

AI in Financial Services

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Generative AI capabilities have rapidly improved over the past 5-7 years, with AI models now able to generate human-like responses with textual and audio-visual responses. AI is expected to disrupt many white-collar sectors, including the finance industry. How can new AI advances disrupt jobs in the sector?



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Financial institutions are increasingly using AI to gain competitive advantages by improving speed, cost, accuracy, and efficiency. They are eager to see machines replicate and potentially surpass human capabilities. By harnessing data to identify patterns, AI-powered systems can enhance predictions and overall efficiency throughout the financial industry and the banking process.



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The anticipation around AI's potential positive impact is accompanied by significant apprehension. AI is projected to generate \$1 trillion in savings for the industry by 2030, and traditional financial institutions are expected to reduce their costs by 22% due to AI implementation.ⁱ According to a 2019 Wells Fargo report, US banks are expected to reduce their workforce by over 200,000 jobs over the next decade.ⁱⁱ In 2017, Vikram Pandit, the former CEO of Citigroup, predicted that 30% of banking jobs could vanish in the next five years.ⁱⁱⁱ Since then, Citi's fintech transformation project has contributed to part of the 5,000 job cuts in 2023.^{iv} In 2017, Mizuho Financial Group in Japan planned to lay off 19,000 employees by 2027 because of AI, however, there have been no updates since.^v



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When examining the evolving landscape of the financial industry, it becomes evident that specific sub-categories are more susceptible to the integration of AI capabilities. These sub-categories, which include asset management, retail banking, underwriting, and regulatory compliance, have been chosen because of their inherent reliance on automation, data-driven workflows, and the potential to greatly enhance customer experiences. The subsequent sections delve into the transformative potential of generative AI in these crucial sectors, illuminating its ability to revolutionize back-office operations and elevate precision and efficiency to new levels.

Retail banking

By 2030, AI is expected to disrupt or replace approximately 70% of banking front office jobs.^{vi} As AI becomes increasingly advanced, jobs involving repetitive tasks, like bank tellers, are likely to be at risk before more complex jobs face potential threats. Currently, chatbots are the most prominent form of AI being adopted in the banking sector, primarily focused on enhancing customer experience. Automated service assistants, such as chatbots, are offering customers the convenience of resolving queries through online messaging systems, reducing the need to visit a physical branch. With the help of machine-learning techniques, chatbots are continually improving in accurately identifying customer issues and providing appropriate solutions.

Bank of America's virtual assistant "Erica" can understand about 500,000 variations of consumer questions, with 7 million active mobile users out of 27 having activated the chatbot, offering services such as card locking/unlocking, scheduling meetings, bill reminders, payment alerts, credit score insights, expenditure tracking, and charge disputes.^{vii} Now, Erica can connect clients with financial specialists for inquiries about new products and services like mortgages,

credit cards, or deposit accounts.^{viii} Chatbots are becoming an industry standard, and though they may not handle complex tasks, they are continuously enhancing their capabilities. Commonwealth Bank of Australia's AI assistant has efficiently handled more than 15.5 million interactions since 2018.^{ix} "Ceba" manages over 60% of incoming contacts, performs 500 tasks, recognizes 70,000 questions, and handles 97% of contacts without customer wait time. "Nina", released in 2016, helped Swedbank achieve a 78% first-contact resolution within the first three months, while customer adoption of the virtual assistant resulted in an average of 30,000 conversations per month.^x Every bank may need chatbots to manage and triage front-office work.

The expansive adoption and use of chatbots are not without their risks. The Consumer Financial Protection Bureau (CFPB) has reported frequent complaints from customers and expressed concerns that "a deeply deployed chatbot can lead to customer frustration, reduced trust, and even violations of the law."^{xi} Financial institutions must ensure that their chatbots comply with federal consumer financial protection laws. Noncompliance occurs when the chatbots information isn't accurate, it fails to protect data and privacy, and it neglects customers invoking their federal rights. Chatbots can weaken customer trust and service through repetitive loops of jargon (especially in urgent circumstances), not providing the appropriate response, and failing to connect the customer with a human representative. Finally, chatbots could harm consumers by providing inaccurate information about financial products and services and payment information which causes the customer to pay unnecessary penalties.



Asset Management

In asset management, the use cases of AI are perhaps most acute in the trading and settlement domains. As AI advances, there is a potential for a significant decline in the number of human traders in the investments industry. The UK Government's Foresight panel released a working paper discussing how high-frequency trading will eventually replace human decision-making.^{xii} New algorithms can provide strategy suggestions and execute trades independently using techniques such as evolutionary computation, deep learning, and probabilistic logic.^{xiii} Programmable AI can be more efficient than humans in fast-paced markets.

In 2017, UBS showcased two AI trading systems.^{xiv} Through machine learning, UBS developed a system that analyzes extensive market data to formulate new volatility trading strategies for clients, aiming to enhance trading performance and achieve greater market returns for the trading division. Then, UBS and Deloitte created a program to process clients' post-trade allocation requests by scanning emails, which significantly reduces a 45-minute job into a matter of minutes.

AI-based algorithms have and will continue to replace single-stock analysts and investors. A report by Opimas predicts that financial firms will reduce their workforce by about 10% by 2025, resulting in the loss of approximately 230,000 jobs, with 40% of those job cuts expected in the money management industry.^{xv} Humans are inherently limited by hardware and processing power that lacks the bandwidth and speed to keep up with the upcoming waves of computer technology and information processing needs.

While AI can reduce fixed costs for financial institutions and increase efficiency, there are pitfalls of its implementation in quantitative

besides contributing to unemployment.^{xvi} The algorithm behind the models and inferences are tremendously complex which make it difficult for managers to monitor and scrutinize. The opacity could lead to systematic crashes, incorrect inferences, and difficulty in performance attribution. This is particularly important for predicting AI's response to black swan events, avoiding market crises, and aligning investment strategies with beneficiaries' preferences. There is also the problem of data integrity and sufficiency. AI inherently requires large amounts of data to "learn" and execute tasks; however, past data does not fully represent the future. The models also heavily rely on high data quality to avoid triggering "garbage in, garbage out."

Underwriting

Advancement in AI and its adoption in modelling customer data is impacting the credit underwriting business. The integration of AI-based credit underwriting and smart contracts technology is anticipated to lead to the displacement of at least 250,000 loan officers.^{xvi} This transformation is driven by the emergence of AI-powered fintech firms and nonbank lenders, intensifying competition and prompting traditional banks to revamp their underwriting and loan-application processes to stay competitive.^{xvii}

Such trends are evident in the experiences of institutions like JPMorgan Chase & Co., where lawyers and loan officers spend a substantial 360,000 hours annually on routine tasks such as deciphering retail and commercial-loan agreements. However, machine learning technologies have drastically reduced this timeframe to mere seconds. A notable example is COIN (Contract Intelligence), a live blockchain application utilizing deep learning within a private cloud network. COIN expedites document review and curbs loan-servicing



errors arising from human misinterpretation of approximately 12,000 new wholesale contracts each year. Demonstrating the impact of these changes, JPMorgan recently implemented workforce reductions, cutting 500 employees from their technology and operations divisions. The robust analytical capabilities of AI bring about considerable time and cost efficiencies, contributing to an imminent industry-wide transformation and disruption.

AI, coupled with alternative data, can also greatly enhance credit accessibility in markets like the US, yet especially so in emerging markets. AI can help improve financial inclusion even in regions with long-established histories of credit scores, by reducing bias, and benefiting both borrowers and lenders.^{xviii} The rise of Buy Now Pay Later (BNPL) serves as one example of the evolving banking landscape, driven by customer expectations and disruptive technology. BNPL's seamless, embedded credit approach aligns with customer preferences for quick, personalized experiences, even to those who have low credit scores and are unable to easily access credit from banks.^{xix} AI's role in credit underwriting has even more promise to improve financial inclusion in emerging and frontier markets, where there are under-developed systems for credit scores but where consumers generate a lot of data. This is even especially so for markets where new population-level infrastructure has been deployed such as India with its 'India-stack'.^{xx}

Although AI can transform credit scoring and direct lending, it is crucial that financial institutions are aware of potential discrimination behind credit decisions. The quality of data fed into the models can skew results. If historical credit data is not scrubbed and analyzed, unequal credit decisions will continue to occur across race and sex groups. As Mike de Vere, CEO of Zest AI, notes "racism is encoded in the

data."^{xxi} However, Anya Prince, associate law professor at the University of Iowa, points out that even if race is erased from the data, there is the risk of "unintentional proxy discrimination". Thus, lenders should avoid opaque algorithms. This leaves financial institutions with two options, scrub historical data or design models from scratch. Any data corrections will have to be accompanied by an explanation of 'how' and 'why', which according to Vere could be problematic for lenders. Furthermore, the tools that financial institutions have for creating their own models are inadequate, and there's the risk that institutions include a variable in their model that accentuates bias if it means better economics. There may be a trade-off between less accurate models and more inclusive ones.

Regulatory, Compliance, & Fraud Detection

Money laundering persists because the global system for financial crime enforcement is expensive and ineffective. Financial institutions filed 1.4 million Suspicious Activity reports in 2021, a 70% increase compared to 2014. Furthermore, there has been an increase in fines from failures and inadequacies in Anti-Money Laundering (AML) structures. Deutsch Bank was fined \$186m by the US Fed because they failed to implement preventative measures for past money laundering violations. US regulators fined Bank of America over \$250 million because of junk fees and fake accounts. In 2022, the Fed ended a decade-long enforcement action against HSBC's money laundering scandal, which would have been \$1.9b in fines. Regulatory compliance and fraud detection has become too extensive and costly for banks to not make drastic changes. AI can effectively catch abnormal and fraudulent behaviors and improve regulative workflows.

Transforming the AML value chain to better address financial crime means incorporating AI components (i.e., machine learning, deep



learning, data mining, analytics). For example, HSBC has partnered with Quantexa, a global data and analytics software company, to counter money laundering. The Financial Conduct Authority (FCA) estimates that banks spend £5bn annually preventing fraud. Harnessing AI will be more efficient and cheaper than a team of compliance staff.

As financial institutions implement AI systems to identify criminal activities, they should not ignore potential risks.^{xxii} AI crime detection should not be an isolated capability addition because it could lead to inexplicable conclusions (false positives), especially in the case of unknown events that the model hasn't been trained for. Secondly, biased data inputs could miss suspicious transactions (false negatives). The algorithm could unintentionally overlook a large money laundering transaction made by customers from wealthy neighborhoods. Yet, a rules-based system would have triggered an alert. Thirdly, to avoid groups from unfair penalizations, financial institutions will have to counter-act AI's self-learning aspect if it develops biases. Furthermore, unintentional racial bias in the system could result in credibility loss from the public, regulators, and stakeholders if false alerts incorrectly label individuals as "criminal" or "suspicious". If the data analytics teams and products are insufficient to handle complex AI algorithms, financial institutions will have to develop in-house. Finally, fraudulent behaviors could be neglected if employees become too reliant on AI with a false sense of comfort in the algorithm and cease consistent output checks.

Conclusion

AI will simultaneously revolutionize and disrupt the financial industry. Simplifying procedures and automating tasks will save institutions billions of dollars and improve financial services. While employees will be displaced, AI may not replace all roles in the future because it still lacks critical thinking. Furthermore, emotional and social intelligence are critical aspects within the financial industry. AI can predict market forces with historical data, but humans hold an advantage over anticipating human behaviors. As with economic models and theories, AI output assumes rational human behavior. Overall, "computers are fast, accurate and stupid. Humans are incredibly slow, inaccurate, and brilliant. Together they are powerful beyond imagination."^{xxiii}



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