The Future of Finance and How AI is Transforming the Industry

Suprateek Ashutosh Nayak[1], Rachit Agarwal[2], Dr. K. K. Mishra[3]

[1]Student, USB, Chandigargh University
[2,3]Assistant Professor, USB, Chandigargh University

Abstract

Artificial Intelligence or AI is usually known as "machine intelligence" because it is used to simulate human brain in machines. It is a brainpower adopted by machines in contrast with natural language processing from humans. AI has evolved rapidly from Google Assistant to self-driving vehicles. There are basically two important concepts of AI – (1) It studies human mind like their thought process and (2) It represents such processes using machine learning (ML).

Hence, this study is aimed to examine the impact of AI on finance industry in this day and age, along with the way it is transforming the finance sector and strategies for organizations to use AI to boost profitability.

In order to fulfil the aforementioned objectives, this study relies on both primary and secondary data. The researchers have collected data using online survey. A self-structured questionnaire was prepared and distributed through Google Forms. Total 109 responses were collected from the participants. The survey data was analysed using SPSS 22.0 software by conducting frequency analysis and one sample T-test. In addition, secondary data was collected from various relevant sources like research papers, press releases, news reports, and other sources.

Findings of this study suggests significant impact of AI on finance sector on the basis of responses from the participants. In addition, the theoretical part of this study has discussed the present status and future potential of AI along with strategies for financial institutions to make the best use of AI to increase profitability.

Keywords – Artificial Intelligence, machine learning, finance industry, finance sector, machine intelligence

1. INTRODUCTION

AI or Artificial Intelligence is probably the next big thing in financial industry in this day and age. Smart solutions can give a steep edge to banks and financial institutions over their rivals by optimizing their products and services in this uncertain world. These days, AI has been ahead of its trial period and is being used in real world scenarios.

The "UBS Daniel chatbot" is the best example as it answers investors about existing market trends (Finextra, 2018). Their AI models helped form cluster groups, segmented entities, and applied rules for "Suspicious Activity Report (SAR)" to help organization to achieve 50% automation (Balakrishna, 2022).

The survey conducted by Bank of England showed this sentiment by predicting the rise of usage of AI to meet operational demands in post-COVID world (Bholat et al, 2020). However, governance frameworks and risk management strategies may restrict this intent as they haven't evolved as smoothly as AI. Several governments and countries are realizing that AI has become indispensable rapidly with the lifestyle of customers and the way they do business.

Use Cases of AI in Finance

The rapid rise of application of AI is going to significant impact on the financial institutions, both internally and externally (Figure 1). AI is externally making it easier to perform tasks easier while saving costs. In the same way, it is internally shaping relationships between organizations and their clients, society and other firms as a whole. Customers also depend on AI for better finances. Organizations work with various medium and small-scale businesses to track their finances smoothly.

Figure 1 - Use Cases of AI in Banking and Finance Industry
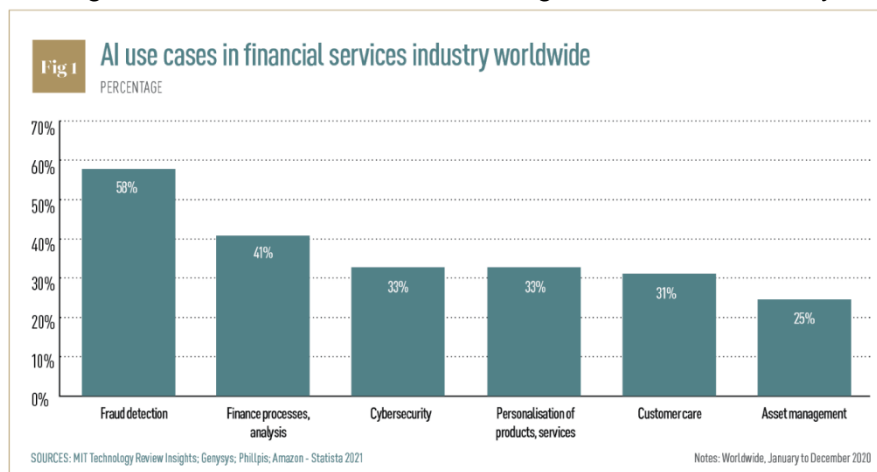
Source – Otieno (2022)

This article is organized in this way – Chapter 2 conducts review of recent literature related to adoption of AI in finance and banking, retail, IT and other sectors and its evolution in recent years. Chapter 3 discusses research methodology, research approach, and research tool adopted to conduct this study and collect data from various sources. Chapter 4 analyses and interprets data collected for this study. Finally, Chapter 5 concludes the recent findings of this study and suggests the ways to improve adoption of AI in finance industry and future directions for further studies.

2. REVIEW OF LITERATURE

Though various nations have chosen their AI strategy, India is yet to formulate its strategy. **Dhanabalan& Sathish (2018)** review the AI's relevance in industries of India in this day and age and future and it promoted the way ahead for the country.

Wamba-Taguimdje et al. (2020) analysed the influence of AI on company's performance, especially by relying on corporate value of transformation by AI. They took a sequence of four steps for this study – (1) Analysing AI and its technologies/concepts; (2) Exploring case studies deeply from several

industries; (3) Collecting data from websites of solution providers; and (4) Conducting a literature review to determine the impact of AI on company's performance while focusing on the business values of transformation by AI projects in organizations.

Reputation of the banks also make a great impact on their ability to appeal to new customers, their success, and the way they retain existing customers. With these issues, it is sure that making decisions on the way to deal with challenges of using AI, digitalization, and cybersecurity is complex. **Rodrigues et al. (2022)** developed a decision-support model with "decision-making trial and evaluation laboratory (DEMATEL)" method and cognitive mapping. They conducted group discussions with a panel of experts to apply methodological approaches.

Okunlaya et al. (2022) developed an "Artificial Intelligence Library Services Innovative Conceptual Framework (AI-LSICF)" model for providing latest insight to the way to use AI technologies for providing value-added library services for digital transformation. It also encourages information and library professionals for the adoption of AI to provide effective services.

Gonçalves et al. (2022) conducted an exploratory and qualitative study with semi-structured interviews to determine the impact of digitalization on accounting. Even though digital transformation is at the nascent stage in medium and small accounting service providers in Portugal, "optical character recognition (OCR)", industry 4.0, AI, "enterprise resource planning (ERP)", and robotics are technologies widely used by participants.

Wang et al. (2022) explored how SMEs achieve smart transformation in Central China using AI. Due to uneven allocation of resources, limitations on smart transformation of small and medium enterprises are different in central China from the ones in technologically advanced and economically developed coastal regions.

Varma et al. (2022) investigated the influence on Fintech on recent changes in banking sector and future challenges with special attention to blockchain. They have made thematic analysis of recent research on Fintech in banking sector. It is observed that there is a huge potential of Fintech to impact and grow banking sector and the whole world.

Digital applications have a great potential in finance sector to resolve major challenges in financing for sustainable and inclusive growth. **Hoang et al (2022)** provided a detailed discussion and summary of recent advancements in financial technologies which promote both global businesses and SDGs.

2.1.Research Gap

Various industries are using AI for tasks which were once done by individuals. Financial services implement AI for processing big data, fraud detection with unexpected operations, perform various vital functions, and interact with customers online. A lot of studies were conducted on the importance of AI, machine learning or technological advancements in various industry. There is a lack of proper survey on the impact of AI on finance industry and how AI is transforming the same. This article is aimed to fill this gap.

2.2. Research Objectives

- To determine the impact of AI in finance industry
- To find out how AI is transforming the finance industry
- To discuss the strategies for financial institutions to improve profitability with AI

2.3. Research Questions

- How AI is transforming the finance industry?
- How AI is making an impact on finance industry?
- What are the strategies for AI to improve profitability in financial institutions?

2.4. Hypotheses

H1 – There is a significant impact of artificial intelligence on finance industry
H2 – There is no impact of artificial intelligence on finance industry

2.5. Scope of the Study

Artificial Intelligence has been in existence for decades. Combined with constant availability of data, technological breakthroughs have made AI closer to commercialization. Internet giants like Amazon, Google, Facebook, Apple, etc. have heavily invested in AI. It underlines the relevance for various business models across the world. Finance industry is highly data-driven and AI is widely focused in pilot projects. There are still few applications of AI which have been tested so far. This study takes a step closer to help financial institutions to understand consumers' perception and impact of AI on financial industries and strategies to improve profitability.

3. RESEARCH METHODOLOGY

3.1. Research Design

This study used informative and concise analysis of impact of AI on finance industry and basic concepts of AI. It is basically a quantitative and qualitative study which gathers data to have deeper insight to various variables of the research. When it comes to research design, this study is both descriptive and exploratory in nature. Exploratory study is undertaken with detailed survey along with quantitative and qualitative analysis. It enlightened the existing status of AI with information and facts collected.

3.2. Research Approach

In this study, the research approach is based on sample for collecting important quantitative data from the participants. Online survey was conducted through Google Forms to gather data from 109 participants who are customers of selected banks. A self-structured questionnaire was used as a research tool with both open- and closed-ended questions. The survey data was analyzed and interpreted with SPSS 22.0 program.

3.3. Data Collection

Both primary and secondary data have been collected for this study, which were further analyzed to provide suggestions and draw conclusions. An online survey was conducted to collect primary data on awareness of customers about using AI in finance industry. Primary data was collected using a questionnaire drafted using random sampling. In addition, secondary data was collected from various relevant sources like research papers, magazines, newspapers, etc.

4. DATA ANALYSIS AND INTERPRETATION

### 4.1. Impact of AI in Finance Industry

In order to find out customers' perception towards the use of AI in financial services and fulfill the first objective, a pilot survey was conducted and total 109 responses were collected. In this study, majority of participants (42.2%) are aged 18 to 25 years. In addition, 19 (17.4%) participants are 26 to 30 years old, 18 (16.5%) participants are 31 to 40 years old, 21 (19.3%) participants are 41 to 50 years old, and only 5 (4.6%) participants are above 50 years (Table 1) (Figure 2).

Table 1 - Age Group

|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 to 25 years	46	42.2	42.2	42.2
	26 to 30 years	19	17.4	17.4	59.6
	31 to 40 years	18	16.5	16.5	76.1
	41 to 50 years	21	19.3	19.3	95.4
	Above 50 years	5	4.6	4.6	100.0
	Total	109	100.0	100.0	

Figure 2 - Age Group

Age Group
109 responses
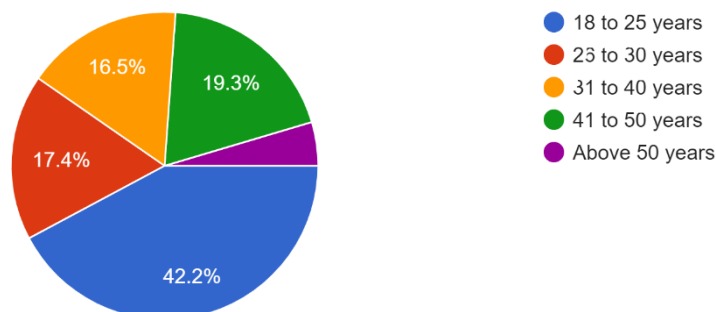
In this study, 59 (54%) participants are female and 50 (46%) participants are male (Table 2) (Figure 3).

Table 2 - Gender of the participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	59	54.1	54.1	54.1
	Male	50	45.9	45.9	100.0
	Total	109	100.0	100.0	

*Figure 3 - Gender of the participants*

Gender
109 responses
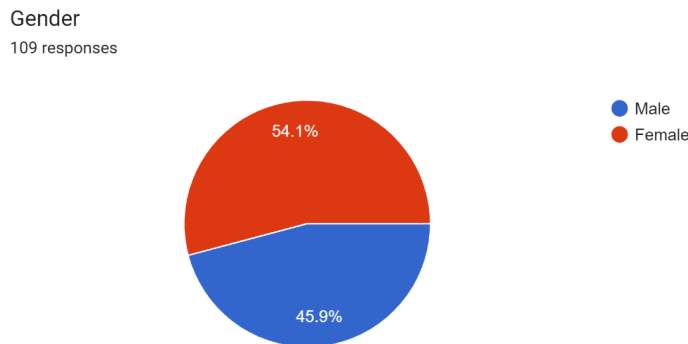
When it comes to academic qualification, 73 (67%) participants have completed post-graduation, 34 (31%) participants have completed graduation, and only 2 (1.8%) participants have done high schooling (Table 3) (Figure 4).

Table 3 - Academic Qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Graduation	34	31.2	31.2	31.2
	High School	2	1.8	1.8	33.0
	Post-Graduation	73	67.0	67.0	100.0
	Total	109	100.0	100.0	

Figure 4 - Academic Qualification


Academic Qualification
109 responses
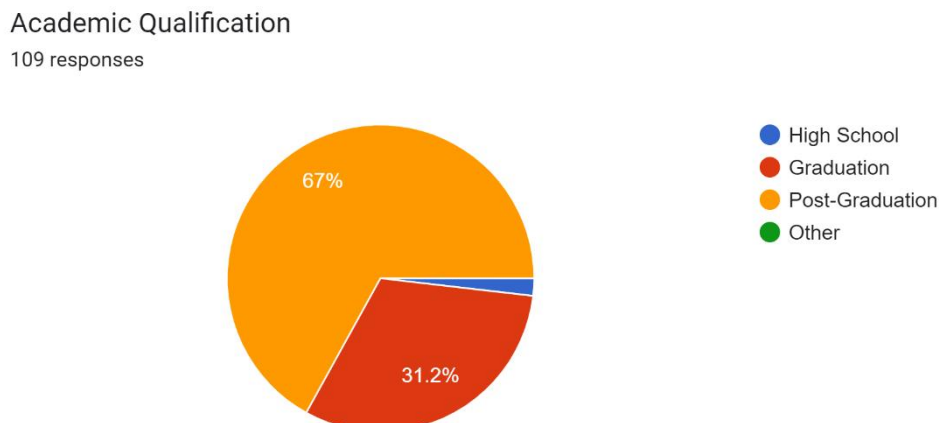
When it comes to occupation of the participants, majority (35%) participants are students, 19 (17.4%) participants are private employees, 19 (17.4%) participants are government employees, 9 (8.3%) participants have their own business, 8 (7.3%) participants are retired, 8 (7.3%) participants are housewives, 7 (6.4%) participants are entrepreneurs, and 1 participant had other profession (Table 4) (Figure 5).

Table 4 - Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Business	9	8.3	8.3	8.3
	Entrepreneur	7	6.4	6.4	14.7
	Govt Employee	19	17.4	17.4	32.1
	Housewife	8	7.3	7.3	39.4
	Others	1	.9	.9	40.4
	Private Employee	19	17.4	17.4	57.8
	Retired	8	7.3	7.3	65.1
	Student	38	34.9	34.9	100.0
	Total	109	100.0	100.0	

Figure 5 - Occupation of the participants
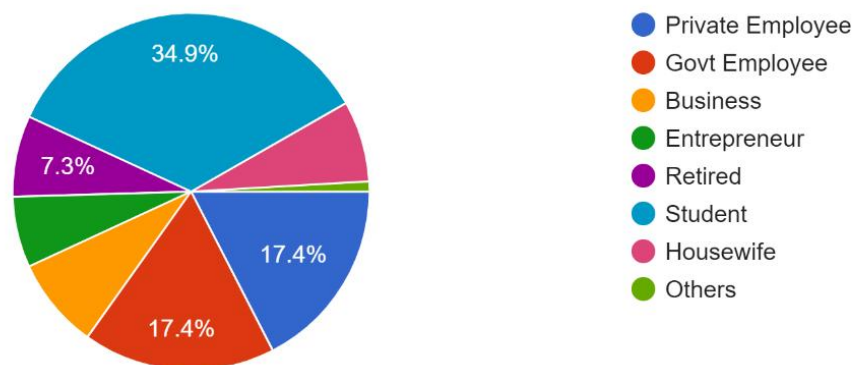
To find out the impact of AI on finance industry, researchers have asked for customers' perception towards the use of AI. The first question was asked whether AI has been valuable and user-friendly to their finance services. Majority of participants, i.e., 54 (49.5%) agree and 24 (22%) participants strongly agree that AI has been user-friendly and valuable (Table 5) (Figure 6).

Table 5 - User-friendly and valuable

AI has been user-friendly and valuable for your finance services		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.9	.9	.9
	Disagree	8	7.3	7.3	8.3
	Neutral	22	20.2	20.2	28.4
	Agree	54	49.5	49.5	78.0
	Strongly Agree	24	22.0	22.0	100.0
	Total	109	100.0	100.0	

Figure 6 - User-friendly and valuable

AI has been user-friendly and valuable for your finance services
109 responses
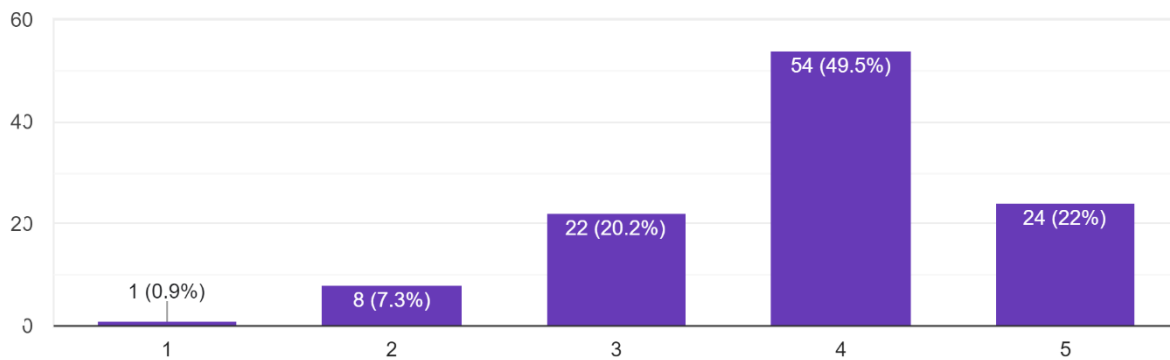
In this study, majority, 41 (37.6%) participants agree and 32 (29.4%) participants strongly agree that they expect financial institutions to bring new innovations with AI every once in a while, (Table 6) (Figure 7).

Table 6 - Innovation with AI

You expect financial institutions to bring new innovations with AI every once in a while		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	1.8	1.8	1.8
	Disagree	10	9.2	9.2	11.0
	Neutral	24	22.0	22.0	33.0
	Agree	41	37.6	37.6	70.6
	Strongly Agree	32	29.4	29.4	100.0
	Total	109	100.0	100.0	

Figure 7 - Innovation with AI

You expect financial institutions to bring new innovations with AI every once in a while
109 responses
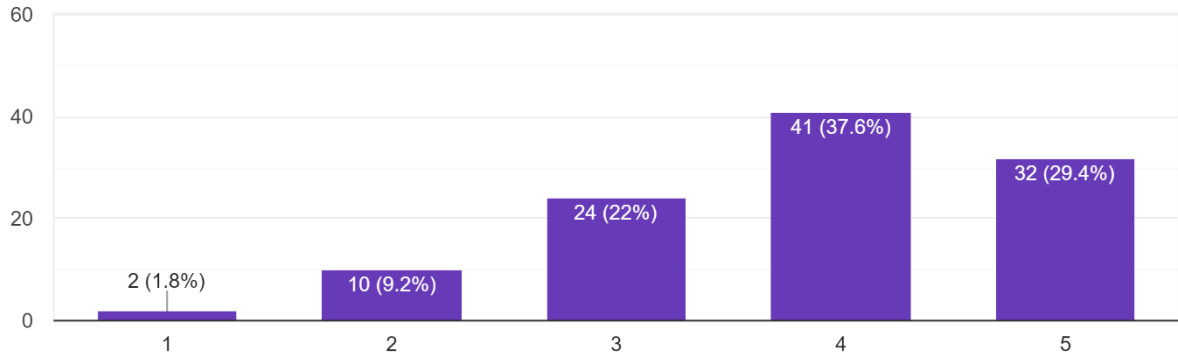
When asked whether using AI for banking and financial services is beneficial, majority, i.e., 57 (52.3%) participants agree and 32 (29.4%) participants strongly agree with that. In addition, 13 (12%) participants neither agree nor disagree, 5 (4.6%) participants disagree and 2 (1.8%) participants strongly disagree (Table 7) (Figure 8).

Table 7 - Consumer Perception on Benefits of AI

Using AI for banking and financial services is beneficial		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	1.8	1.8	1.8
	Disagree	5	4.6	4.6	6.4
	Neutral	13	11.9	11.9	18.3
	Agree	57	52.3	52.3	70.6
	Strongly Agree	32	29.4	29.4	100.0
	Total	109	100.0	100.0	

Figure 8 - Consumer Perception on Benefits of AI

Using AI for banking and financial services is beneficial
109 responses
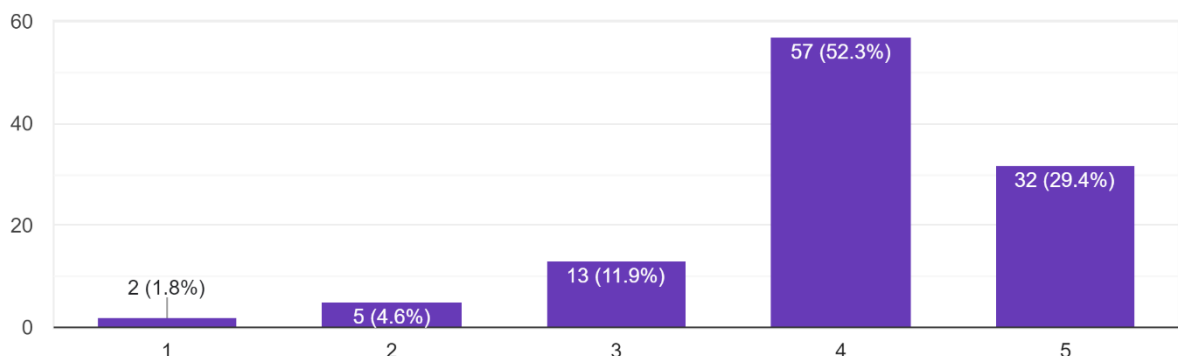
The next question was asked about the viability of automated financial advisor to make investment decisions. There are 80 (73.4%) participants who think that it is viable to rely on automated financial advisor when it comes to take investment decisions in the market (Table 8) (Figure 9).

Table 8 - Customers Relying on Automated Financial Advisor for Investment Decisions

Making investment decisions using automated financial advisor is viable		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	1.8	1.8	1.8
	Disagree	7	6.4	6.4	8.3
	Neutral	20	18.3	18.3	26.6
	Agree	44	40.4	40.4	67.0
	Strongly Agree	36	33.0	33.0	100.0
	Total	109	100.0	100.0	

Figure 9 - Customers Relying on Automated Financial Advisor for Investment Decisions

Making investment decisions using automated financial advisor is viable
109 responses
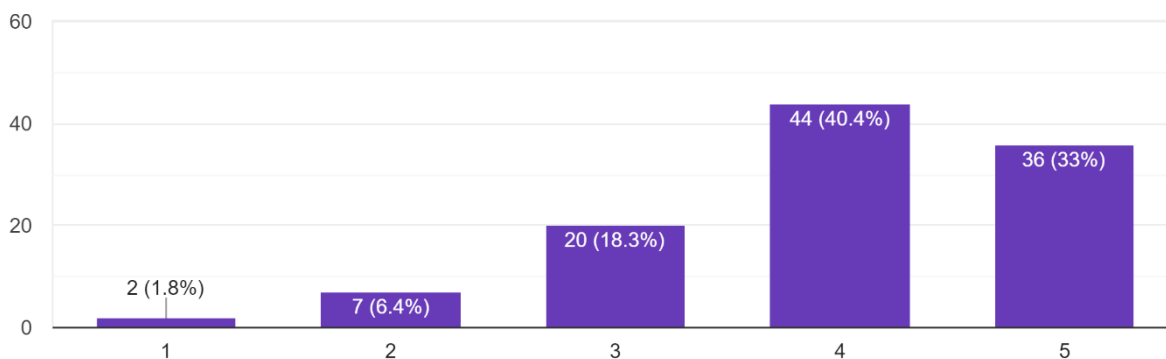
There are 36 (33%) participants who agree and 39 (35.8%) participants who strongly agree that speed of services has been improved with the introduction of AI in financial services, while 27 (24.8%) participants neither agree nor disagree and 7 (6.4%) participants disagree (Table 9) (Figure 10).

Table 9 - Improvement in speed of services with AI

Speed of services has been improved with the introduction of AI in financial services		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	7	6.4	6.4	6.4
	Neutral	27	24.8	24.8	31.2
	Agree	36	33.0	33.0	64.2
	Strongly Agree	39	35.8	35.8	100.0
	Total	109	100.0	100.0	

Figure 10 - Improvement in speed of services with AI

Speed of services has been improved with the introduction of AI in financial services
109 responses
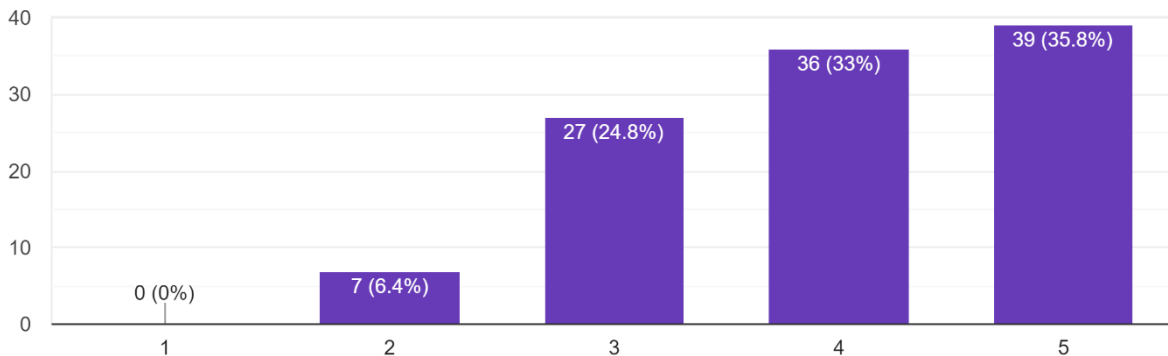
With the rise of digitalization in recent years, there has been a rise in digital modes of payment for added convenience of the customers. There are 78 (71.6%) participants who prefer mobile wallets over cash for various transactions in daily life (Table 10) (Figure 11).

Table 10 - Preference of mobile wallets over cash

You prefer mobile wallets over cash for various transactions in daily life		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	1.8	1.8	1.8
	Disagree	12	11.0	11.0	12.8
	Neutral	17	15.6	15.6	28.4
	Agree	45	41.3	41.3	69.7
	Strongly Agree	33	30.3	30.3	100.0
	Total	109	100.0	100.0	

Figure 11 - Preference of mobile wallets over cash

You prefer mobile wallets over cash for various transactions in daily life
109 responses
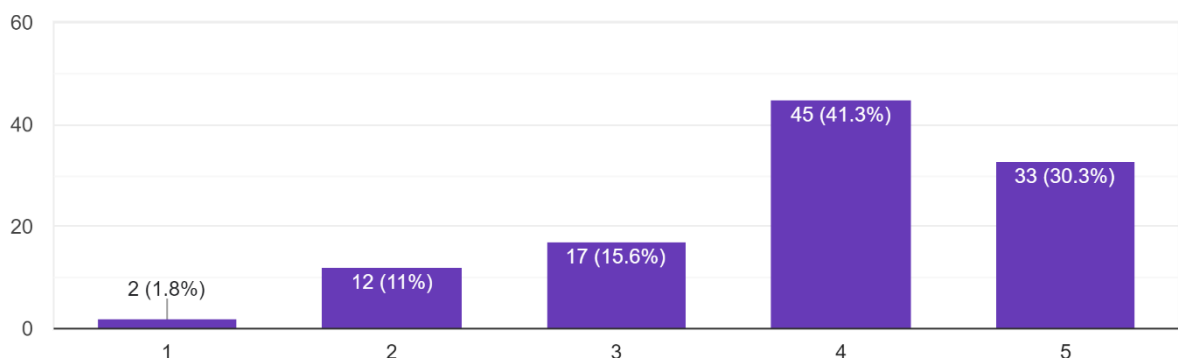
AI has also been helpful to detect online fraud and various security concerns if it is used in the right way. In this study, 46 (42.2%) participants agree and 22 (20.2%) strongly agree with that. However, 34 (31.2%) participants neither agree nor disagree and 7 (6.4%) participants disagree (Table 11) (Figure 12).

Table 11 - Online fraud detection with AI

AI can help detect online fraud and other security concerns in banks		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	7	6.4	6.4	6.4
	Neutral	34	31.2	31.2	37.6
	Agree	46	42.2	42.2	79.8
	Strongly Agree	22	20.2	20.2	100.0
	Total	109	100.0	100.0	

Figure 12 - Online fraud detection with AI

AI can help detect online fraud and other security concerns in banks
109 responses
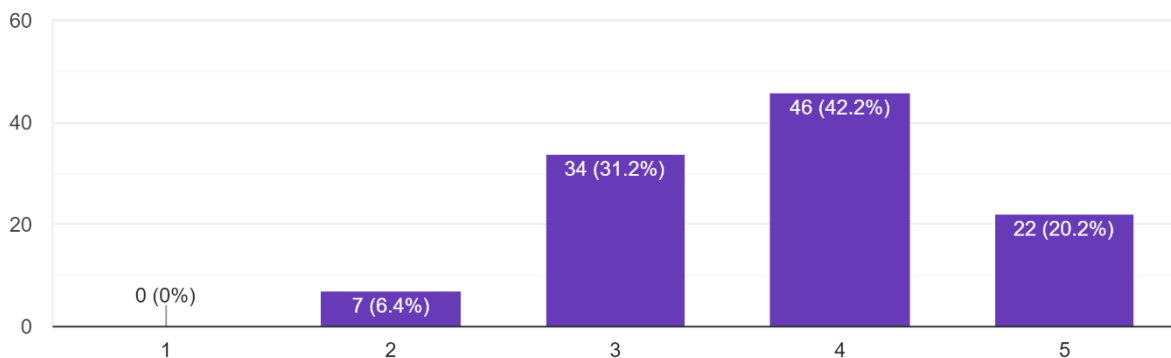
There are 63 (57.8%) participants who have full faith in AI to have secure online transactions. In addition, 30 (27.5%) participants neither agree nor disagree, 13 (12%) participants disagree and 3 (2.8%) participants strongly disagree with that (Table 12) (Figure 13).

Table 12 - Customers' Faith in AI for secure online transactions

You have full faith in AI to have secure online transactions		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	2.8	2.8	2.8
	Disagree	13	11.9	11.9	14.7
	Neutral	30	27.5	27.5	42.2
	Agree	44	40.4	40.4	82.6
	Strongly Agree	19	17.4	17.4	100.0
	Total	109	100.0	100.0	

Figure 13 - Customers' Faith in AI for secure online transactions

You have full faith in AI to have secure online transactions
109 responses
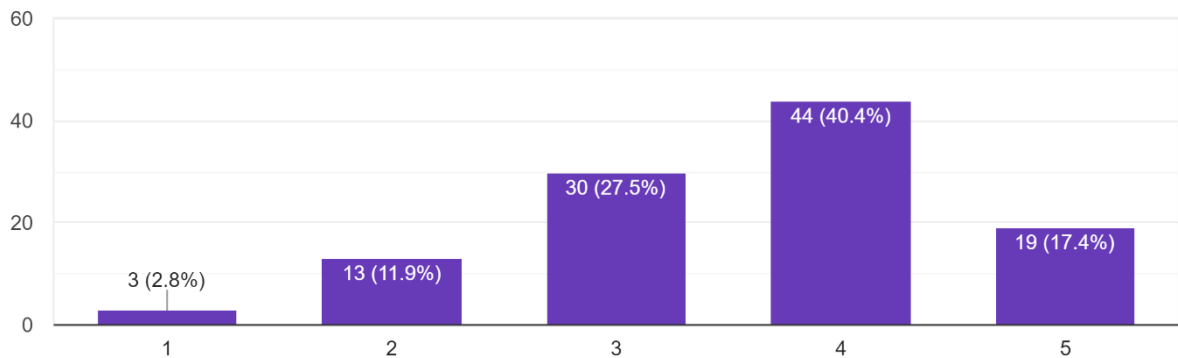
In order to find out whether there is impact of artificial intelligence on finance industry, one sample t-test was conducted on SPSS 22.0 on the collected responses. It is observed that H1 is approved, i.e. "There is a significant impact of AI on finance industry" (Table 13) because level of significance for all the variables is $p<0.05$.

Table 13 - One-Sample Test on responses

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
AI has been user-friendly and valuable for your finance services	45.412	108	.000	3.844	3.68	4.01
You expect financial institutions to bring new innovations with AI every once in a while	39.487	108	.000	3.835	3.64	4.03
Using AI for banking and financial services is beneficial	47.989	108	.000	4.028	3.86	4.19
Making investment decisions using automated financial advisor is viable	42.608	108	.000	3.963	3.78	4.15
Speed of services has been improved with the introduction of AI in financial services	44.567	108	.000	3.982	3.80	4.16
You prefer mobile wallets over cash for various transactions in daily life	39.307	108	.000	3.872	3.68	4.07
AI can help detect online fraud and other security concerns in banks	46.270	108	.000	3.761	3.60	3.92
You have full faith in AI to have secure online transactions	37.254	108	.000	3.578	3.39	3.77

4.2. How AI is Transforming the Finance Industry?

AI has gained prominence in finance sector since the 1980s, when expert systems became more commercialized. In the 1990s, fraud detection became much of a concern. In 1993, the "FinCEN Artificial Intelligence System (FAIS)" was started to track around 200,000 transactions every week. It

identified over 400 potential cases of money laundering in two years, which would worth over $1 billion. Even though expert systems didn't last longer, it helped improve the use of artificial intelligence to achieve prominence, according to "International Federation of Robotics (2015)".

Artificial Neural Network (ANN) has been widely used by financial organizations to identify claims or changes out of the norm for human inquiry. Use of artificial intelligence in finance sector can be traced back to the use of "Fraud Prevention Task Force" in 1987 by "Security Pacific National Bank" in the US to deal with the unauthorized use of debit cards. The potential benefit would be reducing overall audit risk, reduce audit time, and improve security (Buchanan, 2019).

Advancements in AI have recently grabbed attention of stock market researchers and professionals. Researchers have used most promising models in ANN to analyse and predict movement of stocks as ANN can determine non-linear function selectively and theoretically with ample number of units (Jiao, 2018).

There might be time when managers won't have to make decision as it would be done by an AI program. They can perform very complex roles with the evolution of these techniques (Geisel, 2018).

4.3. Strategies for Financial Institutions to Improve Profitability with AI

AI has contributed widely to finance sector as well. It is used for various purposes and activities like solving customer queries, chatbots, replying messages, fraud detection, prediction, underwriting, etc. (Figure 14). AI and deep learning are useful in financial services. Here are some of the applications and strategies to use AI in finance sector –

Figure 14 - Use Cases of AI in Finance
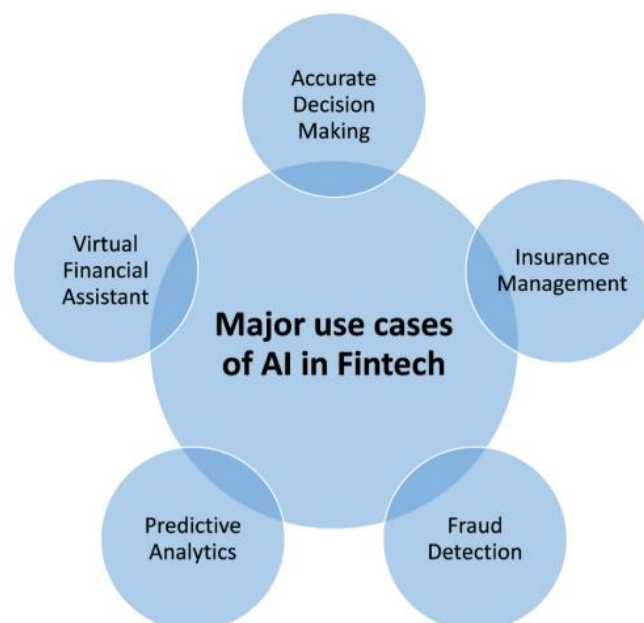
Source – Kunwar (2019)

- **Fraud Detection** – AI is widely used to avoid and screen various events of cyber frauds, negligence, tax evasion, mismanagement, and potential threats. For example, user behavior and company data are used to detect uneven patterns and suspicious transactions. For example, Mastercard has been engaged in using AI technology to identify frauds in financial services. Trade misconduct is also detected using similar techniques (Goudarzi et al., 2018).
- **Lending decisions** –A machine is not likely to be biased unlike an individual. Digital lending apps and banking apps rely on machine learning models to check loan eligibility, credit status, and provide various customized functions (Bachinskiy, 2019).
- **Chatbots** – Banking and finance sectors rely on AI-based options to their existing financial issues. Banks save up to 4 minutes of their executives to handle customer queries using AI chatbots and save billions of hours every year, according to a recent study (ChatBotNews, 2019).
- **Automated Trading** – It has been leading the financial market across the world. It consists of complex AI models for making trading choices easier than any human can do and create millions of trades frequently in a day without human intervention.

5. CONCLUSION AND SUGGESTIONS

AI applications can be used by any business for making accounting and financial decisions. The benefits of AI are constantly increasing to keep up with latest technologies. For businesses and community as a whole, it is going to be important to learn using this technology to stay ahead in competition. Financial institutions should integrate AI with their processes and employees have to upgrade their skills to achieve high paying jobs.

5.1. Suggestions

These days, early adopters and leaders face a lot of challenges in implementing AI. They struggle to have management support. The problems of business leaders have been shifted from "if" to "how". AI also helps in solving the problems related to hiring talent and cultural resistance (MMC Ventures, 2019).

Leaders must have the culture to understand employees' needs rather than replacing them. They should promote analytics and information culture. Machine learning learns from data from processes. An AI structure can help in making choices and enable employees to find various solutions for a complex challenge.

References

1. Alkaraan, F., Albitar, K., Hussainey, K., & Venkatesh, V. G. (2022). Corporate transformation toward Industry 4.0 and financial performance: The influence of environmental, social, and governance (ESG). *Technological Forecasting and Social Change*, *175*, 121423.
2. Bachinskiy, A. (2019). The growing impact of AI in financial services: Six examples. *Geraadpleegd op*, *9*.
3. Balakrishna, D.R. (2022). How AI is changing the future of the financial industry. Mobile Magazine. Retrieved from https://mobile-magazine.com/articles/ai-changing-the-future-of-the-financial-industry.

4. Bholat, D., Gharbawi, M., & Thew, O. (2020). The impact of Covid on machine learning and data science in UK banking. *Bank of England Quarterly Bulletin*, Q4.

5. Buchanan, B. (2019). Artificial intelligence in finance.

6. CDEI (2020). Review into bias in algorithmic decision-making. *Centre for Data Ethics and Innovation*. Retrieved 22 February 2023, from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/957259/Review_into_bias_in_algorithmic_decision-making.pdf.

7. ChatbotNews(2019). Five benefits AI Chatbots bring to the Banking & Financial Companies. Available: https://chatbotnewsdaily.com/five-benefits-ai-chatbots-bring-to-the-banking-financial-companies93fd2306296f.

8. Dhanabalan, T., & Sathish, A. (2018). Transforming Indian industries through artificial intelligence and robotics in industry 4.0. *International Journal of Mechanical Engineering and Technology*, *9*(10), 835-845.

9. Ernst, E., Merola, R., & Samaan, D. (2019). Economics of artificial intelligence: Implications for the future of work. *IZA Journal of Labor Policy*, *9*(1).

10. Finextra (2018). UBS puts digital clone of chief investment officer in branch.Retrieved 22 February 2023, from https://www.finextra.com/newsarticle/32350/ubs-puts-digital-clone-of-chief-investment-officer-in-branch.

11. Gallo, V. (2021). The new EU AI Act | What do financial services firms need to know?.*Deloitte*. Retrieved 22 February 2023, from https://ukfinancialservicesinsights.deloitte.com/post/102gxhz/the-new-eu-ai-act-what-do-financial-services-firms-need-to-know.

12. Geisel, A. (2018). The current and future impact of artificial intelligence on business. *International Journal of Scientific & Technology Research*, *7*(5), 116-122.

13. Gonçalves, M. J. A., da Silva, A. C. F., & Ferreira, C. G. (2022, February). The future of accounting: how will digital transformation impact the sector?. In *Informatics* (Vol. 9, No. 1, p. 19). MDPI.

14. Goudarzi, S., Hickok, E., Sinha, A., Mohandas, S., Bidare, P. M., Ray, S., & Rathi, A. (2018). AI in Banking and Finance. *The Center for Internet and Society*.

15. Hoang, T. G., Nguyen, G. N. T., & Le, D. A. (2022). Developments in financial technologies for achieving the sustainable development goals (SDGs): FinTech and SDGs. In *Disruptive technologies and eco-innovation for sustainable development* (pp. 1-19). IGI Global.

16. Infosys (2020). Launching Infosys applied AI: Integrated Offering for Enterprises to Scale and Future-proof AI-powered Transformation. Retrieved from https://www.infosys.com/newsroom/press-releases/2020/applied-ai-enterprises-transformation.html.

17. International Federation of Robotics (2015). Industrial Robot Statistics. Available: https://web.archive.org/web/20160327031517/http://www.ifr.org/industrial-robots/statistics/.

18. Jiao, Y. (2018). *Applications of artificial intelligence in e-commerce and finance* (Doctoral dissertation, Institut National des Télécommunications).

19. Kunwar, M. (2019). Artificial intelligence in finance: Understanding how automation and machine learning is transforming the financial industry.*Centria University of Applied Sciences*.

20. Manyika, J., &Bughin, J. (2018). The promise and challenge of the age of artificial intelligence. *McKinsey Global Institute Executive Briefing*, *32*.

21. MMC Ventures (2019). The State of AI 2019: Divergence. Available: https://www.stateofai2019.com/chapter-8-the-implications-of-ai.

22. Okunlaya, R. O., Syed Abdullah, N., & Alias, R. A. (2022). Artificial intelligence (AI) library services innovative conceptual framework for the digital transformation of university education. *Library Hi Tech*, *40*(6), 1869-1892.

23. Otieno, N. (2022). The future role of AI in finance. World Finance. Retrieved 22 February 2023, from https://www.worldfinance.com/markets/the-future-role-of-ai-in-finance.

24. Plaschke, F., Seth, I., & Whiteman, R. (2018). Bots, algorithms, and the future of the finance function. *Risk management*, *20*(60), 20.

25. Rodrigues, A. R. D., Ferreira, F. A., Teixeira, F. J., &Zopounidis, C. (2022). Artificial intelligence, digital transformation and cybersecurity in the banking sector: A multi-stakeholder cognition-driven framework. *Research in International Business and Finance*, *60*, 101616.

26. Srivastava, A. (2022). Future Of Artificial Intelligence In Banking & Financial Industries. *Hash Studioz*. Retrieved from https://hashstudioz.com/blog/future-of-artificial-intelligence-in-banking-financial-industries/.

27. Varma, P., Nijjer, S., Sood, K., Grima, S., &Rupeika-Apoga, R. (2022). Thematic Analysis of Financial Technology (Fintech) Influence on the Banking Industry. *Risks*, *10*(10), 186.

28. Wamba-Taguimdje, S. L., Fosso Wamba, S., Kala Kamdjoug, J. R., &TchatchouangWanko, C. E. (2020). Influence of artificial intelligence (AI) on firm performance: the business value of AI-based transformation projects. *Business Process Management Journal*, *26*(7), 1893-1924.

29. Wang, J., Lu, Y., Fan, S., Hu, P., & Wang, B. (2022). How to survive in the age of artificial intelligence? Exploring the intelligent transformations of SMEs in central China. *International Journal of Emerging Markets*, *17*(4), 1143-1162.