

AI IN FINANCIAL INDUSTRY: ETHIC ISSUES

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ABSTRACT

Now Artificial intelligence (AI) is transforming the world, making the revolution in business operation and changing business models. Artificial Intelligence (AI) has emerged as a transformative force in the financial industry, revolutionizing various aspects of financial services. With its ability to learn, reason, and make decisions on its own, AI has the potential to revolutionize the financial and business sectors of the economy. As machines take over critical decision-making processes that impact people's lives, it is important to consider the possible ethical implications of using AI. From privacy concerns to potential biases, it is important to examine the implications of AI in business and financial services. Along with the technological and managerial problems of introducing artificial intelligence technologies, ethical aspects like job cuts, confidentiality and impartiality are becoming very important. It is for this reason that ethical issues in the application of artificial intelligence (AI) have become a growing but important area of scientific research. The paper reveals that AI ethics must pay attention to the morally significant systemic consequences of AI use. The growing use of AI has brought ethicists and practitioners' attention to systemic risks that have yet to be clearly addressed in AI-related professional codes of conduct, industry standards, and ethical discussions in general.

In this article, we examine the key ethical issues raised by advances in artificial intelligence and technology projects related to artificial intelligence and machine learning systems in the financial industry.



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1. INTRODUCTION

Today, the financial sector can significantly increase efficiency by implementing AI models. From improved fraud detection and classification of unstructured data to improved anti-money laundering (AML) processes, and more efficient customer service. Artificial intelligence systems could facilitate additional global economic activity worth about \$13 trillion by 2030. The economic effect from the implementation of generative AI products

in various sectors of the global economy could be as high as \$2.6-4.4 trillion per year. The financial sector is among the industries that will receive the greatest economic benefit from AI implementation. This could increase the revenue of banks worldwide by \$200-340 billion per year, and insurance companies by \$50-70 billion per year. (McKinsey, 2023). AI applications will flourish in sales, marketing, customer service management and channel management, as well in such risk management functions such as fraud and debt analysis, where it will

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help to make better decisions in trading stocks, assets and investment portfolios. On the other hand, the extensive use of AI applications carries a serious risk of unforeseen and unprecedented consequences affecting society and life.

In 2022, OpenAI took over the world with the release of ChatGPT, and then in 2023 Google's launch Bard. Tech giants like Apple, Amazon, Facebook are rapidly joining the race. The intense competition between AI players that will come to redistribute the winners and losers in the pivotal moment of Industry 4.0 (McKinsey, 2022). The main threats of AI implementation for the financial services sector arise from risks associated with errors in the development and incorrect interpretation of the results of AI. Issues can arise from errors in the program code, use of inaccurate or incomplete data, or applying AI algorithms to solve problems the AI model has not been designed for.

There are also ethical risks of AI tools including those related to bias, discrimination, false correlations, and opaque AI decisions. Such risks could arise from incorrect AI model settings or limitations of data for training and analysis. For example, when the system will use discriminatory factors of religion, ethnicity, etc. when pricing financial products and assessing the risks of individual clients.

Today the Internet user leaves the digital trail with a huge amount of data that could be easily tracked by AI tools and used to influence certain decisions the Financial Services customer could not be aware of. Fortunately, AI is only effective when fed with large amounts of relevant data. Risks indicated put the biggest financial services and e-commerce companies in the spotlight. In the World Economic Forum survey, "Transforming Paradigms: A Global Study of Artificial Intelligence in Financial Services," 58% of respondents expressed concern that the mass adoption of AI will increase the risk of bias and discrimination in the financial system. For example, financial institutions or fintech companies that use a machine learning algorithm to make credit limit decisions for a client may inadvertently exploit human biases embedded in historical financial data.

AI ability to process large and not uniform data arrays and produce content in easily usable formats is useful to obtain efficiency and improve customer experience. Key concerns of using AI in finance include embedded bias and privacy shortcomings, opaqueness about how outcomes are generated, robustness issues, cybersecurity, and possible AI's impact on broader financial stability. Privacy concerns include, possible data leakages from the training data sets, unauthorized recording of personal information obtained from in the training data sets after the data are used and discarded resulting in leaks of sensitive data. Another important group of risks is associated with the leakage of personal data or information containing banking, insurance, tax or other types of secrets, hacker attacks or affecting AI tools results by substitution of data sets used for training AI models.

Publicly available GenAI systems pose significant privacy challenges for financial institutions wishing to incorporate their capabilities into their operations. By automatically "opting in" every user, these GenAI systems continuously use inputs from users for training and for fine-tuning of responses. This automation raises the possibility that sensitive financial data and personal information provided by financial institutions' staff in their engagement with the GenAI could leak out. Enterprise level GenAI systems are being developed to improve privacy concerns associated with public GenAI, but some privacy concerns will likely persist. Uncontrolled use of synthetic data which is algorithm-created data with a statistical distribution that mimics real poses challenges with the potential for replication and amplification of inherent real world biases and gaps in the generated data sets. The breadth and diversity of the data used by GenAI make it exceedingly difficult at present to map GenAI's output to the data contributing greatly to the opaqueness of GenAI's output process leading to poor GenAI explainability. However, taking into account drawbacks of AI services the deployment of AI in the financial sector raises risks inherent in the underlined AI technology to be accessed, understood and mitigated by the industry and prudential oversight authorities. The realization of all these risks can lead to financial losses, erroneous decisions, reputational consequences, as well as panic behavior of a significant number of economic entities and disruption of the normal functioning of the financial market. The study of the ethics of artificial intelligence is the study of the development and implementation of responsible and ethical artificial intelligence technologies. The rapid progress in artificial intelligence technology and its potential disruption to our society has highlighted its importance.

With the prospect of advanced artificial intelligence automation and subsequent efficiency gains comes the threat of job losses for millions of office and server workers. Banking may be particularly hard hit. According to a Wells Fargo report, 200,000 banking jobs will be lost to robots over the next decade in the United States alone due to the adoption of artificial intelligence-based financial technologies.

2. LITERATURE REVIEW

The ethical implications of artificial intelligence (AI) in the field of finance have been a subject of increasing scholarly attention as the deployment of AI technologies becomes more widespread.

The study of Gao and Haverly conducts a comprehensive bibliometric analysis of the AI ethics literature over the past two decades. (Gao et al., 2024) The analysis reveals a discernible tripartite progression, characterized by an incubation phase, followed by a subsequent phase focused on imbuing AI with human-like attributes. They identify two notable research gaps in AI ethics regarding the large ethics model (LEM) and AI

identification. Every market player aims to issue principles and guidelines for ethical AI and global agreement can change market rules. (Jobin et al., 2019) Their results reveal a global convergence emerging around five ethical principles, with substantive divergence in relation to how these principles are interpreted.

Today the most researched problem is transparency and accountability in AI systems, emphasizing the need for financial institutions to provide clear explanations of the decision-making processes of their algorithms. Some of the authors argue that transparency is not only crucial for building trust with stakeholders but also for ensuring accountability. (Hagendorff, 2020) The study suggests that financial organizations should implement mechanisms for regular audits and oversight to maintain accountability in the use of AI.

The burgeoning field of AI ethics has been concerned with aspects of AI use such as transparency, fairness, non-maleficence, privacy and accountability (Whittlestone et al., 2019). The challenges that AI practitioners faced in the development of ethical AI-based systems included (i) general challenges, (ii) technology-related challenges and (iii) human-related challenges. (Pant et al., 2023) And landscape of suggested ethical frameworks with a focus on those which go beyond high-level statements of principles and offer practical tools for application of these principles in the production and deployment of systems. (Ayling et al., 2022).

But the influence of AI differs from industry to industry. In the financial industry AI risks includes a ethics of systemic risks to clarify the moral relevance of AI use with respect to the imposition of systemic risks, (2) proposes a theoretical framework based on the ethics of complexity and (3) applies this framework to discuss implications for AI ethics concerned with AI-enhanced systemic risks. (Svetlova, E., 2022) The literature on the ethics of AI in finance reflects a growing awareness of the complex ethical challenges posed by the integration of artificial intelligence into the financial sector. Themes such as transparency, bias, privacy, employment impact, and regulatory compliance emerge as critical areas of concern. Scholars consistently advocate for the development of ethical guidelines, industry standards, and collaborative efforts between stakeholders to ensure that AI technologies in finance are deployed responsibly, balancing innovation with ethical considerations.

3. METHODOLOGY

We used the quantitative research method to conduct this study to gather insights from broader AI practitioners on different ethics-related aspects of AI ethics in finance industry.

4. RESULTS AND DISCUSSIONS

In the last decade, we have observed the widespread use of algorithms based on artificial intelligence (AI) techniques. The rapid advancement of artificial intelligence (AI) has transformed various industries, and the financial sector is no exception. AI technologies, such as machine learning algorithms and predictive analytics, have revolutionized the way financial institutions operate, from risk assessment to customer service. While these innovations bring unprecedented efficiency and opportunities, they also raise ethical concerns that demand careful consideration. This essay explores the ethics of AI in finance, addressing issues such as transparency, bias, accountability, and the potential impact on employment.

Robustness and fairness

AI should have the ability to get trained on samples provided by human practice and deliver results well aligned with practice on a consistent basis. Recommendations based on AI applications should be matching requirements "fit and proper" the models used in AI applications should be robust, accurate and unbiased. Besides learning algorithms the key role of providing accurate and consistent results lie in providing training models reflecting needed aspects of business practice. Non-representative training data will create models with biased results. Among the above factors contributing to model inaccuracy and bias, data quality plays a very important role. The use of non-representative training data, imbalanced data inputs, as well as the use of ambiguous data could all lead to degradation of model performance and subsequently inaccurate or biased model results.

The large amount of training data and model inputs is presented by personal information collected from customers. The way this information is collected and handled might impact the products and services provided. AI applications in the FS sector should be inclusive and should not systematically discriminate against certain individuals or groups protecting customers from potential discrimination and other unfair treatment.

Transparency and explainability

One of the primary ethical considerations in the use of AI in finance revolves around transparency. As machine learning algorithms become increasingly complex, understanding the decision-making process becomes challenging. Transparency not only fosters trust among stakeholders but also helps identify and rectify potential biases. Financial institutions must ensure that the AI systems they deploy are transparent, providing clear insights into how decisions are made. All participants should be able to understand how their data is being used

and how AI systems make decisions; algorithms, attributes, and correlations are open to inspection .

Accountability

Accountability in AI involves defining responsibility when things go wrong. If an AI-driven decision results in financial losses or harm to customers, who is held accountable? Establishing clear lines of responsibility is essential to ensure that AI is used ethically in finance. Financial institutions need to develop robust mechanisms for oversight, regularly auditing and monitoring AI systems to identify and rectify any biases or errors and to determine who is held responsible for the output of AI system decisions

Bias in AI Algorithms

Bias in AI algorithms is a pervasive ethical concern that has gained significant attention. In finance, where decisions have far-reaching consequences, biased algorithms can lead to unfair practices and perpetuate existing inequalities. AI systems learn from historical data, and if that data reflects biased human decisions, the algorithms can unintentionally perpetuate and amplify those biases. Addressing bias in AI requires a multifaceted approach. Financial institutions must carefully curate training data, actively seeking to eliminate biases. Moreover, ongoing monitoring and auditing of AI systems can help identify and rectify bias as it emerges. It is crucial to involve diverse perspectives in the development and testing of AI systems to minimize the risk of unintentional bias and ensure fairness in financial decision-making.

Privacy and Data Security

The use of AI in finance involves the analysis of vast amounts of personal and financial data. This raises significant concerns regarding privacy and data security. Financial institutions must prioritize the protection of customer information, ensuring that AI systems comply with data protection regulations. Transparent data usage policies and robust cybersecurity measures are essential to building and maintaining public trust. The ethical use of AI in finance also involves obtaining informed consent from customers regarding the collection and use of their data. Customers should be aware of how their information is being used to make financial decisions and have the option to opt out if they are uncomfortable with the level of data sharing. Striking the right balance between leveraging data for innovation and respecting individual privacy is a critical ethical challenge in the integration of AI into the financial sector.

We see the increasing volumes of altered and fake information posted on the web. AI model trained on altered or fake personal data will definitely produce wrong and biased results. The other edge of data security is to ensure that the AI training model is fed with accurate and not altered data.set.

Impact on the employment

The integration of AI in finance has the potential to automate various tasks traditionally performed by humans. While automation can lead to increased efficiency and reduced costs, it also raises ethical concerns about job displacement. Financial institutions must consider the societal impact of AI adoption and develop strategies to mitigate potential negative consequences on employment. To address these concerns, there is a need for proactive measures such as reskilling and upskilling programs for the workforce. Additionally, ethical considerations should guide the deployment of AI in a manner that complements human capabilities rather than replacing them entirely. Collaborative efforts between industry, government, and educational institutions are essential to navigate the ethical challenges associated with the impact of AI on employment in the financial sector.

Regulatory Frameworks and Compliance

Ethical considerations in AI cannot be separated from the regulatory frameworks governing the financial industry. Governments and regulatory bodies play a crucial role in establishing guidelines and standards for the ethical use of AI in finance. Financial institutions must comply with these regulations to ensure that their AI systems operate within legal and ethical boundaries.

However, the rapidly evolving nature of AI technology often outpaces the development of regulatory frameworks. It is essential for regulators to adapt swiftly to emerging challenges and collaborate with industry experts to create comprehensive guidelines. Moreover, financial institutions should not only adhere to existing regulations but actively participate in shaping ethical standards to ensure that the regulatory landscape aligns with the evolving capabilities and challenges of AI in finance.

Calls for working out standards and establishing regulations for AI led to multiple national and international initiatives. Leading global organizations (UNESCO, G20/OECD) have issued their vision of AI frameworks from an ethical viewpoint promoting human-centered values, safety, transparency and inclusivity. Several countries like Japan, Korea, and India Have developed national ethical frameworks and AI development principles aligned with OECD AI Principles. China, the United States, the United Kingdom and Israel choose an approach by establishing cross-sectoral, non-binding principles of AI leaving regulators activity in their authority sectors. The European Union and Canada have proposed to regulate AI systems across domains and applications with comprehensive frameworks applicable to all sectors. International standardization led to the introduction of ISO/IEC 23053 (2022), establishing its Framework for AI Systems Using Machine Learning. Some countries like Spain, UK, Norway, Russia and some others choose to delay

regulatory decisions by promoting controlled environment for experimentation through regulatory sandboxes where firms are getting experience by testing innovative AI products without the burden of existing legal frameworks.

Comparing international practices in shaping the principles of ethics and rules of conduct for AI, seven

common elements can be identified: reliability, fairness, accountability, transparency, privacy and data security, human oversight and social and environmental well-being. In general, the key elements covered are similar across regions, with only differences in document structure and wording.

Table 1. Examples of AP AI Principles: International comparison

Key elements	European Union	Singapore	Russia	Hong Kong SAR	South Korea	Australia
Robustness	Technical robustness and safety	Accuracy	Accuracy and safety	Sufficient expertise, explainability and good data quality	Accuracy and safety	Reliability and safety
Fairness	Diversity, non-discrimination and fairness	Justifiability, bias	Responsibility for the consequences of AI use is always with human	fairness	Fairness Consumer rights	Fairness Human values
Accountability	Accountability	Interaccountability External accountability	Accountability	Governance and accountability Auditability, model validation and third-party oversight	Responsibility Equivalent level of safety and security for third-party contractors	Accountability
Transparency	Transparency	Transparency	Transparency and disclosure	Transparency and disclosure Develop strategic recommendations	Transparency	Transparency and explainability Contestability
Privacy and data security	Privacy and data governance			Data privacy and protection		Privacy and data security
Human oversight	Human agency and oversight		People-oriented and humanistic approach			
Social and environmental wellbeing	Societal and environmental wellbeing	Ethics	ethics			Human, societal and environmental wellbeing

5. CONCLUSIONS

Today, a wave of artificial intelligence is experiencing rapid, never-before-seen levels of adoption. The cost of implementing generative artificial intelligence is relatively low. This is primarily due to the fact that implementation does not require any equipment. People already have the smartphones, tablets, and desktop computers needed to experiment with generative artificial intelligence. Another motivating factor is the greater involvement in the use of new technologies by millennials and generation Z. Ease of use also plays a motivating role - there is no need to learn new software tools or complex online services. The fourth reason is that these tools turned out to be incredibly useful right away. App growth measures the rate at which a platform acquires users, reflecting advancements in technology and user preferences. The launch of Chat Generative Pre-Trained Transformer (ChatGPT) on November 30, 2022 caused a massive global response. Notably, the platform has attracted more than 100 million active users worldwide within two months, which is much faster than other innovative platforms. Suddenly, artificial intelligence seemed like the fastest-adopted business technology in history.

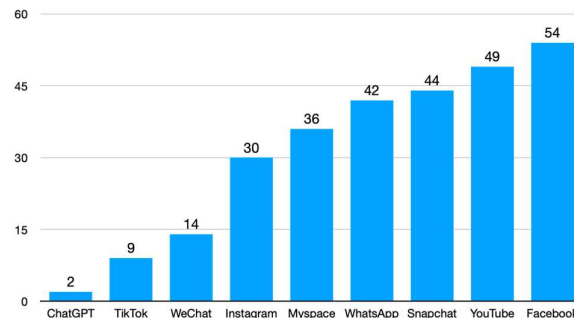


Figure 1. Months to reach 100 million users

The integration of artificial intelligence into the financial sector offers unparalleled opportunities for efficiency, innovation, and improved customer experiences. However, the ethical implications of AI in finance cannot be understated. Financial institutions must prioritize transparency, accountability, and fairness in their use of AI to build and maintain public trust. AI/ML systems can improve productivity of financial systems, risk assessment, management and pricing; improve reliability. On the other hand, machine learning and artificial intelligence systems create new and unique risks due to decision uncertainty, vulnerability, trust issues, and privacy issues. This could undermine public confidence in financial systems that rely on artificial intelligence and machine learning.

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