



Impact of Organizational Culture and Leadership on Knowledge Management in Manufacturing Companies

* S.D. Uma Mageswari ** Dr. Chitra Sivasubramanian

*Research Scholar, Pondicherry University

** Associate Professor, Pondicherry University

ABSTRACT

Purpose –For several decades the world's best-known forecasters of societal change have predicted the emergence of a new economy in which brainpower, not machine power, is the critical resource. But the future has already turned into the present, and the era of knowledge has arrived. –"The Learning Organization," Economist Intelligence Unit. This new world of business which is characterized by globalization, heightened level of competition, uncertainty about future makes the traditional factors of production land, labour and capital as irrelevant. The only source of sustainable competitive advantage is knowledge and intellectual capital. Hence Knowledge management practices become vital.

Research Methodology – An empirical study was conducted by collecting primary data through questionnaire from employees of varied departments of the company. Statistical tools used for analysis in the study are Reliability analysis, factor analysis, correlation and simple research model is done using LISREL.

Research limitations–There is a few limitations which may affect the scope of the study. First, the study was conducted in only one manufacturing firm. Hence, blanket generalization of the findings of the study to each and every manufacturing firm in India should be done with caution. Second, the study focuses only on two variables, organizational culture and leadership style, and their impact on knowledge management processes and practices.

Findings – The extent to which KM dimensions, Knowledge Capture / Acquisition, Knowledge Creation, Knowledge Storage, Knowledge sharing or transfer, Knowledge Application practiced in the company are studied. It is found that KM is practiced significantly.

Originality/value – The main discussion of this paper brings together a large range of knowledge management practices in a manufacturing firm and the impact of organizational culture and leadership on knowledge management practices.

Keywords : Knowledge, Knowledge Management(KM), Organisational culture, Leadership, KM dimensions

Introduction

Eventhough, the concept of knowledge has been there for ages as generations have used it for achieving prosperity, it has started gaining its momentum only in early 1990s. Knowledge management gurus, Karl Wiig, Alavi, Leidner, Davenport and Prusak, Nonaka and Takuchi paved way for its accelerated growth. Value creation and competitive advantage in any organization depends on its potential to leverage intangible assets of firms and knowledge is one such asset. The ability to marshal and deploy this organizational knowledge is crucial. The way in which tangible resources are combined and applied is directly affected by knowledge. This knowledge is embedded in and carried through organizational culture, policies, systems and individuals. In addition, transition into information age fuelled the organisations to focus more on knowledge and knowledge management systems(Alavi & Leidner, 2001). As a result, knowledge audits, benchmarking, networks of practice, communities of practice, best practice transfer etc. have become common to the organisations. KPMG (1998) reports that one in ten firms have benefitted from knowledge management practices and at least 43% of the firms are in the process of knowledge management implementation.

Literature Review

From a practical perspective, APQC defines *knowledge* as information in action. Until people take information and use it, it isn't knowledge. In a business context, knowledge is what employees know about their customers, each other, products, processes, mistakes, and successes, whether that knowledge is tacit or explicit.

Knowledge Management Definitions:

Several definitions have been in use for knowledge management and a few are given below:

1. As early as 1949, Mayo defined KM as a management concept which involves processes like managing the generation of new knowledge; capturing, storing and retrieving knowledge and experience; sharing, communication, collaborating and transferring; and using and building on what is known.
2. Nonaka and Takeuchi, 1995 definition of KM is the process of applying a systematic approach to the capture, structure, management, and dissemination of knowledge throughout an organization in order to work faster, reuse best practices, and reduce costly rework from project to project.
3. Grey, 1996 defined KM as a collaborative and integrated approach to the creation, capture, organization, access and use of an enterprise's intellectual assets.
4. O'Dell and Grayson (1998) defined KM as a conscious strategy of getting the right knowledge to the right people at the right time; it is also helping people share and put information into action in ways that strive to improve organisational performance.
5. Levinson, 2004 defined KM as the process through which organisations generate value from their intellectual and knowledge-based assets. Most often generating value from such assets involves codifying what employees, partners and customers know, and share that information among employees, departments and even with other companies in an effort to devise best practices.
6. APQC definition of *knowledge management* (KM) - KM is

a systematic effort to enable information and knowledge to grow, flow, and create value. The discipline called KM is about creating and managing the processes to get the right knowledge to the right people at the right time and help people share and act on information in order to improve organizational performance.

To gain a competitive edge in today's marketplace, an organization must embrace new ideas and processes and requires constant improvement. Manufacturing Excellence is an imperative tool that leads an organization to the path of competitiveness. The underlying objective of these initiatives is building the organizational internal competitiveness through enhancing & upgrading the skills of the employees via proper training and on-job implementation of concepts. All these initiatives eventually lead to customer delight and sustainable cultural change in the organization. (CIL, 2011)

World Competitiveness Report 2010 has ranked India at 51 among 139 countries, 17th rank globally in terms of its financial markets, and 44th in business sophistication and 39th in innovation, which clearly indicates that India lags behind in terms of competitiveness. Competitiveness & innovation activities are expected to need large amounts of new knowledge. Knowledge is inextricably linked to core competence. Knowledge plays a unique role in building and conserving core competences. (Prof. Shailja Dixit, SME word, Special reports).

Knowledge management (KM) was initially defined as the process of applying a systematic approach to the capture, structure, management, and dissemination of knowledge throughout an organization in order to work faster, reuse best practices, and reduce costly rework from project to project (Nonaka and Takeuchi, 1995). The knowledge management practices are found to benefit the organisation in terms of financial performance measures (Tanriverdi, 2005), non-financial performance measures such as quality (Mukherjee et al., 1998), innovation (Francisco and Guadamillas, 2002) and productivity (Lapre and Wassenhove, 2001). Organisational performance is a function of how organisations use, apply, and leverage what they know (Khalil et al., 2006).

Kuan Yew Wong and Elaine Aspinwall, 2005 conducted a survey in UK SMEs enumerated few success factors for KM implementation viz. Management leadership and support, Culture, Information technology, Strategy and purpose, Measurement, Organisational infrastructure, Processes and activities, Motivational aids, Resources, Training and education, Human resource management. In addition to the above critical success factors, benchmarking is also reported as a key factor responsible for KM implementation (Changiz Val-mohammadi, 2010).

Organisational culture and knowledge management

Ribiere (2001) examined the relationship between knowledge management initiative success and organizational culture orientation in primarily service-oriented organizations from the information technology, government, and consulting sectors located in the Washington, DC area. He reported that organizations with a communal (high trust, high solidarity) culture achieved success with knowledge management initiatives that focused on both codification and personalization.

Lawson (2003) examined the relationship between organizational culture and knowledge management in various businesses in the finance, government, health, and education sectors and found a significant correlation between all of the culture types and knowledge management.

Roman, Ribiere, and Stankosky (2004) examined the relationship between organizational culture and knowledge management systems (KMS) success in the federal and state governments, universities, and other nonprofit institutions and reported that organizations with stronger cultural values at the organizational and work unit levels had greater success with

knowledge management efforts.

Similarly the relationship between organizational culture and knowledge management are studied in various organization in various countries (Kangas, 2005; Lai and Lee, 2007; Chang and Lee, 2007; Palanisamy, 2007, Ciganek, Mao, and Srite, 2008; Nayir and Uzuncarsili, 2008). The extent research presented reveals that organizational culture is an important aspect of knowledge management.

Leadership and knowledge Management:

Building knowledge in an organization is a challenge that begins at the very top who is tasked with seeing a company through all sorts of changes, ranging from exponential growth and sudden market changes to mergers and layoffs. To maintain a firm's performance and set an example for employees, leaders need to be flexible, willing learners who understand that their own knowledge development begins with an accurate assessment of their leadership style and a clear understanding of how their skills match the company's needs. They should also be aware of the messages their strategies convey about the importance of institutional knowledge, especially in times of upheaval (*Knowledge@Wharton, 2007*).

Sherry D. Ryan et al., (2012) conducted a survey in a medium-sized city government in the United States to investigate the relationship between leadership triad components, leadership strategic planning, and customer/market focus, with knowledge management and reported a significant relationship between these components and knowledge management.

Ferenc Farkas (2003) examined the relationship between role of leadership and knowledge management in professional service organizations in Germany and Hungary and reported a strong influence of leadership on external and internal knowledge transfer.

Sajay Kumar Singh (2008) analysed the role of leadership in knowledge management in a software company. He reported that a directive style of leadership is found to be negatively and significantly related to knowledge management dimensions whereas delegating style of leadership has a positive and significant relationship.

Although management scholars and practitioners are increasingly aware of the importance of KM practice, there are still many unanswered questions like the actual KM practices adopted by the organisations and the relationships between the various components.

The objective of this paper is to understand the KM practices in an Indian manufacturing organization, Madras cements. This paper reports the findings of a survey carried out to assess the status of KM practices in manufacturing firm.

Company Overview

This investigation took place in the case study company which is the flagship company of the Ramco Group, a well-known business group of South India. The company was incorporated in the year 1957. The company is the sixth largest cement producer in the country and the second largest in South India. It is headquartered at Chennai and has five manufacturing plants in Tamilnadu, Andhra Pradesh and Karnataka. The main product of the company is Portland cement, manufactured in five state-of-the-art production facilities spread over South India, with a current total production capacity of 13.0 MTPA. The company is the fifth largest cement producer in the country. Ramco Supergrade is the most popular cement brand in South India. The company also produces Ready Mix Concrete and Dry Mortar products, and operates one of the largest wind farms in the country. The company also has State-of-the-art research center, Ramco Research Development Centre, Chennai. The company has approximately 2000 employees, 60% of which are directly involved with product manufacturing. Another 20% are involved with sales, marketing, and customer service, and 15% are

in research and development and engineering. The remaining are responsible for other administrative functions, such as finance, IT, purchasing, etc.

Objectives of the Study:

- To identify the major knowledge management practices that are adopted in Madras Cements
- To know the relationship between organizational culture and knowledge management practices
- To know the relationship between leadership and knowledge management practices.

Research hypotheses

- 1. There exists a relationship between organizational culture and knowledge management practices
- 2. There exists a relationship between leadership and knowledge management practices

Sampling

The sample in this investigation was drawn from the case study company and includes representatives of a diverse group of professionals. 138 respondents (N = 138) completed the survey, representing engineering, manufacturing, projects, information technology (IT), packaging, and finance.

The respondents' years of service ranged from two to more than 15 years. The Bachelors degree concentrations are broken down as follows: 36 are information and computer technology-related, 8 chemistry, 66 engineering and 28 business-related.

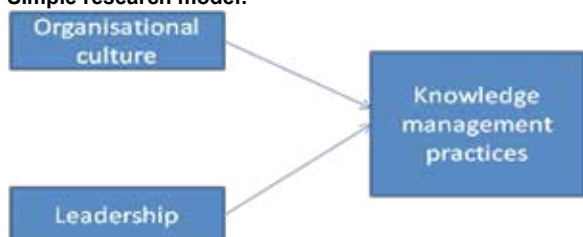
Measurement and data collection

Data concerning Knowledge Management practices are collected by adopting quantitative method. The instrument used for data collection was adopted from Khalil et al. (2006) which in turn was adopted from Filius et al (2000). The questionnaire comprised five sections representing the five KM dimensions: Knowledge capture(KC), Knowledge Creation(KCR), Knowledge Storage(KS), Knowledge Transfer(KT), and Knowledge application(KAP). Responses were measured on a 5 point Likert-type scale, ranging from strongly agree (1) to strongly disagree (5). Appendix A includes the 18 statements on the five dimensions of knowledge management practices. In addition, the instrument also has sections for analyzing the role of organizational culture and leadership.

For this research, the five KM dimensions are defined as follows:

- 1) KC--the extent to which an individual or organization learns or attains external knowledge or skills.
- 2) KCR--the extent to which an individual or organization uses the knowledge to create new ideas internally
- 3) KS--the extent to which an individual or organization codes or records the acquired knowledge.
- 4) KT--the extent to which an individual or organization shares knowledge.
- 5) KAP--the extent to which an individual or organization uses knowledge to improve processes, performance or products and services.

Simple research model:



Analysis and interpretation

Table 1

Reliability Statistics	
Cronbach's Alpha	N of Items
.862	30

An examination had been made from the reliability of the data to check whether random error causing inconsistency and in turn lower reliability is at a manageable level or not, by running reliability test. From table 1 it is clear that values of Co-efficient alpha (Cronbach's Alpha) have been obtained, the minimum value of Coefficient alpha obtained was .862 .This shows data has satisfactory internal consistency reliability.

Factor analysis

Questionnaire was designed with 30 (18 on knowledge management practices, 7 on organizational culture and 5 on leadership style) statements. The individual statements on Knowledge management practices was examined using factor analysis based on 18 individual statements and are grouped into five categories and the reliability of the samples collected was tested for internal consistency of the grouping of the items. Table 2 summarises the KMO test statistics.

Table2 KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.644
Bartlett's Test of Sphericity	Approx. Chi-Square	808.059
	df	210
	Sig.	.000

KMO measure of sampling adequacy is an index to examine the appropriateness of factor analysis. High values between 0.5 and 1.0 indicate factor analysis is appropriate. From the above table it is seen that Kaiser – Meyer – Olkin measure of sampling adequacy index is 0.644 and hence the factor analysis is appropriate for the given data set. Bartlett's Test of Sphericity is used to examine the hypothesis that the variables are uncorrelated. It is based on chi- Square transformation of the determinant of correlation matrix. A large value of the test statistic will favor the rejection of the null hypothesis. In turn this would indicate that factor analysis is appropriate. Bartlett's test of Sphericity Chi-square statistics is 808, that shows the 18 statements are correlated and hence as inferred in KMO, factor analysis is appropriate for the given data set.

The next step in the process is to decide about the number of factors to be derived. The rule of thumb is applied to choose the number of factors for which 'Eigen Values' with greater than unity is taken by using Principal Component Analysis method. The component matrix so formed is further rotated orthogonally using Varimax rotation algorithm which is the standard rotation method(Kaiser, 1958). All the statements are loaded on 5 factors. The total variance matrix and the rotated component matrix are given in Appendix 2.

The five components arrived after factor analysis is named after knowledge management practices as under:

1. Knowledge Capture(KC)
2. Knowledge Creation(KCR)
3. Knowledge Storage(KS)
4. Knowledge Transfer(KT)
5. Knowledge Application(KAP)

Correlation:

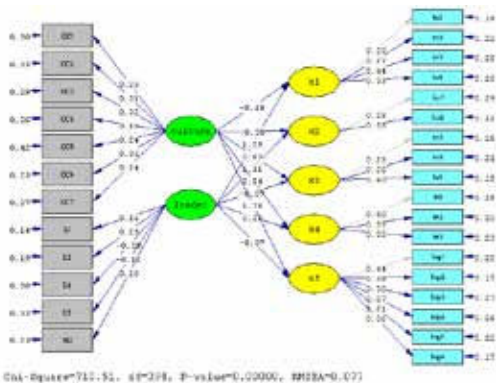
Mean values of the data for knowledge dimensions, organizational culture and leadership style are computed individually and then using SPSS, bivariate correlation was done. The correlation between the variables knowledge capture, kcr, ks,kt,kap, oc and leadership are significant. Closer analysis of the relationship between the variables reveal that organization culture has more significant effect on the other variables. The values are given in Table 3.

Table 3 : Correlation analysis

	kc	kcr	ks	kt	kap	oc	leader
kc	1						
kcr	.474**	1					
ks	.354**	.219**	1				
kt	.331**	.358**	.330**	1			
kap	.471**	.357**	.375**	.456**	1		
oc	.584**	.392**	.435**	.464**	.673**	1	
leader	.256**	.212**	.347**	.359**	.300**	.298**	1

Structural Equation model

Simple correlation calculations reveal that organizational culture and leadership has an impact on knowledge management practices and hence the proposed simple research model was tested with the data. LISREL was used for testing the conceptual model and was proved significant.



Structural equation model is used to determine the strength of the relationship between unobserved variables (Latent variables) and measured variables. The above figure displays the path diagram resulting from the structural modeling analysis from LISREL. The diagram shows that there is a positive relationship between the variables. The model fit is explained as follows:

- The Chi-Square value is the traditional measure for evaluating overall model fit and, 'assesses the magnitude of discrepancy between the sample and fitted covariances matrices' (Hu and Bentler, 1999: 2). A good model fit would provide an insignificant result at a 0.05 threshold (Barrett, 2007) and for this model chi-square is insignificant and hence it is a good model fit.
- The RMSEA tells us how well the model, with unknown but optimally chosen parameter estimates would fit the populations covariance matrix (Byrne, 1998). In recent years it has become regarded as 'one of the most informative fit indices' (Diamantopoulos and Siguaw, 2000: 85) due to its sensitivity to the number of estimated parameters in the model. It is generally reported in conjunction with the RMSEA and in a well-fitting model the lower limit is close to 0 while the upper limit should be less than 0.08. Our model gives the RMSEA of 0.077.
- Root mean square residual value is 0.029 for a best fit model the value should be less than 0.08. Values for the SRMR range from zero to 1.0 with well fitting models obtaining values less than .05 (Byrne, 1998; Diamantopoulos and Siguaw, 2000), however values as high as 0.08 are deemed acceptable (Hu and Bentler, 1999). For this model, SRMR value is 0.081.
- Normed Fit Index value for the model is 0.71 and NNFI is 0.79. Recommendations as low as 0.80 as a cutoff have been preferred however Bentler and Hu (1999) have suggested NNFI ≥ 0.95 as the threshold.

The Comparative Fit Index (CFI: Bentler, 1990) is a revised form of the NFI which takes into account sample size (Byrne, 1998) that performs well even when sample size is small (Tabachnick and Fidell, 2007). A cut-off criterion of CFI ≥ 0.90 is presently recognised as indicative of good fit (Hu and Bentler, 1999). But CFI value for this model is 0.81 and is slightly below 0.9.

The LISREL analysis confirms that the research hypotheses, viz. there is a significant relationship between organizational culture and knowledge management practices and there is a significant relationship between leadership style and knowledge management practices hold good for the given set of data.

Findings:

The study reveals that knowledge management practices are significantly adopted by the case study company as given in table 4 (Individual mean scores are given in Appendix 3). Majority of the respondents are aware of and take part in various KM activities of the company.

Table 4

KM dimension	Mean score
Knowledge capture(KC)	1.46
Knowledge creation(KCR)	1.48
Knowledge storage(KS)	1.45
Knowledge Transfer(KT)	1.50
Knowledge Application(KAP)	1.46

Similarly, organizational culture (Mean=1.56) studies reveal that when formal procedures govern the everyday activities and the organization is result oriented they agree that the organization is like an extended family. Another important aspect of organizational culture is that the flow of information. Again, majority of the respondents agree that the information flow is fast and without barriers.

Another crucial enabler of knowledge management, leadership style (Mean = 1.46) assessment reveals that managers give priority to high achievement and at the same time work well with the employees and communicate the goals of the organization.

Correlation between the exogeneous variables, in this case organizational culture and leadership, and endogenous variables viz. KM dimensions proved to be significant and is further confirmed by SEM. Structural equation modeling (SEM) for the given set of data presented a good fit for the proposed simple research model.

Conclusion:

The new world of knowledge economy, organizations distinguish themselves from those of the last millennium in recognizing KM as core competency and adopting knowledge management practices as essential for achieving the organization's goals. The objective of this paper is to understand the KM practices in a manufacturing organization which by far less explored. The findings suggest that manufacturing firms also have realized the importance of knowledge management practices and have adopted them even though not explicitly in the name of knowledge management strategy.

REFERENCES

1. Alavi, M., & Leidner, D. E. (2001). "Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues", *MIS Quarterly*, Vol.25, No.1, pp 107-136. | 2. APQC. (2000), "Building and sustaining communities of practice: Final report", American Productivity and Quality Center Report. | 3. Chang, S., & Lee, M. (2007). "The effects of organizational culture and knowledge management mechanisms on organizational innovation", *The Business Review*, Cambridge, 7(1), 295-301. | 4. Changiz Valmohammadi,2010, "Investigation and Assessment of Critical Success factors of KM implementation in Iranian SMEs", *Journal of Applied Sciences*, 10(19) | 5. Daire Hooper, Joseph Coughlan, Michael R. Mullen(2008),"Structural Equation Modelling: Guidelines for Determining Model Fit", *Electronic Journal of Business Research Methods*, Volume 6 Issue 1,pp 53-60 | 6. Francisco, J.F. and Guadamillas, F. (2002), "A case study on the implementation of knowledge management strategy oriented to innovation", *Knowledge and Process Management*, Vol9: no.3, 162-71. | 7. Hu, L.T. and Bentler, P.M. (1999), "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives," *Structural Equation Modeling*, 6 (1), 1-55. | 8. Khalil, Omah,Claudio, Allison,Seliem, Ahmed(2006) ," Knowledge Management: the case of the Acushnet Company", *SAM Advanced Management Journal* | Kuan Yew Wong and Elaine Aspinwall(2005), "An empirical study of the important factors for knowledge-management adoption in the SME sector", *Journal Of Knowledge Management* , Vol. 9 No. 3, pp. 64-82. | 9. Lapr M.A and Wassenhove L.N.V.2001. 'Creating and transferring knowledge for productivity improvement in factories'. *Management Science*, 47 (10):1311-1325. | 10. Lee, S. K., & Yu, K. (2004), "Corporate culture and organizational performance", *Journal of Managerial Psychology*, 19(4), 340-359. | 11. Mukherjee, A.S., Lapre, M.A. & Wassenhore, L.N.V. (1998), "Knowledge driven quality improvement", *Management Science*, 44(1), 35-49. | 12. O'Dell, C., and C. Grayson. 1998,"If Only We Knew What We Know: Identification And Transfer Of Internal Best Practices", *California Management Review* 40(3): 154-174. | 13. Palanisamy, R. (2007), "Organizational culture and knowledge management in ERP implementation: An empirical study", *The Journal of Computer Information Systems*, 48(2), 100-120. | 14. Stoica, M., Liao, J., & Welsch, H. (2004),"Organizational culture and patterns of information processing: The case of small and medium-sized enterprises", *Journal of Developmental Entrepreneurship*, 9(3), 251-266. | 15. Tanriverdi, H. and Venkatraman, N. (2005), "Knowledge relatedness and the performance of multibusiness firms", *Strategic Management Journal*, 26: 97-119. | Websites: | 1. www.cii.in/ | 2. www.smeworld.org | Dissertations: | 1. Michael Brandt Jones(2009), "Organizational Culture And Knowledge Management: An Empirical Investigation Of U.S. Manufacturing Firms",A Dissertation Submitted to Nova Southeastern University