



AI IN FINANCE

About the intersection

Today, machine learning has come to play an integral role in many parts of the financial ecosystem, from approving loans, to credit scores, to managing assets, and assessing risks.

What is the financial industry about?

The financial industry refers to the economy segment that is dedicated to the management of money and investments. The sector comprises a broad range of businesses and institutions including banks, investment companies, insurance companies, and real estate firms, all dedicated to providing financial services to people, corporations, and governments.

Why consider machine learning in finance?

Given the high volume of accurate historical records and quantitative nature of the finance world, few industries are better suited for artificial intelligence.

Financial data is constantly being created by personal devices, online and market activity. The quick and easy access to vast amounts of private and public data together with secure and powerful cloud computing platforms provide the perfect scenario for the adoption of AI technologies.

Most companies in the space understand the potential of AI and have been adopting the technology. Some of the key drivers include the reduction in operational costs due to process automation, the increased revenues thanks to better decision making, better compliance, and reinforced security. However, there are still many challenges in efficiently applying machine learning to financial data.

The intersection

AI is rapidly reshaping the business landscape of the financial industry. A global survey done by the Cambridge Centre for Alternative Finance and the World Economic Forum, which interviewed

151 big financial firms and FinTech's across more than 30 countries, suggests that AI is a crucial business driver in the industry.

Several examples of AI initiatives at the largest banks are listed below:

- JP Morgan is using AI to automate credit agreement analysis.
- Wells Fargo announced the creation of a dedicated Artificial Intelligence Enterprise Solutions team which will pursue payments technologies and improved customer experience for corporate banking customers.
- Bank of America released an AI-powered virtual assistant that is planned to be implemented in their mobile app and ATM network.
- Citibank has made several investments in AI related companies, including Feedzai which uses AI to identify and fight fraud in online banking, or Clarity Money which recommends financial products to help customers save money and better manage their finances.

Future

Digital assistants and apps will continue to perfect themselves thanks to cognitive computing. There are high hopes for the increased transactional and account security, especially as the adoption of blockchains and cryptocurrency expands. We also expect to see better customer care, as natural-language processing advances and learns more from the expanding data pool of past experience. A new level of transparency will stem from more comprehensive and accurate know-your-client reporting and more thorough due-diligence checks, which now would be taking too many human work hours.

Types of Applications

Many AI solutions have emerged in the financial sector. Below you may find some of the most popular applications, which include fraud detection, advisory services, personal financial management, trading assistance and execution.

Financial Advisory Services

Personal AI financial assistants are built from a collection of different technologies to help users in assessing their overall financial status and improving their financial position. Furthermore, advisors are also able to ascertain risk tolerance and recommend appropriate investments and financial products.

Cybersecurity and Fraud Detection

Fraud is an extremely serious issue in the financial field. In terms of fraud detection, AI has proven itself to be extremely useful and accurate. Comparing a customer's spending behaviour against huge amounts of historical data allows for extremely sophisticated and proactive fraud alerts,

which are continually evolving. Darktrace and Vectra are examples of companies providing AI-based cybersecurity solutions to major financial institutions.

Credit decision

High credit scores unlock the access to favourable financing options, however credit risk is dependent on many variables which makes it difficult to assess. Artificial intelligence solutions are helping banks and credit lenders make smarter decisions by utilizing a variety of factors that accurately assess traditionally underserved borrowers in the credit decision making process. Zestfinance, Datarobot and Underwrite.ai are examples of companies operating in this space.

Risk Assessment

Accurate forecasts are crucial to the speed and protection of many businesses. Financial markets are leveraging the machine learning capabilities to create models that generate accurate forecasts, helping financial experts utilize existing data to pinpoint trends, identify risks, conserve manpower and ensure better information for future planning. Kensho and Ayasdi are examples of companies that implement AI to improve prediction accuracy and to manage risk.

Quantitative Trading

Quantitative trading is a market strategy that uses large datasets to derive insight on how to optimally trade. In this sector, AI tools are implemented to analyse complex data faster and more efficiently than humans. The resulting algorithmic trading can also process trades automatically, saving valuable time. Alphasense, Kavout and Alpaca are examples of companies providing AI tools that help financial institutions to optimise their trading strategies.

Personalised Banking

AI-based robots are replacing humans in customer services across a wide range of fields. Chatbots have proven to be a powerful tool that boosts customer satisfaction, whilst helping companies to save time and money. Furthermore, these AI assistants use artificial intelligence to generate personalized financial advice and natural language processing to provide instant, self-help customer service. Kasisto and Abe AI are examples of companies using AI to learn from customers and provide a better banking experience.

Personal financial management has also been a particularly promising space. Some platforms are built to help users manage their personal finances. These tools are highly customisable, and offer the ability to make recommendations, create spending or savings goals, and plan/execute short- and long-term tasks, from paying bills to preparing tax filings. Mint and Wallet are examples of companies dedicated to offer personal financial management tools.

Types of Companies

Financial Services is also a popular sector for a large number of AI startups. In many cases, startups are aiming to disrupt the traditional businesses of the large banks. In other cases, they are looking to provide advanced new services to the banks to allow them to improve their product offerings. Some of the well known organizations are listed below.

- Bulge Bracket Banks - JP Morgan, Goldman Sachs, Morgan Stanley
- Insurance - AIG, PWC, EY
- Consulting - Quantum Black, Accenture, IBM
- FINTECH - Monzo, Revolut, Atom
- Data Analytics

Types of Jobs

Risk Manager

Financial risk analysts identify and analyse the areas of potential risk threatening the assets, earning capacity or success of organisations in the industrial, commercial or public sector. Check all the details of the job responsibilities, skills, experience and salaries [here](#).

Compliance Expert

As a compliance officer, you're responsible for ensuring a company complies with its outside regulatory requirements and internal policies. In short, you're responsible for making sure that your employer plays by the rules. Check all the details of the job responsibilities, skills, experience and salaries [here](#).

Cybersecurity Analyst

As a cyber security analyst, you will protect IT infrastructure from a range of criminal activity. You will monitor networks and systems, detect security threats, analyse and assess alarms, and report on threats, intrusion attempts and false alarms, either resolving or escalating them, depending on the severity. Check all the details of the job responsibilities, skills, experience and salaries [here](#).

Quantitative Analyst

A quantitative analyst provides research and information to help traders, fund managers and stockbrokers make decisions about investments. The information you provide ensures investment portfolios are well managed and that potential investment opportunities are highlighted. Check all the details of the job responsibilities, skills, experience and salaries [here](#).

Financial Manager

A financial manager is responsible for providing financial guidance and support to clients and colleagues so they can make sound business decisions. As a financial manager, you'll need a good head for figures and for dealing with complex modelling and analysis, as well as a sound grasp of financial systems and procedures. Check all the details of the job responsibilities, skills, experience and salaries [here](#).

Data Analyst

Data analysts are in high demand across all sectors, such as finance, consulting, manufacturing, pharmaceuticals, government and education. The ability to pay attention to detail, communicate well and be highly organised are essential skills for data analysts. They not only need to understand the data but be able to provide insight and analysis through clear visual, written and verbal communication. Check all the details of the job responsibilities, skills, experience and salaries [here](#).

Example of Interview Questions

Examples of Competency based questions examples:

Can you talk through a time you worked with a co-worker? How did you build that relationship?

Can you tell me a time when you failed to meet a deadline?

Describe a time when you worked in a team where there were disagreements.

Describe a time you research a subject of interest to you. How did you go about that?

Examples of Technical questions:

What is the difference between AI, Machine Learning and Deep Learning?

What is Artificial Intelligence? Give an example of where AI is used on a daily basis.

List out some of the best practices for data cleaning?

Explain what is logistic regression?

List out some common problems faced by data analysts?

Write the pseudo code to generate the Fibonacci numbers.

References

<https://medium.com/neuromation-blog/ai-in-financial-services-4250d857b665>

<https://builtin.com/artificial-intelligence/ai-finance-banking-applications-companies>

<https://marutitech.com/ways-ai-transforming-finance/>

<https://towardsdatascience.com/the-growing-impact-of-ai-in-financial-services-six-examples-da386c0301b2>

<https://www.businessstudent.com/careers/best-fintech-careers-and-jobs-for-the-future/>

<https://emerj.com/ai-sector-overviews/machine-learning-in-finance/>

<https://medium.com/raison-ai/artificial-intelligence-in-finance-fd3bce6cd13a>

<https://www.prospects.ac.uk/>