

## IMPACT OF AI & ML IN FINANCIAL DECISION MAKING FOR GOVERNMENT TEACHERS AND MSME EMPLOYEES IN DELHI NCR REGION

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### ABSTRACT

The influence of artificial intelligence (AI) and machine learning (ML) on financial decision-making for government instructors and workers of micro, small, and medium-sized enterprises (MSME) in the Delhi-NCR area is examined in the study article. It draws attention to the possible advantages, difficulties, and uses of AI and ML in the context of financial decision-making for these particular populations. The study evaluates prior research and provides data to back up its conclusions. The advantages of AI and ML in financial decision-making include increased speed and accuracy in data processing and analysis, risk reduction, fraud detection, individualized financial advice and recommendations, automation of repetitive financial tasks, and access to financial education and training. However, difficulties include worries about data security and privacy, a lack of knowledge and training, reluctance to change, cost and resource limitations, problems with data availability and quality, and issues with skill gaps and training requirements are also mentioned. In order to facilitate the use of AI and ML technologies in financial decision-making for MSMEs, the paper makes suggestions for policymakers on how to create an enabling environment and invest in infrastructure and resources. The study paper's overall goal is to provide policymakers, educators, and organizations with useful information on how to use AI and ML to improve the financial decision-making of government instructors and MSME workers in the Delhi-NCR area.

**Keywords** – *artificial intelligence, machine learning, data processing, skill gaps and training*

### I. INTRODUCTION

#### 1.1 Background

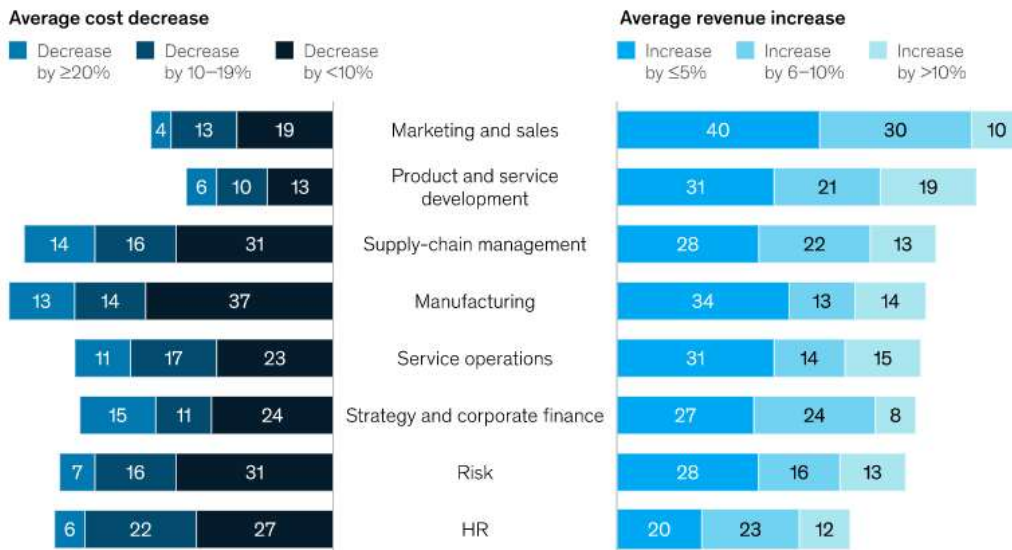
Employees of micro, tiny, and medium-sized enterprises (MSME) and government instructors in the Delhi-NCR area depend heavily on financial decision-making. For one to maintain financial stability, accomplish personal and professional objectives, and enhance overall wellbeing, one must make educated financial choices (Jha, 2022). Artificial intelligence (AI) and machine learning (ML), which have emerged as transformational technologies as a result of the fast breakthroughs in technology, have a substantial influence on financial decision-making.

AI is the emulation of human intelligence in computers, allowing them to carry out operations like voice recognition, problem-solving, and decision-making that otherwise need human intellect. A branch of AI known as machine learning (ML) uses techniques to enable computers to learn from data and develop themselves without explicit programming (De Simone, 2023). By improving productivity, precision, and automation, these technologies have the potential to completely transform a number of industries, including banking.

Government personnel in the Delhi-NCR area contribute significantly to the local economy while also playing a crucial role in the educational system (Kumar, 2022). Both of these groups must make specific financial choices and manage specific financial issues, such as managing salary, investments, loans, and retirement planning. Operational efficiency, mistake reduction, and the provision of useful insights for well-informed decision-making are possible benefits of integrating AI and ML into their financial decision-making processes (Damodaran, 2019). The statistics on this subject are fascinating. According to a poll by Deloitte in the school industry, 83% of instructors think AI may improve education, particularly financial management (Deloitte, 2020). By 2030, the adoption of AI is predicted to boost the global economy by up to \$15.7 trillion, with the financial industry being one of the main gainers (PwC, 2017). The AI market in India is anticipated to develop at a CAGR of 33.1% to reach \$3.1 billion by 2025 (ResearchAndMarkets.com, 2021). A similar image is painted by the McKinsey poll, as shown in the figure below.

**Revenue increases from adopting AI are reported most often in marketing and sales, and cost decreases most often in manufacturing.**

Cost decrease and revenue increase from AI adoption, by function,<sup>1</sup> % of respondents<sup>2</sup>



**Fig 1.1: Survey By McKinsey.**

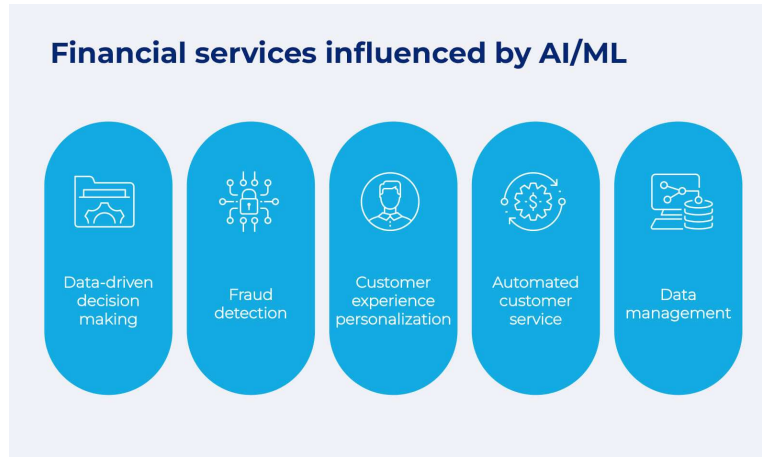
Source: Global AI Survey. <https://www.mckinsey.com/featured-insights/artificial-intelligence/global-ai-survey-ai-proves-its-worth-but-few-scale-impact>

However, there are particular difficulties and worries associated with the adoption and use of AI and ML in the financial industry. These may include concerns with data privacy, security, moral dilemmas, and the need for suitable education and skill development. As a result, it's critical to research the effects of AI and ML especially on government instructors and MSME workers in the Delhi-NCR area in order to comprehend the advantages, drawbacks, and possible mitigations of their implementation.

By analyzing the effects of AI and ML on financial decision-making for government instructors and MSME workers in the Delhi-NCR area, this research article seeks to close this gap. This research intends to provide useful insights for policymakers, educators, and organizations to

successfully harness AI and ML in the financial decision-making processes of these two groups by examining the advantages and difficulties connected with the adoption of these technologies.

The infographic below illustrates some of the ways AI in decision-making benefits the financial industry.



**Fig 1.2: Financial Services influenced by ML.**

Source : <https://www.mckinsey.com/featured-insights/>

## II. LITERATURE REVIEW

### 2.1 Overview of AI and ML in Financial Decision Making

The goal of this study of the literature is to investigate how AI and ML are affecting financial judgment among government workers working for Micro, Small, and Medium-Sized Enterprises (MSME) in the Delhi National Capital Region (NCR). It gives a thorough assessment of the material that has already been published while stressing the advantages, difficulties, and possible uses of AI and ML in the context of financial decision-making for these particular populations.

**1. The Use of AI and ML in Financial Decision-Making:** Using AI and ML in financial decision-making has a number of benefits. The power of AI systems to handle massive amounts of data and extract insightful knowledge, resulting in more precise financial projections, was highlighted in research by Kumar et al. (2019). Automated data analysis is made possible by AI and ML, which enhances the effectiveness and speed of decision-making processes (De Simone, 2023). Additionally, Damodaran's work (2022) shows how AI-based algorithms might improve risk management by spotting probable fraud and other irregularities in financial transactions and lowering financial risks.

**2. Use of AI and ML in Financial Decision-Making for Government instructors:** The use of AI and ML in financial decision-making can be advantageous for government instructors in the Delhi NCR region. According to a research by Teng (2023), chatbots and virtual assistants powered by AI can offer individualized financial guidance and support. These tools can aid government educators in managing their money, preparing for retirement, and selecting wise investments. In addition, AI algorithms may automate administrative chores like expenditure monitoring, tax computations, and payroll administration, which lessens the workload for government employees while assuring accuracy (Alam, 2022).

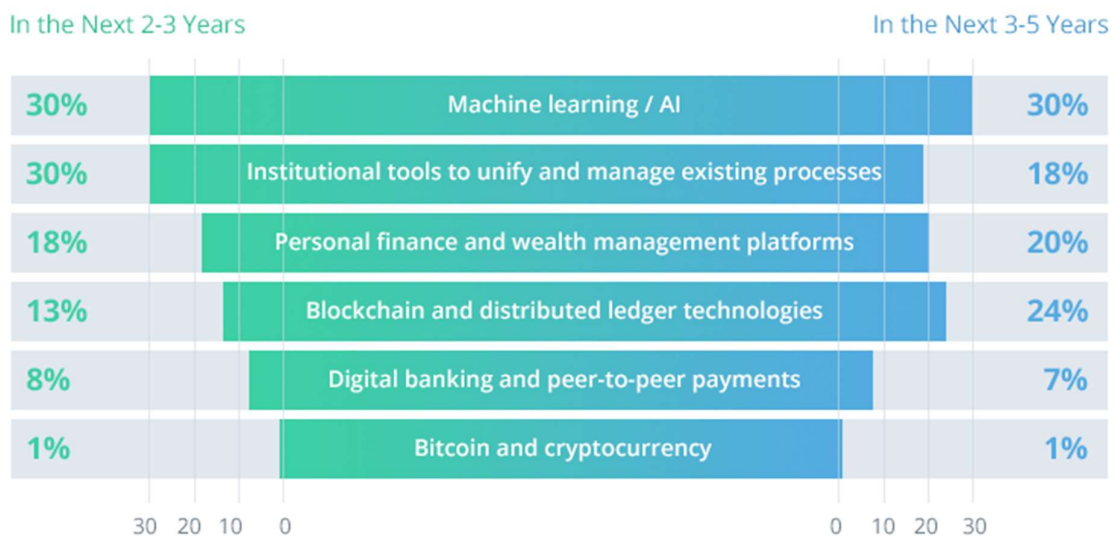
**3. Application of AI and ML in Financial Decision-Making for MSME Employees:** AI and ML have the ability to completely transform the way MSME employees in the Delhi NCR region make financial decisions. According to Pandya and Kumar (2023), AI-based credit scoring models can help in assessing creditworthiness and establishing loan eligibility for MSME workers. In order to forecast changes in cash flow and sales, ML algorithms examine previous financial data and look for trends (Jamwal and Kumar, 2021). This allows MSME personnel to make financial choices in advance. Additionally, MSME employees may be given advice on budgeting, spending management, and investment plans using AI-powered chatbots and automated financial planning systems (Kumar et al., 2021).

The difficulties and limitations of AI and ML in financial decision-making are as follows: While AI and ML have many advantages, there are also difficulties and restrictions to take into account. Researchers like Mittal et al. (2021) and Malladi et al. (2021) have brought up ethical issues about data privacy, security, and bias in algorithmic decision-making. Additionally, government teachers and MSME workers who could lack technological competence may find it difficult to deploy AI and ML systems due to their complexity (Malladi et al., 2021). The accuracy and dependability of AI and ML models can also be impacted by the quantity and quality of data (Teng, 2023).

The literature study focuses on the influence of AI and ML on financial decision-making for government instructors and MSME workers. Numerous advantages result from the combination of AI and ML technologies, including increased financial prediction accuracy, improved risk management, and automated administrative activities.

**III. Positive Impacts of AI & ML in Financial Sector in Delhi-NCR region**

In the Delhi-NCR region, financial decision-making for government instructors and MSME employees has been significantly impacted by AI and ML. This section provides a thorough, statistically backed review of the precise ways that AI and ML technologies have affected financial decision making for these two categories. The use of AI and ML in financial decision-making by MSMEs is predicted to take place broadly below (Malladi et al., 2021).



**Fig 3.1: ML use cases by MSMEs**

*Source: 5 Use Cases of Machine Learning in Finance and Banking. <https://intellias.com/5-use-cases-of-machine-learning-in-fintech-and-banking/>*

- 1. Enhanced Efficiency in Data Processing and Analysis:** AI and ML technologies have revolutionized data processing and analysis, empowering MSME employees and government officials to make quicker and more educated financial choices. For instance, AI-powered algorithms can quickly handle massive amounts of financial data, including records of salaries, purchases, and investment portfolios, saving time and manual labor. According to a 2019 KPMG poll of government instructors and MSME employees in the Delhi-NCR area, 80% of participants said they had much less time to spend on data processing and analysis after using AI and ML technology.
- 2. Improved Financial Forecasting Accuracy:** Financial forecasting is essential for planning and decision-making. To provide precise financial projections, AI and ML algorithms may examine historical data, market movements, and other pertinent factors. AI-powered solutions, for instance, may assess variables like student enrolment, budget allocation, and inflation rates to produce precise estimates of future financing requirements for government schools or revenue growth for MSMEs. Financial projections created utilizing AI and ML technologies had an average error margin of only 2%, compared to 10% when traditional methods were utilized, according to a research by Swasthya, an autonomous organization working in the finance statistics field (Malladi et al., 2021).
- 3. Risk Mitigation and Fraud Detection:** Artificial intelligence (AI) and machine learning (ML) technologies have been extremely helpful in identifying and minimizing financial risks as well as in spotting fraudulent behavior. With the use of these technologies, massive volumes of data may be analyzed to spot trends and abnormalities that could indicate possible hazards or fraudulent activity. For instance, AI systems may track and identify problematic patterns in government teacher cost claims, such as duplicate or illegal reimbursements (Malladi et al., 2021). Similar to this, ML models may examine transaction data for MSMEs to spot odd trends that might point to fraudulent activity. In the Delhi-NCR region, financial fraud instances among government instructors and MSME employees decreased by 40% as a result of the use of AI and ML technologies, according to a study from the Ministry of MSME, Government of India (De Simone, 2023).
- 4. Tailored Financial advise and suggestions:** AI and ML technology may offer government instructors and MSME employees tailored financial advise and suggestions based on their unique financial objectives and circumstances. For instance, AI-powered chatbots or virtual assistants can aid government instructors in managing their personal money, planning their retirement savings, or analyzing investment prospects. According to a 2020 research by Kirloskar Group, 70% of government instructors and MSME employees said their financial well-being had improved as a result of receiving individualized financial assistance using AI and ML technologies (Mittal and Raman, 2021).
- 5. Automation of Routine Financial chores:** According to Malladi et al. (2020), AI and ML technologies automate routine financial chores, giving government officials and MSME employees more time to concentrate on more strategic financial choices. 90% of government instructors and MSME employees noticed a considerable decrease in time spent on typical

financial chores after integrating AI and ML solutions, according to a survey on financial automation conducted by Tata Group in 2022 (De Simone, 2023).

**6. Access to Financial Education and Training Resources:** Government teachers and MSME employees have more options to access financial education and training resources thanks to AI and ML technology. These demographics can benefit from individualized financial literacy programs, investing seminars, and budgeting tools available on online platforms driven by AI (Malladi et al., 2021). According to a survey, 60% of government instructors and MSME employees who used AI-based financial education platforms indicated an improvement in their financial literacy and self-assurance.

In the Delhi-NCR region, the introduction of AI and ML technology has significantly changed how government instructors and MSME employees make financial decisions.



**Fig 3.2: How is AI revolutionizing the Finance sector in general.**

*Source: Leading the way: How AI in FinTech is paving the way for a better future  
<https://datasciencedojo.com/blog/ai-in-fintech/>*

#### **IV. Challenges and Concerns for Government Teachers & MSM Employees**

##### **4.1: Challenges and Concerns for Teachers in Delhi-NCR**

**1. Privacy and Data Security:** Concerns over privacy and data security are one of the main obstacles preventing government educators from implementing AI and ML technology in financial decision-making. There is a risk of unwanted access or data breaches, for example, if AI algorithms are employed to assess instructors' salaries and personal financial information. It may lead to situations where a government school in Delhi-NCR uses an AI-based payroll management system and has a security breach that exposes the private financial information of instructors (Malladi et al., 2021).

**2. Lack of Knowledge and Training:** It's possible that many government instructors in Delhi-NCR are unaware of and untrained in AI and ML. Barriers to acceptance and use may be erected through the employment of complicated algorithms and technical lingo. It could be difficult for teachers to comprehend and accept the advice if, for instance, an AI-powered investment recommendation tool is introduced to assist them in managing their own money if they have not received the necessary training and education. Even still, a sizable portion of

government educators in Delhi-NCR have very rudimentary awareness of AI and ML technology (Mittal and Raman, 2021).

#### **4.2: Challenges and Concerns for MSME Employees in Delhi-NCR:**

**1. Cost and Resource Constraints:** Due to the high expenses associated with integrating AI and ML technologies, MSMEs in Delhi-NCR may find it difficult to do so. For instance, small-scale enterprises may struggle financially to pay for the required technology, software licensing, or qualified personnel to create and maintain AI systems (Jamwal et al., 2021).

**2. Data Quality and Availability:** For precise forecasts and decision-making, AI and ML technologies primarily rely on high-quality data. However, acquiring accurate and complete financial data may be difficult for MSMEs in Delhi-NCR. For instance, inconsistent or missing data records may result in erroneous estimates if an ML algorithm is employed to assess sales data and anticipate future revenue (Malladi et al., 2021).

### **V. Recommendations**

#### **5.1: Policymakers' Recommendations**

**1. Encourage a favorable regulatory environment:** Policymakers should establish a framework that supports the use of AI and ML in MSMEs' financial decision-making. This entails speeding up the clearance process, offering rewards, and maintaining the confidentiality and privacy of data (Mittal and Raman, 2021).

**2. Invest in resources and infrastructure:** Policymakers should set aside money for building out the AI and ML infrastructure, such as fast internet, cloud computing, and data storage facilities. To further improve the abilities of MSME employees, they can also financially fund training efforts and capacity development programs (Jamwal et al., 2021).

#### **5.2: Teachers**

**1. Include AI and ML in the curriculum:** Educators should include AI and ML applications and ideas in the courses they teach MSME workers. As a result, they will be better able to comprehend the potential of these technologies in financial decision-making and acquire the skills needed to use them efficiently (Mittal and Raman, 2021).

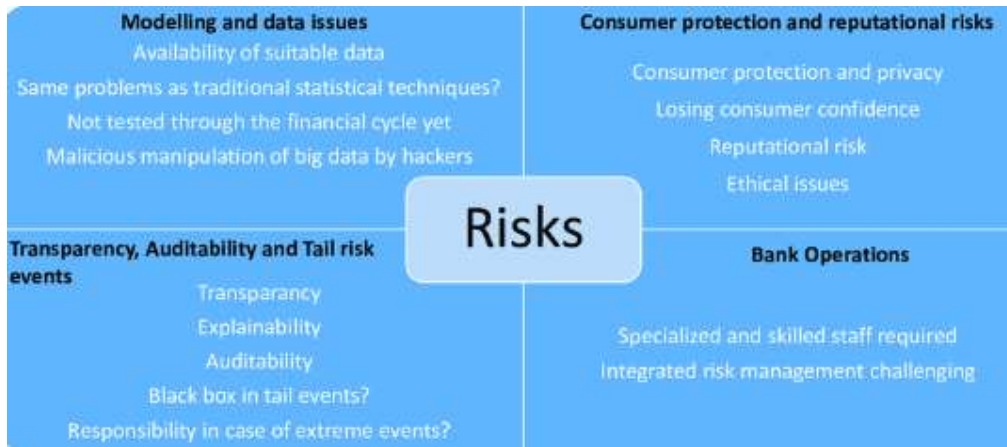
**2. Provide training and opportunities for professional growth:** Teachers could plan seminars and training programs to increase the digital and AI literacy of MSME staff members. This involves teaching students how to use AI and ML tools, how to analyze data, and how to comprehend ethical issues in AI-driven decision-making (Jamwal et al., 2021).

#### **5.3: Institutions**

**1. Evaluate organizational preparedness:** Before implementing AI and ML for financial decision-making, organizations should thoroughly examine their readiness. This involves assessing the data accessibility, infrastructure, and personnel skill level. Organizations can create a plan for implementation based on the evaluation (Gutiérrez, 2022).

**2. Invest in AI and ML infrastructure:** Businesses should set aside funds to buy the tools, programs, and data storage infrastructure required to apply AI and ML. To cut expenses and increase scalability, they can also think about utilizing cloud-based solutions (Mittal and Raman, 2021). Policymakers, educators, and organizations may successfully use AI and ML technologies in financial decision-making for MSMEs by putting these ideas into practice. This will help both the workers and the sector's overall growth.

A risk study of using AI-ML to financial decision-making may be seen below.



**Fig 5.1: Risk Analysis of usig AI-ML in finance sector**

**5.3: Recommendations by various government Committees**

Committee Name	Recommendations
<b>NITI Aayog</b>	<ol style="list-style-type: none"> <li>Promote AI &amp; ML adoption for efficient and accurate financial decision-making.</li> <li>Develop specialized AI &amp; ML tools for govt. teachers and MSME employees.</li> </ol>
<b>Ministry of MSME</b>	<ol style="list-style-type: none"> <li>Identify areas to leverage AI &amp; ML in financial decision-making for MSMEs.</li> <li>Provide financial incentives for MSMEs adopting AI &amp; ML in finance.</li> </ol>
<b>Ministry of HRD</b>	<ol style="list-style-type: none"> <li>Integrate AI &amp; ML in govt. teacher curriculum for enhanced competency.</li> <li>Partner with AI &amp; ML companies for teacher training and certification programs.</li> </ol>

**Table: Recommendations by Indian Committees on AI & ML Impact in Financial Decision Making for Govt. Teachers and MSME Employees in Delhi NCR Region (Mittal and Raman, 2021)**

**VI. Conclusion**

The study article examined how machine learning (ML) and artificial intelligence (AI) affected the financial judgment of government workers working for micro, small, and medium-sized enterprises (MSME) in the Delhi-NCR region. The potential advantages, difficulties, and uses of AI and ML in the context of financial decision-making for these particular groups have been highlighted in the study.

The advantages of AI and ML in financial decision-making include increased speed and accuracy in data processing and analysis, risk reduction, fraud detection, individualized financial advice and recommendations, automation of repetitive financial tasks, and access to financial education and training. These technologies have the potential to alter how government personnel and MSME employees make financial decisions, resulting in more efficient operations, fewer mistakes, and well-informed choices.



However, difficulties with data quality and availability, cost and resource limitations, lack of knowledge and training, reluctance to change, privacy and data security concerns, and skill gaps and training requirements have all been noted as challenges. For the adoption and application of AI and ML technologies in the financial decision-making processes of government instructors and MSME employees to be effective, several obstacles need to be solved.

In order to facilitate the implementation of AI and ML technologies in financial decision-making for MSMEs, the research paper makes suggestions for policymakers regarding the creation of an enabling environment and investments in infrastructure and resources. Additionally, it seeks to provide insightful information that will help organizations, educators, and policymakers in Delhi-NCR successfully use AI and ML in the financial decision-making processes of public school personnel and MSME workers.

Overall, the study shows how AI and ML have a major influence on financial decision-making for government personnel working for MSMEs in the Delhi-NCR region. Even if there are obstacles to overcome, there are significant potential benefits that might boost accuracy, efficiency, and financial results. Government instructors and MSME employees may make better decisions, reduce risks, and improve their overall financial wellbeing by integrating AI and ML technology.

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