

Artificial Intelligence (AI) in FinTech



Emergent areas for innovation



Introduction

1. Estimates of the value of the global Financial Technology (Fintech) market vary but fall roughly in the range of US \$133 – 250 Billion annually. All assessments however agree on the rapid projected growth of the sector with some predicting it will reach US \$1.5 Trillion by 2030. This will amount to a doubling of its current share of global financial services revenues by 2030.
2. A significant aspect in this growth is attributed to the ongoing application of innovative digital technology. Of particular note have been the **opportunities emerging from the deployment of Artificial Intelligence (AI)** to the sector. As with many industries, AI offers a vast range of transformative possibilities as consumer, industry and regulator confidence grows.
3. This report highlights some of the **emerging opportunities from AI within FinTech**.



Overview

4. FinTech is the reference to the application of technology to deliver financial services. FinTech provides new ways to disrupt traditional financial delivery models and improve efficiency, effectiveness as well as customer experiences. It includes a broad range of technological advancements, from mobile banking, digital payments, automated advisors, use of big data, to a myriad of other possibilities.
5. There are a number of related subsectors also worth noting that have either a direct and/or indirect association with existing FinTech solutions. These include InsurTech (Insurance Technology); RegTech (Regulatory Technology) which are solutions that help institutions comply with regulatory requirements; PayTech (Payment Technology) that facilitate digital payments; WealthTech (Wealth Technology) and PropTech (Property Technology).
6. In a broader sense, FinTech also offers opportunities for new innovations that enable transformation for individuals, businesses, institutions and societies. It can provide means to challenge the accepted roles of traditional intermediaries in financial transactions and connect consumers directly to providers. As well as the obvious competitive and cost advantages for businesses and financial institutions, it can also increase financial Inclusion and the lives of vulnerable groups.
7. **AI has emerged as a key enabler of the innovation and disruption underway in the FinTech industry.** AI technologies, such as machine learning, natural language processing, and data analytics, are now essential components for forward looking financial institutions and startups. This is because AI can help the automation of processes, increase accuracy, and handle complex tasks at scale. Key areas where FinTech is rapidly evolving are discussed in the following section of this report.



Financial sector fraud detection and prevention

8. AI algorithms can be used to analyse large volumes of financial data in real-time to identify patterns and anomalies, enabling institutions to detect and prevent fraudulent activities. This includes:
 - Transaction monitoring: AI algorithms can analyse vast amounts of transactional data, including payment history, customer behaviour, and network connections, to identify suspicious patterns. For instance, if a credit card was used for multiple transactions in different international locations within a short period, the AI system could highlight it as potentially fraudulent activity.
 - Anti-Money Laundering (AML): AI algorithms can analyse large volumes of financial transaction data to identify suspicious activities that may indicate money laundering. By learning from historical patterns and identifying anomalies, AI systems can assist institutions in complying with AML regulations and detecting potentially illegal activity.
 - Behaviour analytics: AI models can learn from historical data to build profiles of what normal user activity looks like. Deviations from these patterns can be flagged as potential fraud. For example, if a customer usually makes small purchases but then starts making high-value transactions, the AI system can alert the appropriate institution to investigate.
 - Identity verification: AI-powered identity verification systems can use facial recognition, biometric data, and document analysis to verify the authenticity of individuals during account creation or transaction authentication. These systems can detect fake identities or manipulated documents, helping prevent identity theft and fraud.
 - Social network analysis: AI techniques can analyse the connections and relationships between individuals or entities within a financial network to uncover hidden links and potential fraudulent networks. By identifying unusual or suspicious connections, AI can help detect complex fraud schemes involving multiple parties.

9. Companies that are undertaking some interesting work in this space include the likes of Feedzai, Forter, and Featurespace. Feedzai provides AI based fraud detection solutions to analyse real-time transaction data, identify patterns, and detect fraudulent activities. Forter also focuses on fraud prevention by combining AI and machine learning to analyse various data points, including user behaviour, device information, and transactional data, to detect and prevent fraud in e-commerce transactions. Featurespace uses AI behavioral analytics solutions to detect anomalies and suspicious activities in real-time, helping institutions combat fraud.

Financial credit scoring and underwriting

10. AI models can also be used to assess the creditworthiness of an individual or organisation by analysing different data points and making predictions about credit risk. This enables faster and more efficient credit decisions. Examples of how AI models can be used in this context include:

- **Data collection:** AI models that gather and analyse a wide range of data points, including credit history, income, employment history, financial statements, loan applications, social media data, and more. This data is used to build a more complete profile of the borrower or organization being provided credit.
- **Feature engineering:** AI models can be used to perform feature engineering, which involves identifying relevant features or variables from the collected data that may have predictive power in the assessment of credit risk. This step helps to identify patterns and correlations that might not be immediately evident.
- **Credit Scoring:** AI models assign credit scores or ratings to individuals or organizations based on their credit risk predictions. These scores help lenders determine the likelihood of default or delinquency and make informed decisions about lending or credit approvals.
- **Machine Learning algorithms:** AI models can utilise various machine learning algorithms, such as logistic regression, decision trees, random forests, or gradient boosting, to analyse data collected and generate credit risk predictions. These models learn from historical data and adapt to new information to make accurate assessments.
- **Automation and speed:** AI-powered credit scoring and underwriting processes can automate repetitive tasks and analyse large amounts of data faster and more efficiently than traditional manual methods. This enables quicker credit decisions and reduces the time taken to process loan applications.

11. Examples of companies leading the way in AI-driven credit scoring and underwriting include ZestFinance, Upstart, CreditVidya, and LenddoEFL. ZestFinance have developed underwriting solutions that leverage machine learning algorithms to assess credit risk from alternative data sources and non-traditional variables. This is particularly helpful for borrowers who may have a more limited credit history.

12. Upstart uses AI to analyse various data points beyond traditional credit data, such as education, employment, and income information to provide lenders with enhanced credit risk assessments. CreditVidya assesses creditworthiness from the likes of digital footprints, mobile data, and social media to generate credit risk scores for individuals. LenddoEFL offers similar services using behavioural and psychometric data, smartphone usage patterns, and social network data, to provide credit risk assessments.

Financial sector chatbots and virtual assistants

13. AI-powered chatbots and virtual assistants are now being widely used in finance sector customer service operations to handle routine inquiries, provide personalized recommendations, and assist with account management. These AI systems can enhance customer experience and reduce operational costs.

Examples of this AI application include:

- **Customer support and query Resolution:** AI-powered chatbots employed to handle routine inquiries and provide rapid responses to customer queries. These chatbots can address common questions related to account balances, transaction history, product information, and basic troubleshooting using natural language processing (NLP) techniques.
- **Personalized recommendations:** AI-powered virtual assistants analyse customer data, transaction history, and behavioural patterns to provide personalised recommendations for financial products and services. They can suggest investment opportunities, savings plans, or credit options tailored to the individual's financial goals and risk appetite.
- **Account management and transactions:** Chatbots and virtual assistants enable customers to perform various account management tasks, such as initiating fund transfers, updating personal information, setting up new notifications, and tracking expenses. These AI systems can handle transactions securely and provide real-time updates on account activities.
- **Financial planning and budgeting:** AI-powered virtual assistants can assist users in creating and managing budgets, tracking expenses, and setting financial goals. They can also provide insights and recommendations based on spending patterns, helping individuals make informed financial decisions.

14. Examples of companies offering AI-powered chatbot and virtual assistant solutions in the fintech sector include Cleo, Kasisto, Capital One, and Ally Bank. Cleo provides a virtual assistant that integrates with users' bank accounts and utilises AI to provide insights on behaviours (spending habits, savings, and budgeting) to offer personalized recommendations.

15. Kasisto offers support to financial institutions in creating virtual assistants for their customers such as the provision of product and service information and financial advice. The Capital One chatbot (“Eno”) assists customers with account-related inquiries and financial recommendations and helpfully integrates with popular messaging platforms. Ally Banks assistant (“Ally Assist”) helps customers with account inquiries, transaction history, and routine money transfers.

Trading utilising algorithms

16. AI algorithms can potentially be used for financial markets trading activity based upon market data and historical trends to make automated trading decisions in real-time. These systems could undertake trading activity more rapidly than human traders and could foreseeably take advantage of market opportunities. Examples of how such AI systems could work include:

- **Data analysis:** AI algorithms can be used to process significant amounts of market data, including price movements, trading volumes, news sentiment, and other indicators. They can be used to analyse data to identify patterns, correlations, and anomalies that could inform trading decisions.
- **Machine Learning:** AI-powered trading systems can use machine learning techniques to extract learnings from historical data and adapt to changing market conditions. This could enable the identification of trends, forecast price and other movements, and adjust trading strategies accordingly.
- **Speed and efficiency:** Because AI-powered algorithmic trading systems can process market data at high speeds they can more effectively identify and capitalize on brief market opportunities (i.e. price discrepancies or arbitrage situations) that may not be picked up by human traders.
- **Risk Management:** AI algorithms can be incorporated within wider risk management techniques to reduce losses and optimize trading. This could include setting automatic stop-loss orders, position sizing strategies, and the adjustment of risk exposure based on market conditions.
- **Quantitative Analysis:** AI-based trading systems can undertake quantitative analysis to assess market conditions, calculate trading indicators, and generate trading signals. These systems can simultaneously analyse multiple instruments and markets enabling diversified trading strategies.

17. Examples of the extent to which companies are currently using AI-powered algorithmic trading services is challenging to ascertain. A number of investment firms claim to be utilising AI and machine learning techniques to analyse vast amounts of data to identify trading opportunities.

Financial risk assessment and management

18. There is also strong interest in the application of AI for the analysis of significant amounts of data to assess and manage financial risks. By incorporating AI techniques, financial institutions can potentially make more informed decisions and optimize risk management strategies. Examples of how this can be applied include:

- **Data Analysis:** AI algorithms can analyse large volumes of structured and unstructured data from various sources, including financial statements, market data, customer information, and external data feeds. AI can be used to process this data and identify patterns, trends, and correlations that may affect risk levels.
- **Risk Quantification:** The quantification of risks could be supported by AI by assigning probabilities and estimated potential losses associated with specific events or scenarios. By applying statistical models and machine learning techniques, AI can provide more accurate risk assessments and quantify the impact on portfolios.
- **Risk Identification:** AI models can be used to identify potential risks by detecting anomalies, deviations from historical trends, or events that may impact investments. AI systems can utilise real time data to flag emerging risk and alert financial institutions accordingly.
- **Portfolio Optimization:** AI could enable optimisation of portfolio allocation and diversification. Advanced algorithms could help balance risk and return, considering factors such as asset correlations, historical performance, and risk appetite.
- **Fraud and Compliance Risk Management:** Financial institutions could use AI to detect and mitigate fraud and compliance risks. This could be undertaken by analysing patterns in transaction data, customer behaviour, against regulatory requirements. AI systems could identify suspicious activities and ensure compliance with regulatory standards.

Conclusion

The FinTech sector is undergoing rapid growth, innovation and transformation. Much of this is being powered by the application of AI technologies and solutions. Specific examples within FinTech where AI is playing a significant role include (but are not limited to): fraud detection and prevention; credit scoring and underwriting, Chatbots and virtual assistants, trading utilising algorithms, and risk management. Further research, support, and investment in innovative AI applications will enable the finance sector to continue to take advantage of the transformational opportunities. Sound governance and processes will also be essential to ensure this work is undertaken in a safe and ethical manner so that it maximises the benefits in a balanced way.

Helpful references

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