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I am a Principal Academic in Strategy and Deputy Head of the Centre for Sustainable Business Transformations at Bournemouth University. I hold a PhD in Economics from the University of Jena, Germany, and a master's in mathematics with Computer Science, specialising in AI, from IIT Delhi. My research focuses on sustainable transformation for business and society and how AI and emerging technologies can be harnessed to foster inclusive innovation and drive sustainable business practices.

My work supports the transformation of innovation ecosystems to become more equitable and resilient, with a strong emphasis on environmental and social responsibility. I have contributed to the UK Science and Technology Committee's Diversity in STEM inquiry, and Women and equalities committee's inquiry on High growth women entrepreneurship. I work with both national and international organisations on initiatives at the nexus of gender, tech, and sustainability.

My research and media commentary have global reach, influencing public discourse and policy on inclusive, tech-enabled, and sustainable business and society.

How is AI currently used in different sectors of financial services and how is this likely to change over the next ten years? Its impact on STEM and Gender gap

Executive Summary

AI is Transforming Financial Services

- Boosting Efficiency & Insight – AI automates operations, enhances decision-making, and improves forecasting, risk management, and compliance.
- Revolutionising Customer Experience – Tools like chatbots, robo-advisors, and personalisation engines reduce costs and improve engagement.
- Widespread Adoption – 75% of UK firms already use AI; uptake is expanding into treasury, HR, and legal functions.

Inclusion & Skills Gaps

- Low Representation in AI & STEM – Only 22% of AI professionals are women. Lack of diversity risks biased systems and unequal access.
- STEM & Skills Shortage – A significant talent gap in AI, ML, and data science limits growth, especially among women and minority groups.

Key Recommendations

- Build Ethical, Transparent AI – Mandate governance frameworks, bias audits, and explainable AI (XAI) for fairness and trust.

- Close the STEM Gender Gap – Fund targeted programs, scholarships, and mentorship for underrepresented groups in AI and tech.

- Design for Inclusion – Ensure AI systems are accessible to all users, including those with disabilities or diverse needs.

- Strengthen Regulation – Partner with regulators to align AI use with ethical, legal, and consumer protection standards.

Introduction

Artificial Intelligence (AI) is a branch of computer science focused on developing intelligent machines capable of performing tasks requiring human intelligence. These machines can learn, organise, and interpret data to make predictions and decisions based on the information they process.

AI involves machines demonstrating intelligence similar to human cognitive abilities. The development of AI began with early systems like the General Problem Solver (GPS), which was one of the first attempts to replicate human problem-solving capabilities. Although AI faced challenges in funding and progress during the mid-1970s, a period known as the "AI winter," the field has seen substantial growth and innovation in recent years.[1] AI is now recognised as an intelligent agent system that autonomously uses technology to replicate human cognitive functions, improving the ability to achieve goals and enhance task outcomes.

AI in Different sectors of Financial Services

1. The rapid advancement of AI is reshaping industries worldwide, with the financial services sector leading this evolution. AI fundamentally changes how financial products and services are offered, improving operational efficiencies, automating processes, and personalising customer experiences.

2. Machine Learning (ML) and Generative AI (GenAI) are particularly impactful in how financial institutions handle data, assess risks, and deliver more personalised, efficient services.

3. AI has vast potential to reshape financial services industry, particularly due to its ability to revolutionise language processing across the entire value chain, unlocking significant efficiencies and new opportunities.[2]

4. AI technologies are expected to drive up to $1 trillion in value for the global banking industry alone. According to the Bank of England, adopting artificial intelligence (AI) in financial services is not a distant future prospect, but a current reality. 75% of firms already use AI, with an additional 10% planning to adopt AI within the next three years. This is a significant increase compared to the 2022 joint report by the Bank of England and the Financial Conduct Authority, which showed 58% and 14% usage rates in UK financial services, respectively.[3]

[1] https://www.historyofdatascience.com/ai-winter-the-highs-and-lows-of-artificial-intelligence/
[2] https://www.accenture.com/gb-en/insights/banking/generative-ai-banking

5. The industry is not just talking about AI, but actively implementing it Implementation of AI started few years back as firms embarked on applying machine learning (ML) across most business areas as per Bank of England survey in 2019 which suggested that, 'customer engagement' and 'risk management' were the top areas, making up 28% and 23% of all reported ML applications, respectively. The 'miscellaneous' category, which includes areas like HR and legal, came next with 18%. The area with lowest ML application that time was treasury however the applications of ML in treasury are rapidly evolving since then.

6. AI has significantly enhanced real-time treasury operations, making opportunities for real time treasury management and delivering efficiency gains of up to 90%.[4] AI and machine learning (ML) are transforming treasury operations in a way similar to the fourth Industrial Revolution. These technologies are reshaping how treasurers identify efficiencies and streamline everyday tasks. By analysing historical data, market trends, and other variables, AI improves cash flow forecasting, optimizes cash positions, and ensures liquidity.[5]

7. AI is revolutionising customer experience in finance by enabling hyper-personalised services and streamlining decision-making processes.[6]

8. AI-driven customer service tools like chatbots and virtual assistants are widely adopted in financial services, helping to reduce costs, improve user experience, and enhance operational efficiency. AI-powered chatbots in banking have significantly cut costs and boosted customer engagement. For example, Bank of America uses "Erica," an AI-based virtual assistant, to assist with transactions and provide financial advice, increasing customer interaction. These AI solutions replace costly, routine tasks, improving operational efficiency.

9. Humanoid robots, such as Nao at Bank of Tokyo, enhance customer service through emotional analysis and multilingual capabilities. There is a rapidly evolving innovation in humanoid robots as tech giants invest in these technologies.

10. AI is rapidly transforming fraud detection in the financial sector by identifying suspicious patterns and anomalies in real-time transactions. There is crucial role of AI in monitoring transactions and identifying fraudulent behaviour faster than traditional methods.[7]

11. Inclusive Finance leading to more accurate and personalized decisions is enabled by AI, especially for individuals with limited credit history, promoting a sense of fairness and justice in the financial sector.[8]

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[3] https://www.bankofengland.co.uk/report/2024/artificial-intelligence-in-uk-financial-services-2024
[4] https://www.pymnts.com/spend-management/2024/ai-for-real-time-treasury-delivers-up-to-90percent-efficiency-gains/?utm_source=chatgpt.com
[5] https://www.pymnts.com/artificial-intelligence-2/2023/ai-gives-treasurers-real-time-insight-into-liquidity/
[6] https://www.pwc.com/us/en/services/consulting/business-transformation/library/rise-of-ai-customer-experience.html
[7] https://www.pwc.co.uk/forensic-services/assets/impact-of-ai-on-fraud-and-scams.pdf
[8] https://www.centerforfinancialinclusion.org/equitable-ai-for-inclusive-finance/

12. AI-powered robo-advisors, like those from Betterment and Wealthfront, are gaining popularity in wealth management due to their ability to provide low-cost, automated financial advice.

13. There is rapid growth of AI in this space, where AI algorithms create personalised investment portfolios based on an individual's financial goals and risk tolerance.[9]

14. AI is playing a significant role in regulatory compliance by automating tasks like anti-money laundering (AML) screening and know-your-customer (KYC) checks.

15. However, there are significant limitations of AI in financial services as Bloomberg 2025 suggests that Generative AI models can quickly become outdated, and, on their own, cannot reason or perform basic calculations. Some of these issues have a significant impact on the financial sector, where a lot is at stake.

AI in Financial services and its impact on STEM and Gender gap

16. **[Gender and Inclusion Gap]** Research by Shrivastava 2021 suggests that STEM pipeline is prevalent across the globe particularly UK. AI can also pose challenges in terms of gender representation, with women making up only about 22% of AI professionals globally.[10]

17. Lack of gender diversity can lead to biased AI models, potentially reinforcing gender biases in financial decision-making. For instance, financial algorithms may favour male-led startups when issuing loans or neglect the unique financial needs of women.[11] AI systems, if not carefully designed, can perpetuate and even amplify gender biases.

18. STEM Education and AI in Financial Services: As the financial services industry continues to adopt AI, the demand for skilled professionals in AI, machine learning, and data science is growing. However, there is still a significant gap in the number of professionals equipped with these skills, particularly among underrepresented groups, such as women and racial minorities. [12]

19. However, AI-powered systems can be used to identify and nurture talent from underrepresented groups, such as women and minorities, in STEM roles, and they offer personalised learning pathways to address the skills gap.[13]

20. These developments highlight both the challenges and opportunities that AI presents in fostering inclusivity and diversity in financial services. While AI holds the potential to

[9] https://www.forbes.com/councils/forbesbusinesscouncil/2023/07/17/how-artificial-intelligence-is-revolutionizing-stock-investing/
[10]https://eige.europa.eu/sites/default/files/documents/artificial_intelligence_platform_work_and_gender_equality.pdf
[11] https://www.cambridge.org/core/journals/data-and-policy/article/ai-for-womens-financial-inclusionanalysis-of-product-design-and-policy-approaches-in-nigeria/318A5E8D230F680E49E3DD522FB2CFFC
[12] https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/09/bridging-talent-shortages-in-tech_983d7ca6/f35da44f-en.pdf
[13] https://draup.com/talent/blog/empowering-women-in-stem-ais-impact-on-gender-diversity/

transform financial solutions and improve access for marginalised groups, it also requires careful design and oversight to avoid reinforcing biases that may hinder true inclusivity.

Recommendations to enhance the opportunities and limit the challenges of AI in Financial Services on Business and Society

21. AI implementation in financial services must address risks from rapid development, establish cross-functional ethics committees, and engage regulators to shape and follow evolving AI governance frameworks.[14]

22. **[Address Biases]** The penetration of AI in financial services need to go along with implement Explainable AI (XAI) to prevent discrimination and enhance trust in automated decisions.

23. Financial institutions should implement rigorous audits and continuous monitoring of AI systems to detect and correct biases. Diverse teams of AI developers should be involved in the creation of these systems to ensure that gender-neutral algorithms are being deployed, with fairness and equity at the core of their design (European Commission).

24. **[Educate]** Financial institutions and tech companies should focus on creating programs that encourage young women to pursue STEM careers, especially in AI and data science. Mentorship programs, scholarships, coding boot camps and early engagement through school and university outreach initiatives can increase female representation in the AI workforce.

25. AI can improve employee retention and career growth by identifying skill gaps and recommending personalized training programs. For underrepresented groups in financial services, such as women and people with disabilities, AI can help identify career advancement opportunities and offer tailored developmental resources.

26. **[Inclusive]** AI-driven mentorship programs can also foster an inclusive environment where employees from diverse backgrounds are supported in their career journeys.

27. Inclusivity in AI Deployment: Financial services firms should ensure that their AI applications are designed with accessibility in mind, supporting employees and customers with disabilities and diverse skills and needs.

28. These recommendations can create a more inclusive, fair, and equitable financial services industry, where AI technologies are used to empower all individuals regardless of gender, background, or ability.

[14] https://www.bankofengland.co.uk/report/2024/artificial-intelligence-in-uk-financial-services-2024?utm_source=chatgpt.com

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