

Artificial Intelligence Trends and Ethics: Issues and Alternatives for Investors

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Abstract

Artificial intelligence (AI) based technology, machine learning, and cognitive systems have played a very active role in society's economic and technological transformation. For industrial value chains and international businesses, it means that a structural change is necessary since these machines can learn and apply new information in making forecasts, processing, and interacting with people. Artificial intelligence (AI) is a science that uses powerful enough techniques, strategies, and mathematical modelling to tackle complex actual problems. Because of its inevitable progress further into the future, there have been considerable safety and ethical concerns. Creating an environment that is AI friendly for the people and vice versa might be a solution for humans and machines to discover a common set of values. In this context, the goal of this study is to investigate the emerging trends of AI (the benefits that it brings to the society), the moral challenges that come from ethical algorithms, learned or pre-set ideals, as well as address the ethical issues and malpractices of AI and AI security. This paper will address the consequences of AI in relation to investors and financial services. The article will examine the challenges and possible alternatives for resolving the potential unethical issues in finance and will propose the necessity of new AI governance mechanisms to protect the efficiency of the capital markets as well as the role of financial authority in the regulation and monitoring of the huge expansion of AI in finance.

Keywords

Artificial Intelligence Machine Learning, Banking Sector, Ethical AI

1. Introduction

Medicine, public health and medical research, banking technology, the manu-

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facturing sector, etc. are all being transformed by digital technology and artificial intelligence (AI), especially machine learning. AI-based technologies are now being tested in low- and middle-income nations, and their value is being examined in the Organization for Economic Co-operation and Development (OECD) (LMIC). The Secretary-General of the United Nations has remarked that the safe deployment of new technologies, such as AI, could assist the globe in achieving the United Nations Sustainable Development Goals (1), which also include health-related, finance related, and manufacturing related goals within United Nations Sustainable development 3. AI might potentially assist the world to attain its goal of universal development. Nonetheless, the use of machine learning for these sectors presents ethical, regulatory, commercial, and cultural challenges across borders [1]. Most of these issues aren't specific to AI. For more than a half-century, the use of computing and software in different economic sectors like healthcare, finance, mechanics has posed ethical issues to programmers, policymakers, and practitioners, and AI raises new potential dilemmas that are outside the jurisdiction of conventional legislators and players in these economic sectors. Most of these challenges have to be addressed amicably if AI is to be successful in creating sustainable development on all economic fronts, especially in the field of finance, manufacturing, and healthcare which affect daily human consumption.

2. What Is AI?

Artificial intelligence is defined as the theories and development of complex computer programs and systems which are intended to execute functions and tasks that would require human intelligence, such as the recognition of speech, visual perception, forecasting and decision-making, deciphering complex language algorithms and translating them, as well as making informed, independent decisions which can help them survive on their own [2]. Tech companies are developing software and hardware systems that integrate machine learning with programmed data to learn and apply the newly acquired information to perform tasks. Starting from self-driven cars, chatbots, quantum computers, etc., most companies are investing in artificial technology to help them maximize productivity by ensuring that tasks are executed quicker and more accurately than the traditional human effort would.

Emerging Trends in AI

Siri

Siri has become one of Apple's most known software's which act as assistants, which is available in most of their electronic devices, *i.e.*, iPad, phone. People interact with the female voice-activated assistance frequently at a moment's notice. She is crucial in discovering information, obtaining travel routes, making phone calls, sending texts, opening apps, and scheduling activities.

Tesla

Cars have also become increasingly popular as a target for artificial intelli-

gence. For vehicle enthusiasts, they are losing out on Tesla. It is perhaps the greatest vehicle selling in the market. The automobile has received several awards and characteristics like predictive skills, self-drive, and ultimate technological innovation.

Cogito

Dr. Sandy and Joshua co-founded Cogito, which is presently on the market as one of the greatest instances of the behavioral version to boost the intelligence of customer service professionals. The organization combines machine learning with behavioral science to improve customer collaboration for phone experts. Cogito may be used on millions of voice calls every day. The AI technology monitors human speech and gives real-time feedback to help people improve their behavior.

Echo

Amazon unveiled the Echo, which has become intelligent and added new functions. It is a revolutionary solution that offers the Alexa Voice Service to help you check the internet for personal data, appointment scheduling, make purchases, ways to navigate, switches, and heating systems, respond to inquiries, read audiobooks, report weather and traffic, providing information regarding local companies, providing sports schedules and scores, and more. The applications of AI, as well as its potential benefits, have been discussed below.

3. Uses of AI in Financial Services and Financial Management

1) AI is being used by financial services organizations to aid them in differentiating their competitors from themselves and improve client experience. In reality, a large number of businesses have incorporated some of the first AI technologies, such as speech recognition, predictive analytics, and engines for a recommendation, which is a critical tool for forecasting what customers would want [3]. The companies are using artificial intelligence to promote productivity, customer engagement, fraud detection, risk mitigation, and assist customers in making educated purchasing decisions. The capacity to gather and analyze large volumes of data is required for financial services firms to deliver their goods and services. Those companies who can use client data to improve their services will be successful in the future. According to experts [4], AI, which has become the most popular emerging trend in informatics and machine and IT, has become the key to improve consumer pleasure. **Figure 1** below shows the rate at which different countries have adopted AI in their financial sectors [5].

Artificial intelligence is a major section of the science of computers, mainly associated with developing smart machines to perform tasks with similar efficacy as humans. This subject is quickly becoming a necessary component of today's technologies. In this sector, research is very specialized and technical reasoning. Knowledge, problem-solving, perception, planning, and the capacity to control and move objects are among the key human elements of artificial intelligence ([6], p. 34). Concurrently, financial services refer to the services offered by

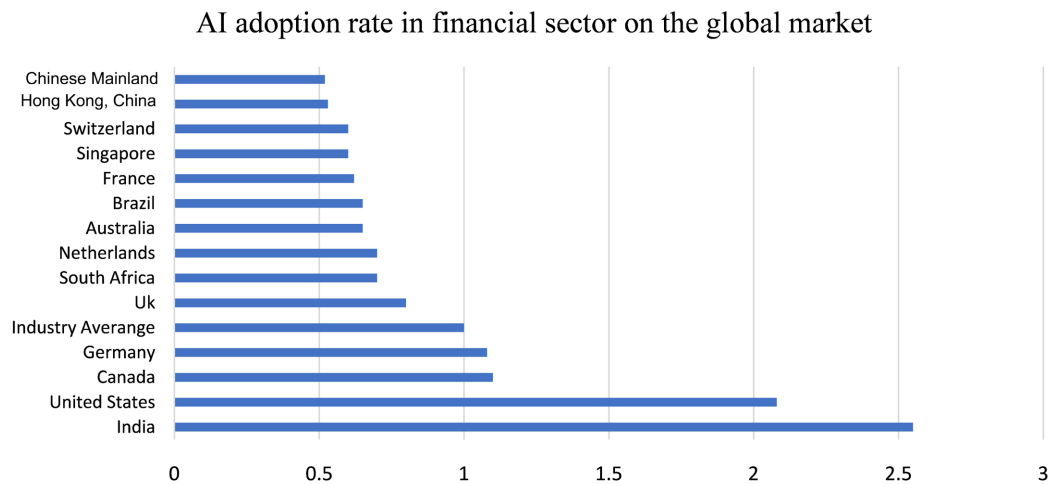


Figure 1. Source: <https://www2.deloitte.com/>.

banks and other financial organizations. Artificial intelligence (AI) is being more widely used in finance. Banks see artificial intelligence as a means to improve client engagement and productivity, among other things. Artificial intelligence is being used in financial organizations to improve productivity, particularly in contact centers. In recent years, banks and other financial institutions have highly relied on AI to improve their operations as well as communication with their customers, as shown in **Figure 2** below. In this approach, artificial intelligence deployment in contact centers is crucial because it can manage more inquiries than humans.

2) In the financial industry, artificial intelligence has a variety of uses. It has influenced how individuals bank, invest and obtain credit, and prevent financial crimes. Machine learning, a subset of AI, aids in the detection of fraudulent transactions by examining a variety of data points. The rise in popularity of e-commerce has increased the prevalence of online fraud. According to recent data, both wholesalers and retailers lose \$118 billion due to bogus rejects and legitimate transactions incorrectly denied (Cambridge Centre for Alternative Finance, World Economic Forum [7] [8]). As a result, many businesses are looking towards implementing an AI-based crime prevention strategy. The recent development of MasterCard's Decision Intelligence Technology is an excellent illustration of artificial intelligence in financial crime. As a result, artificial intelligence will assist banks in preventing financial crimes in the present and future. Another use of artificial intelligence in the banking business is bank chatbots. In recent years, chatbots that employ natural language processing and machine learning algorithms have become strong tools for providing tailored and conversational experiences to many user areas. Chatbots can assist bankers in managing and planning for savings, in naming a few ways they may improve quality in the banking business [9]. Plum, which can be accessed through facebook messenger, is an example of a chatbot. Cleo is another example that aids with tracking income and expenses across many accounts. Banks are also using chatbot services to improve self-service interfaces.

AI IN BANKING MARKET: APPLICATION DYNAMICS (USD BILLION)

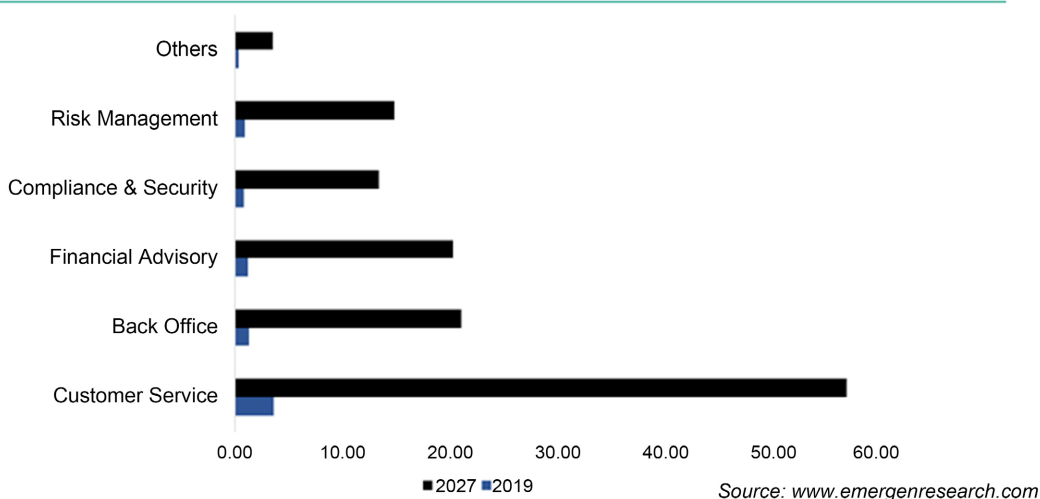


Figure 2. Investment in AI in different banking sectors from 2019 and expected adoption till 2027. Source: <https://www.emergenresearch.com/>.

3) Finally, algorithm trading has benefited from machine learning. Banking institutions have been able to crunch statistics, resulting in the discovery of trade patterns and the forecasting of trends, resulting in profitable trading of stock choices [10]. Numerai is one of the few perfect examples of algorithm trading. The company has hired data analytics experts anonymously to compete for the best algorithms and, as a consequence, to earn cryptocurrency for their work. Algorithmic trading has enhanced revenue for the corporation in this way.

4) It is expected that the use of robotics in financial and legal services would increase staff efficiency by roughly 50% (Robotics, Artificial Intelligence, and the Workplace of the Future [11]). In entertainment, for example, virtual reality existence has changed human interface dynamics in several ways. As Deloitte concludes [12], applying artificial intelligence by top-level management in financial institutions is required for enhanced development and efficiency (The Future of AI in Banking[Deloitte Luxembourg]). Because of the availability of hosted analytics systems and outsourced data storage facilities, small and large businesses may profit from AI to the most feasible. The people's role in the financial sector is being re-evaluated in light of the growth of artificial intelligence [13]. The fact that artificial intelligence technology such as robotics will put humans out of work sparked this research. The key issue was if humans were relevant in the sector (Banking) in the age of AI. **Figure 3** below shows that most of the jobs available in today's financial sector are heavily attached to AI, meaning most banks and financial organizations have adopted robot technology to increase output.

5) In [14], authors propose that in complex scenarios including asymmetry of knowledge, such as bank lending, humans fail to act rationally. In this paper, authors propose that AI may be used to research these standards and, consequently, assist in making reasonable lending decisions. Authors examine the influence

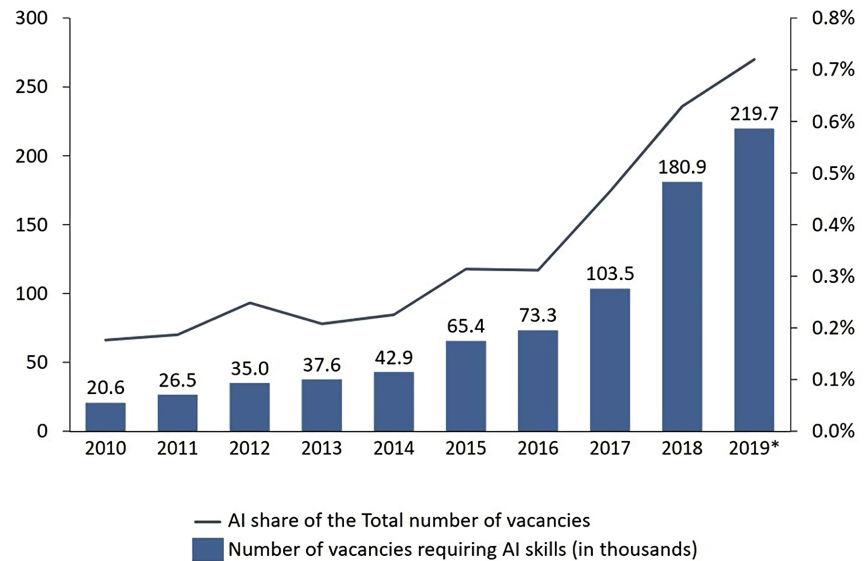


Figure 3. Showing the demand for AI skills in the financial sector since 2010. Source: voxEU.

of changes in the environment of borrowers' bank information and their possible impact on the loan process. On the other hand, the credit registry is boosted by artificial intelligence. The registry communicates critical lender information, and the response by financial institutions is by delegating numerous jobs to loan officers. The information hardening leads to a shift in focus toward relationship banking. If an organization invests in communication technologies and information—artificial intelligence—the bank manager will be assigned more authority at the local level. With the manager being granted more autonomy, they make more artificial intelligence investments enabling them to gather soft consumer data. According to [15] (p. 5477), opaque models' wide utility is likely to result in some consequences which are unintended. For example, if several banks use artificial intelligence and machine learning to implement a variety of strategies, but the models are so complicated that they are difficult to comprehend, it will be difficult for both the company and its management to foresee the market impact of such models. It is conceivable that the market interactions of such models would have a detrimental influence on the profitability market. Furthermore, some unexpected consequences in credit scoring, cybercrime prevention and detection applications, and associated dangers are likely. The objective of artificial intelligence in the banking industry might be to better coordinate lending officers' motivations with the bank's set targets. In [16], the authors investigate the changes in lending in financial institutions as a result of credit rating technology deployment. According to the findings by [16], credit committees are more inclined to support problematic loan applications. Credit scoring technology minimizes the likelihood of loan default and boosts loan profitability. They also believe that credit score data helps the lending committees solve difficulties [17].

4. Positive and Negative Impact of AI on Financial Services

4.1. Positive Impact

1) AI may aid a bank in determining a customer's spending habits, developing a tailored investment strategy, and assisting consumers with budgeting. Banks can also send notifications regarding recommendations for keeping track of costs and investments based on data. To maximize the customer's experience, transactional and other data sources may be used to track their habits and patterns. AI can sift across massive amounts of data and recognize trends that humans might overlook. Many financial service providers utilize artificial intelligence and machine learning analytics to track fraud on a real-time basis, a critical capacity ([18], p113). AI allows banks to have accessibility to client data such as detailed demographic trends, click-through rates, and records of offline and online payments and purchases, and algorithms that can aggregate and assess data.

2) By assessing essential data from the potential borrower, AI systems can manage and streamline this procedure. Machine intelligence can integrate and evaluate data linked to the most recent transactions, industry trends, and banking transactions to identify possible hazards in lending. The mobile app may detect any suspicious activity in the user's account depending on behavioral science, and any online transaction of a significant amount from a user's account with a history of modest transactions can be recognized promptly.

3) AI improves staff efficacy and enhances customer service through specific target email messages as well as other offers, and it tends to increase income and sales reproductivity. AI provides better quality and reliability, from cash transfers to bill payments, card maintenance, as well as other support, Machine learning can increase your customers' overall satisfactions, and all of these operational processes can indeed be effectively handled via desktop computers, cell phones, as well as other smart applications. In banks, AI systems may use statistics to search for patterns, groupings, and correlations in massive volumes of data ([19], p16). Machine learning may help with fraud detections, pose threats, person authentication, and credit underwriting. Because artificial intelligence regards each contact as a teaching opportunity, chatbots (digital aides) improve as they learn new clients. Chatbots already have been included in the majority of large banks' instant online automation, voice monitoring system, and mobile apps. AI can help robot-advisors deliver better customer service. Machine learning can identify fraud elements and forensic aid experts; it enhances financial stability through advanced fraud detection and prevention; it serves as a legitimate scam solution for the commercial banks when faced with complex situations. AI can proactively identify and prevent fraud by identifying anomalous behavior, and it filters down into the user's profile, resulting in a safe environment.

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5) AI basically fulfills numerous jobs via complicated automation, which results in increased production capacity. AI, which is based on an algorithm for machine learning, can swiftly absorb as well as analyze a vast data quantity at a high level. This incredible speed improves banking services by allowing customers a customized offering option. AI is able to make fast judgements while executing activities rapidly. Machine learning is being used in the finance industry to reduce operational costs and increase profitability. This section basically involves activities from multiple institutions moving both front and back. Machine learning makes so many data point analyses thereby flagging suspicious transactions.

6) Artificial intelligence enhances the effectiveness, precision, as well as calculation speed; it can store large amounts of data; and financial institutions can determine the most appropriate mixture of initial trade percentages based on degrees of minimum past reserve reduction under varying configurations of the trades in real time.

4.2. Negative Impact of AI

1) AI bias

One of the biggest challenges that AI poses today is bias. This would occur in situations where the individuals who have attributed the algorithms have created them or trained the data sets with bias. The immediate impact of this is the production of biased results, which would result in unintended consequences like in the scenario where the Twitter chatbot by Microsoft became racist. As a remedy, companies need to monitor the development, training and entry of datasets to the machines to eliminate bias.

2) Increased cybercrime

With autonomous machines, the speed of task execution becomes much faster, meaning that multiple tasks can be accomplished at once. This creates a situation where humans cannot follow along with what the machines are carrying out. This means that malicious activities such as the development and delivery of virus software, phishing, and taking advantage of the vulnerabilities in AI systems can be carried out without immediate notice by humans. This creates losses and time wastage as mechanisms to correct the damages is developed.

5. How AI Could Harm the Financial Sector and Investors

1) One cannot expect AI to be fully unbiased as it is developed by humans

who are themselves biased. AI could be biased inadvertently or intentionally. As AI has matured, we are discovering everyday malware. In the financial ecosystem, high frequency trading could affect the volume of transactions in the stock market creating a larger bid-ask spread and a higher perception of risk from the investors as volatility rises. At the behavioral finance, this could affect the investment and induce hoarding. The asymmetry of information between the management and the investors will increase, the agency cost will increase, and the requests of informative signals like dividends might be disturbed. We can observe similar disruptions at the options market, commodity market and currency markets.

2) Because artificial intelligence robots are extremely complicated, they necessitate exorbitant production and maintenance expenses. AI also comprises powerful software programs that should always be updated regularly to meet changing environmental needs. In the case of a serious breakdown, the method of system restoration and retrieving lost codes may take an inordinate amount of time and money [20].

3) Although AI can learn and get better, it still cannot make the decisions. Humans could indeed take particular judgment calls into consideration when making decisions, which AI may never be able to do. Trying to replace adaptive individual interactions with AI would result in aberrant behavior within human-thing ecosystems.

4) AI can provide a lot of power to the few people who control it; thus, AI carries the risk of taking control away from the people while demeaning actions in various ways [21]. Artificial intelligence delivered into the wrong hands can turn out to be a significant threat to serve humanity; if people start to think damagingly, wreaking havoc with this modern machinery [22].

5) Machine intelligence allows individuals to end up replacing the working population with machines, which can lead to widespread unemployment; when AI utility becomes widespread, people will become strongly reliant on this equipment hence losing their creative ability; whether in other sectors or banking, AI could lead to reduced employment, and individual people without anything else to do could indeed result to the destructive use of their thinking.

6. How Could AI Be Unethical in General?

1) Access to technology by wicked people- While artificial intelligence has the potential to accomplish a great deal of good, humans should be concerned about AI under the control of hazardous users. Artificial intelligence (AI) is potentially capable of considerable harm if used improperly as technology improves. What happens when individuals, criminal syndicates, and rogue nations employ AI technology for nefarious reasons? Many firms are already thinking about such questions and taking precautions against hostile AI threats. New technologies can take advantage of vulnerabilities in AI and machine learning systems. As AI technologies improve in intelligence, they will be able to alter the structure of

threats, rendering them increasingly undetectable, more random in appearance, more responsive to protocols and settings, as well as more effective at detecting and exploiting system weaknesses.

2) Furthermore, the providers of machine learning services, particularly those offering cloud-based services which are on demand, should be aware of the identities of their clients. Suppose harmful persons utilized dangerous platforms to organize AI attacks or other actions. In that case, states will start to tighten and follow up on the perpetrators and apply “Know Your Customer (KYC)” rules, similar to how financial institutions do [23]. If such persons do not wish to be on the regulatory cycle’s wrong side, they must get smarter and begin their efforts to ensure that they ensure their customers are aware of their activities and who they are on their platforms.

3) Rise in misinformation—AI systems have over time adapted to the unscrupulous traits of producing bogus photos, conversations, movies, and other forms of material. People are skeptical of everything they see, hear, read and see. What occurs if you are unable to detect or distinguish if a picture is genuine or artificially made or whether you are speaking to bots or a human? It has been widely stated that bots played a part in distributing political misinformation during the US Presidential elections in 2016. These profiles in the social media platforms, which have been automated, aided in the dissemination of misinformation on the internet, seeking voter deception and feeding the fires of partisanship [24]. Bots, unlike humans, never tire of working 24 hours a day and may create a great volume of material in a short period. When this news is re-tweeted and re-tweeted by others, whether genuine or false, it quickly spreads and becomes unstoppable. These bots are adept at disseminating fake or significantly distorted data, message amplification, and implanting thoughts and ideas in the minds of people. Criminals and terrorists can employ fabricated pictures or audio messages to bring commercial or personal harm or disrupt state activities. All it takes now is a few malevolent actors circulating misleading accusations to traumatize public opinion and swiftly affect the public’s attitude.

4) Companies will need to make considerations on ways to limit the potential harm which has been caused by AI-enabled production of content. Most governments and businesses are encouraged to view bogus information as harmful as cybersecurity risks and respond accordingly. Misinformation, propaganda, blackmail, hostile interference, and other “information crime” types may just devastate systems as electronic and physical attacks. The world is equipped for the unleashing of AI on individuals who have not been protected. Corporations that free trade in the user-generated material face the same penalties as governments when it comes to policing it.

5) At the non-financial level, like education for example, the interaction between students and teachers will be affected by the technological barriers which will impact many skills like emotional intelligence, communication, critical thinking and other soft skills. On the other hand, the privacy of Citizens is

hugely adversely affected by AI if not properly used in all the chain of information. Cybersecurity is another pitfall of AI. Deep fake news could be used with not only its political and economic implications, but it becomes also an arm in the hands of a few people to harm and harass businesses and individuals. Needless to talk about the negative consequences of AI on unemployment [25] [26], not only for automated tasks but even for medical surgeons or lawyers, the machine learning becomes more efficient with more accuracy and less fatigue. We can enumerate many other dark sides of AI [27]. But the focus is kept in the paper at the financial landscape.

7. How Companies Protect Their Investors from Non-Responsible and Malpractices of AI

1) Responsible AI leadership is being empowered

The Responsible AI program should be led by an internal advocate, such as chief AI ethical officers. This leader gathers stakeholders, develops advocates within the company, and creates policies and principles to govern the development of AI systems. However, leadership which has authority is insufficient. No individual processes all of the solutions to the complicated situations identified. To have a real influence, organizations must have ownership that includes various opinions. An AI committee responsible for AI-related discipline helping in directing the whole program and addressing complicated ethical concerns such as unintended repercussions and prejudice is a strong method to guarantee various viewpoints. The committee should involve representations from various business departments (public relations, compliance, legal, etc.), geographies, and backgrounds. The same may be said about Responsible AI. Navigating the complicated difficulties that will certainly arise when businesses implement AI systems requires diversified leadership.

2) Creating human-AI governance

Roles, responsibilities, and processes, in addition to senior leadership and a generally understood ethical framework, are required to guarantee that firms incorporate Responsible AI into the goods and services they generate. Effective governance entails bridging the gap between the teams developing AI products and the leaders and governance committees providing supervision, allowing high-level ideas and policies to be implemented [28]. Responsible AI governance can take many different shapes [29]. Elements include established escalation channels when hazards arise at a certain project stage, consistent code reviews, ombudspersons responsible for analyzing individual complaints, and continual improvement to increase capabilities and face new difficulties (The 5 Biggest Technology Trends In 2022).

8. How Could We Constrain AI from Harming Financial Ecosystem?

AI governance: Mankind had grown up and moved past an era when AI devel-

opment was limited to the laboratory [30]. Artificial intelligence (AI) is now a continuous integration technology that is deeply embedded in modern life. People think that if AI is used correctly, technology may provide significant benefits to economies and civilization and help better, safer, more equitable, and informed choices. However, such promise would never be achieved without significant caution and commitment, which includes thinking about how the technology's creation and use should be managed and what level of legal and ethical monitoring—with whom and when—is required. Till present, self- and co-regulatory measures based on current laws and opinions from businesses, academia, and related technical groups have been mainly effective in limiting inappropriate AI usage [31].

Within the restrictions imposed by present governance processes, scientists believe that such measures will continue to be sufficient in the great majority of cases (e.g., sector-specific regulatory bodies). However, this does not negate the necessity for government intervention. On the contrary, this report calls for governments and civil society organizations throughout the world to contribute meaningfully to the AI governance debate [32]. In particular, the study identifies five areas where the government, in conjunction with civil society and AI practitioners, may help to clarify expectations regarding AI's implementation in different contexts. Standards for explainability, ways to judge fairness, safety considerations, criteria for human-AI collaboration, and general responsibility frameworks are among them.

The paper has included commentary mostly on concerns and tangible steps that the government, with the help of other stakeholders, may provide further direction in each area. These proposals are realistic suggestions that individuals feel would have a demonstrable impact on ethical AI use. This paper expresses its viewpoint on these specific concerns. Google does not have all of the solutions; on the contrary, it is critical for policymakers worldwide to participate in the debate. Researchers hope that as AI technology advances and our personal experience improves, the international society will gain more and more nuances, including better awareness of the market and potentially undesirable consequences that tough decisions imply.

9. Conclusions

In conclusion, artificial intelligence is an emerging trend that is quickly shaping today's financial sector. As shown in the literature review [33], AI is being integrated into the IT framework, creating a huge demand for AI skills from employees, meaning that IT skills will be a mandatory requirement in the future of banking. The essence of AI cannot be understated since there is a myriad of ways that this technology is useful in the financial sector. It includes the detection of crime, trading algorithms, and others. Additionally, the challenges presented by AI are being explored, and amicable ways to control them are being approached while the trend is still on the take-off stage. The financial sector's future is bright

with artificial intelligence.

The main motivation of the paper is to shed basic light on the irresponsible AI [34]. Too much ink has been spilled about the positive effects of AI which has made our lives more efficient and even more enjoyable through all the social media and alike. The same has been written on the economic role of AI, positive healthcare impacts, and education and transportation benefits from AI. It is time to dig in the dark sides of AI in different sectors other than the financial ecosystem.

Future research should also pinpoint ways of limiting the negative impacts of artificial intelligence on human kind like the dangerous autonomous and automated weapons. Researchers should develop algorithms to assess the unethical behavior of AI and stop the malpractices before further harming the humanity. Researchers are responsible at the first place to develop AI Governance mechanisms to allow the policymakers to know where to draw redlines for algorithm development. NGOs should be responsible to uncover the degradation of the environmental sustainability through the waste of electronic devices and the increased CO₂ related to powering machines by GPUs.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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