

## DEVELOPMENT OF ARTIFICIAL INTELLIGENCE FRAMEWORK TO BOOST ENTREPRENEURSHIP GROWTH OF MUDRA YOJANA (PMMY)

**Mr. Chandrashekhar S Ingole**

*Research Scholar, Department of Management Science (PUMBA), Savitribai Phule Pune University, Pune, India  
chandringole@gmail.com*

**Prof. Dr. D. R. Mane**

*Research Supervisor, Department of Management Science (PUMBA), Savitribai Phule Pune University, Pune, India*

### **Abstract**

*In light of modern, multi-dimensional venture development, Artificial Intelligence holds significant importance, as it can immediately enhance entrepreneurship progression, leading to improved business functioning and, consequently, financial growth. However, the relation between Artificial Intelligence and entrepreneurship continues to be underdeveloped. On the other hand, socio-economic sustainability is necessary for comprehensive advancement, as business owners are an essential component of the system to attain this aim. The key gap discovered at the time of the analysis of the Pradhan Mantri Mudra Yojana (PMMY) plan is that usage of funds is a deficient link, which may be tweaked to banking NPA status. Hence, the proposed study pays attention to the introduction of Artificial Intelligence by the proposed methodology PMMY-AI, which may drive uniqueness, bridges entrepreneur as well as PMMY features, and also contributes significantly to financial growth.*

**Keywords:** Artificial Intelligence, PMMY, MUDRA, Entrepreneurship growth, Economical growth, Sustainable banking

### **1. Introduction**

Although Artificial Intelligence (AI) is broadly known as the most recent mode of automation that will trigger important technical interferences, it continues to be ambiguous how AI performs a necessary role in stimulating entrepreneurial activities [1, 2]. Furthermore, irrespective of the continuous conversations between AI and entrepreneurship, the literature is lacking in opinion concerning many of these businesses, and so their impact on economic development [3].

The Pradhan Mantri Mudra Yojana has made vital advances in endorsing socioeconomic sustainability with the aid of entrepreneurship. Through approaching existing issues and leveraging its positive results, the plan can play a crucial role in obtaining comprehensive advancement as well as financial strength. Tactical policy innovations, including strengthening monetary literacy, endorsing the virtual component, and fostering public-private ties, will assure PMMY's positioning with India's Vision Viksit Bharat@2047 [4]. In the Indian environment, as SMEs underpin the overall economy, advancement is an essential component triggered by economic regulators. The Indian administration has identified the importance of small-scale business associations from the beginning and has subsequently enforced many policy guidelines to enrich the entrepreneurial mindset. Out of all these concurrences, the PMMY plan is one of the key types of initiatives to catalyze the funding challenge of the small-scale business models. PMMY was founded in 2015 to present

working capital devoid of security for the MSEs to support them in utilizing the funds needed for their progress [5].

The PMMY programme is executed within the umbrella of the Micro Units Development and Refinance Agency (MUDRA), which in turn gives collateral-free finances to noncorporate, non-farm small as well as micro-businesses. The plan is organized right into 3 loan classes: Shishu (up to INR 50,000), Kishore (INR.50,001 to INR 5,00,000), and Tarun (INR 5,00,001 to INR 10,00,000), catered to firms at distinct levels of development [6,7].

This segmentation facilitates the plan to bring up the different requirements of entrepreneurs, from new credit seekers needing modest capital to considerably more proven firms searching to broaden their businesses. The overarching targets of PMMY incorporate promoting self-reliance, enhancing employment generation, endorsing comprehensive financial growth, and so cutting down local disparities [8,9].

Hence, the proposed study incorporates an AI framework to track the entrepreneur's business growth, payment/repayment, and feedback reporting for the banking hub.

### **2. Related Literature**

Looking at the AI as well as entrepreneurship separately may be misguiding for researchers as well as policy-makers as the joint impact of entrepreneurship, and AI may give distinctive results on financial progression. Currently, this

knowledge of just how AI and so entrepreneurship can chip in to financial development continues comparatively understudied. Consequently, the research designed a framework for contemplating regarding the association among AI, entrepreneurship, as well as financial progression, as presented in Fig. 1 [10].

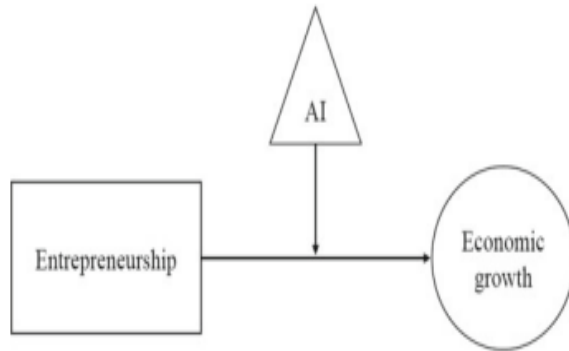


Fig.1: AI recommended framework (H. Ghura and A. Harraf, 2021)

AI retains assurance in assisting many of these alternatives; however, it needs mindful assessment to ensure its proficient and moral deployment in the pursuit of sustainability targets. The author aimed to determine whether AI considerably affects the sustainable entrepreneurial procedure. This thorough analysis framework combines strategies from entrepreneurship, stakeholder theory, and virtual concept, providing a diverse perception [11]. However, conceptual framework development is important for AI strategy development.

Even though many firm owners understand efficiency as well as job gratification benefits linked with AI, critical obstacles to understanding and applying AI continue to exist. Major difficulties consist of limited understanding, issues regarding data privacy as well as reliability, and the intricacy and speedy development of AI systems. Considering that understanding the concepts of AI is principally self-directed, firm owners with better time frames and resource limitations have been slow to adopt AI. The author identified that business owners prefer on-demand assets and methods of understanding the concepts that do not necessitate significant planning to conform to their plans [12]. However, in the case of banking and PMMY tracking, it is crucial to reflect on two circumstances: the bank's point of view and the entrepreneurs' growth point of view.

The MSMEs have taken a critical position in cultivating entrepreneurial undertakings with the aid of impressive venture techniques. These kinds of associations are indicated by varied procedures around the market, featuring an extensive spectrum

of products and services to provide to both domestic and offshore markets. In India, MSMEs have proven important by producing considerable employment possibilities with decreased capital expenditure compared to huge sectors [13, 14]. Additionally, they have worked out for industrialized rural sectors, lessening local instability and facilitating them to encourage a more fair distribution of national income and wealth.

Corresponding to the latest market research carried out by NSS, India had about 633.88 lakh unincorporated nonagricultural MSMEs associated in different financial activities [15]. On the other hand, small-scale firms in the remarkably ambitious Indian market face various difficulties, including modest resources, a lack of guarantees, and a modest credit story. Access to financing continues to be essential for all of them to fulfill operating capital demands, purchase accessories, increase their business, and promote advancement. Sufficient economic support not only assists these firms in enduring but also enables them to capitalize on growth prospects and contribute to the country's entire economic advancements [16].

### 3. Proposed Artificial Intelligence Model Framework

According to the literature review, it is confirmed that there is little research that collaborates entrepreneur growth tracking and banking associations. Numerous studies focused on the statistical analysis to depict the growth ratio of PMMY for the past decade. The proposed strategy includes four key pillars, as shown in Fig.2 below.

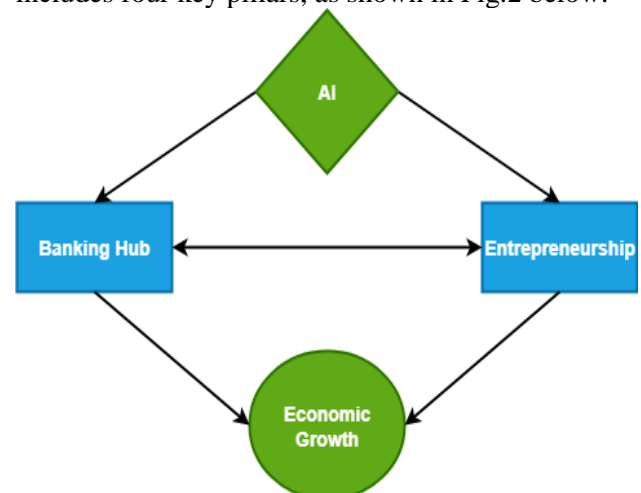


Fig.2: PMMY-AI framework (Generated by the Researcher)

The ultimate aim of the system is 'Entrepreneur Growth', which in turn lowers the banking NPA. By monitoring the status of an entrepreneur's business profit, the bank can automatically demand

the loan repayment. Also, for successful loan repayment, the bank can get automatic business indexing, which may help to provide a next-level business loan. For defaulter entrepreneurs, consultation can be provided by an incubator organization or a dedicated banking expert.

Hence, the proposed study suggests a strategy for end-to-end PMMY-AI flow, which can be used for practical implementation. As shown in Fig.3 below, the AI monitoring system is a module that takes part in an automatic decision and alert system where the banking expert's task remains to update new data of PMMY loan borrowers and provide next-level loan demand for successful entrepreneurs.

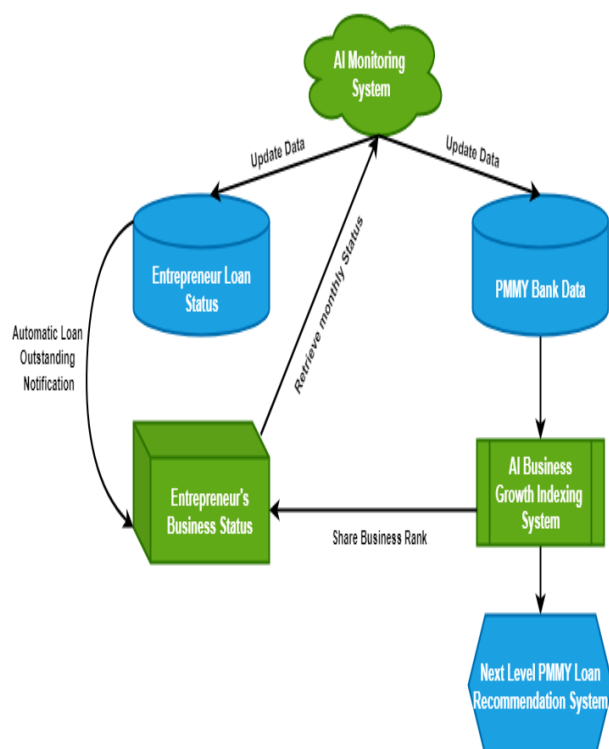


Fig.3: Proposed strategic PMMY-AI model flow  
(Generated by the Researcher)

This system will streamline and motivate entrepreneurs by monthly reporting of business profit and loss. Along with this, an automatic business indexing alert can push entrepreneurs to do more business to stay ahead. The proposed strategy is designed to motivate both entrepreneurs and banking professionals, which will impact the overall loan cycle.

#### 4. Conclusions

In the era of AI and process modernization, few traditional monitoring ways can stay behind, causing a loss of business. However, the proposed PMMY-AI strategy gives an opportunity to collaborate between the bank and entrepreneurs by monitoring the business cycle as well as the loan repayment cycle. Innovative business indexing and

automatic alerts about the business profit/loss system will motivate entrepreneurs to perform better. As a future techno-managerial focus, the proposed strategy can be implemented to provide alerts in regional languages so any entrepreneur can understand the importance of the system.

#### References:

1. Sharma, Deepa. "The perspective of entrepreneurs: AI is a boon for startups and innovation." Cases on AI-Driven Solutions to Environmental Challenges. IGI Global Scientific Publishing, 2025. 483-510.
2. Mittal, Shashank, Ajay Chandel, and Phuong Mai Nguyen. "AI and social media analytics: Leveraging real-time data for entrepreneurial growth." Improving Entrepreneurial Processes Through Advanced AI. IGI Global, 2025. 267-290.
3. Uriarte, Sebastián, et al. "Artificial intelligence technologies and entrepreneurship: a hybrid literature review." Review of Managerial Science (2025): 1-49.
4. CHANDRA, M. "Socio-Economic Sustainability through Women Entrepreneurship: Challenges and Prospects of the PMMY Scheme." (2025).
5. Chatterjee, Aditi, and Shreekanth Iyengar. "Financial Inclusion in Robotics Entrepreneurship: Leveraging the Pradhan Mantri Mudra Yojana (PMMY) Scheme for Robotics Entrepreneurs."
6. Ganapathi, S., and V. Mayakkannan. "Pradhan Mantri Mudra Yojana (Pmmmy) Scheme: Challenges And Future Prospects." (2025).
7. Aggarwal, Nipun. "Analyse The Impact of Pmmmy in Fostering Businesses under Msme's Sector." Journal of Pharmaceutical Negative Results 13 (2022).
8. Malik, Firdous Ahmad, and D. K. Yadav. Financial inclusion schemes in India. Berlin: Springer, (2022).
9. Singh, C. B., and Priyanka Tiwari. "Entrepreneurial Culture Development through Financial Support under Mudra Scheme in India." Integral Review: A Journal of Management 11.1 (2021).
10. Ghura, Hasan, and Arezou Harraf. "How will artificial intelligence reshape the future of entrepreneurship and economic growth?." Applications of artificial intelligence in business, education and healthcare. Cham: Springer International Publishing, 2021. 69-79.
11. Ahmić, Azra, and Lejla Ahmić Šahović. "Artificial Intelligence Impact on the Sustainable Entrepreneurial Process." Journal of Ecohumanism 4.2 (2025): 235-248.

12. Chandler, Miles, Howard Wial, and Dobbin Bookman. "AI in Business: How Small Business Owners Are Learning, Using, and Navigating Challenges with AI Tools AI in Business." Using, and Navigating Challenges with AI Tools AI in Business (February 06, 2025) (2025).
13. Aggarwal, Nidhi Pande, and Arun Kumar. "Women Economic Empowerment Policies: Challenges and Opportunities." Empowering Indian Women Through Resilience: Recent Developments and Future Perspective (2025): 213-233.
14. Eliganur, Basavaraja, and B. Ravi. "A Descriptive Study on Government Schemes for Startup Initiatives in India with special reference to Pradhana Mantri Mudra Yojana (PMMY)." (2025).
15. Nambiar, Jayasree. "A Study of Performance of PMMY among MSMEs in Promoting Financial Inclusion." (2025).
16. Solanki, Poonam, and Kuldip Singh Chhikara. "Constraints to the promotion of financial inclusion in India: an empirical study of implementing agencies under Pradhan Mantri MUDRA Yojana." International Journal of Social Economics 51.8 (2024): 1076-1092.