

A study on knowledge management implementation in Indian automotive SMEs

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Abstract

Small and medium-sized businesses (SMEs) may boost their efficiency, creativity, and competitiveness with the help of Knowledge Management (KM), a new strategic approach. This research looks at how small and medium-sized automobile companies in India are using KM techniques and how it relates to their sales numbers. Stratified random sample and a structured questionnaire were used to gather primary data from 250 SMEs in Pune that produce automotive components. A descriptive study approach was then used. Descriptive statistics, analysis of variance, & Spearman's rank correlation were used for data analysis. The findings indicate that most SMEs have adopted moderate to good KM practices, although investment in information technology infrastructure remains limited. While organizations reported satisfactory levels of knowledge sharing, management support, and customer satisfaction, no statistically significant relationship was observed between KM practices and sales performance. The study concludes that Knowledge Management contributes to organizational learning and operational effectiveness but may not directly influence short-term sales. Strengthening technological capabilities and fostering a knowledge-sharing culture are recommended for sustainable competitiveness.

Keywords: Knowledge management, automotive smes, knowledge sharing, organizational performance, sales performance, innovation, organizational learning, India

Introduction

Knowledge is currently among an organization's most prized assets in today's cutthroat business environment. Knowledge management refers to the process of systematically developing, organising, storing, sharing, and using knowledge to enhance organisational performance, innovation, and decision making. 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. Knowledge loss and the exit of experienced employees are both made worse by the lack of formal procedures to record and disseminate tacit knowledge.

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

1. To study the KM practices adopted by automobile component SMEs in India.
2. To examine the relationship between KM practices and sales performance of Indian automotive SMEs.

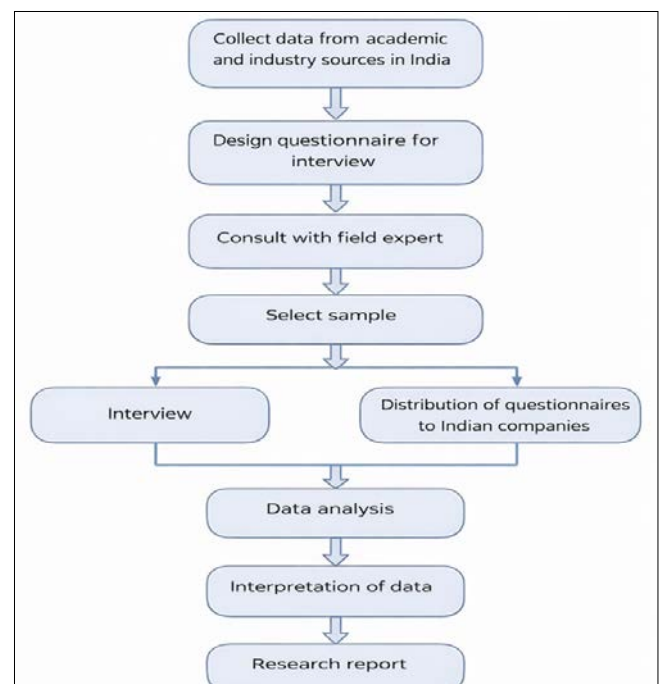


Fig 1: Research Methodology Flow Diagram

Research Methodology

A descriptive study approach was used, together with a standardised normative survey, in order to investigate the practices of (KM) and their relationship with the sales outcome in Indian automotive small and medium-sized enterprises (SMEs) headquartered in Pune.

1. Population and Sample

Specifically, the research focused on SMEs in the automotive parts manufacturing sector based in Pune, India, who were members of the (MCCIA). In Pune, the automobile business was vital to more than 6,000 SMEs. Stratified Random Sampling was used to pick 250 SMEs from the whole population of SMEs according to their participation willingness. During the data collecting period (August - October 2022), the owners and/or top executives were individually interviewed to get their responses.

2. Questionnaire Construction

To create the questionnaire, a multi-stage process was employed:

2.1 To review literature and to conceptualize.

Knowledge management (KM) procedures, SMEs in India, and SMEs in the automotive component business were the subjects of an extensive literature analysis aimed at building a complete grasp of the key ideas and theoretical models involved. In order to establish the research framework relevant goals, this review built a solid theoretical groundwork by identifying the important factors, pertinent concepts, and current research gaps.

2.2 Questionnaire Design

Questions for the survey were derived from the findings of the literature study by:

- Discussion of existing methods of questionnaire construction
- Determination and organisation of relevant dimensions
- Developing and writing questions to each part of the study

2.3 Expert Consultation

The questionnaire was pretested with the research supervisor for clarity, relevance and appropriateness of the items. Five rounds of consultation have been undertaken.

2.4 Revision and Finalization

The questionnaire was iteratively revised based on expert feedback. The instrument was several times revised, prior to the completion. It took six months to study a lot of literature, to design and consult about it and to refine it.

3. Data Collection

In August-October 2021, Pune data was gathered from primary sources. Interviews with chosen company owners and CEOs utilising standard questionnaires provided information. Key informants who have high knowledge on each business answered to make the accurate and reliable results. Statistical analysis was performed on the data using SPSS and EXCEL 2003.

4. Data Analysis

4.1 Basic & Summary Tableau Analysis

Using means/medians to review data from tables and pie chart. Petrends took data from continuous measurement and built to display on multiple continuous data measurement pieces with frame by using (Freedman *et al.* [1997]).

4.2 Framework Analysis

All variables measured by continuous variables became discrete and dimensioned into one discrete variable without loss of information. Methodology was employed to provide a common measure to assess the effect that questionnaire variables have upon KM. Scores of all framework components used the same minim-type structure provided an equal weight when summing the standardised score to create a KM process assessment score.

4.3 Correlation Analysis

Data from the KM process was arranged into order of rank and used to apply the S PRCC to calculate the relationship between variables' scores in the KM process and sales performance. The SPCRCC is the appropriate method for conducting correlation analysis of discretized data and is a non-parametric method of correlation analysis, thus it does not assume a specific distribution for the variables based on the results of correlation. (Levin & Rubin, 2008; Levin p. 2008^[10]: 793). Here is a comparison of the data distribution in correlation analysis utilising the S PRCC and the P CC, as shown in the following figure:

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}.$$

Where

ρ – Coefficient of rank correlation.

n – Number of paired observations.

Σ – Notation meaning “the sum of”.

d – Difference between the ranks for each pair of observations

There are few test parameters as crucial as the significance level. The observed value of ρ would show it whether it was a simple coincidence or whether or not the experiment yielded identical results if repeated. Whether the real value of ρ differs considerably from zero is determined, from a statistical standpoint. The t-test is used in this study to ascertain the degree of significance. According to George and Mallery (2006), when using the two-tailed level of significance, ρ values below 0.01 are considered extremely significant, while values lower than or equal to 0.05 are considered significant. In other words, when doing relationship identification with a 2-tailed level of significance of 0.05 or lower, only ρ values in a probability of 5% or lower will be taken into account, instead of 1% and 5% for 0.01 and 0.01 2-tailed levels of significance, which is the case since the observed value of ρ happened by chance. A t-test was used to determine significance, with a 2-tailed significance value of less than 0.05 being deemed significant and ≤ 0.01 being deemed highly significant, as stated by George and Mallery (2006). For organisational, technical, & strategic KM issues, SMEs in the automotive industry were ranked using one-way analysis of variance (ANOVA). Post hoc analysis was done when the F ratio was thought to be statistically significant.

Result

Using Indian automotive SMEs as a case study, this article examines the correlation between knowledge management (KM) methods and organisational success. The standardised questionnaires were filled out by the owners, managers and executives of SMEs in Pune, India. The chapter focuses on the implementation of KM, preparedness of the organisation and technology and hurdles in acceptance. Descriptive statistics, analysis of variance, & Spearman's rank correlation were used for analysis of data and hypothesis testing. It also reveals the demographics of respondents, their IT infrastructure, KM tools, organizational policies, customer and government support, and strategic variables that impact KM adoption, competitiveness, and sales success.

Table 1: Demographic Profile: Age Distribution of Respondents

Age Range	Frequency	Percent (%)
26–30	2	10.0
31–35	1	5.0
36–40	1	5.0
41 and above	16	80.0
Total	20	100.0

According to Table 1, 80% of the interviewees were employees of Indian enterprises, and the bulk of those employees were 41 and older. This indicates that the majority of participants were seasoned experts in their fields, holding senior management or ownership roles in their respective companies. It is evident that younger professionals are not actively participating, since the age categories of 26–30, 31–35, and 36–40 years only made up 10%, 5%, and 5% of the total, respectively. The dominance of senior respondents suggests that the information collected in the study was obtained from individuals with substantial industry knowledge, practical exposure, and strategic decision-making experience regarding KM practices in SMEs.

Table 2: Educational Qualification of Respondents

Education	Frequency	Percent (%)
Bachelor's Degree	10	50.0
Master's Degree	6	30.0
Other	4	20.0
Total	20	100.0

In Table 2, it indicates that fifty percent of the people who answered had a Bachelor's Degree and 30% had a Master's Degree. Twenty % identified as "Other," possibly including diplomas or professional or technical certifications. The results show that the respondents had a good level of education and were academically equipped to appreciate organizational practices and KM concepts. The number of graduates and post graduates indicate a significant proportion of educated people managing Indian SMEs can play an effective role in technological adaptation and KM implementation in their organizations.

Table 3: Level of IT Infrastructure Investment by SMEs

IT Investment (Rupee)	Frequency	Percent (%)
0–500000	163	65.0
500001–1000000	50	20.0
1000001–1500000	12	5.0
1500001–2000000	12	5.0
2000001 and above	13	5.0
Total	250	100.0

As suggested by the data in Table 3, most of the Indian SMEs (65%) have invested between ₹0-500000 on their IT infrastructure. Around 20% invested between ₹500001–1000000, while only 15% invested above ₹1000000. It's evident that the majority of SMEs have minimal investment in terms of IT infrastructure. The low IT spend signals that there may be financial challenges and SMEs might not regard advanced technological developments as a priority. However, a small percentage of firms that are investing more suggests that there is an understanding among some SMEs of the strategic value of IT as a tool to support KM and operational efficiency.

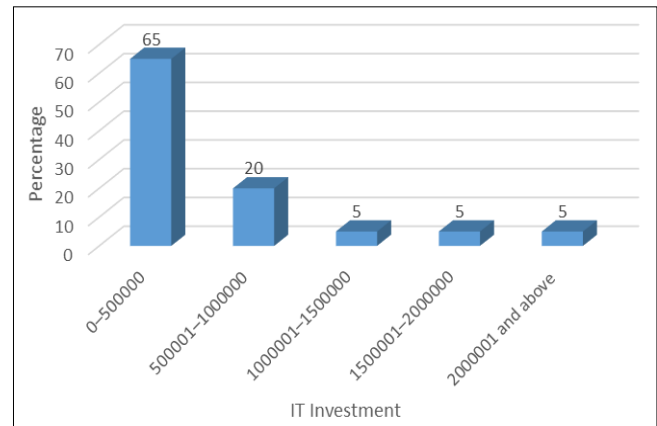


Fig 2: Level of IT Infrastructure Investment by SMEs

Table 4: Adoption of Specialized Software in SMEs

Uses Specialized Software	Frequency	Percent (%)
Yes	125	50.0
No	125	50.0
Total	250	100.0

Table 4 shows that 50 percent of the companies had special software and 50% did not. This equal distribution indicates that KM and special IT applications are only partially adopted by SMEs in India. Many SMEs are still using traditional or manual methods instead of software systems to manage organizational knowledge and efficiency, although some consider software systems as important tools. The outcome shows moderate level of technological adoption in the sector.

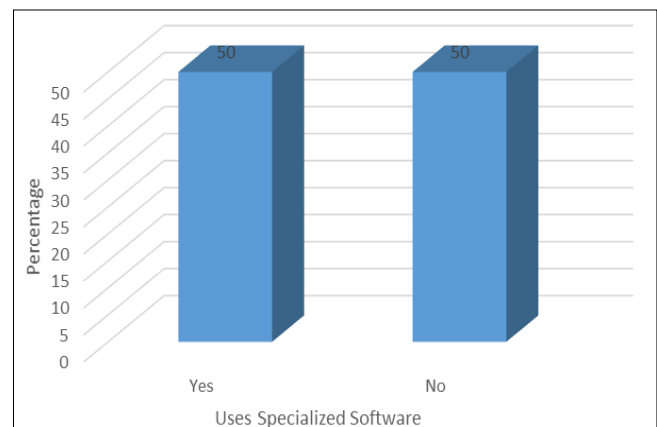


Fig 3: Adoption of Specialized Software in SMEs

Table 5: Distribution of Strategy and Management Style Scores

Strategy and Management Style Total Score	Frequency	Percent (%)
26–30	38	15.0
31–35	37	15.0
36–40	88	35.0
41–45	50	20.0
46–50	37	15.0
Total	250	100.0

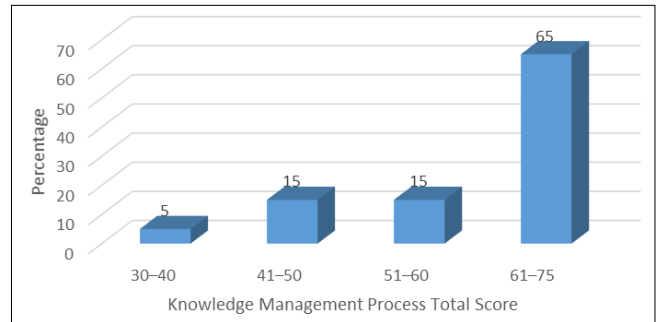
The results in Table 5 indicate that 35% of firms received scores ranging from 36 – 40 in strategy and management style; 20% of firms scored from 41 – 45 while 15% scored between 46–50. The findings revealed that majority of SMEs have somewhat positive management styles and directions of their strategies. The high scores indicate that a significant number of organizations have supportive management practices in place which could foster team working, communication and organizational learning, all of which are key components of effective KM.

**Fig 4:** Distribution of Strategy and Management Style Scores**Table 6:** Distribution of KM Process Scores

KM Process Total Score	Frequency	Percent (%)
30–40	13	5.0
41–50	37	15.0
51–60	38	15.0
61–75	162	65.0
Total	250	100.0

As seen in Table 6, 65% of the firms scored in the range of 61–75 showing that the KM process in Indian SMEs is comparatively good. The distribution of scores in lower category percentages were smaller. The results indicate that SMEs have encountered technological and organizational

difficulties, but most firms have established reasonable KM practices in terms of sharing, storing, and using knowledge. This is the reflection of the increased awareness of the Strategic value of KM among SMEs.

**Fig 5:** Distribution of KM Process Scores**Table 7:** Distribution of Customer Satisfaction Scores

Customer Satisfaction Total Score	Frequency	Percent (%)
22–24	25	10.0
25–27	63	25.0
28–30	162	65.0
Total	250	100.0

Table 7 shows that 65% of the firms rated 28–30 for customer satisfaction and is a high level of customer satisfaction among the Indian SMEs. Only 10% scored between 22–24. The results indicated that overall, SMEs have good customer relationships and offer satisfactory products or services. Customer satisfaction can be a driver of customer loyalty and good word of mouth advertising, vital to the sustainability and competitiveness of SMEs.

**Fig 6:** Distribution of Customer Satisfaction Scores**Table 8:** Sales Performance Correlated with Strategy & Management Style Parameters (n = 250)

No.	Parameters	Rho	Sig (2-tailed)
1	Your company's objectives were well-defined.	-0.238	0.312
2	Employees have been informed of your company's objectives.	-0.245	0.297
3	New markets are the main emphasis of your marketing strategy.	-0.210	0.374
4	Export is a key component of your marketing strategy.	0.023	0.925
5	The goal of your R&D is to create new products.	0.118	0.622
6	Your senior management group is dedicated to process and product innovation.	-0.067	0.778
7	Innovative ideas from employees are acknowledged and rewarded.	0.039	0.871
8	Executives aim for market and customer excellence.	0.055	0.818
9	Practice and ongoing improvement of computer and English skills are encouraged.	0.384	0.094
10	Management is able to react quickly and effectively to the shifting market.	-0.164	0.489

The Spearman rank correlation results for Strategy, Management and Style parameters with respect to sales

performance (n = 250) are presented in Table 8. None of the ten parameters had a 2-tailed significance value ≤ 0.05 . The

closest was 'English and computer training are encouraged and continuously improved' ($\rho = 0.384$, $\text{Sig} = 0.094$) which was not significant. Therefore, the null hypothesis (H_0) is accepted in this section,

which states that the characteristics of Strategy & Management Style do not have a statistically significant association with sales performance in the sample of Indian automotive SMEs.

Table 9: Sales Performance and KM Process Parameters (n = 250)

No.	Parameters	ρ	Sig (2-tailed)
1	There is a KM process in place at your organization.	0.125	0.599
2	A KM process is offered by your organization.	0.224	0.342
3	Every employee in the business takes part in your KM process.	0.309	0.185
4	The KM process is supported by organisational policy.	0.164	0.489
5	Your KM process is supported by your staff.	0.223	0.344
6	Your business benefits from your KM process.	0.172	0.486
7	Using the KM process helps your business function quickly.	0.117	0.624
8	Work efficiency is the outcome of your KM process.	0.192	0.419
9	Positive connections inside the organization are the outcome of your KM method.	-0.008	0.927
10	Conflict inside the organization is lessened by your KM approach.	-0.178	0.452
11	The company's development is supported and encouraged by your KM process.	-0.120	0.610
12	Everyone in the company benefits from having a clear picture thanks to your KM approach.	-0.078	0.743
13	You support the use of KM procedures in your company.	-0.029	0.902
14	Your management benefits from using your KM process.	0.030	0.901
15	You believe that several departments within your company can make use of KM procedures.	0.044	0.852

The correlation results of the fifteen KM Process parameters (n = 250) are shown in Table 9. All the parameters failed to reach 2-tailed significance of ≤ 0.05 . The correlation with the highest value was the 'Everyone in the company participates in your KM process' ($\rho = 0.309$, $\text{Sig} = 0.185$) which did not meet the level of statistical significance. H_0 is thus accepted (no significant relationship between KM Process parameters and Sales performance of Indian automotive SME sample).

Table 10: Spearman Correlation: Overall KM Process Estimate vs. Sales Performance Indian Sample (n=250)

No.	Parameters	ρ	Sig (2-tailed)
1	KM Process Estimate.	-0.032	0.892

The correlation between overall KM process estimate and sales performance (n = 250) is shown in Table 10. The KM process estimate ($\rho = -0.032$, $\text{Sig} = 0.892$) did not provide any significant relationship to sales performance. So, we can accept the null hypothesis (H_0): This group of Indian car small and medium-sized businesses doesn't show a strong link between the general evaluation of the KM process and alterations in sales.

Conclusion

The study demonstrates that Knowledge Management has become an important organizational practice for Indian automotive SMEs, supporting knowledge sharing, learning, and operational improvement. Although most enterprises reported satisfactory implementation of KM processes and management support, investment in information technology and specialized KM systems remained relatively limited. There was no statistically significant relationship among KM practices, approaches to management, or sales performance. This suggests that KM is more useful for improving organisational capabilities & long-term competitiveness than for producing short-term financial gains. The findings emphasize that effective KM should be viewed as a strategic investment that strengthens innovation, employee competence, and decision-making rather than a direct driver of short-term sales growth. To improve

organizational performance, SMEs should enhance digital infrastructure, encourage continuous employee training, establish formal knowledge-sharing mechanisms, and cultivate a supportive organizational culture. Future studies should include broader geographical coverage and additional performance indicators to assess the long-term impact of Knowledge Management.

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