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Indian Knowledge System and Enterprise Evolution: A Review of Indigenous Knowledge Integration in Indian SMEs

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Abstract

Small and Medium Businesses (SMEs) are essential to creating jobs, encouraging innovation, and fostering inclusive growth in India's changing economic environment. At the same time, there is unrealized potential for sustainable skill development in Indian Knowledge Systems (IKS), a storehouse of indigenous knowledge including health, education, architecture, handicraft, and agriculture. The relationship between IKS and skill development in the SME sector is examined in this review article, which also critically looks at how traditional knowledge might be used to fill the skill shortages among current employees by enhancing current professional frameworks. In order to determine how IKS might influence training models, entrepreneurial practices, and community-based learning in SMEs, the article reviews current literature, policies, and case studies. Along with outlining the difficulties of integration, such as scalability, formal recognition, and digitization, it also offers a strategic plan for utilizing IKS in modern organizational growth. In order to promote IKS as a catalyst for SMEs that are prepared for the future rather than as a holdover from the past, the study highlights the necessity of an inclusive, culturally founded skill ecosystem that respects tradition while welcoming innovation.

Keywords; Indian Knowledge Systems (IKS), Skill Development, Small and Medium Enterprises (SMEs), Sustainable Development, Innovation in SMEs.

INTRODUCTION

The diverse range of traditional knowledge systems (IKS) in India, from artisanal methods and indigenous craft practices to holistic healing systems like Ayurveda and sustainable agriculture, constitutes a priceless reservoir of economic, scientific, and cultural potential. These methods have supported local economic self-reliance, encouraged innovation, and maintained communities for generations. However, modern scientific and skill-based approaches have frequently suppressed or superseded traditional knowledge in the context of increasing globalization, industrialization, and technological change. The introduction of Indian Knowledge Systems (IKS) into conventional development paradigms has garnered renewed attention in recent years, especially in the context of small and medium-sized firms (SMEs). SMEs are regarded as the foundation of the Indian economy, making substantial contributions to GDP, industrial production, and employment. However, they frequently encounter obstacles when it comes to innovation, sustainable practices, and technology adaptability.

An effective way to close these gaps while protecting cultural heritage, encouraging inclusive growth, and improving community involvement is through the integration of IKS into SME operations. This study examines how Indian SMEs are developing creative, competitive, and sustainable business models by combining traditional knowledge with present abilities and technology. The study seeks to demonstrate the potential of IKS as a strategic resource in SME growth by examining case studies and current literature. Additionally, outlining the policy implications and capacity-building strategies required to promote this integration, it also looks at the difficulties in bridging the gap between traditional ideas and modern industrial demands.

The National Education Policy (NEP) 2020, "Make in India," "Skill India," and other national development goals all benefit from this study's contribution to the larger conversation on knowledge hybridity, sustainable entrepreneurship, and the function of indigenous systems. This study contributes to the overall discussions on knowledge hybridity, sustainable entrepreneurship, and the role of indigenous systems, which benefits the National Education Policy (NEP) 2020, "Make in India," "Skill India," and other national development goals.

- To take a look at how Indian SMEs combine traditional methods with cutting-edge knowledge, tools, and business plans.
- To investigate conventional knowledge systems' (IKS) applicability and usefulness in the modern SME environment.
- To determine the main factors that encourage and hinder SMEs' adoption of IKS-driven strategies.

Indian Knowledge Systems (IKS) in SMEs: Important Foundations

Traditional Skills and Indigenous Craftsmanship: rooted in age-old crafts such as traditional handicrafts, metalworking, woodworking, ceramics, and handloom weaving. inherited from artisan and craft groups over many years. maintains cultural heritage and encourages employment in rural areas.

Utilizing Resources Locally and Sustainability: The use of locally obtained, eco-friendly, and natural raw materials (such as bamboo, jute, and herbal dyes). conforms to models of the circular and sustainable economies. promotes SME manufacturing with minimal environmental impact and low waste.

Mixing Natural Systems: IKS promotes harmony with nature in design, health, and agriculture (e.g., organic farming, Vrikshayurveda, Vaastu Shastra). It. provides an eco-enterprise and green SMEs with a basis.

Knowledge Sharing Focused on the Community: operates through oral traditions, informal apprenticeships, and peer learning in local communities. encourages decentralized approaches to communal enterprise and talent distribution. promotes inclusive participation, particularly among women and underrepresented groups.

Figure 1 Key Element in SMEs

LITERATURE REVIEW

In Small and Medium Enterprises (SMEs), the integration of Indian Knowledge Systems (IKS) with modern entrepreneurial abilities has become an essential field of study, with a focus on innovation, cultural preservation, and sustainable growth. Traditional knowledge is an important resource for grassroots creativity, according to some academics. IKS includes thousands of years of experiential learning that can offer economical and environmentally sustainable solutions for SME difficulties, claim Gupta and Kumar (2018). Singh and Sharma (2020), who describe how rural SMEs use traditional skills and local resources to produce distinctive goods that appeal to both local and international markets, reinforce this viewpoint. Additionally, a great deal of research has been done on how current skills and technology adoption might boost the productivity of SMEs situated in IKS. Digital literacy, e-commerce, and refined manufacturing processes are essential for these businesses to grow and compete globally, according to Reddy et al. (2019). These writers do, however, also highlight how many conventional sectors lack formal training and have a sizable skills gap, which impedes sustainable growth. Several government programs, such as Make in India and Skill India, are designed to support SMEs by encouraging a combination of traditional talents and modern business methods (Government of India, 2021). However, Chakraborty and Basu (2022) contend that the execution of these initiatives is still uneven, especially in underserved and rural regions with limited access to resources and information. The literature also discusses the difficulties of sharing information inside IKS. It is challenging to formalize training programs and scale up the workforce since oral traditions and informal apprenticeships predominate (Joshi & Mehta, 2017). According to scholars, this gap may be closed by combining IKS with digital platforms and traditional vocational education (Patel &

Desai, 2020). Furthermore, there is growing interest in the potential for social entrepreneurship and sustainability driven by IKS in SMEs. In line with the global sustainable development goals, Narayan and Gupta (2021) explore how businesses based on indigenous knowledge support ecological balance and community empowerment. Despite these realizations, there is still a substantial need for more study since complete frameworks that systematically connect IKS with SME modernization are still lacking. The informal character of talent transmission in traditional sectors is one of the main obstacles noted in the literature. According to Gupta and Kumar (2018), traditional talents continue to be underused in competitive marketplaces in the absence of formal processes like vocational training, certification, and institutional support. Additionally, according to Reddy et al. (2019), integrating technology-driven training with contemporary educational approaches can improve the effectiveness and reach of traditional craftspeople. Additionally, indigenous knowledge is crucial in advancing environmentally friendly and sustainable economic operations. According to Pandey et al. (2021), traditional ecological knowledge aids in environmental stewardship and resource conservation. By using these techniques, Indian SMEs may improve their export potential and brand value while also aligning with worldwide sustainability norms. In order to close the gap between ancient knowledge and contemporary capabilities, institutional and governmental support has been essential. Initiatives to record indigenous knowledge, offer skill development programs, and ease access to capital and markets have been started by the Ministry of MSME and the National Innovation Foundation (NIF) (Chakraborty & Basu, 2022). To guarantee successful knowledge transfer and entrepreneurial growth in rural and underprivileged regions, researchers point out that more concentrated efforts are needed (Kumar & Singh, 2023).

SWOT Analysis: Conventional Enterprises vs. IKS-Driven SMEs

This SWOT analysis analyzes conventional enterprises compared to IKS-driven SMEs (based on Indian knowledge systems) in three important areas: sustainability, scalability, and innovation.

Strengths

1. **IKS Driven SMEs**
   - **Innovating Through Heritage:** Utilize traditional knowledge (such as Ayurveda and handicrafts) to create unique, heritage-rich goods.
   - **Sustainability at the Core:** A natural emphasis on low-impact, environmentally friendly production that complies with international ESG standards.
   - **Cultural resonance:** Deep emotional ties to specialized markets both domestically and internationally.
   - **Resilience:** Work flexibly in contexts with limited resources and in rural areas.

2. **Traditional Enterprises**
   - **Effective R&D Infrastructure:** Access to cutting-edge technology and organized innovation pipelines.
   - **Scalability:** Well-established supplier networks and funding sources for quick international growth.
   - **Operational Excellence:** Production and distribution efficiency worldwide.
   - **Brand Trust:** High levels of consumer loyalty and worldwide brand awareness.

Weaknesses

1. **IKS Driven SMEs**

Limited Scalability: Reliance on conventional techniques and artistry might make it more difficult to expand internationally.

Formalization challenges include a lack of digital documentation, IP protection, and organized R&D.

Capital Restrictions: Limited availability of formal credit markets and funding.

Dependency on elderly craftspeople and dispersed cultural knowledge poses a risk of knowledge erosion.

2. **Traditional Enterprises**
   - **Environmental Impact:** Supply networks using a lot of resources may not be as sustainable in the long run.
   - **Cultural Disconnect:** Danger of alienating markets that are environmentally conscientious and heritage-conscious.
   - **Regulatory Pressures:** Environmental and social governance policies are being examined more closely.
   - **Commoditization:** The inability to differentiate goods in fiercely competitive international marketplaces.

Opportunities

1. **IKS Driven SMEs**
   - **Growing Demand for Sustainability:** There is a growing demand for eco-friendly, historically inspired products and services worldwide.
   - **Government Support:** Policies that encourage the growth of rural businesses and traditional knowledge.
   - **Digital Transformation:** Growing international e-commerce sites for historic and handmade goods.
   - **Cultural tourism:** Combining historic tourism with cultural tourism to achieve both cultural and economic advantages.

2. **Traditional Enterprises**
   - **Sustainability Focus:** A chance to differentiate yourself in the market by implementing sustainable methods inspired by heritage.
   - **Utilizing AI**, IoT, and digital platforms to optimize supply chains and expand markets is known as technological leverage.
   - **Rural Market Growth:** Bringing customized products to rural and historically significant markets.
   - **Ethical Branding:** Presenting businesses as heritage-aware and environmentally conscientious to win enduring patronage.

Threats

1. **IKS Driven SMEs**
   - **Competition:** The possibility that international corporations would copy traditional knowledge.
   - **Climate Impact:** Changes in the environment impact the supply of raw materials.
   - **Policy Uncertainties:** Modifications to laws protecting intellectual property or cultural heritage.
   - **Market disruption:** Synthetic items and low-cost alternatives pose a threat.

2. **Traditional Businesses**
   - **Consumer pushback:** A growing lack of faith in the effects of industrial production on the environment and society.
   - **Disruption of Niche:** Competition from heritage-driven businesses attracting customers from around the world.
   - **Geopolitical instability:** The susceptibility of supply chains to international wars and shifts in the economy.
   - **Cost pressures:** The effect of stricter environmental laws and an increasingly demanding consumer base.

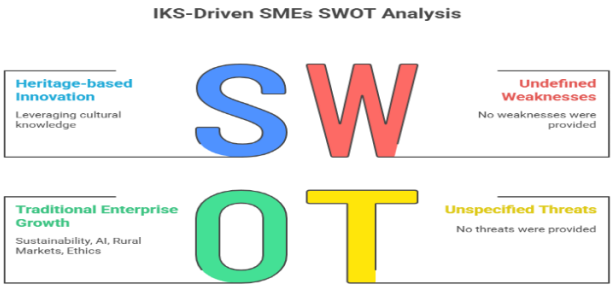

Figure 2 SWOT Analysis of IKS-Driven SMEs

A comparison between current modern skills and traditional knowledge

The oldest types of traditional knowledge and contemporary modern skills used in Indian SMEs are contrasted historically in this table.

Table 1 comparison between current modern skills and traditional knowledge

The Elements	Traditional Wisdom (Earliest Types)	Current Skills
Origin Time	Orally transmitted throughout ages and generations	The previous century saw the development of formal education and training.
Mode of Transmission	Family and community apprenticeships and oral traditions	Vocational training, internet resources, and formal institutions
Resources & Methods	Natural materials, basic hand tools, and handmade workmanship	Modern equipment, electronic instruments, and automation
Information System	Experience-based, situation-specific, and regional	Standardized, scientific, and universally applicable
Style of Innovation	Innovations that are economical and flexible, dependent on the local environment (Jugaad)	Technology-based, process-optimized, and research-driven

Area of Use	Cultural customs, community requirements, and local marketplaces	Domestic, regional, and global markets
The Formality of Skills	Informal, acquired by experience and observation	Certifications in writing and standardized courses
Enterprise Framework	unofficial, collaborative, bartering, and trust-based	Profit-driven, market-competitive formal businesses
Attention to Sustainability	Environmentally friendly by nature, with little effect on the environment	Sustainability as a strategic decision and green technology adoption
Marketing and Communication	Local fairs, bazaars, and word of mouth	E-commerce sites, branding tactics, and digital marketing

CASE STUDIES USING IKS IN SMES

1. Mysore Sandalwood Oil Cooperative Society (MSOCS), Karnataka

The Mysore Sandalwood Oil Cooperative Society (MSOCS) is an Indian state of Karnataka-based cooperative of distillers and sandalwood farmers. While using contemporary scientific procedures for quality improvement and expanded market access, it has maintained the traditional expertise of extracting sandalwood oil utilizing ancient processes passed down through generations. Aspects of Traditional Knowledge: Sustainable sandalwood tree harvesting and distillation using local methods. Family-inherited skills with a focus on sustainable and environmentally favourable extraction techniques. robust community collaboration that facilitates quality assurance and information exchange. Modern Skill Integration: Introducing a state-of-the-art distillation apparatus that increases oil output and purity. adoption of packaging technologies and quality certification criteria to satisfy demands from the worldwide market. initiatives to improve commercial and marketing abilities for distillers and farmers. using digital channels for worldwide product exporting and marketing.

Impact on SMEs

- Higher demand both locally and abroad is a result of improved product quality.
- Increased revenue for cooperative members and farmers as a result of value addition.
- Using sustainable economic strategies to preserve indigenous knowledge and cultural legacy.
- Increased market competitiveness and organizational efficiency through the integration of contemporary entrepreneurial abilities with historic knowledge.

2. Case Study: Integrating Indigenous Knowledge in Indian SMEs using Khadi and Village Industries

India's past has long been symbolized by Khadi and Village Industries (KVIs), which show how traditional knowledge and rural business may coexist harmoniously. Mahatma Gandhi's Khadi Movement established the groundwork for a robust SME sector based on Indigenous Knowledge Systems (IKS). Institutions such as the Khadi and Village Industries Commission (KVIC) continue this history today by balancing traditional craftsmanship with the needs of the contemporary market.

Impact of Khadi and Village Industries (KVIC) Integration of IKS

- **Employment in Rural Areas:** Developed means of subsistence for more than 10.3 million people, particularly rural craftsmen and women.
- Women's empowerment raises household income and social standing by empowering rural women to engage in economic activity.
- Heritage skill preservation allows traditional workmanship to endure and develop throughout time.
- **Strong MSME Sector Growth:** KVIC is a key component of rural economic growth, providing support to more than 7,000 rural businesses.
- The Khadi and Village Industries sector's economic significance is demonstrated by its annual turnover, which exceeded ₹1,15,000 Crore (~USD 14 billion) in 2023–2024.
- **Import Substitution & Export Growth:** Promotes "Make in India" by increasing exports from rural areas and decreasing reliance on imports.

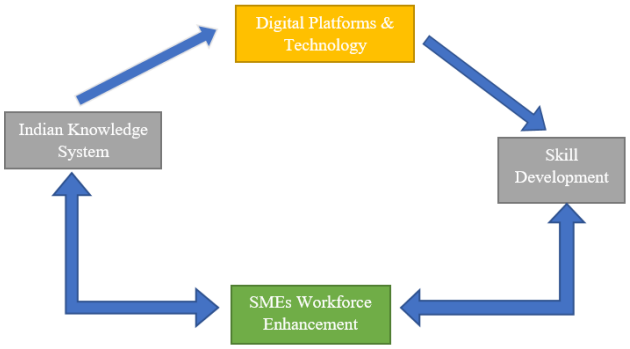

Figure 3 Conceptual Framework

Interpretation of Conceptual Framework

The study's conceptual framework explains how digital platforms, Indian Knowledge Systems (IKS), enhance the workforce capabilities, skills, and performance. It explains how digital platforms & technology impact SMEs, Skill development, and Indian knowledge. Here, the Indian knowledge system is the independent variable, and digital platform & technology work as a mediating variable that bridges the gap between traditional knowledge and modern skills developed would help give the outcomes by SMEs. To make this change possible, Digital technologies and platforms are presented as a mediating variable. These include AI-based skill delivery platforms, digital certification tools, e-learning platforms, and mobile apps. These systems make traditional knowledge accessible, scalable, and compatible with modern learning approaches by digitizing and distributing IKS information. This means that technology serves as a bridge, converting traditional information into organized, skill-based learning programs. The dependent variable, skill development, is due to a combination of IKS with digital technologies. This entails using organized job education to transform conventional knowledge into employable, industry-relevant abilities. The improvement of worker capacities in SMEs is the last output variable. Small and medium-sized businesses gain from having a staff that is more skilled, flexible, and culturally aware when conventional knowledge is digitized and transformed into certified skill sets. In addition to increasing productivity, this also fosters innovation, sustainability, and the maintenance of traditional economic traditions.

DISCUSSION

Modern technology combined with Indian Knowledge Systems (IKS) offers SMEs in India a game-changing potential. Traditional crafts, indigenous skills, and community-based activities are all part of IKS, which has enormous potential for skill development. However, it frequently stays apart from conventional technical training institutions because of its informal and regional character. Digital platforms and emerging technologies can play a critical mediating role by capturing, preserving, and distributing this traditional knowledge in structured and scalable ways. When IKS is digitized and delivered through accessible formats, like mobile apps, e-learning portals, and AI-driven training systems, it becomes a powerful tool for upskilling the workforce, especially in rural and semi-urban SMEs. In addition to making skills more relevant, this concept strengthens local communities by updating and valuing their cultural legacy. Stronger, more creative SMEs are the consequence of a trained staff that combines conventional knowledge with contemporary efficiency.

CONCLUSION

The novel road to equitable and sustainable growth is provided by the incorporation of Indian Knowledge Systems (IKS) into the framework for the development of small and medium-sized businesses (SMEs). Indian SMEs may improve their resilience, encourage innovation, and create culturally based business models that are both locally relevant and globally competitive by fusing traditional knowledge with contemporary capabilities. This research shows how IKS may unleash unrealized potential in indigenous and regional communities when carefully paired with digital technologies, vocational training, and entrepreneurial behaviours. To institutionalize this synergy going forward, cross-sector partnerships, supporting legislation, and capacity-building programs are crucial. In the end, an IKS-driven strategy may enable India's SMEs to make significant contributions to the domestic and international economies in addition to restoring traditional industries and crafts

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