



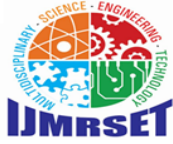
# International Journal of Multidisciplinary Research in Science, Engineering and Technology

*(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)*



**Impact Factor: 8.206**

**Volume 9, Issue 4, April 2026**



## International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

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# Artificial Intelligence in Credit Risk Assessment for MSMEs in India

## An Empirical Study of Perception, Adoption, and Operational Efficiency

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**ABSTRACT:** This paper empirically examines the awareness level, adoption readiness and the operational efficiency implication of AI in credit assessment to Indian Micro, Small and Medium Enterprises (MSMEs). The Indian economy hinges on a major part of MSMEs which traditionally struggle from disproportionate access to credit facilities. In this paper, we make an attempt to examine awareness, the digital readiness and trust in AI systems and willingness for its use, through a well-structured questionnaire from 52 respondents i.e. Owners, finance manager, accounts officer of the firms; loan officer and representative from financial institutions and a statistical evaluation is made on the obtained data. In terms of findings, we report that awareness level regarding the AI based credit risk system is high (61.5%), digitalized records are maintained by 80.8% and 80.8% respondents expressed willingness for adopting AI based credit systems. The AI system is generally seen by respondents to increase loan approval speed (82.7%), reduce human biases (65.4%) and enhance the credit inclusiveness for MSMEs (80.7%), while concerns of data privacy and security along with explainability is expressed by many. In light of good prospects the paper suggests that implementation of these concepts will be eased with strong data governance frameworks, regulatory standards, and development of explainable AI driven credit scoring model.

**KEYWORDS:** Artificial Intelligence, Credit Risk evaluation, MSMEs, India, Financial inclusion, machine learning, alternate data, FinTech, Digital Lending.

### I. INTRODUCTION

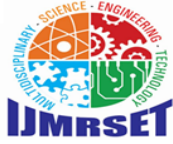
The most crucial driver of the growth and development of MSMEs is access to credit at low cost and on time. The MSME sector accounts for 30% of the GDP, 45% of the exports and has employment support for more than 110 million people (Ministry of MSME, 2023). The sector faces a credit gap of Rs. 20-25 trillion. The primary reason for this credit gap is the inherent weakness in traditional credit evaluation mechanisms which heavily depend on formal credit history, collateral and manual document submission.

The rise of AI/ML technologies is challenging the conventional credit risk models. With AI/ML, enormous amounts of structured and unstructured data (GST returns, digital payment transactions, social behavior, psychometric data, etc.) can be processed in order to create a real-time and holistic assessment of creditworthiness for previously underserved credit consumers.

This paper solely focuses on the MSME domain in India where the digital landscape is quickly evolving through the development of UPI, GST Network, Account Aggregator framework etc. Within this framework, it becomes paramount to understand the perception of MSME stakeholders towards AI based credit risk systems, their level of trust and future intentions to adopt the technology.

### II. STATEMENT OF PROBLEM

Existing methods of credit assessment in India are document-intensive, collateral-centric and rely on past trends derived from credit bureau records. This renders a large segment of MSMEs-especially micro-entreprises and first-



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generation entrepreneurs-structurally excluded from formal credit access as paper-intensive and time-consuming credit appraisals have result in long turnaround times, biased and arbitrary appraisals and ultimately, high rates of rejection. Though AI-based credit risk systems have been successfully implemented in the developed economies and in the FinTech segment of developed economies at a macro level, their adoption is still at a nascent stage in India's MSME environment and at a low awareness level among MSMEs. There is thus a disparity between the availability of technology solutions in AI-based credit assessment and willingness, awareness and readiness of stakeholders of MSME sector. In this paper we aim to empirically evaluate this disparity and to explore the inhibiting and enabling factors in widespread adoption of these systems.

### III. REVIEW OF LITERATURE

Arora & Bhatt (2024) showed ML models are much more accurate in predicting the default risk for Indian MSMEs by using GST transactions and UPI payment behavior as alternative credit signals, and reduces false positive rates by 23%.

Baesens et al. (2023) gave a comprehensive review on AI techniques in credit risk, stated gradient boosting and neural network models perform better in discriminatory power than logistic regression, yet face major interpretability challenges to the regulator driven credit systems.

RBI (2022) acknowledges the potential of account aggregator-enabled data flows on empowering AI-driven credit scoring but also identifies the importance of fair, transparent and explainable algorithmic credit decision in the regulator driven system.

Sahay et al. (2020) highlight in IMF working paper that AI alternative credit scoring can provide financial inclusion for thin-file clients, enabling credit access for up to 40% of those under-banked clients in emerging economies while pointing out the lack of transparency and data privacy risk for the system need appropriate regulation.

Verma & Singh (2023) study MSME credit behavior in Maharashtra found that firms with organized digital financial records are 2.8 times more likely to be granted with a formal credit loan, stressing on the role of digital preparedness as a catalyst for access to formal finance.

Kumar & Patel (2024) examine FinTech lending in Indian MSME and report that ML algorithms with psychometric variables along with traditional credit data offer increased access to credit for first-generation MSME without traditional credit history. Agarwal & Chua (2020) provide evidence that the digital footprint-including, for instance, patterns of mobile phone use, social media activity, e-commerce usage-constitutes a useful proxy for creditworthiness for under-served SME clients in Asia-Pacific markets, which may suit India's growing digital economy.

### IV. RESEARCH GAPS

There is a noticeable lack of discussion of the views and willingness to adopt of MSME clients. Most papers analyze AI credit risk systems based on models or the FinTech company view rather than taking a holistic look at individual customers of FinTech firms and considering the MSME perspective and dynamics in the Indian context. Empirical study on the awareness, digital readiness, trustworthiness, and willingness to adopt AI credit scoring from all relevant MSME stakeholders- owners, finance managers, and accounts officers-is missing from the current literature. Moreover, it has not sufficiently investigated the efficiency of the new system relative to traditional models in the practitioners' eyes. This paper is designed to address these gaps by gathering primary data from stakeholders in different types and sizes of MSME.

#### Objectives of the Study

- To assess the level of awareness of AI-based credit risk assessment systems among MSME stakeholders in India.
- To evaluate the digital readiness of MSMEs and its relationship with credit access perceptions.
- To analyse respondent perceptions of AI efficiency, accuracy, and bias reduction relative to traditional credit systems.
- To identify key concerns and barriers inhibiting AI adoption in MSME credit assessment.
- To determine the willingness of MSME organisations to adopt AI-based credit assessment tools in the future.



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### V. RESEARCH METHODOLOGY

#### Research Design

This research used descriptive research design to investigate this study by using primary quantitative data. Questionnaire was constructed to collect data on demographic, awareness level, digital readiness, Likert scale attitude toward AI in credit appraisal, level of concerns and level of intention.

#### Target Population

The target population comprises MSME owners, finance managers, accounts officers, loan officers, and personnel from financial institutions engaged in credit decision-making for or within the MSME sector in India.

#### Sample Size

Total responses received were 52, covering micro, small, medium enterprises and banks of various age, experience levels, positions held within the respective organizations.

#### Sampling Technique:

Convenience sampling has been employed in collecting data through a structured questionnaire using online (Google Forms) methodology to make the research wider geographically while economical.

#### Data Collection:

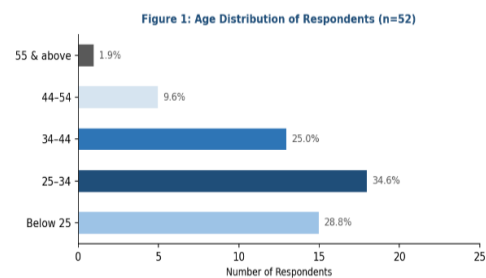
*Primary data:* The data was collected using a structured questionnaire having 26 items including demographics, knowledge, readiness to digital world, attitude with the use of Likert- scale based items, patterns of concerns, opinion based items (open-ended).

*Secondary data:* Data was gathered from sources like articles published in peer-reviewed journals, reports published by RBI and MSME Ministry, IMF Working Papers and also, published analysis by FinTech players for the period 2019-2025.

### VI. DATA ANALYSIS AND INTERPRETATION

Table 1: Age Distribution of Respondents

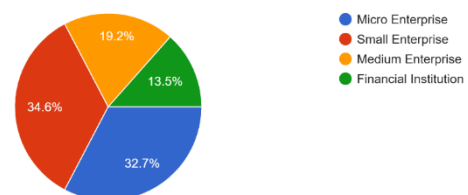
Age Group	Frequency	Percentage
Below 25 years	15	28.8%
25-34 years	18	34.6%
34-44 years	13	25.0%
44-54 years	5	9.6%
55 years & above	1	1.9%
<b>Total</b>	<b>52</b>	<b>100%</b>



As many as 34.6% of respondents are from the 25-34 age group, trailed by respondents under 25 years (28.8%) and those in the 34-44 age group (25.0%). This relatively young respondent profile is consistent with India's emerging entrepreneurial MSME demographics and suggests a higher baseline affinity for digital and AI-based financial tools.

Table 2: Organisation Type of Respondents

Organisation Type	Frequency	Percentage
Micro Enterprise	17	32.7%
Small Enterprise	18	34.6%
Medium Enterprise	10	19.2%
Financial Institution	7	13.5%
<b>Total</b>	<b>52</b>	<b>100%</b>





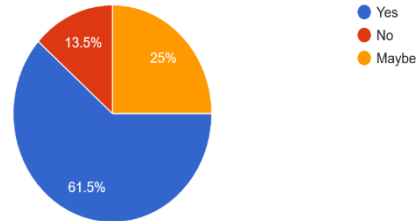
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The most numerous category (34.6%) is the small enterprises category, the next (32.7%) being micro enterprises and the following (19.2%) medium enterprises. The percentage of respondents representing financial institutions is 13.5%. This reflects the credit-seeking MSMEs and the credit-disbursing institutions in a balanced way.

**Table 3: Awareness of AI-Based Credit Risk Systems**

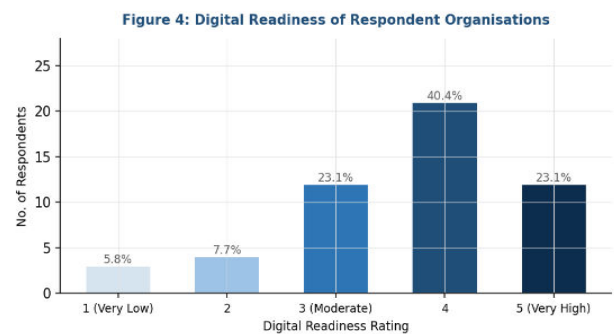
Awareness Level	Frequency	Percentage
Yes	32	61.5%
Maybe	13	25.0%
No	7	13.5%
<b>Total</b>	<b>52</b>	<b>100%</b>



Interestingly 61.5% are aware about AI driven credit risk evaluation systems. Among them 25% are partially or somewhat aware. Only 13.5% are completely unaware. In totality 86.5% have heard something or the other about AI credit and this shows the extent to which FinTech talks have started reaching out to Indian MSME segment within India's MSME community.

**Table 4: Digital Financial Records and Readiness**

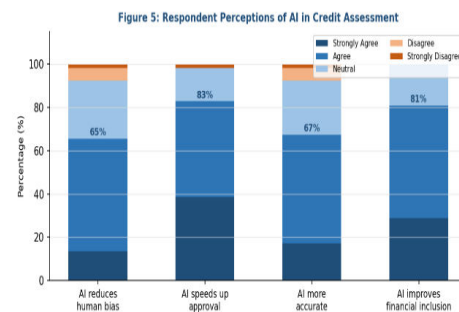
Parameter	Category	Frequency	Percentage
<b>Digital Records Maintained</b>	Yes	42	80.8%
	No	10	19.2%
<b>Digital Readiness (1-5)</b>	Rating 4-5 (High)	33	63.5%
	Rating 3 (Moderate)	12	23.1%
	Rating 1-2 (Low)	7	13.5%



An overwhelming 80.8% of respondent organisations maintain digital financial records, and 63.5% rate their digital readiness at 4 or 5 on a 5-point scale. This substantially digitalised MSME cohort suggests that infrastructure preconditions for AI credit adoption are increasingly being met at the enterprise level.

**Table 5: Perceptions of AI in Credit Assessment (Likert Scale)**

Statement	Agree + Strongly Agree	Neutral	Disagree + Strongly Disagree
AI reduces human bias	65.4%	26.9%	7.7%
AI speeds up approval	82.7%	15.4%	1.9%
AI more accurate	67.3%	25.0%	7.7%
AI improves financial inclusion	80.7%	19.2%	0.0%





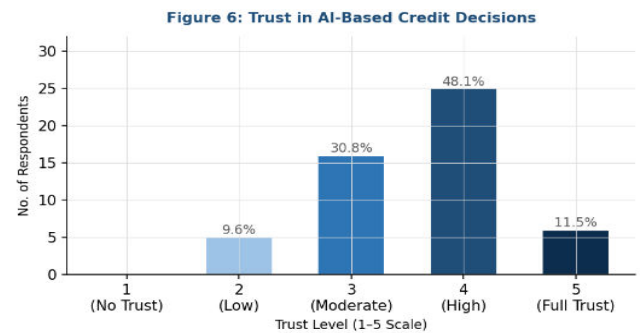
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Results of Perceptual analysis show a high positive consensus regarding AI functionalities on the four studied domains. A large proportion of respondents 82.7% of respondents concur or strongly agree that the AI has the capability to speed up the loan application process-the highest score on the set. The perception on AI's contribution in advancing financial inclusion in SMEs is at 80.7%. Improvements in accuracy of AI, as indicated, stand at 67.3% whilst perceived improvements in reduction of AI bias at 65.4% is relatively lower. These responses portray optimistic views of respondents who have recognized the potential of the AI to achieve efficiency but have cautious beliefs about the AI's accuracy and fairness.

**Table 6: Trust in AI-Based Credit Decisions (Scale 1–5)**

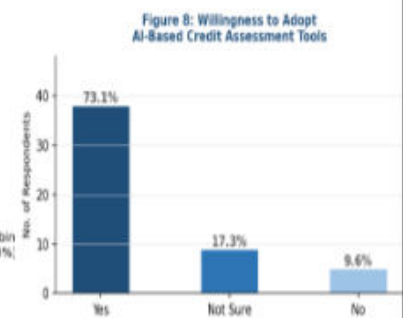
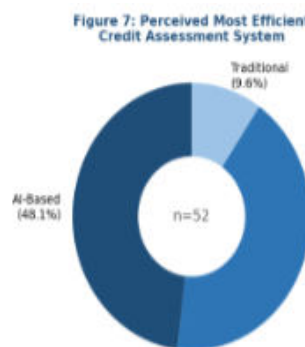
Trust Level	Frequency	Percentage
1 – No Trust	0	0.0%
2 – Low Trust	5	9.6%
3 – Moderate	16	30.8%
4 – High	25	48.1%
5 – Full Trust	6	11.5%
<b>Total</b>	<b>52</b>	<b>100%</b>



The level of trust is mostly favorable, as 59.6% of the people have rated their trust in AI-based credit decisions with a score of 4 or 5. A moderate trust level (3) is expressed by 30.8%, while only 9.6% report low trust. Importantly, no respondent selected the lowest trust level (1), indicating a complete absence of outright rejection of AI-driven credit decisions.

**Table 7: Perceived System Efficiency and Adoption Willingness**

Parameter	Category	Frequency	Percentage
Most Efficient System	AI-Based	25	48.1%
	Combination of Both	22	42.3%
	Traditional	5	9.6%
Adoption Willingness	Yes	38	73.1%
	Not Sure	9	17.3%
	No	5	9.6%



When asked to identify the most efficient credit assessment system, 48.1% select AI-based systems, while 42.3% advocate for a hybrid combination. Only 9.6% prefer exclusively traditional systems. This near-consensus on AI's value is mirrored in adoption intentions: 73.1% of organisations indicate willingness to adopt AI-based credit tools, constituting one of the study's most significant empirical contributions.

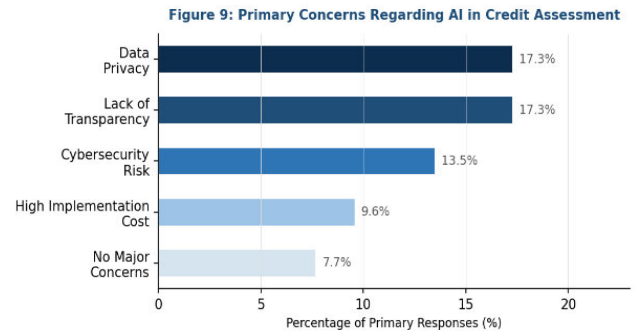


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**Table 8: Primary Concerns Regarding AI in Credit Assessment**

Concern Area	Respondents Citing	Percentage
Data Privacy	~28	17.3% (primary + multi-select)
Lack of Transparency	~27	17.3% (primary + multi-select)
Cybersecurity Risk	~24	13.5% (primary + multi-select)
High Implementation Cost	~12	9.6% (primary + multi-select)
No Major Concerns	4	7.7%



Data privacy and opacity are cited as the top two concerns at 17.3% apiece among the highest reported single concerns. Cyber risk is third, with implementation costs the next highest. None of these concerns are a "primary" concern for just 7.7% of respondents, showing that overall the participants agree that AI implementation should be encouraged, but with limitations and safeguards.

### Reliability Analysis

To assess internal consistency of the Likert-scale perception items, Cronbach's Alpha was computed for the four core attitudinal statements pertaining to AI capabilities in credit assessment (bias reduction, speed, accuracy, and financial inclusion).

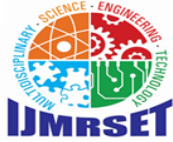
**Table 9: Reliability Statistics**

Cronbach's Alpha	N of Items	N of Respondents
0.714	4	52

The Cronbach's Alpha obtained was 0.714 which is greater than the generally acceptable value of 0.70, showing acceptable reliability. This means that the four likert-scaled items that were constructed to represent perceived notions on AI is a valid, and internally consistent construct that provides an acceptable measure to create aggregated perception scores presented in Table 5.

## VII. FINDINGS

- 61.5% of the MSME stakeholders interviewed are aware of the existing AI-driven credit assessment systems and 86.5% are partially or fully aware of it, indicating an increasing level of FinTech knowledge among Indian MSMEs.
- 80.8% of the responding organizations use digital financial records and 63.5% rate themselves as 4 or 5 on digital readiness, showing that a prerequisite for AI adoption is well met among MSME.
- 82.7% believe that AI enhances the speed of loan approval (the largest percentage on perceptions on any attribute of AI), suggesting that turn-around time is the most apparent benefit.
- 80.7% are of the opinion that AI-lending enhances financial inclusion for MSMEs, which corresponds to the literature that finds the efficiency of alternative data based credit scoring for the thin-files segment.
- 59.6% of the MSME stakeholders have trust level 4 or 5, and not a single MSME has less than level 4 of trust in the AI-based credit scoring decisions. An overwhelmingly positive initial assessment!
- 73.1% of the responding organizations are planning to adopt the AI-driven credit appraisal system and none of them clearly denies this. Thus there is significant unmet demand for AI credit scoring tools.



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- Data privacy and opaqueness of the algorithms were identified as the most critical challenges which could only be solved at design- and regulation-level and/or through the use of XAI-based systems.
- Only 9.6% feel that the traditional scoring system is the most efficient compared to 48.1% which considers the AI-based one more efficient and 42.3% suggests a hybrid model.

### VIII. CONCLUSION

This empirical paper provides strong evidence that, not only is a substantial and growing group of Indian MSME stakeholders aware of AI credit risk assessment systems and are digitally ready and willing to adopt them, but they also exhibit high levels of agreement about its benefits in terms of speed and financial inclusion and about its limitations in terms of transparency, data security, and cyber security. The extremely high level of trustworthiness and, critically, intention of adopting the system (73.1%), shows there is a strong empirical mandate for rapid and well-governed rollout of AI credit infrastructure into the MSME environment. The study also unequivocally points to the fact that any such rollout must be backed by XAI infrastructure, data security practices, affordable implementation strategies, and clear regulatory policies. The hybrid AI-traditional approach seems the most appropriate short-run strategy for the vast majority of Indian MSME stakeholders. Policy and institutional structures should therefore build on, rather than substitute for, existing credit-delivery mechanisms. It is expected that a favorable ecosystem for AI-enabled credit integration will be steadily developed with a widening digital public infrastructure-via Account Aggregator Framework and OCEN- in India.

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