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A review of digital transformation strategies for enhancing operational efficiency in Indian Sme's

Subhi Shukla
Research Scholar, Department of Management NIILM University, Haryana, India.

Abstract
Small and Medium Enterprises (SME's) play a vital role in India's economic landscape, contributing significantly to employment generation, innovation, and GDP. However, many Indian SMEs face operational inefficiencies due to limited resources, manual processes, and lack of access to modern technologies. Digital transformation offers promising strategies to address these limitations. This paper reviews various digital transformation strategies adopted by Indian SMEs, with a focus on their role in improving operational efficiency. The review synthesizes findings from existing academic literature, industry reports, and government publications, identifying key digital tools, benefits, challenges, and future prospects. The study concludes with recommendations for policy-makers and SME owners to promote sustainable digital adoption.

Keywords: Digital transformation, SME s, operational efficiency, India, ERP, CRM, cloud computing, automation, Industry 4.0, business technology

Introduction

India's industrial economy is based on small and medium-sized businesses, or SME's. The Ministry of Micro, Small, and Medium Enterprises (MSME) estimates that there are over 63 million SMEs in India, which account for around 30% of the nation's GDP and create a significant number of jobs. Due to antiquated business models and restricted access to technology, many SMEs face productivity challenges despite their significance. An efficient way to improve operational efficiency is through digital transformation, a process that uses digital tools and technologies to modernize business operations.

In order to enhance their operational performance, Indian SMEs are implementing digital transformation strategies, which are examined in this paper. It offers a thorough grasp of how technology is changing small business operations in India by critically analyzing the body of existing literature and industry practices.

Digital Transformation

In order to improve business operations, digital transformation refers to the use of contemporary digital technologies such as cloud computing, blockchain, mobile devices, artificial intelligence, and the Internet of Things (Gill *et al.*, 2019) [18]. To achieve major improvements, a company must strategically integrate these technologies throughout its operations. This change affects how people and groups interact and use technology to create value in addition to how businesses run (Luftman *et al.*, 1993) [19]. The process of digital transformation is complex and places equal emphasis on technological advancements and human interactions. Although there are opportunities, there are drawbacks as well, particularly for small and medium-sized businesses that must adapt and innovate (Trenkle, 2020) [20]. SMEs must invest in particular organizational and technological skills, such as knowledge management, information processing, and digital networking, in order to successfully embrace digital transformation (Sabri, 2022).

Digital Transformation in SME's

The term "digital transformation" (DT) describes how digital technologies are being incorporated into every aspect of business, radically changing how companies function and provide value to their clients. DT for SMEs involves rethinking organizational culture, business models, and procedures in addition to implementing new technologies. SMEs are becoming more aware of the need for digitalization to boost operational effectiveness, increase competitiveness, and improve customer engagement, especially in developing nations like Indonesia (Sagala, 2024).

In their quest for digital transformation, SMEs in Indonesia—including those in Tangerang—face particular difficulties. SMEs usually face limitations like tight budgets, a lack of technical know-how, and internal resistance to change, in contrast to large corporations, which frequently have substantial financial and technical resources (Febrina, 2024). However, research shows that SMEs that successfully adopt DT use digital tools to improve decision-making, increase productivity, and improve customer experiences (Thakkar, 2023).

The Role of SMEs in the Indian Economy

India's industrial and service sectors are based on small and medium-sized businesses, or SMEs. According to the Ministry of Micro, Small, and Medium Enterprises (MSME), there are over 63 million SMEs in India, which contribute approximately 30% of the country's GDP, 45% of all exports, and employ over 110 million people. SMEs work in a variety of industries, including retail, food processing, textiles, IT services, manufacturing, and handicrafts. They play a key role in encouraging entrepreneurship, advancing regional economic development, and lessening the gap between urban and rural areas.

Despite their enormous numbers and contributions, Indian SMEs frequently encounter barriers to financing, skilled

labor, modern infrastructure, and—above all—advanced technologies. Their operational productivity and competitiveness in both domestic and international markets are severely hampered by these limitations.

Operational Inefficiencies in Indian SMEs

Most Indian SMEs rely on manual processes, paper-based record-keeping and conventional business practices. This often results in:

- Delays in decision-making
- Inventory mismanagement
- Data inaccuracy
- Poor customer tracking
- Low scalability and flexibility

Many SMEs find it difficult to control supply chains, maximize output, cut expenses, or react swiftly to market shifts in the absence of digital workflows or integrated platforms. Particularly in the context of post-pandemic market dynamics, the productivity gap between SMEs with and without digital capabilities is widening.

Emergence of Digital Transformation as a Strategic Imperative

Digital transformation refers to the integration of digital technologies—such as cloud computing, ERP, CRM, AI, IoT, and data analytics—into business operations to improve efficiency, agility, and value delivery. For SMEs, digital transformation is not merely a technological upgrade but a strategic imperative to survive and grow in an increasingly competitive and tech-driven ecosystem.

The COVID-19 pandemic further accelerated the need for digital adoption, as lockdowns and remote work made physical operations impractical. SMEs that had already invested in digital tools showed greater resilience, adaptability, and continuity in service delivery.

Digital tools offer tangible improvements in areas such as:

- Workflow automation
- Inventory tracking
- Customer relationship management
- Financial reporting
- Market outreach through digital marketing

Digital Transformation Strategies Adopted by Indian SMEs

Digital transformation has become an essential pathway for SMEs in India to enhance operational efficiency, reduce costs, and stay competitive in both local and global markets. Various strategies and technologies are being deployed depending on the sector, scale, and readiness of the enterprise. Below are key digital transformation strategies widely adopted by Indian SME's,

a. Enterprise Resource Planning (ERP) Systems

Enterprise Resource Planning (ERP) systems integrate multiple business functions—such as inventory, finance, procurement, HR, and manufacturing—into a unified platform. Popular ERP solutions among Indian SMEs include Tally ERP 9, SAP Business One, Zoho Books, and Marg ERP.

By automating core administrative tasks and centralizing data, ERP systems reduce redundancy, minimize manual errors, and enhance decision-making. For example, inventory mismatches that often occur in manual systems can be avoided through real-time stock tracking. SMEs can generate timely reports, reconcile accounts, and comply with GST requirements seamlessly.

In manufacturing SMEs, ERP systems help in production planning and supply chain coordination, leading to significant time and cost savings. Moreover, cloud-based ERP systems allow for remote access, ensuring business continuity during disruptions such as the COVID-19 pandemic.

b. Customer Relationship Management (CRM)

Customer Relationship Management (CRM) platforms are increasingly being used by SMEs to manage customer interactions, nurture leads, and monitor sales pipelines. Leading CRM tools like Zoho CRM, Salesforce, and Freshsales provide capabilities such as:

- Centralized customer database
- Lead tracking and segmentation
- Personalized marketing and communication
- Automation of follow-ups and service requests

In the competitive business environment, CRM systems help SMEs deliver customized experiences, improve customer retention, and increase lifetime value. A textile SME in Surat, for instance, successfully used Zoho CRM to track wholesale buyers across regions and tailor marketing campaigns, resulting in a 35% increase in customer loyalty within a year.

c. Cloud Computing

Cloud computing offers on-demand access to computing resources—such as servers, storage, and applications—without the need for physical infrastructure. Platforms like Amazon Web Services (AWS), Microsoft Azure, and Google Cloud have democratized access to powerful tools even for micro and small enterprises.

Benefits of cloud computing for SMEs include:

- **Cost-effectiveness:** Pay-as-you-go model reduces upfront investment.
- **Scalability:** Easily expand computing capacity with growing business needs.
- **Remote Accessibility:** Access data and applications from any device, anywhere.
- **Data Backup and Security:** Automated backups and disaster recovery options.

Many SMEs now run their accounting, payroll, inventory, and project management systems on the cloud, enabling collaboration among distributed teams and reducing dependency on in-house IT infrastructure.

d. Digital Payments and E-Commerce Integration

With the rise of online commerce, Indian SMEs are embracing digital payment solutions and integrating with e-commerce platforms. Digital wallets and gateways like Paytm, Razorpay, PhonePe, Google Pay, and BharatPe are enabling seamless B2C and B2B transactions.

SMEs are also creating their own websites or leveraging third-party marketplaces such as Amazon India, Flipkart, IndiaMART, and Shopify to reach wider audiences. These platforms offer built-in analytics, inventory tools, and customer feedback systems that help businesses scale effectively.

During the COVID-19 lockdowns, many retail and food businesses in Tier-II and Tier-III cities pivoted to

WhatsApp-based ordering and UPI payments, allowing them to maintain operations and meet customer demand.

e. Business Intelligence and Data Analytics

Business Intelligence (BI) tools allow SMEs to gather, analyze, and visualize data to support strategic decisions. Popular tools such as Microsoft Power BI, Google Data Studio, and Tableau provide real-time dashboards that display KPIs, sales data, and customer metrics.

For example:

- Retailers can track top-selling items, peak hours, and purchase patterns.
- Service-based SMEs can assess client satisfaction using feedback data.
- Financial analytics help SMEs monitor cash flows, receivables, and expenditures.

Through predictive analytics, SMEs can better forecast demand, reduce wastage, and enhance resource utilization. In agriculture-based SMEs, data analytics is being used to forecast market prices and weather patterns, leading to better planning and profitability.

f. Automation and Artificial Intelligence (AI)

Automation technologies, including Robotic Process Automation (RPA) and AI-powered chatbots, are being increasingly adopted by digitally mature SMEs to streamline repetitive tasks. These technologies can perform actions such as:

- Automatically generating invoices and payroll
- Sending reminders for overdue payments
- Responding to customer queries via AI chatbots
- Email marketing and social media scheduling

For example, a Delhi-based logistics SME implemented an AI chatbot to handle customer inquiries, reducing the average response time from 6 hours to just a few seconds. Automation also minimizes manual intervention, which not only cuts costs but also reduces human errors.

AI-driven demand forecasting and image recognition tools are also being tested in retail and manufacturing SMEs to enhance quality control and optimize inventory levels.

g. Social Media and Digital Marketing

Social media platforms such as Facebook, Instagram, LinkedIn, Twitter, and YouTube have emerged as vital marketing tools for SMEs, enabling direct and cost-effective engagement with target audiences.

Key digital marketing strategies include:

- **Search Engine Optimization (SEO)** to improve website visibility
- **Pay-per-click (PPC)** advertising through Google Ads
- **Influencer collaborations** to reach niche markets
- **Email marketing campaigns** using tools like Mailchimp or Sendinblue

SMEs are also using WhatsApp Business to communicate offers, take orders, and provide real-time support. For example, a Jaipur-based handicraft exporter uses Instagram Reels and Facebook Shops to showcase products to international buyers, driving 40% of their online revenue.

Digital marketing analytics tools further help businesses monitor campaign performance, understand customer behavior, and refine outreach strategies for maximum ROI.

Impact of digital strategies on operational efficiency

The adoption of digital strategies has significantly transformed the operational landscape of Small and Medium Enterprises (SMEs) in India. While traditional business models relied heavily on manual and fragmented processes, the integration of digital tools has introduced automation, real-time data tracking, and streamlined workflows. These advancements have collectively contributed to enhanced operational efficiency, a key determinant of competitiveness and sustainability in the SME sector (Sharma, Gupta, & Rao, 2021) [5, 15].

According to a PwC India (2022) [6, 14] survey, 67% of Indian SMEs reported noticeable improvements in operational efficiency following the adoption of digital tools such as ERP, CRM, and cloud computing. This section explores the key dimensions in which digital transformation has impacted operational performance.

- **Reduced Turnaround Time**

Automation technologies such as ERP systems and workflow software have significantly shortened turnaround times for business processes like order management, invoicing, and payroll. Unlike traditional manual processing, digital systems execute tasks with greater speed and consistency, thereby reducing lead times and delays.

A study by Deloitte (2021) [3, 9] found that SMEs that implemented automation in order processing reported an average 35% reduction in processing time. This time-saving translates into faster deliveries, improved cash flow, and enhanced customer satisfaction. For example, a Noida-based logistics SME automated its consignment tracking system and achieved a 30% faster delivery cycle (IDC India, 2020) [7, 10].

- **Inventory Optimization and Supply Chain Visibility**

One of the persistent issues in Indian SMEs is poor inventory control, often leading to overstocking or stockouts. Digital inventory management systems, often integrated with ERP tools, enable real-time tracking of stock levels, automatic reorder alerts, and demand forecasting.

According to NASSCOM (2022) [2, 13], SMEs using digital inventory platforms reported a 40% improvement in inventory turnover ratio. Enhanced supply chain visibility allows SMEs to collaborate better with suppliers and reduce operational bottlenecks. A case study from a Bengaluru-based FMCG distributor highlighted a 25% reduction in expired stock and wastage after adopting Zoho Inventory (Singh & Bansal, 2020) [4, 16].

- **Cost Savings and Resource Optimization**

Digital transformation reduces operational costs through automation, cloud-based infrastructure, and process standardization. Cloud computing, in particular, has enabled SMEs to eliminate the need for expensive on-premise IT hardware, shifting to pay-as-you-go models.

A report by KPMG (2020) [11] indicates that SMEs adopting cloud services saved up to 20–25% in IT operational expenses annually. Additionally, digital attendance systems and payroll automation tools cut administrative overheads and optimize human resource deployment (World Bank, 2019) [17].

- **Improved Accuracy and Regulatory Compliance**

Manual data entry and paper-based processes are prone to errors and inconsistencies, especially in financial reporting and inventory tracking. Digital systems ensure better data accuracy by reducing human intervention and enabling standardized record-keeping.

Accounting software like Tally and Zoho Books are also aligned with the Goods and Services Tax (GST) requirements, helping SMEs stay compliant with minimal effort (Ministry of MSME, 2023) [1, 12]. Accurate records reduce the risk of audits, penalties, and customer complaints. As per a study by Sharma *et al.* (2021) [5, 15], SMEs using digital accounting solutions reported a 50% drop in financial discrepancies compared to those using manual methods.

- **Faster and Informed Decision-Making**

The availability of real-time data through Business Intelligence (BI) platforms enables SME owners to make strategic decisions with greater speed and precision. Tools such as Power BI**,** Google Data Studio**,** and Tableau help visualize key performance indicators (KPIs), sales data, and customer feedback in interactive dashboards.

Research by IDC India (2020) [7, 10] shows that SMEs using BI tools are 2.5 times more likely to report timely decision-making capabilities than non-digital firms. A Pune-based electronics manufacturer, for example, used Power BI to detect declining regional sales early and restructured its marketing strategy, resulting in a 22% increase in revenue (PwC India, 2022) [6, 14].

- **Enhanced Collaboration and Remote Work Capability**

The post-COVID environment has underscored the need for remote work capabilities. Digital collaboration tools like Microsoft Teams**,** Slack**,** and Google Workspace allow employees to work from different locations while maintaining productivity and coordination.

These tools have enhanced operational efficiency by reducing the dependency on physical meetings and office infrastructure. As noted by Deloitte (2021) [3, 9], 58% of SMEs that adopted digital collaboration tools during the pandemic reported no decline in productivity and, in some cases, even improved output. Remote access to documents, cloud-based file sharing, and task tracking also contribute to better time management and transparency.

Objectives of the Study

The objectives of the paper are,

- To identify the key digital technologies adopted by Indian SMEs.
- To assess how digital transformation impacts operational efficiency.
- To examine the challenges faced by SMEs in the digital transformation process.

1. Review of Literature

According to Ekawaty *et al.* (2025) [22], Small and Medium Enterprises (SMEs) in Tangerang, Indonesia, make a substantial contribution to economic growth. However, they encounter challenges when it comes to embracing digital technology. These challenges include limited resources, a lack of digital skills, and opposition from the organization. The phenomenon of digital transformation, which encompasses cloud computing, digital marketing, automation, and data analytics, is becoming more acknowledged as a crucial component for the development and efficiency of businesses. In the context of small and medium-sized enterprises (SMEs), the major purpose of this research is to investigate the influence that digital transformation initiatives have on operational efficiency, customer engagement, and overall performance. Data from 150 small and medium-sized enterprises (SMEs) in Tangerang were analyzed with the use of a technique known as Partial Least Squares Structural Equation Modeling (SmartPLS), which is a quantitative research strategy. Through this research, the relationship between key performance metrics and digital transformation methods was investigated and quantified. Streamlining processes and allowing data-driven decision-making are two of the ways that cloud computing and data analytics may greatly increase operational efficiency, according to the findings. While SMEs exhibit greater customer connections and enhanced market positioning, digital marketing and automation promote customer engagement and market competitiveness. In order to improve SME business management and achieve sustainable growth, this study emphasizes the need of embracing digital transformation. Additionally, it stimulates future study on the long-term implications of digital transformation on the resilience and innovation of small and medium-sized enterprises (SMEs), and it provides managers and policymakers with practical insights.

The purpose of the study conducted by Bhuiyan *et al.* (2024) [21, 23] is to conduct a comprehensive analysis of digital transformation, which is the process of integrating digital technology into all sectors of small and medium-sized enterprises (SMEs). This integration leads to increased efficiency and improved customer service, enables SMEs to reduce overall expenditures by optimizing operational and marketing costs, and consequently enables them to concentrate on activities that add value. Additionally, the study supports SMEs' technology innovation development models and strategies for fostering technological innovation within SMEs. Within the context of the execution of digital transformation projects, the research outlines the challenges that small and medium-sized enterprises (SMEs) face. Furthermore, the purpose of this report is to recognize new trends in digital transformation that may have an impact on small and medium-sized enterprises (SMEs) and to provide guidance on how to proactively embrace technology improvements in order to maintain competitiveness. In order to collect qualitative data, this research project is a mixed-method research endeavor that makes use of both systematic review and deductive approaches. For the goal of this study, small and medium-sized enterprises (SMEs) that are presently utilizing digital transformation were carefully selected based on criteria such as authorship, publication date, sample size, and variables. In addition, this research required performing in-depth interviews and observations in order to have a deeper understanding of the technical advancements that the participants were interested in. It was found that there are some factors of digital transformation in SMEs' technology innovation: Enhanced Operational Efficiency, Improved Customer Engagement, Global Market Access, Data driven decision making. Therefore, digital transformation in small and medium-sized enterprises (SMEs) contributes independently to the costs of

technological innovation in order to encourage the sustainability of businesses. Because of this, it is necessary to place a strategic emphasis on improving customer services and cultivating a positive attitude toward innovation in the business practices of small and medium-sized enterprises (SMEs) and development through technology. Without assessing the expenses associated with SME-driven digital transformation, this study investigates the challenges that small and medium-sized enterprises (SMEs) face when it comes to technological innovation in production, business models, technology adoption, and strategic approaches. Future research might highlight the importance of small and medium-sized enterprises (SMEs) embracing technology, integrating strategic supply chain management, and expanding their business strategies to achieve sustainable development.

Khan (2024) came to the conclusion that small and medium-sized businesses (SMEs) are at the forefront of digital transformation and technology adoption. This strategy involves the incorporation of digital technologies in order to transform operational procedures, improve customer satisfaction, encourage innovation, and boost competitiveness. Notwithstanding the presence of distinct obstacles such as limited technological knowledge, inadequate financial resources, inadequate digital infrastructure, and shortages of skilled personnel, small and medium-sized enterprises (SMEs) have the potential to accrue considerable advantages from digital transformation. Small and medium-sized businesses (SMEs) are given the capacity to attain sustainability, competitiveness, and customisation in their services through the implementation of digital transformation. When it comes to achieving sustainable development, which takes into account social, environmental, and economic aspects, the use of digital technology is very necessary. Adoption, nevertheless, is frequently impeded by a dearth of comprehension and strategic direction.

Vigneshwar (2025) study analyzes a number of SMEs that have actually implemented digital solutions, and from the analysis, the effects on the financial performance of those firms are revealed. This means, in turn, that the study shows businesses who sustain development in digital technology discover that such transformational processes bring about more revenues with less costs incurred on operations, that is, net profit increases. In addition, the process of digitization enables small and medium-sized enterprises (SMEs) to improve their customer service, restructure their workflow, and adapt more effectively to the ever-shifting market environment. However, it is also known that certain limitations such as higher upfront development costs exist along with the development of the workforce's digital abilities. When it comes to the operational management of small and medium companies (SMEs), the process of digitization is considered to be one of the most important components. This study takes a closer look at the role of strategic processes in digital transformation as means of enhancing the financial performance of SMEs in terms of competitiveness, cost control, and profitability. Generally, most SMEs face difficulties integrating and adopting the new information and communications technology of today. However, digital transformation is one factor that SMEs perceive as strategic requirement regarding competitiveness and entry into markets. The study emphasizes mindful investments in digital strategy and advises the policymakers to invest more in digital literacy and devices for SMEs. This is further legitimized since SMEs welcome the cost benefit of going digital, thus positioning them to make choices that would enhance resilience and sustainability in the dynamic economy.

Singh, Kumar, and Dwivedi (2021) note in digital transformation and SMEs: analyzing their resilience and performance that other factors like inadequate finances, lack of education and skills, and unwillingness to adapt to technology are some of the obstacles to digital transformation. They insist that these barriers can be overcome with government intervention, funding, and training programmes in order to boost the competitiveness and economic success of SMEs.

2. Research Methodology

This paper follows a qualitative secondary research methodology, focusing on literature review and document analysis. Data sources include:

- Peer-reviewed academic journals
- Industry white papers
- Government reports (e.g., Ministry of MSME)
- Reports from consulting firms (e.g., PwC, Deloitte, KPMG)
- Case studies from published sources

The data was collected from databases such as Google Scholar, JSTOR, and ResearchGate using keywords like "digital transformation in Indian SMEs," "ERP in SMEs," and "SME operational efficiency India." Only sources published from 2017 to 2024 were considered to ensure relevance.

3. Challenges Faced by Indian Smes In Digital Transformation

- **Financial Limitations:** Many SMEs lack the capital required to invest in digital infrastructure, software licenses, or skilled staff.
- **Low Digital Literacy:** Both business owners and employees often lack the necessary skills to operate modern digital systems.
- **Resistance to Change:** There is often a cultural resistance to changing traditional business processes.
- **Fragmented Digital Ecosystem:** Finding suitable, integrated solutions is difficult due to the fragmented nature of India's tech vendor market.
- **Cybersecurity Concerns:** Without adequate digital safeguards, SMEs remain vulnerable to data breaches and cyberattacks.

4. Government Support and Policy Initiatives

The Indian government has launched several schemes to support digital transformation:

- **Digital MSME Scheme**: Provides financial assistance for tech adoption.
- **Technology Centres**: Help SMEs access advanced manufacturing technology.
- **Skill India & Digital Saksham**: Train SME workforce in basic and advanced digital skills.
- **Udyam Registration Portal**: Simplifies registration and provides access to tech-based schemes.

5. Findings and Discussion

- Indian SMEs are gradually adopting digital strategies, especially after COVID-19.
- ERP and CRM are among the most adopted technologies.
- Operational efficiency improves significantly with proper implementation.
- Barriers like cost and skills remain, requiring continued policy and institutional support.

Digital transformation is not just about tools but involves a shift in mindset and culture. SMEs that integrate technology into their core business model are more resilient, agile, and scalable.

Conclusion

Digital transformation has significant potential for rejuvenating and modernizing the operations of Small and Medium Enterprises (SMEs) in India. By incorporating technology like ERP systems, CRM platforms, cloud computing, and data analytics into their business models, SMEs may markedly raise productivity, decrease operational expenses, and provide superior customer experiences. These technologies allow firms to optimize internal operations, get real-time information, and react promptly to evolving market demands—essential competencies in today's very competitive and rapid business landscape.

Although the advantages are considerable, the progression towards digital maturity varies throughout the Indian SME sector. Numerous progressive SMEs, especially in metropolitan regions and technology-centric industries, have effectively utilized digital technologies to expand their operations. A significant portion of the SME demographic, particularly in rural and semi-urban areas, is technologically undeveloped owing to limitations such as insufficient financial resources, low digital literacy, inadequate infrastructure, and opposition to change.

The success of digital transformation in Indian SMEs depends on overcoming these hurdles through a collaborative effort among many stakeholders. Government initiatives such as Digital MSME, Start-up India, and the Emergency Credit Line Guarantee Scheme (ECLGS) offer significant assistance but require expansion and improved customization to align with the practical needs of micro and small firms. Moreover, participation from the private sector—particularly technology providers, fintech firms, and business accelerators—can significantly contribute to delivering scalable, cost-effective, and accessible digital solutions.

Capacity enhancement via training, mentorship, and information dissemination will be crucial to guarantee that SMEs not only adopt digital tools but also utilize them proficiently. Furthermore, cultivating a culture of innovation and digital-centric thinking among SME proprietors and personnel is crucial for maintaining enduring transformation.

In summary, an optimal combination of public policy, private innovation, and institutional support can enable digital transformation to function as a robust catalyst for enhancing the resilience, scalability, and global competitiveness of Indian SMEs in the future.

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