



## Applications of Artificial Intelligence: Business Management Perspective

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### ABSTRACT

This is a short paper based on qualitative for the benefits of Artificial Intelligence (AI) which is the most growing branch of computer science and most of the service sectors are obtaining benefits from its application. This is an extended research article provides a general role of AI in financial services and its definition in practical scenarios. The research work is mostly qualitative and does not include any data analysis for its results. This article describes the major benefits derived by the practices of AI in general in the banking and financing firms. For the study, some examples of the role of AI in financial firms are analyzed and results are given from the positive observation shared by the FI firms on their official website. AI benefits both service providers and users, this research report explains the advantages of AI in finance and also describes how AI can aid in market development.

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### I. INTRODUCTION

Artificial intelligence (AI) has been accepted for various applications and benefits by industries for Financial Services (FS). Therefore it is imperative to examine the role and advantages of AI in a financial context such as how AI helps in achieving Financial Stabilities (FSt). The use of AI in FS is growing very significantly and incredibly.

The range of AI's implication is varied like AI works for supply and demand factors in FS. The supply factors include advancements in technology, and for demand, it explains opportunities for profitability, level of competition. There are many applications of AI applied in present financial sectors that include

[2].

- AI is referred by Financial Institutions (FI) and vendors to automate client interaction, measure credit quality concerning price and in context to market insurance contracts.
- FI can identify scarce resources and analyze the influence of the market value of the firm with the help of AI.
- AI facilitates FI and other firms to evaluate Return on Investment (ROI) and establish the correlation between funds available, allocation of resources, and hedging of the funds.

Adopting any technology is not always beneficial, both advantages and disadvantages are associated with using it. AI has also given rise to some issues about handling and privacy of data. Some problems have arisen due to AI applications <sup>[1]</sup> such as the question of efficiency in the processing of information, how certain decisions may lead to achieving stability in the financial system, etc. These decisions may include decisions for credit, Financial Markets (FM), insurance contracts, and interactions with customers <sup>[4]</sup>. Another issue is about more dependencies on emerging technologies for achieving FSt <sup>[4]</sup>. Last but not the least; AI considers many irrelevant and not related factors for achieving and measuring FSt <sup>[4]</sup>.

This research article includes an exemplary scenario of the role of AI in PricewaterhouseCoopers (PWC), India.

## II. LITERATURE REVIEW

AI and Machine Learning are fast-paced growing technologies and have been adopted by diverse fields [2]. This research deals with the role of AI in FS.

Father of AI John McCarthy defined AI as the science of making intelligent machines, especially intelligent computer programs [2] [7] [9].

AI began its journey in the 1950s with the Dartmouth Summer Research Project on AI at Dartmouth College, USA [4]. There are not many firms working without the use of AI in recent years because AI systems deliver more creative services and results oriented [1] [4].

PricewaterhouseCoopers (PWC) is a UK based second-largest service providing professional organization in the world. It is operating in many countries and India is one of them [9]. This firm has partners across the globe and it is a lead firm in AI technologies, Data and Analytics [7] [8] [9]. PWC India has been applying AI in broader financial decisions to individual decisions. PWC India elucidates an application of AI techniques at clients as well as the firm's level [9].

AI has been adopted more by service industries such as FIs and hospitals, etc in developing markets. Service industries have started applying AI systems for several benefits such as fraud detection, diagnosis of diseases, illustrating and identifying side effects, detecting prognosis, etc [8] [9] [10].

## III. DISCUSSION

In the current scenario sharing and analyzing of information has taken a digital platform and AI has a critical role in its working. For instance, AI specifically uses algorithms to automate the processing of financial data for market development [3]. AI develops a liaison between FS markets; resolves issues pertaining to buying and selling and enhances decision-making processes. AI is an example of emerging technologies and FIs are extensively applying it in checking the financial data sets for developing infrastructure, creating reliable policies for market growth and financial trading.

A market development strategy [16] is defined as a product or service based long term policies to create

needs in the businesses. Market development Strategy seeks AI's applications in achieving this objective. AI helps not only locally but marketing at the global level [17]. The empirical application of AI can be witnessed in financial market development. Some examples are in the exportation of licenses for different financial marketing firms, merging and assembling joint ventures, or direct investments at diversified levels. But the process of applying is not very simple because the financial market is inclusive of several crucial dependents and independent variables in the economic system [17]. Nation's economy is based on the financial market which concludes that surpluses and deficits have to be examined under many financial consequences. Tools and techniques of AI have tried to solve and support the process. The figure below explains more about the working part of the procedure. AI has also assisted financial markets in meeting their objectives such as augmenting the capability of the financial market to act efficiently as an intermediary, negotiator, and creation of needs. Some more instances of AI in facilitating financial markets on the supply side are to provide and allocate a wide range of financial instruments, offering choices of issuers, credit risks, etc. and the similar scenario at the demand side also where AI helps in making investment decisions to meet trends and demand levels eventually reducing the risk factors [17] [18]. There are highly liquid financial markets have the ability to accommodate large and varied issuance of financial instruments with minimum price effect which can be swiftly transformed and exchanged at a reasonable cost by the support of AI's application in automating the timeline and adding values also AI help Financial institutions and banking sectors to lower the transaction cost, enhance the efficiency of routine operations and can predict reasonable interests targets [16] [17] [18].

FI uses AI's applications for three major benefits at the demand level such as identifying the opportunities for cost reduction, managing risk, and increase in productivity. Table 1 below shows the level at which AI aids in FI.

Table 1: AI at Demand Level



Every firm or FI clearly describes the reasons for using AI. For market development (MD), these techniques are used to reduce costs, manage risk, and increase productivity. Also, AI is used for enhancing decisions for developing new products, identifying the best services for clients, and developing effective connections between systems and staff [4] [5].

For example, the firm, PWC, India has listed in its study that it uses cases of AI for enhancing financial security systems [7] [8] [9]. The study also explains the methods through which AI systems benefit in FS by reducing human errors, automating the process, and contributing to financial analytics in decision-making processes [7] [8] [9].

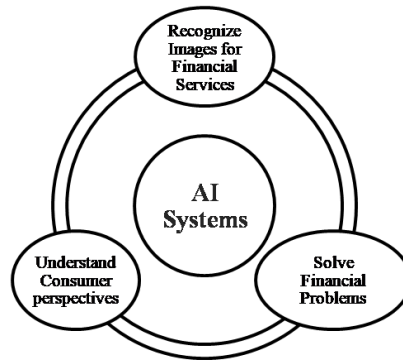


Fig.1: Working Model of AI in PWC, India

### 3.1 Micro Financial Point

FSt is dealt with at the micro-level and AI makes possible in describing the factors that need to be considered for financial stability and in recognizing the areas of improvements. Financial markets, consumers, and institutions are the players at a micro-level. Therefore it is vital to know how AI influences these parts. PWC, India annually prepares a report based on its financial results, consumers' survey, and stakeholder's satisfaction after using tools of AI in its working. PWC, India evidently concludes the importance of AI at its micro-level in financial perspectives.

### 3.2 Possible effects of AI in financial markets

AI has the prospects to affect at the macro and micro level in FM. It can process financial information accurately, reduce all information distortion, and make the financial system more efficient. Therefore financial markets depending on AI for processing of information achieve better results than without using. PWC, India applies AI for analyzing information for market participants and for lowering market trading costs. Noticeably, AI affects service industries both at the micro and macro level.

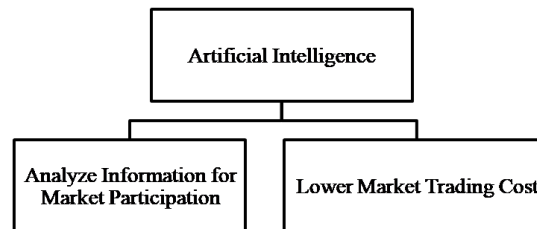


Fig.2: AI in Financial Market

AI techniques include the following in financial markets:-

- AI uses several techniques in increasing financial market stabilities and development, like sentimental analysis to build up relationships with all key entities in FM, reduces all price irregularities, and develops effective pricing strategies. AI also assists in analyzing the information as a whole for the firm covering all major areas including financial decisions. For example PWC, India shows the role of AI in HRM, Financial decisions, Accounting decisions, user groups, etc [9]

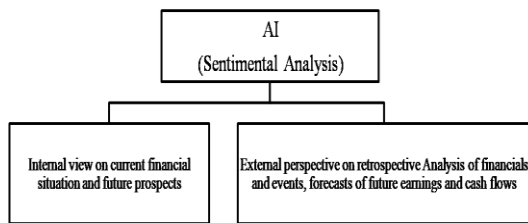


Fig. 3: AI in PWC, India <sup>[9]</sup>

- Most important reason for financial services to adopt AI is to lower market participants' trading costs that can comply with trading and investment strategies and develop markets for their consumers. AI also helps in discovering and reducing the prices over transaction costs.

The Financial Firm explains that AI can be used for credit scoring in FM. AI is used by financial sectors to explore opportunities and growth in businesses <sup>[8] [10] [12]</sup>. There are some businesses also that are capitalized by AI in receiving benefits to produce quality data, accurate data, and cost efficiency <sup>[7] [8] [9]</sup>. These benefits clearly encourage FIs to apply AI in its work to achieve financial stability and developing markets.

### 3.3 Possible effects of AI learning on FI

It is assumed that if a firm is having large profitability consequently it will achieve financial stability. AI applications contribute to earning a good return on investment by controlling costs and monitoring other risk factors that prevent market growth.

The firm explains that AI applications automate the business processes that result in reducing routine costs. Also, the FI can use AI to know their customers, how to achieve customer satisfaction, resource allocation, and new product development. In the current scenario, AI techniques are more used by FI for detecting fraud, identifying suspicious transactions, and cyber attacks. AI applications are used by FI for risk management too. This process is based on retrospective behavior of cash flows, various relations among prices of fixed assets, and revenue flow.

The firm describes that if financial decisions are mechanical by AI, it will offer accurate outcomes. Finance functions also indicate that AI is very impactful <sup>[10] [12]</sup> at all levels of operations.

### 3.4 Possible effects of AI on consumers and investors

If AI reduces the costs and enhances the efficiency of FS, consumers can obtain several benefits.

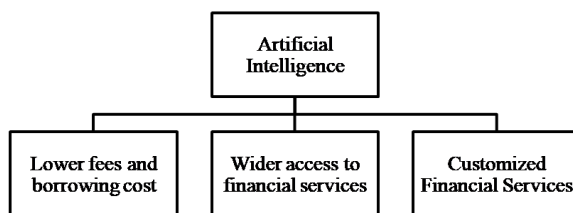


Fig.4: Role of AI on Consumers and investors

AI aids customers in reducing borrowing costs increases the scope of financial services in their real life and can receive services and benefits based on their personal requirements. Another scope of AI is in big data analytics that can analyze the characteristics of customers that are available in the public domain. FI can take benefit of this analysis in understanding the consumer's needs and investors' requirements and accordingly can suggest financial products and services for them.

### 3.5 Macro-Financial Analysis

The application of AI to FS has capabilities to escalate the proficiency of the economy and contribute to understanding the need for adoption of AI that can affect the financial systems on the whole [2] [7].

Table 2: Impact of AI in the Financial System

AI	↓
Increasing the effectiveness of FS [IEFS]	
Developing Alliance with Economies of Scope [DAES]	
Stimulating investments through AI [SIAI]	

Table 2 gives a clear picture that AI contributes in three imperative areas in financial systems namely, IEFS, DAES, and SIAI.

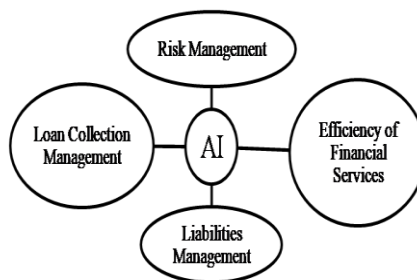


Fig. 5: Benefits of AI in Finance Systems

AI has contributed to providing benefits to clients; they can make effective financial decisions, allocate funds, and utilize them optimally. AI has made it possible to diminish the costs of payments for financial clients. AI has provided achievable standards for FIs by satisfying financial consumers with FS, by managing risk, liabilities, and loan portfolio. AI also elaborates the economies of scope for FI while realizing the relationship with other institutions in service sectors.

This film explores how AI creates opportunities for financial and non-financial firms to grow together and get involved in research and development to stimulate economic growth. Macro financial aspects provide a range of benefits for the adoption of AI. It can be implemented from short term to long term economic growth.

Table 3: AI Potentials in PWC, India [9]

Areas valued by AI	AI Potentials
<b>AI stimulating Economic growth</b>	Financial services using AI-powered solutions like a digital assistant, recommender systems, etc for helping financial clients and financial businesses for sharing data freely. Along with enhancing financial security systems.
<b>AI as Customer care</b>	Some systems of AI like chatbots, digital assistants, and robots can conduct and help financial clients, offer solutions to financial issues, give information on new financial products and services.



<b>AI for market growth</b>	AI applications can integrate business processes, reduce costs, and bring higher productivity, growth, and efficiency.
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This organization expresses the potentialities of AI in FS. AI focuses on financial systems from several perspectives, like how to stimulate economic growth so that FS using AI-powered solutions can provide relevant financial data and security systems. AI assists financial clients by informing new financial products, investment decisions, and solving financial problems. AI presents solutions to high costs and the lack of technical expertise. AI applications can integrate business processes, reduce costs, and bring higher productivity, growth, and efficiency.

**Results**

This research article has concluded that AI provides key benefits to all service industries. There are many applications of AI used invariably by these service industries but this descriptive study explains the relevance and applications in Financial Systems and in developing the market in general.

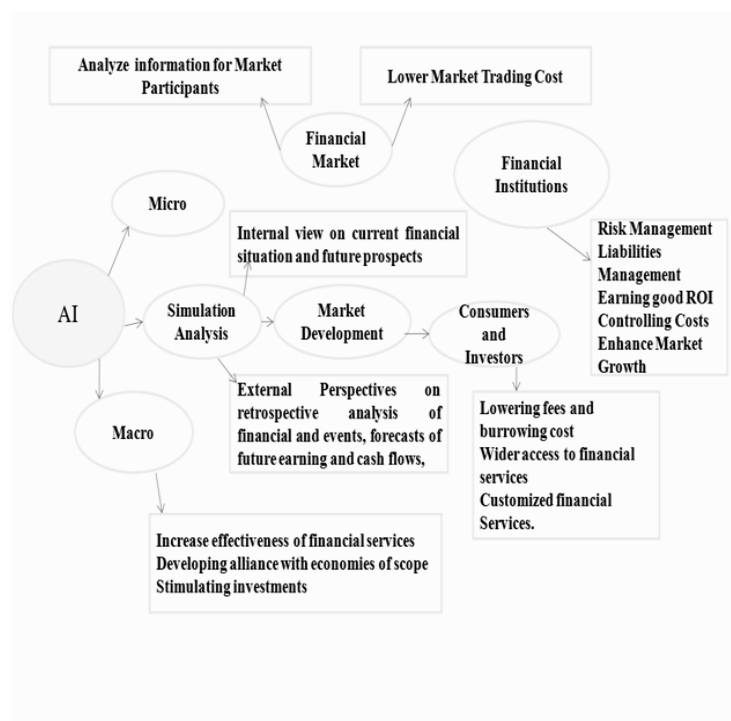


Fig.6: Role of AI in FS

The above given table presents the comprehensive environment of AI application in FS. AI has been adopted to achieve benefits at various levels of micro and macro. This research article has illustrated the significance of AI and how it impetuses and exhibits the growth of the service industry in general and specifically for the financial sector. Since this paper deals with financial sectors we tried to identify the key benefits provided by AI for financial institutions and financial customers. Through the example of PWC, we presented the concern and benefits of AI in FS and for market development too.

The discussion part clearly explained how AI is playing a great role in PWC as an example and for any financial service providers in developing markets, achieving customers' satisfaction, enhancing security systems, controlling costs, managing risk factors, etc.

## Conclusion

The use of AI will continue to be used more and more by service sectors and its various applications will make the services more autonomous, accurate, and cost-effective. Customer satisfaction and trust will be achieved by the service providers by using AI in their working and they will be able to provide more customized features too. Also, AI will play a more vital role in enhancing security systems, especially in the financial sectors.

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## References

1. Advantages and Disadvantages, issues of allocation of AI in FS “European Joint Committee Discussion Paper on the Use of AI by FI,” .Jonathan Stuart Ward and Adam Barker (2016).
2. “Definition of AI,” Arthur Samuel (1959), for AI. IBM Journal: 211-229; Tom Mitchell (1997), AI and *Machine Learning*, New York: McGraw Hill; Michael Jordan and Tom Mitchell (2015), “: Trends, perspectives, and prospects,” *Science* 349(6245): 255-26.
3. AI in algorithm, Thomas Cover and Peter Hart (1967), “Nearest Neighbor Pattern Classification,” *IEEE transactions on information theory*. 13.1: 21-27. See Luke Dormehl (2016), *Thinking Machines: The Quest for Artificial Intelligence--and Where It's Taking Us Next*, London: Penguin Books.
4. Dependencies in Emerging technologies, Tim Dettmers (2015), History of AI,” *Parallel Forall*, December.2017.(Available on <https://devblogs.nvidia.com/paralleforall/deep-learning-nutshell-history-training/>)
5. AI in Assessing Risks: a Regulatory Perspective,” OpRisk North America, June 21. Bauguess (2017). Gerard Hobergand Craig M. Lewis (2015),
6. AI in FS and for FSt Brynjolfsson, E. & McAfee, A. (2017). The business of artificial intelligence. Harvard Business Review. (Available on from <https://hbr.org/coverstory/>)
7. Importance of AI in services PwC. India (2017 (Available on <http://www.pwc.com/gx/en/issues/analytics/assets/pwc-ai-analysis-sizing-017/07/the-business-of-artificial-intelligence> )
8. Policies of AI (2017), AI technology implecations , PWC, India Research Papers.( Available on <http://www.nedo.go.jp/content/100865202.pdf> )
9. AI used by Financial sectors, “ explore oportinies, provide correct and reliable data” ‘ achieve cost effectiveness by AI’ Application of AI Bauguess (2017)
10. AI in business, “effectiveness” “market development”, Rao, A. (2017). (Available on <https://www.strategy-business.com/article/A-Strategists-Guide-to-ArtificialIntelligence>)
11. Changes in service industries with the application of AI, PwC. (2017) ( Available on <https://www.pwc.com/us/en/industry/entertainment-media/publications/consumer-intelligence-series/assets/pwc-botme> )



12. Market Development, achieving ROI, appropriate application of AI, results from the Survey PwC, India (2017). (Available on <http://www.pwc.in/assets/pdfs/publications/ceo-survey/20th-ceo-survey-being-fit-for-growth.pdfoklet.pdf> )
13. New era of AI and machine learning ‘Knight W. (2017). (Available on <https://www.technologyreview.com/s/609038/chinas-ai>)
14. An decade of electronics, moving with AI in services PwC. (2017), India, (Available on <https://www.pwc.com/us/en/advisory-services/digital-iq/assets/pwc-digital-iq-report.pdf-awakening/>)
15. AI for present scenario in FS and future of AI in service industries, Sara El-Hanfy,( Posted on:13 June 2018 – Categories):I, Industrial strategy challenge fund AI, Next Generation Services (Available on <https://innovateuk.blog.gov.uk/>)
16. Kumar V, Rajan B, Venkatesan R, Lecinski J. Understanding the Role of Artificial Intelligence in Personalized Engagement Marketing. Sage publications California Management Review. 2019;61(4):135-155. doi:10.1177/0008125619859317
17. Popkova E.G., Parakhina V.N. (2019) Managing the Global Financial System on the Basis of Artificial Intelligence: Possibilities and Limitations. In: Popkova E. (eds) The Future of the Global Financial System: Downfall or Harmony. ISC 2018. Lecture Notes in Networks and Systems, vol 57. Springer, Cham. [https://doi.org/10.1007/978-3-030-00102-5\\_100](https://doi.org/10.1007/978-3-030-00102-5_100)
18. Ahmadi, M., Jafarzadeh-Ghouschi, S., Taghizadeh, R. et al. Presentation of a new hybrid approach for forecasting economic growth using artificial intelligence approaches. Neural Computer & Application 31, 8661–8680 (2019) Springer. <https://doi.org/10.1007/s00521-019-04417-0>
19. Khan, N., Naim, A., Hussain, M. R., Naveed, Q. N., Ahmad, N., & Qamar, S. (2019, May). The 51 v's of big data: survey, technologies, characteristics, opportunities, issues and challenges. In Proceedings of the international conference on omni-layer intelligent systems (pp. 19-24).
20. Naim, A., & Alahmari, F. (2020). Reference model of e-learning and quality to establish interoperability in higher education systems. International Journal of Emerging Technologies in Learning (iJET), 15(2), 15-28.
21. Naim, A., Khan, M. F., Hussain, M. R., & Khan, N. (2019). “Virtual Doctor” Management Technique in the Diagnosis of ENT Diseases. JOE, 15(9), 88.
22. Naim, A., Alahmari, F., & Rahim, A. (2021). Role of Artificial Intelligence in Market Development and Vehicular Communication. Smart Antennas: Recent Trends in Design and Applications, 2, 28.
23. Naim, A. (2020). Realization of diverse Electronic tools in learning and teaching for students with diverse skills. Global Journal of Enterprise Information System, 12(1), 72-78.
24. Naim, A., & Bashir, A. (2016). Application of Quality Matters Standards on Supportive and Online Module in Higher Education Program. Research Revolution, 5(3), 6-12.