

AI-Driven Risk Resilience: Transforming MSME Risk Assessment for the Bharat Economy

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Introduction

In the past, small and medium businesses in India have been important for the country's economy. New data from the 2023-24 report by the Ministry of MSMEs shows that these businesses contribute 29.1% to the country's overall economic output and also account for 43.59% of all exports. In places like Pune, which is a major centre for car-making, engineering, and IT, these businesses play a key role in global supply chains that serve markets in the USA, Europe, and Southeast Asia. However, many of these small businesses in Pune are run by families and have limited resources, making them more likely to be affected by big changes or problems.

As the "AI for Bharat" program becomes more popular, there is a big need for these businesses to move from old, manual ways of identifying risks to using smart, data-based systems for managing risks.

These systems can help them deal with new risks like cyber-attacks, changes in environmental rules, and unstable world markets.

Risk assessment, which means carefully looking at and understanding risks, is the first step in using AI for better predictions. Even though Pune's businesses are near big financial centres like Mumbai, they often don't have strong systems for managing risks that are tailored to their needs. This study helps fill that gap by mixing traditional risk management methods with AI's ability to predict future issues. By taking advantage of Pune's special position as a place where traditional manufacturing meets digital tech, this research offers a clear plan to help Indian small and medium businesses become more ready to handle unexpected problems in a fast-changing global economy.

Keywords: MSMEs, Enterprise Risk Management, Risk Identification, Risk Assessment

I. Background, problem and Objective

MSMEs have always played a key role in India's economy. Recent reports show that this sector now contributes about 31.1% to India's GDP and nearly 48.58% of total exports. However, even though they are important for the economy, many

of these businesses are family-run and depend on a few key people for decisions. This setup, along with limited access to money, makes them more vulnerable to economic challenges.

Pune is a major industrial and educational center with over 7.6 million people living there.

It is a mix of traditional manufacturing and modern high-tech services. Known as India's "Automobile Hub," Pune has many small and medium-sized businesses in areas like forging, engineering, and IT.

Pune has several advantages that support its industries:

- Good transportation links by road, rail, and air, connecting to major ports and Mumbai, which is just 150 km away.
- These local businesses are important parts of global supply chains, exporting products like precision parts and software to places like the US, EU, and ASEAN.
- The city has top-class educational and research institutions, which help in adopting new technologies like AI.

As companies move towards data-based decision-making, risk management has become a key part of running a business.

For MSMEs in Pune, using AI for risk assessment is important to handle modern threats that traditional methods can't predict.

In India, especially in areas like Pune, local businesses face unique challenges with AI, such as:

- Using AI to manage risks in unstable supply chains.
- Protecting automated factories from online threats.
- Using data to deal with changes in laws and the environment, especially in heavy industries like foundries and metalworking.

The research looks at how MSMEs in Pune identify and manage risks today, aiming to connect traditional methods with new AI-based systems that can help these businesses become more resilient in the long term.

II. Research Methodology

This study used existing information, and most of the findings come from research done recently.

Since there is not much research on this topic in India, most of the studies used were from other countries. I tried to include research from all around the world with a focus on emerging economies. However, I also used the MSME Annual Report published by the Ministry of Micro, Small and Medium Enterprises in collaboration with the Ministry of Statistics and Program Implementation, Government of India. This report helped me understand the general state of the Indian economy and specifically the MSME sector. My goal was to make the review relevant to today's business environment, so most of the literature used was published in the last ten years, making the study more up-to-date. I also tried to present the literature in chronological order to see if there was any pattern in how the risk management process has evolved and been applied over time.

III. Theoretical Framework

Risk Management usually follows these steps:

- Understanding the organization's environment
- Identifying risks
- Analyzing risks
- Evaluating risks

- Managing risks

Risk assessment is a vital part of risk management, and how accurate it affects the whole process.

According to the ISO 31000:2018 standard, there are two main ways to identify risks:

- Qualitative approach: This method involves checking how serious a risk is and how likely it is to happen.

Its purpose is to create a short list of risks that need more attention.

- Quantitative approach: This uses data to calculate risks and helps determine exactly how much a risk could cost the business.

Based on these ideas, this study explores how the reviewed literature connects to the overall field of study.

IV. Mapping the Resilience of MSME's in Bharat: Integrating Global Risk Perspectives with AI Capabilities

Operational stability in Pune's small and medium-sized businesses is often threatened by problems that come from inside and outside the company, which can affect how things are made and how safe the workplace is. Although international standards like ISO 9001:2015 suggest that identifying risks and understanding their impact should be directly linked (Islam & Tedford, 2012), early studies in India mostly ignored a full approach to Enterprise Risk Management (ERM) and instead focused on solving problems one at a time (Gupta, 2012). For the specialized engineering and auto parts companies in Pune, the ISO 31000 framework is often too complicated and needs too many resources to use. Because of this, a more flexible and connected method is needed—one that measures risk by looking at how likely something is to happen and how bad the effects would be. Without clear ERM guidelines, the owners of Pune's businesses often have trouble deciding how much risk they are willing to take, which makes them rely more on their own guesses rather than using real data. This lack of clear direction shows that there is a big need for an ERM system that's tailored for the Indian small and medium-sized business environment and can grow with Pune's fast industrial expansion (Gwangwava, 2014; Pacaiova et al., 2013).

As risks related to technology become more complex (Aven, 2015), Pune's role as a "Phygital" hub means it needs to move toward using cognitive analysis and Artificial Intelligence.

Old ways of analyzing risks are not enough to handle the large amounts of data that modern manufacturing produces; AI helps by finding both hidden and new risk factors that people might miss when they do things manually (Zigiene et al., 2019). While risk management in smaller Pune companies is currently more based on instinct than on a structured system (Gaschi-Uciecha, 2019), the **AI for Bharat** initiative offers a way to fix this. By using AI tools that are easy to use even with limited resources, small and medium businesses can move from rough guesses to precise assessments and ongoing monitoring of remaining risks (Mansor, 2017). This change makes sure that risk management helps, rather than slows down, important business decisions, allowing Pune's small and medium businesses to continue playing an important role in the global supply chain.

India's MSME Economic Indicators (2021-2024)

Economic Metric	Value (%)	Source
Share in National GDP	29.1%	MSME Annual Report 2023-24
Share in Total Exports	43.59%	Ministry of Commerce

Share in Manufacturing	36.0%	Ministry of Statistics
Employment Generation	~11 Crore People	MSME Ministry

Table 1: MSME Ministry Report, 2023-24

In the AI for Bharat initiative, risk assessment acts as a key intelligence tool that helps Pune's small and medium businesses move from just reacting to problems to building strong, long-term strategies. By combining technical rules and legal requirements into a digital system, these businesses can find clear ways to handle risks and prepare for unexpected issues (Kruger & Meyer, 2021). For Pune, which is a major manufacturing area, a well-organized risk check does more than show possible problems; it gives high-quality information that helps build smart AI models. These models can then automatically track compliance and give instant insights about managing risks, making sure that decisions in small industries are based on careful analysis, not just guesswork.

Also, as international markets more and more focus on ESG standards—Environmental, Social, and Governance—sustainability has become a key part of managing risks for Pune's export businesses.

AI systems help these companies keep up with the changing rules and laws around sustainability (Abbas et al., 2021). By automatically reporting on sustainability goals, small businesses in Pune can follow regulations and also improve their image in markets like the USA and EU. In the end, putting AI into the risk assessment process changes it from a hard, time-consuming job into a powerful tool that helps "Bharat's" smaller businesses grow and stay stable in a changing global market.

Category	Percentage (%)	Research Insight
Recognize AI as a Growth Driver	94%	High awareness of AI's potential.
Intend to Adopt GenAI/ML (by 2030)	60%	Forward-looking strategic intent.
Currently Use AI for Risk/Ops	18%	The "Implementation Gap"
Report Lack of AI Governance	72%	Main cause of AI project failure.

A good risk management system does more than just stop problems; it also finds opportunities that can help a business gain an edge over others. For the small and medium-sized enterprises (MSMEs) in Pune, using a complete Enterprise Risk Management (ERM) approach is really important to stop issues like poor management and bad financial decisions that stop these businesses from growing (Doreswamy et al., 2022). As Pune becomes a top global center for cars and precise engineering, the idea of "AI for Bharat" needs a change from old, separate ways of managing risks to a new, smart system that uses data. This change helps businesses connect risk assessment with their main goals, so local business owners can see risks in a bigger picture rather than just as problems for one department (Przetacznik, 2022).

Even though this system has a lot of benefits, many MSMEs in Pune still use old, haphazard methods, like paying for fixes only when something breaks, often because they don't have enough knowledge about technology (Chakabva & Tenegh, 2023).

Moving to a structured, AI-based way of assessing risk helps these businesses move away from the usual "fix after it breaks" approach. Using a digital risk tool that gives numbers for how likely and how bad different events are helps Pune's businesses decide what needs attention first and set up automatic plans for dealing with risks (Mattinen, 2023). In the time of "AI for Bharat," these number-based tools work well as training data for AI systems, turning guesswork into a smart, scalable way of managing risks that protects Pune's reputation as an industrial center and makes sure businesses keep running smoothly in the long term.

Risk Type	Pre-2020 Impact (Low-High 1-5)	2025-26 Impact (Low-High 1-5)	Primary AI Solution
Cybersecurity	1.2	4.8	Real-time threat detection
Supply Chain Delay	2.5	4.2	Predictive logistics ML
Compliance/Regulatory	3.0	4.5	NLP Legal-Bots
Cash Flow (Delayed Pmts)	4.0	4.9	AI Credit Scoring (CAM)

Table 3: Ministry of Micro, Small & Medium Enterprises, GoI

In the growing field of "AI for Bharat," it's well understood that small and medium-sized businesses in the Pune industrial area face special difficulties when trying to use Enterprise Risk Management (ERM). These problems include not having enough money and not having experts who focus on risk. These issues often leave local businesses in a situation where they only act when problems arise. But moving to an AI-based ERM system can give Pune's manufacturing and IT areas a big advantage. It helps with better risk control, smarter use of resources, and more trust from stakeholders (Ahmed & Teo, 2024). In a place like Pune, where accuracy and meeting deadlines are essential, being able to measure and understand risk

levels is not just helpful—it's necessary for success. Evaluating the level of risk has two important benefits for small and medium businesses in Pune.

First, it helps classify risks as very important, important, or not important based on how much they could affect local supply chains or global delivery times. Second, this classification helps create smart, data-based plans to deal with those risks (Tsay, 2024). By using these risk evaluation tools in AI systems, businesses in Pune can go beyond using old spreadsheets to use real-time dashboards. This "Smarter Bharat" method means even the smallest engineering companies can focus their limited resources on the biggest risks, helping them keep their reputation strong in the international market.

Conclusion:

Looking at how Enterprise Risk Management (ERM) has changed over the past ten years, it's clear that the focus has moved toward results and using data more effectively.

Risk assessment has become the most important part of the ERM system, acting as the main way to handle risks properly. In the busy industrial area of Pune, where small and medium businesses (MSMEs) are key parts of supply chains for big global companies, the ideas of risk management are slowly spreading from bigger organizations to smaller ones. This "trickle-down" of resilience helps local businesses deal with the growing rules and regulations from around the world. Yet, even with this progress, there's still no standard ERM system that's easy to use and fits the special economic and social challenges faced by Indian entrepreneurs. With the initiative of **AI for Bharat**, there's a big chance to fix this by creating smart, AI-powered tools. These tools could offer Pune's MSMEs the smart guidance they need to move past just surviving and build long-term, stable growth in a digital global market.

Limitations:

It should be noted that this research is mainly based on secondary sources.

Even though the basic ideas of risk are the same everywhere, much of the existing research comes from global settings, which may not fully match the unique cultural, economic, and practical situations of the Indian MSME sector. Therefore, while the theory behind ERM is strong, applying these models to a specific place like Pune—where traditional manufacturing and modern IT services mix—needs more real-world testing. Future work under the AI for Bharat initiative should focus on collecting data directly from local business owners. This will make sure that the AI-based ERM tools are not only high-tech but also fit well with the real needs and conditions of small industries in Bharat.

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