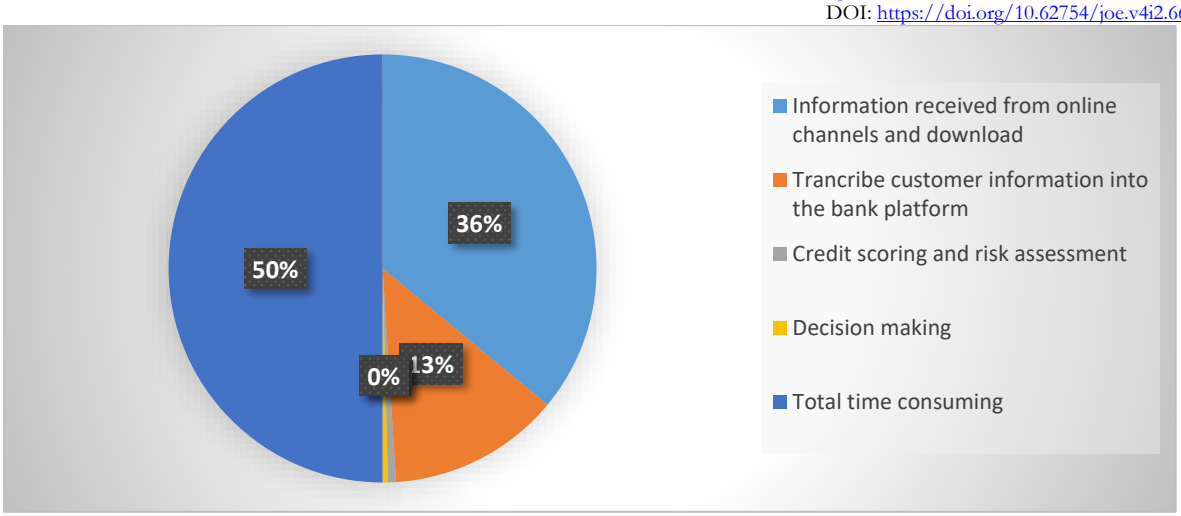

Figure 5. The Duration Required for Each Individual Procedure

Total cost saved after RPA application: The average monthly salary for employees at Minsheng Bank's credit card center is $2,000. Workers put in an average of 22 days a month, eight hours a day, at their jobs. As a result, $12 may be calculated as the hourly labor cost. RPA and AI technology might save $36 million in costs when used in credit card processing, according to Minsheng Bank's performance statistics. The following expression can be used to express the computation:

$$CS = BV \times TS \times \frac{ES}{Minute}$$

$$= 42, 17300 \times 44 \times \frac{\$11}{60\ minute}$$

$$= \$34019553.33$$

Type equation here.

Where CS stand for cost saving per annum; BV is the business volume, which represents credit cards numbers provided; TS is the time saved, and ES is the employee salary released in a minute. Based on the deployment of AI and RPA, the analysis indicates that the annual cost savings come to $33019553.33. Figure 6 & 7 shows that the advantage and disadvantage.

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Figure 6. Advantages of Robotic Process Automation

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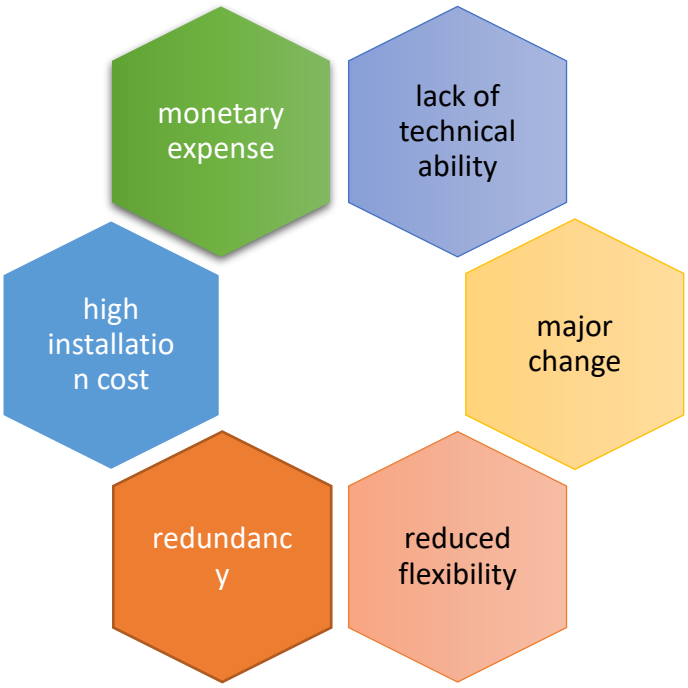

Figure 7. Disadvantages of Robotic Process Automation

In conclusion, the banking industry benefits from increased efficiency, accuracy, cost savings, improved risk management, enhanced customer experience, and improved decision-making when AI and robotics are applied to regulatory compliance.

Conclusion

With the introduction of cutting-edge technologies, risk management and banking fraud prevention are fast changing. Artificial Intelligence is one of the main technological forces in these fields AI. It is impossible for anyone to manually sort through and find anomalies. That's where AI comes in, allowing fraud detection and prevention to move from reactive to proactive methods. AI allows for immediate response in questionable situations and provides predicted insights by utilizing the massive amounts of data produced by banks. These models' prediction power is increased when they are trained on past fraud data The "Know Your Customer" (KYC) procedure, which is essential to banking operations, is further improved by AI. AI may examine textual data from a variety of sources, such as customer records, social media posts, or further digital exchanges. The users' authentication will determine how safe banking operates in the future. Because biometric verification is based on each person's distinct bodily characteristics, it provides a strong answer. This is furthered by AI, which strengthens and improves systems like face recognition, voice recognition, and fingerprint scanning. It is occasionally possible to trick conventional biometric systems with excellent copies or records. But when AI is combined with these systems, they become more precise and flexible as well. Through continuous data assimilation and comprehension of developing fraud trends, these artificial intelligence algorithms guarantee that detection and prevention instruments stay at the forefront of security. Additionally, when banking expands.

As fraud becomes more multichannel, it needs to be detected holistically. AI-enabled cross-channel analysis offers a consolidated picture of a customer's actions across many platforms, from online banking to ATM withdrawals, and makes sure irregularities are quickly identified. Regulators must constantly adapt as a result of the growth of digitalization, robotization, and artificial intelligence as well as the advent of financial and economic issues brought on by crises, in this case, the coronavirus pandemic to fresh dangers. As was previously said, regulation will inevitably lag behind new demands and developing technologies since proper regulation of these technologies cannot be established until the authorities have a complete grasp of their functions and associated hazards. We must develop, establish, and uphold principles for a global society

Journal of Ecohumanism
2025
Volume: 4, No: 2 , pp. 2596 – 2609
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6672

that transcend personal gain maximization and economic profit maximization. The goal must be to guarantee a respectable quality of living, safety, and sustainability for all of mankind, and the compliance department needs to be prepared to carry out its responsibilities to accomplish this.

References

A. M. Laith T. Khrais, "Investigating of Mobile Learning Technology Acceptance in Companies," Ilkogretim Online - Elementary Education Online, 2021.
D. L. Sang M. Lee, ""Untact": a new customer service strategy in the digital age," Service Business, 2020.
K. L.T., "THE EFFECTIVENESS OF E- BANKING ENVIRONMENT IN CUSTOMER LIFE SERVICE AN EMPIRCAL STUDY (POLAND)," POLISH JOURNAL OF MANAGEMENT STUDIES, vol. 8, 2013.
„. O. T. 1. S. F. 2. Y. S. 2. Bohdan Mytnyk 1, "Application of Artificial Intelligence for Fraudulent Banking Operations Recognition," Licensee MDPI, vol. 7, 2023.
K. V. P. V. D. A. G. V. D. E Muthu Kumaran, "Artificial intelligence-enabled IoT-based smart blood banking system," Advances and Applications, 2022.
H. S. a. P. S. M. Riikkinen, "Using artificial intelligence to create value in insurance," Journal of Bank, 2018.
Y. Z. A. D. B. C. a. W. T. A. Aljarbouh, "Chattering-free simulation for hybrid dynamical systems semantics and prototype implementation," eeexplore.ieee.org, 2016.
M. T. a. S. Fernando, "Artificial Intelligence for Futuristic Banking," ieeexplore.ieee.org, 2021.
·. M. Y. C. C. Shirie Pui Shan Ho1, "The role of artificial intelligence in consumers' brand preference for retail banks in Hong Kong," Journal of Financial Services Marketing, 2023.
M. I. a. I. H. S. B. D. Bagana, "ARTIFICIAL INTELLIGENCE AS A HUMAN SUBSTITUTION? CUSTOMER'S PERCEPTION OF THE CONVERSATIONAL USER INTERFACE IN BANKING INDUSTRY BASED ON UTAUT CONCEPT," Review of Management and Entrepreneurship, vol. 5, 2021.
S. J. a. D. Materassi, "Analysis and compensation of asynchronous stock time series," IEEE, 2017.
R. V. a. H. Ravi, "Innovation in banking: fusion of artificial intelligence and blockchain," Asia Pacific Journal of Innovation and Entrepreneurship, vol. 15, no. 1, 2021.
R. Y. a. Y. L. Z. Bai, "Mental task classification using electroencephalogram signal," arXiv preprint arXiv, pp. 1-6, 2019.
A. D. e. al., "Advanced hazard analysis and risk assessment in the ISO 26262 functional safety standard using rigorous simulation," First Online, pp. 108-126, 2020.
C. V. a. P. Nivetha, "ABC technology-artificial intelligence, blockchain technology, cloud technology for banking sector," Advances in Management, 2020.
V. K. S. a. S. V. S. F. Suhel, "Conversation to automation in banking through chatbot using artificial machine intelligence language," ICRITO, pp. 1-8, 2020 .
W. L. a. J. J. Y. Liang, "Structural Vibration Signal Denoising Using Stacking Ensemble of Hybrid CNN-RNN," arXiv e-prints, pp. 1-10, 2023.
M. K. S. a. S. Nagaraj, "Applications of artificial intelligence on customer experience and service quality of the banking sector," International Management, 2021.
H. D. A. A. W. a. A. A. Z. O. Wibisono, "The use of big data analytics and artificial intelligence in central banking," IFC Bulletins, 2019.
M. S. A. M. V. a. B. D. D. A. Aljarbouh, "Intellectualization of information processing systems for monitoring complex objects and systems," Современные инновации, системы и технологии, vol. 2, no. 1, pp. 9-17, 2022.
K. V. P. V. D. A. G. a. V. D. E. Muthu Kumaran, "Artificial Intelligence-Enabled IoT-Based Smart Blood Banking System," Advances and Applications, p. 119–130, 2022.
S. S. a. L. Agarwal, "Pros and cons of artificial intelligence in banking sector of India," BICON-2019, 2019.
R. M. a. E. A. M. I. E. Ahmed, "The role of artificial intelligence in developing a banking risk index: an application of Adaptive Neural Network Based Fuzzy Inference System (ANFIS)," Artif Intell Rev, pp. 1-23, 2023.
T. O. S. a. T. A. K. E. Mogaji, "The implications of artificial intelligence on the digital marketing of financial services to vulnerable customers," Australasian Marketing Journal, vol. 29, no. 3, pp. 235-242, 2021.
A. Aljarbouh, "+
First Online, pp. 16-31, 2019.
D. K. Y. L. S. T. a. J. Y. A. Chavez, "Identify statistical similarities and differences between the deadliest cancer types through gene expression," arXiv preprint arXiv, 2019.
A. M. a. O. G. J. Ortiz, "Implementation of a banking system security in embedded systems using artificial intelligence," Advances in Natural and Applied Sciences, vol. 10, no. 17, pp. 95-101, 2016.
M. A. M. a. Y. A. L. T. Khrais, "A Readiness Evaluation of Applying e Government in the Society: Shall Citizens begin to Use it?," Editorial Preface From the Desk of Managing Editor, vol. 10, no. 9, 2019.
G. L. a. R. F. R. Hernández-Murillo, "Strategic online banking adoption," Journal of Banking & Finance, vol. 34, no. 7, pp. 1650-1663, 2010.
L. T. Khrais, "The adoption of online banking: A Jordanian perspective," European Journal of Business and Management, vol. 4, no. 16, 2012.
D. H. W. C. L. a. R. B. K. B. Yap, "Offline and online banking–where to draw the line when building trust in e-banking?," International Journal of Bank Marketing, vol. 28, no. 1, pp. 27-46, 2010.
L. T. K. S. A. A. a. A. A. S. H. A. Riyadh, "Association between mass collaboration and knowledge management: a case ofJordan companies," International Journal of Organizational Analysis, vol. 31, no. 4, pp. 973-987, 2023.

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ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i2.6672

M. M. a. G. Ioannou, "Consumers' perspectives on online banking services," International Journal of Consumer Studies, vol. 30, no. 6, pp. 552-560, 2006.

M. T. S. M. H. R. G. M. A. L. T. K. a. M. M. E. M. T. A. Azizi, "Investigating the effectiveness of monetary vs. non-monetary compensation on customer repatronage intentions in double deviation," CEMJP, vol. 30, no. 4, pp. 1094-1108, 2022.

A. A. a. H. F. H. M. Audi, "Nexus Among Innovations, Financial Development and Economic Growth in Developing Countries," Journal of Applied Economic Sciences, vol. 17, no. 4, 2022.

L. T. Khrais, "Verifying persuasive factors boosting online services business within mobile applications," Periodicals of Engineering and Natural Sciences, vol. 9, no. 2, pp. 1046-1054, 2021.