



Knowledge management implementation in Indian Automotive SMEs: Challenges and improvement strategies

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Abstract

Knowledge Management (KM) has become an essential strategic tool for improving organizational learning, innovation, and competitiveness in small and medium-sized enterprises (SMEs). This study examines the major challenges affecting the implementation of KM in Indian automotive SMEs and proposes suitable measures for strengthening KM practices. A comprehensive review of national and international literature was undertaken to analyse the role of KM in enhancing organizational performance, innovation, and sustainability. The study identifies key barriers to KM adoption, including limited financial resources, inadequate technological infrastructure, lack of skilled personnel, weak organizational awareness, resistance to change, poor knowledge-sharing culture, and regulatory challenges. The findings indicate that effective KM practices can significantly enhance knowledge sharing, decision-making, employee capability, and long-term competitiveness. The study recommends greater investment in digital infrastructure, employee training, leadership commitment, and government support to facilitate systematic KM implementation and improve the sustainable growth and global competitiveness of Indian automotive SMEs.

Keywords: Knowledge management, automotive smes, knowledge sharing, organizational learning, innovation, competitiveness, digital infrastructure, India

Introduction

Knowledge is currently among an organization's most prized assets in today's cutthroat business environment. The systematic process of creating, structuring, keeping, disseminating and utilizing information to improve decision making, innovation and organizational performance is called (KM). Today, in a knowledge economy, KM has emerged as a strategic tool for improving the efficiency of their operations, competitiveness and sustainable development. In India, automotive SMEs have a significant role in the economy due to their contribution in various sectors such as manufacturing, employment, exports, and industrial growth. With trained staff and an expanding vehicle industry these companies market parts, replacement parts, and specialized services to top automotive companies. But businesses face increased challenges – intense competition, rapid technological change, globalization, high production costs and stringent quality standards are among the tough challenges. For SMEs, effective KM can be used to enhance organizational learning, communication, employee skills, knowledge retention and better decision making and innovation. However, budget constraints, inadequate technology infrastructure, lack of awareness, lack of employee training and resistance to change have constrained KM implementation. There are no formal systems in place to capture and share tacit knowledge, increasing the risk of knowledge loss as well as the departure of experienced staff. Considering that knowledge has been increasingly becoming a strategic asset, the analysis of KM adoption in Indian automotive SMEs is crucial. Knowing what factors contribute to or hinder KM adoption could help enable SMEs to enhance their knowledge exchange, retention,

innovation and overall competitiveness. This study aims to discuss the prime challenges faced by KM adoption in car SMEs of India and impacts of KM practise on productivity, competitiveness and performance of the car SMEs.

Objectives

- To identify major challenges faced by Indian automotive SMEs in implementing knowledge management.
- To suggest suitable measures for improving KM practices in Indian automotive SMEs.

Review of Literature

Massaro *et al.* (2016) ^[1] examined and assessed the literature on KM in SMEs. The study summarised current research and provided a road map for where the field should go from here. Our study shows that there is a lack of cohesive literature on KM in (SMEs). Most of the studies focus on individual nations rather than doing cross-national comparisons. It is possible that the KM study on SMEs will become irrelevant since the results did not consider the consequences of the findings for practitioners & policymakers.

Fink & Ploder (2009) ^[2] depicted the four essential knowledge processes using survey data collected from 219 SMEs in Switzerland and Austria. The authors went on to address the social perspective of KM for SMEs and came to the conclusion that IT utilisation is now more crucial than incorporating a social-cognitive viewpoint.

Wang & Yang (2016) ^[3] conducted research among Taiwanese SMEs and proposed a mechanism for evaluating KM's impact on these businesses. There has never been an

empirical test like this one. In order to examine the effects of KM and interactions on the productivity of workers in SMEs, the authors modified the Jennex & Olfman KM success model, which is theoretically well-grounded. The results provided academics and practitioners with valuable information to use when studying how SMEs may reap the advantages of KM and what factors contribute to its effective implementation.

Gourova and Dragomirova (2014) developed a KM Strategy framework for SMEs. The authors recommended the analysis of the internal and external company environments before the company formation of the strategy on the basis of the Balanced Scorecard (BSC) of Kaplan and Norton. They offer practical guidance to develop KM strategies and strategies that are aligned with the organisation's objectives. Knowledge loss and attrition were explored in SME by Durst and Leyer (2014) ^[5]. They proposed a risk-oriented knowledge mapping, which was grounded in the concept that workers need to share important information related to the organisation. The study highlighted the risk of employee attrition and the importance of knowledge sharing and KM activities in keeping the organisational knowledge alive and safeguarding knowledge loss.

Kohl *et al.* (2015) ^[6] presented the idea of implementing KM in a process-oriented manner inside German SMEs using the ProWis methodology. They proved that a company's size is less important than its business strategy and key skills when it comes to KM activities. The authors said that their suggested ProWis method to KM implementation might guide readers step-by-step toward a business process-oriented KM.

C. S. Lee & Wong (2015) ^[7] assessed the KM performance of SMEs in Malaysia using a (ANOVA) to determine the relevance of several constructs derived from knowledge resources, KM procedures, and KM variables. (KMPPM) was determined to be impacted by firm size and KM maturity in (SMEs), according to the authors' investigation into these factors.

Karami *et al.* (2015) ^[8] developed a model that would work for the Bahan car business, ranked the most important criteria for successful KM adoption, and made our recommendation. An extensive literature search yielded 26 criteria, which were then divided into 5 categories. Organisational culture, objectives, IT, organisational factors, HRM, and 26 sub-factors make up the five dimensions. The factors were confirmed by the authors using confirmatory factor analysis. Finally, the model was put out and recommendations were made.

Small and Medium Enterprises (Smes)

Both nationally and internationally, small and medium-sized enterprises (SMEs) drive the economies by creating jobs, innovating products and processes, growing industries and developing local and/or regional economies. The Organisation for Economic Co-operation and Development (OECD, 2017,) indicates that within OECD member countries, SMEs comprise 95% of firms and 75% of jobs. Globalisation, outsourcing and decentralisation enhance productivity, competitiveness and sustainability in developing economies (Yadav; 2018) ^[9].

Approximately 95% of industrial units in India are SMEs and are significant contributors to increases in manufacturing value, exports, and GDP. They are the second-largest job provider after agriculture, and play an

important role in the socio-economic development of the country. Although SMEs often operate with scarce resources, they innovate by developing new products, enhancing production processes and adapting to changing market conditions, as evidenced by Government support through regulatory initiatives and continued market potential (Baporikar; 2015; Baporikar; 2016) ^[10, 11]. In today's knowledge economy, information and knowledge management (KM) are critical factors in innovation, adaptability and performance. The use of knowledge resources through MNC networks and OEMs may improve organisational learning, improve performance and enhance organisational competitiveness (Pillania; 2005; Inkpen & Ramaswamy; 2006) ^[12, 13].

In the era of globalisation and economic liberalisation, information management has become a crucial issue for emerging countries such as India. In the present scenario, Indian business is facing competition from other international organizations and imports in the international market. Companies need to establish, administer and safeguard their intellectual property in order to achieve success. The National Knowledge Commission (NKC), set up by the Government of India, is focused on value of Knowledge development, distribution and utilisation. Indian policy makers have been advocating several attempts to create a knowledge power house to compete with the global knowledge economy (Pillania, 2007) ^[23].

Given that their financial, physical and human resources are less than those of the larger firms, they require expertise from SMEs. The competitiveness of a company is mainly influenced by its knowledge, intellectual abilities and talents. Knowledge is usually more important to small firms than land, labour and capital (Desouza & Awazu, 2006) ^[15]. For the majority of small and medium companies, knowledge is provided by owners and employees through their skills and experiences. Many small firms are limited in their physical resources but have the potential to leverage their intellectual resources to create a long-term competitive advantage. Knowledge management is a critical factor for the survival and growth of small and medium enterprises; therefore, effective knowledge management practices will produce increased efficiencies, innovation, decision making and ability to respond to markets.

Characteristics of Smes

Evidence from McAdam & Reid (2001), Desouza and Awazu (2006), and Supyuenyong *et al.* (2009) ^[15, 16, 18] suggests that (SMEs) use KM efforts in a way that is distinct from big organisations. By creating jobs, reducing poverty, developing new products and services, and improving living conditions, small and medium enterprises (SMEs) stimulate economic growth. Flexibility and adaptability allow a nation's competitiveness and progress to be enhanced.

SMEs find it easier to respond to changes in the marketplace because they have strong internal networks, employee involvement, unwritten document-based knowledge in the organisation, informal methods of communicating with staff, low levels of bureaucracy, and close connections to their customers (Desouza & Awazu, 2006) ^[15]. However, SMEs operate under different organisational structures, possess less financial and human resources, have different methods and processes, and therefore require specific knowledge management (KM) techniques (Mukherjee & Kumta, 2016) ^[19].

Although SMEs are vital to the economy, they also face problems with limited resources, bad management, and a lack of KM awareness or understanding. Many SMEs see KM as expensive or unnecessary activities, affecting their ability to learn, innovate, or share information with other SMEs. Also, the speed of change within organisations and in the marketplace makes it difficult for SMEs to adopt KM systems.

This adaptability enables them to quickly change for new opportunities and problems but it is difficult to gather, maintain and share organisational knowledge. Therefore, proper KM is essential for the continuity, competitive advantage and growth of the firm. KM strategies and priorities should change throughout the life cycle (Mukherjee and Kumta, 2016) ^[19]. A wide variety of SMEs make use of a wide variety of knowledge types. Knowledge is a competitive advantage for SMEs, hence it's important for them to make good use of it (Desouza and Awazu, 2006) ^[15]. Companies in the manufacturing sector, for instance, make use of product knowledge as it is intrinsic to the product itself. According to Mukherjee and Kumta (2016) ^[19], these companies also provide information on process innovation. Nunes *et al.* (2006) ^[20] found that SMEs seldom use officially established information and communication technology (ICT) systems to assist their KM operations.

A written KM agreement is not necessary for the KM process to arise spontaneously in a company (Wee and Chua, 2013). Megdadi *et al.* (2012) ^[21, 22] found that KM is used by SMEs in Jordan since it is essential for keeping up with company and market changes while staying competitive. It has been found that the (KM) methods of the SMEs are different across countries. SMEs in Turkey are interested in knowledge sharing. According to Bozbura (2007) ^[23], the danger of losing control over their expertise and passing it on around their organization is also a concern for managers. This approach will prevent key information from getting lost and may impede knowledge transfer and external knowledge acquisition. This can impede innovation, learning and organizational success. B2B and B2C ecommerce platforms are helping to enhance the performance of UK SMEs. Maguire *et al.* (2007) ^[24] report that many SMEs are not aware of the importance of information that they have generated as a result of their everyday business operations and e-business applications. There are different ways of developing, safeguarding and applying knowledge in organizations. Research indicates that successful KM has a positive impact on financial results, organizational development (Edvardsson, 2006) ^[25] and managerial effectiveness.

In practice, however, the adoption of KM varies from one country to another, depending on the various cultural, structural and technological readiness levels of organisations. Culture and organizational structure were found to be important obstacles in implementing KM in Iranian SMEs (Valaei & Aziz, 2011) ^[26]. There is also some international evidence that SMEs are starting to see the importance of KM from what are increasingly seeing as a strategic perspective, and are typically using both formal and informal KM practices to facilitate learning and knowledge sharing. Coyte *et al.* (2012) ^[27] found that knowledge harvesting helped alleviate resource shortages. The International study on (KM) in Small and Medium Enterprises (SMEs) reveals that there are multiple problems and techniques in KM in SMEs. Many SMEs in Germany

are financially fragile, which has an impact on succession planning and other KM activities, says Durst and Wilhelm (2012) ^[28]. Budget constraints mean that many organisations focus on everyday business needs and operations over long-term plans for KM, and are aware that there is a need for ongoing improvement and learning.

Innovation in Mexico is promoted by KM. Guzman *et al.* (2017) identified three categories of innovations (product, process and management system) that successful KM practises would improve SMEs' competitiveness. International studies show that successful knowledge management (KM) in SMEs is achieved through trust, leadership, and employee participation and compensation systems that promote sharing of information. SMEs can start KM, and cooperation and tacit knowledge reuse enhance organisation learning (Wee & Chua, 2013) ^[21]. Studies reveal that KM is able to promote innovation, competitiveness and performance of SMEs, however, there are barriers to its use in many developing countries such as low awareness, limited resources and economic reasons (Pillania, 2006a; Choochote, 2012). The use of KM in SMEs depends on organizational, cultural, technical and economic considerations, requiring business specific techniques. The "humanistic approach" to KM (Desouza and Awazu, 2006) ^[15] is typically the approach that SMEs employ. Man *et al.* (2002) found that SMEs depend more on their owners and staff' competence than financial and physical resources. Open organisation borders and a simple organisation are among the SME advantages. SMEs can enhance relationships within the firm, as well as enhance opportunities and respond quickly to fluctuations in the market by interacting with their consumers, suppliers, and other participants in the market. SMEs are more inclined to innovate and adapt faster than larger companies because of their direct connection with their customers, which also allows them to be innovative and competitive (Wee & Chua, 2013) ^[21].

Due to fewer resources, less market strength, and more external volatility on the economy, SME operations can be more unpredictable than large firm operations. The actions taken towards the firm are strongly reliant upon the actions of the customer, the supplier, partners, and competitors, all of which greatly impact the firm's success and stability. Thus, SMEs heavily rely on external information and knowledge for developing and making decisions. Larger businesses possess more knowledge resources and management systems and use internal knowledge more (Sparrow, 2001) ^[16].

KM Challenges in Smes

Management (KM) contributes positively to the way SMEs learn, adapt and build employee capabilities. SMEs have difficulty in accessing sufficient resources, creating environments conducive to KM, receiving adequate management support, acquiring technology and nurturing a knowledge sharing culture (Hussain *et al.*, 2011) ^[26]. Research shows that businesses that wish to remain competitive must work together to share, transfer and learn from each other, rather than just rely upon technology (Desouza & Awazu, 2006; Sparrow, 2005) ^[12, 15]. KM will also provide a means of preserving organisational memory and knowledge (Bhanumathi, 2015) ^[6]. KM approaches should be specifically designed for SMEs as a result of their size, resources and cultural background (Durst & Edvardsson, 2012) ^[28].

KM In India

Sanghani (2008) found that Indian companies are using technology in KM to enhance their capability to learn, innovate and be competitive. SME's need knowledge to help them cope with financial, technical, and human resources constraints. However, many Indian SMEs do not have a formal system for capturing, sharing, storing and applying knowledge, leading to inefficiencies and reduced competitiveness (Anand & Singh, 2011) ^[26]. In order to improve an organisation's performance and assist in achieving sustainable development, KM practices need to be improved. According to A. Anand *et al.* (2012) ^[22] and Apurva Anand and M.D. Singh (2011), Indian SMEs do not adhere to any comprehensive KM framework. Very little is known about KM studies conducted in India. The area of KM has only been explored by a small number of Indian writers. Research has been conducted and findings have been presented in the Indian context by researchers such as Pillania (2008a), Bhanumathi and Rathb (2014), Apurva Anand and M.D.Singh (2011) and Chadha and Ritika (2012), Sanghani (2008), Karthikeyan and Muralidharan (2010), Mukherjee and Kumta (2016) ^[19], Mageswari, Sivasubramanian, and Dath (2016), Baporikar (2015) ^[10, 19], Kamath, Rodrigues and Desai (2011).

Challenges to Smes

SMEs contribute to the economic growth, job creation and industrial development but government, banks and others ignore them. Funding, skilled labour, technology, marketing, production and even market identification is a problem for many SMEs. Enlarging the company, updating it and conforming to regulations are the challenges. Furthermore, many SMEs lack a structured approach for capturing and retaining knowledge of the business, from the owner or management. The loss of information affects the efficiency of the organization. Under these challenges, it is important for SMEs to manage and apply knowledge to reach their maximum competitiveness, productivity and sustainability

Challenges to Smes in the Indian Automotive Sector

The Indian automotive SMEs make components, generate employment, export and impart technology. This industry is being rapidly expanded by the process of globalisation, government initiatives, and increased demand. SMEs suffer due to lack of financial, technical and human resources, competition, consumer changes and quality standards. To increase competitiveness, innovation, and sustainability, these issues need to be addressed.

1. Limited Financial Resources

Some of the financial constraints for automotive SMEs are access to formal credit, demanding collateral and personal/formal fundraising. Funding restrictions constrain technology, R&D, training staff, quality development and investing in infrastructure. Late payments from large companies can cause cash flow issues, inefficiency, growth and competitiveness problems.

2. Technological Challenges

The automotive industry is undergoing a transformation with the advent of automation, robotics, AI, sector 4.0, digital manufacturing and electric vehicles. Many SMEs face challenges in implementing these technologies due to budget, infrastructure and technical skills limitations. A lack

of modern machinery and industrial practices reduces production, increases costs, and diminishes quality. To gain a competitive edge in the local and global marketplace, automotive SMEs need to invest in the latest technology and gain digital and sustainable manufacturing skills.

3. Lack of Skilled Worker.

In the knowledge-based automotive industry, it is crucial to have a skilled labor force. Many Indian automotive SMEs find it difficult to hire and keep technically skilled employees, as they are not adequately compensated, have limited career growth prospects, and lack resources. Low productivity and the risk of tacit knowledge getting lost when key employees leave are due to inadequate training and lack of formal knowledge sharing. Therefore, continuous skill development and knowledge management is essential for competitiveness.

4. Quality management and standardization

Automotive quality, precision and reliability are important and ISO, Six Sigma, and TQM specifications are usually required. Unfortunately, many SMEs do not meet these standards because of financial restraints, lack of technical expertise, and inadequate quality control. Quality problems can incur loss of contracts, increased manufacturing expenses and reputation damage. Therefore, quality management should be enhanced to meet competitiveness and long-lasting success.

5. Intense Market Competition

Indian small and medium scale enterprises (SMEs) have to battle with local and global companies from abroad who have a lower cost base. Limited financial resources, technology, and market reach make it difficult for SMEs to compete with respect to quality, pricing, and innovation. The automobile industry's main manufactures' problems reduce their profits. Even with constraints on resources, SMEs need to improve product quality, operational efficiency, and innovation to be competitive.

6. Problems associated with Supply Chain and Inventory management

Timely delivery of components and efficient supply chain management are crucial to automotive manufacturing. One of the problems that frequently occur in SMEs is the breakdown in raw material supply, transportation delays, fluctuations in material prices, and stock problems. If there are problems in any part of the supply chain, it can affect the car manufacturer and result in fines.

Many SMEs do not have modern technologies for inventory management and supply chain, which contribute to the loss of material, creation of excess inventory and inefficiency in the production. Limited suppliers and customers also raise the risks in businesses. During an economic crises& downturns, an interruption in the supply chain can have a significant impact on the operations and financial condition of SMEs.

7. Lack of research and development activities.

R&D is crucial for innovation, product improvement and technological advancement. But financial constraints and lack in technical capabilities are the reasons why most of the automotive SMEs in India do very little investments in R&D activities. They are limited in their innovation,

product development, process re-engineering, and market adaptation. Businesses lacking creativity may end up in a technologically advanced business. Suppliers are driving their product and services to meet the rising requirement for fuel efficiency, environmental safety and technological advancement.

8. KM Challenges

Organisational knowledge is important but many automotive SMEs do not have formal mechanisms for acquiring, keeping, communicating and using the knowledge of the organisation. Lack of systematic knowledge transfer particularly tacit information, leads to knowledge loss if experienced people leave the organisation. The factors that constrain KM adoption are lack of awareness and poor IT infrastructure, limitations on resources, and resistance to change. Enhance organizational learning, working together, productivity, decision making and future competitiveness through KM techniques.

9. Decreasing regulatory/compliance burden

The automotive SMEs have to comply with the evolving tax, labor, environmental, safety and industrial legislation. Compliance is however not easy because of limited knowledge of compliance, complicated processes and frequent changes of the regulations. The stricter environmental and energy efficiency standards require significant investments in technology and infrastructure that many SMEs may not be able to make. Noncompliance can result in legal fines, monetary damages and loss of business opportunities.

10. Infrastructure Constraints

Indian automotive SMEs suffer from lack of infrastructure. Inadequate transportation systems, unreliable electricity, limited manufacturing capabilities and inadequate digital infrastructure reduce production efficiency and increase operating costs. These challenges also inhibit digital manufacturing and KM adoption. Automotive SMEs need to invest in the physical and digital infrastructure to become more productive, competitive and sustainable.

Based on the challenges identified in the preceding section, this study proposes a set of measures to strengthen knowledge management practices among Indian automotive SMEs. At the organisational level, firms need to build greater awareness of KM's strategic value through structured training programs and by securing stronger top-management commitment to KM initiatives, since limited awareness and weak leadership support were found to be significant barriers. On the technological front, SMEs should invest incrementally in affordable IT infrastructure and knowledge-repository systems, prioritising tools that integrate easily with existing operations rather than requiring large upfront capital outlay, which is often a constraint for smaller firms. Strategically, KM efforts must be aligned with core business objectives such as sales growth and customer satisfaction, rather than treated as a standalone function, so that the value of KM adoption is visible to decision-makers. Finally, greater facilitation from government bodies and industry associations — through subsidised training, shared knowledge platforms, and sector-specific guidelines — could help bridge the resource gap that many SMEs face in implementing KM independently. Together, these measures address the organisational,

technological, and strategic barriers identified in this study and offer a practical roadmap for improving KM adoption in the sector.

Conclusion

The study concludes that Knowledge Management is a critical driver of sustainable growth and competitive advantage for Indian automotive SMEs. Despite their significant contribution to manufacturing, employment, and exports, these enterprises continue to face numerous challenges, including financial constraints, inadequate technological infrastructure, shortage of skilled manpower, limited research and development, and weak knowledge-sharing mechanisms. The absence of formal KM systems often results in the loss of valuable organizational knowledge and reduced operational efficiency. Successful KM implementation requires strong leadership commitment, a supportive organizational culture, continuous employee training, and greater adoption of affordable digital technologies. Collaboration among industry associations, government agencies, and SMEs can further strengthen knowledge-sharing networks and improve organizational capabilities. By integrating Knowledge Management into strategic planning and daily operations, automotive SMEs can enhance innovation, productivity, decision-making, and customer satisfaction while achieving long-term sustainability and improved competitiveness in both domestic and global markets.

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