Assessment Of Knowledge Management Maturity In An R&D Organization

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ABSTRACT:

Assessment Knowledge Management Maturity is a necessary step for any organization which has initiated the journey of Knowledge Management. Also validation of any knowledge management maturity model is an important test for the model. This paper details the work done to achieve the dual purpose of assessing the knowledge management maturity of an R&D organization and validating the Knowledge Management Maturity Model developed by the authors.

Keywords: *Knowledge management, Maturity assessment, Maturity model validation*

1. Introduction

Knowledge Management (KM) is a fast moving interdisciplinary field that has been created by the collision of several others like Information and Communication Technology, Information Science, Systems Science and Engineering, Knowledge Engineering, Collaborative Engineering, Human Resource Management, Organizational Development, Change Management and Performance Management. It is a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that will improve organizational performance (APQC, 2000). KM is an important capability in an organization's arsenal, but it has been one of the least scientific approaches with an absence of proper methodologies for assessment, application or implementation (Natarajan, 2005). While there is not a cookbook solution to implementing and achieving improvements in KM performance, paths have emerged that in case of some organizations, have yielded benefits (Bukowitz and Williams, 1999). It is unlikely that the KM implementation can be achieved in one giant leap, and a staged framework is thus desirable (Kochikar, 2000, Mohanty and Chand, 2005, Pee and Kankanhalli, 2009). Regardless of whether an organization is just getting started, conducting the first implementation of KM pilot projects, or preparing to revitalize or leverage successful KM approaches and tools to other areas in the enterprise, it should have a road map with milestones and checkpoints to guide its efforts (Hubert and Lemons, 2010). If KM is to become a professional discipline within the organization rather than a short lived 'fad', it is essential to have a reliable instrument for defining ones current position and driving long-term development (Ehms and Langen, 2002)). Knowledge Management Maturity Models (KMMM) provide such an instrument with a clear cut road map for any organization that is embarking on knowledge management implementation. It provides the clear vision with a description of the path to improvement (Klimko, 2001).

In order to assess the maturity of the KM implementation in any organization the KMMM applicable for the organization need to identified. For this study the KMMM developed by the authors (Kuriakose et. al, 2011) is used. A major R&D organization in India is the context of study.

This paper evaluates the Knowledge Management Maturity of an R&D organization based on the KMMM developed by the authors, through a case study. It also evaluates the KM maturity of the sub units of the organization, through the embedded case study. It also identifies the inhibiting factors of the sub units of the organization and the organization as a whole, in achieving higher levels of maturity through a survey and also suggests methods to improve KM maturity of the organization. The study also validates the KMMM developed by the authors. The paper is organized as follows. The first section describes the organizational context. The second section briefly describes the KMMM. The third section details the case study and analysis. The fourth section dwells on the conclusion and the future work

2. The Organizational Context

The organizational activities are mainly Research and Development (R&D) with respect to Fast Reactor. The organization has eleven major technical groups and two non technical groups. Only ten technical groups are considered for the study. The organization had initiated formal K M practices a few years back. It had developed and documented a formal KM policy for the organization. It had implemented an interconnected technology infrastructure for knowledge preservation and sharing, with freedom for individual groups to organize its own knowledge repository. It also had created part time KM rolls like Chief Knowledge Officer and Group Knowledge Officers, with a task force constituted by the Director, who is the Chief Executive Officer of the organization.

Though the organization is predominantly R&D oriented, it has groups which are carrying out technical services, operation and maintenance and project execution. Brief description of the activities of the groups are listed in Table 1 below (IGCAR, 2011a): The actual names of the groups are not mentioned for confidentiality

Group	Activities
G1	Carrying out R&D and analytic support with respect to all the Chemistry aspects of the Organization
G2	Developing Electronics and Instrumentation Systems, providing computational and information services to the Organization
G3	Providing Engineering Services to the Organization
G4	Design and Project Execution
G5	Development and testing of models and prototype components
G6	Carrying out basic research and applied research
G7	Carrying out basic research
G8	Carrying out Design and R&D
G9	Plant Operation and Maintenance
G10	Technology Development, R&D activities and Project execution

Table 1. Groups And Activities

The organizational website (IGCAR, 2011b)) reads the following facts:

- The organizations was established in 1971 with a clear mission of conducting broad based multi disciplinary programme of Scientific Research and Advanced Engineering, directed towards the development of sodium cooled Fast Breeder Reactor Technology.

- Over the years, the organization has established comprehensive R&D facilities covering the entire spectrum of Fast Breeder Reactor Technology related to Sodium Technology, Reactor Engineering, Reactor Physics, Metallurgy and Materials, Chemistry of Fuels and its materials, fuel Reprocessing, Reactor Safety, Control and Instrumentation, Computer Application etc. and has developed a strong base in a variety of disciplines related to this advanced technology. Apart from thrust areas related to nuclear technology, the organization has credentials as a leader of basic research in various frontier and topical areas.

- The organization has staff strength of 2816 including 1274 Engineers and Scientists. The annual outlay of the Organization is 670 million rupees towards R&D activities and plan schemes.

- Many of the Departments of the Organization are ISO 9001.2008 certified.

- The Organization extends its expertise and facilities to other R&D Sectors and industries. It also has collaborations with other R&D Organization and educational institutions. It also has identified the knowledge gap areas, where expertise needs to be developed.

- The organization in its journey of excellence has achieved several scientific and technological milestones, with international benchmarks and high impact on its mission program. To quote, its Director “Enhancing Quality and Commitment of Human Resources is the key to our strategy of achieving and sustaining excellence. We believe in innovations in management of Science and Technology forenhancing our focus, creativity and productivity” (IGCAR, 2007; p. 2)

It was decided by the top management to assess the Knowledge Management Maturity of the Organization and identify methods to improve the maturity. In order to assess the maturity, the Knowledge Management Maturity Model (KMMM) developed by the authors was used (Kuriakose et al, 2011). The Organizational study to assess the maturity was also used to validate the model. A case study approach was found to be appropriate since many of the questions were pertaining to 'how' and 'why' and an in depth description of the phenomenon was required (Yin, 2009).

3. Knowledge Management Maturity Model

The KMMM (Kuriakose et al, 2011) has six maturity levels. It identifies five Key Areas: People, Process, Technology, Knowledge and Return On Investment (ROI). It also identifies 20 parameters (Key Parameters) for all the Key Areas (People-6, Process-4, Technology-6, Knowledge-3, ROI-1). The parameters can have different values called Key Values, which can be either qualitative values (Low, Medium and High) or quantitative values (0-100%). The value 'Nil' indicates that, either the parameter is not applicable, or it is not assessed or the value is negligible. Each maturity level is identified by a group of Key Maturity Indicators (KMI), which is a combination of Key Areas, Key Parameters and Key Values. The maturity levels and KMIs are reproduced in table 1.

Maturity Level	People	Process	Technology	Knowledge	ROI
0 Default	_	_	Only routine	_	
1 Initial	▪ Awareness- Low ▪ Participation -Low ▪ KM roles –Low ▪ Mentoring and Succession Planning-Low ▪ Communities of Practice-Nil ▪ Reward and Recognition Scheme- Nil	▪ KM Policy-Low ▪ KM Strategy-Low ▪ KM Processes-Low ▪ Process Integration-Nil	▪ Network-Medium ▪ Data and Information management-Medium ▪ Explicit Knowledge Management-Low ▪ Tacit Knowledge Management-Low ▪ KE techniques-Nil ▪ Technology Integration- Nil	▪ Knowledge Classification-Low ▪ Knowledge Capability Areas-Nil ▪ Knowledge Organization-Nil	▪ Employee Satisfaction-Nil
2 Qualitative Development	▪ Awareness-Medium ▪ Participation -Medium ▪ KM roles -Medium ▪ Mentoring and Succession Planning-Medium ▪ Communities of Practice-Low ▪ Reward and Recognition Scheme- Low	▪ KM Policy-Medium ▪ KM Strategy-Medium ▪ KM Processes-Medium ▪ Process Integration-Low	▪ Network-High ▪ Data and Information management-High ▪ Explicit Knowledge Management-Medium ▪ Tacit Knowledge Management-Medium ▪ KE Techniques-Low ▪ Technology Integration-Low	▪ Knowledge Classification-Medium ▪ Knowledge Capability Areas-Medium ▪ Knowledge Organization-Medium	▪ Employee Satisfaction-Medium

3 Quantitative Development	▪ Awareness->50 ▪ Participation ->50 ▪ KM roles ->50 ▪ Mentoring and Succession Planning->50 ▪ Communities of Practice->50 ▪ Reward and Recognition Scheme- >50	▪ KM Policy->50 ▪ KM Strategy->50 ▪ KM Processes->50 ▪ Process Integration->50	▪ Network->50 ▪ Data and Information management->50 ▪ Explicit Knowledge Management->50 ▪ Tacit Knowledge Management->50 ▪ KE techniques->50 ▪ Technology Integration->50	▪ Knowledge Classification->50 ▪ Knowledge Capability Areas->50 ▪ Knowledge Organization->50	▪ Employee Satisfaction->50%
4 Maturity	▪ Awareness->90 ▪ Participation ->90 ▪ KM roles ->90 ▪ Mentoring and Succession Planning->90 ▪ Communities of Practice->90 ▪ Reward and Recognition Scheme- >90	▪ KM Policy->90 ▪ KM Strategy->90 ▪ KM Processes->90 ▪ Process Integration->90	▪ Network->90 ▪ Data and Information management->90 ▪ Explicit Knowledge Management->90 ▪ Tacit Knowledge Management->90 ▪ KE techniques->90 ▪ Technology Integration->90	▪ Knowledge Classification->90 ▪ Knowledge Capability Areas->90 ▪ Knowledge Organization->90	▪ Employee Satisfaction->90%
5 Extended-organizational maturity	Same as level 4 with extended value chain of the organization.	Same as level 4 with extended value chain of the organization	Same as level 4 with extended value chain of the organization	Same as level 4 with extended value chain of the organization	Same as level 4 with extended value chain of the organization

Table 2. Maturity Levels And Key Maturity Indicators

As per the model, for an organization to be in a specific maturity level, all the KMIs pertaining to that level and all preceding levels need to be satisfied. No levels satisfies all the KMIs pertaining to one level say level 1 and at least one KMI pertaining to the next level for each KA, then organization can be considered to be i organization satisfies at least 50% of the KMIs pertaining to level 2 for each KA, then that organization can be considered to be in a level of 1++. Also if the orga 1 and satisfies at least one KMI or at least 50 % of the KMIs of level 2 in one or more specific KAs alone, the organization is considered to be in level 1 in the ov specific KAs alone.

4. Case Study

According to Yin (2009) case studies are preferred, when, how, or why questions are posed, the investigator has little control over the events and the focus is on real-life context. In case studies the richness of the phenomenon and the extensiveness of the real life context require the case study investigators to cope with a t more variables of interest than data points. Here, an essential tactics is to use multiple sources of evidence, with data needing to coverage in a triangular fashion (

4.1. Research Methodology

The main research questions are:

- Why the organization had initiated the formal KM practices?
- How can the KM practices of the organization be improved to achieve its objectives?

Since, the main research questions are 'how' and 'why' type, case study is the most appropriate methodology (Yin, 2009).

The other research questions are:

- What is the current level of KM maturity of the Organization?
- What are the current maturity levels of different Groups of the Organization?
- Is there any difference in the maturity levels of individual Groups, if so what are the reasons?
- What are the possible ways in which the maturity levels of the organization can be improved?

In order to answer the above questions, it is necessary to have a structured methodology to implement the KM practices and to measure the progress of the implen consideration. A KM maturity model is an accepted methodology (Klimko, 2001) for systematic implementation of Knowledge Management practices. Hence, a model was developed by the authors (Kuriakose et al, 2011) and it is used as the basis, to find the probable answers to the main research questions and to evaluat organization as a whole and the individual Groups in the organization.

The main focus of the case study is the KM implementation and current KM practices of the organization. After identifying the current stage of the KM practices identifies the ways and means to improve further and to move to higher maturity levels. It also tries to find out the probable inhibitors of KM maturity in the orga

The study propositions are:

- Organization had implemented Knowledge Management practices to achieve sustainable superior performance and break through innovation.
- Organization is keen to identify the inhibitors to achieve higher levels of maturity and eliminate them

The unit of analysis is the KM practices of the organization and sub units of analysis are the KM practices of the groups of the organization.

4.2. Plot Study

Pilot study was conducted using semi-structured interviews with selected representatives of the organization. Plot study revealed that the KM awareness needs sig study revealed some of the prevailing inhibiting factors for attaining higher levels of KM maturity.

4.3. Embedded Case Study

Since there are sub-units of analysis, an embedded case study is found to be appropriate (Yin, 2009). Based on the experience gained through pilot study, the follo the case study:

- Conduct an awareness seminar in each group,
- Conduct a focus group discussion with the participants on their current practices and expectations
- Administer a questionnaire.
- Verify various records

Based on the study, the current maturity levels of individual groups were arrived at by the investigators. The records verified includes the web site of the organiza organization, the knowledge management portal of the organization, and various data and information management systems of the organization. The Key Maturity arrived at, by the investigators are depicted in the table 3.

Sl.No.	Parameters	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
1	Awareness	L	M	L	L	M	L	M	M	M	L
2	Participation	L	M	L	L	M	L	M	M	M	L
3	KM Roles	L	M	L	L	M	L	M	M	M	L
4	Mentoring & Succession Planning	L	L	L	L	L	L	L	L	L	L
5	Reward & Recognition Scheme	L	L	L	L	L	L	L	L	L	L
6	Communities of Practice	L	L	L	L	L	L	L	L	L	L
7	Network	H	H	H	H	H	H	H	H	H	H
8	Data & Information Management	M	M	M	M	M	M	M	M	M	M
9	Explicit Knowledge Management	L	M	L	L	M	L	M	L	M	L
10	Tacit Knowledge Management	L	L	L	L	L	L	M	L	L	L
11	A I Techniques	N	L	N	N	N	N	N	N	N	N
12	Technology Integration	N	N	N	N	N	N	N	N	N	N
13	K M Policy	L	L	L	L	L	L	L	L	L	L
14	K M Strategy	L	L	L	L	L	L	L	L	L	L
15	K M Processes	L	L	L	L	L	L	L	L	L	L
16	Process Integration	N	N	N	N	N	N	N	N	N	N
17	Knowledge Classification	L	L	L	L	M	L	M	L	L	L
18	Knowledge Capability Area	L	L	L	L	L	L	M	L	L	L
19	Knowledge Organization	N	L	N	N	N	N	N	N	N	N
20	Employee Satisfaction	L	L	L	L	L	L	L	L	L	L

Table 3. Key Maturity Indicators For Groups (N - Nil; L - Low; M - Medium; H - High)

The questionnaire contained 21 factors, that can influence KM maturity, which were developed based on the discussions in Bukowitz and Williams (1999) and the factors can act as enablers and the absence can act as inhibitors. The questionnaire used a five point Likert scale (strongly agree, agree, neither agree/nor disagree, collect the response from the participants. The questionnaire was pre-tested, with a few senior, middle and junior level employees, for the understanding of the qu represented. Based on the feedback received, the structure was modified to make the inhibiting factors more explicit by adding the 'if' to all the inhibiting factors. "lack of adequate time" the initial question was 'I am willing to share more of my work, experiences, ideas, expertise, etc. with other members of the organizatio organizational knowledge repository, if: I have more time'. The question was modified as 'I am willing to share more of my work, experiences, ideas, expertise, e organization as my contribution to the organizational knowledge repository: if I have more time'. Also since the questionnaire was personally administered, by the seminar, the necessary clarifications could be provided. However the clarifications required were minimum.

If the answer to the question is 'strongly agree', it indicates that 'lack of time' is a strong inhibiting factor. If the answer is 'strongly agree' or 'agree' it is consider (Kulkarni and Freeze, 2004). The mean, standard deviation and percentage of positive responses for each group are summarized in the table 4. The strongest inhib highlighted.

S.No	Inhibitors	G1			G2			G3			G4			G5			G6			G7
		M	SD	PR	M	SD	PR	M	SD	PR	M	SD	PR	M	SD	PR	M	SD	PR	M
1	Lack of time	3.33	1.12	56	3.43	1.01	54	3.86	0.92	78	4.13	0 .81	87	3.82	0.97	74	3.93	0.96	78	3.67
2	Lack of awareness of knowledge requirements	3.67	1.12	75	3.94	0.73	77	3.95	1.00	81	4.31	0.48	100	4.13	1.00	82	3.86	0.99	71	4.28
3	Lack of expertise in organizing the available Knowledge	4.33	1.12	78	3.40	1.01	51	3.70	0.91	70	3.88	0.62	75	3.97	0.90	77	2.86	0.91	28	3.44
4	Lack of awareness of the process of contribution	4.11	0.33	100	3.66	0.84	60	4.08	0.72	84	4.00	0.52	87	4.03	0.81	79	3.36	1.11	50	3.89
5	Lack of assistance in contribution	3.22	1.39	44	3.20	1.21	43	3.43	1.12	54	3.56	0.89	56	3.38	1.16	59	2.21	1.37	14	2.83
6	Lack of user friendly technology infrastructure	3.67	1.32	67	4.06	0.76	80	4.00	0.78	75	4.31	0.70	87	4.28	0.69	92	3.93	0.96	64	3.72
7	Lack of integration of the process of contribution with day-today work	3.11	1.45	56	4.09	0.70	86	3.92	0.89	67	4.44	0.73	87	4.38	0.63	82	4.00	0.85	78	3.83
8	Lack of awareness of the utility of the contributions	4.22	0.67	89	3.40	1.03	54	3.57	1.01	57	3.44	1.03	62	3.77	0.81	69	3.86	0.83	71	3.39
9	Lack of tangible reward	3.78	1.09	56	3.00	1.08	34	3.03	1.21	32	2.94	1.06	31	3.38	1.09	43	3.00	0.93	21	3.00
10	Lack of recognition	4.22	1.20	67	3.29	0.99	48	3.14	1.13	38	3.06	1.29	50	3.59	1.23	66	3.21	1.15	43	3.00
11	Lack of gratefulness	4.44	1.13	78	3.03	0.89	28	3.22	1.20	40	3.13	1.20	37	3.44	1.25	54	2.57	1.12	14	2.83
12	Lack of feedback	4.56	0.53	100	3.77	1.06	74	3.89	0.97	70	3.88	0.96	81	4.10	0.75	77	2.00	0.65	78	3.94
13	Lack of weightage for contribution in performance appraisal	2.89	1.36	33	3.31	1.11	46	3.35	1.14	46	3.31	1.45	62	3.64	1.04	66	3.71	0.80	78	3.00
14	Lack of protection of intellectual property	4.11	1.27	78	3.40	3.80	48	3.41	1.01	48	2.75	1.34	31	3.54	1.27	56	4.14	0.83	86	3.44
15	Lack of assurance against negative reverse impact	3.89	0.78	67	3.80	0.93	71	3.84	0.90	67	3.31	1.14	50	3.56	1.17	64	4.36	0.81	93	3.39
16	Lack of assurance against belitting by colleagues	3.22	0.97	33	2.80	1.13	28	3.27	0.90	38	2.69	1.08	18	2.90	1.02	25	3.21	0.77	43	2.61
17	Lack of awareness on the significance of the contribution to the organization	4.11	1.05	78	3.77	1.03	66	3.73	1.07	62	3.88	1.15	75	4.18	0.91	84	4.43	0.49	100	4.00
18	Lack of directive from the reporting officer	3.11	0.93	33	3.06	1.00	31	3.05	0.97	38	3.50	1.15	50	3.36	0.84	38	3.57	1.05	50	2.83
19	Lack of contributions from colleagues	3.67	0.87	67	3.00	1.06	34	2.97	1.07	27	3.00	1.26	31	3.31	1.06	43	3.64	0.89	50	2.83

20	Lack of assurance on meeting the knowledge requirements by the organizational knowledge repository	4.00	0.76	78	3.43	1.09	46	3.54	0.96	57	3.50	0.86	75	3.87	0.86	66	3.54	0.93	61	3.11
21	Lack of mandatory organizational policy on contributions	4.00	0.7	78	3.26	1.07	74	3.14	1.25	43	3.00	1.41	31	3.31	1.17	46	3.07	0.88	21	2.67

Table 4: Inhibiting Factors Of Groups (M – Mean ; SD – Standard Deviation ; PR – Positive Response)

4.4. Analysis

The analysis was carried out based on various groups of the organization to identify the maturity levels of individual groups and the prominent inhibiting factors. organization wide to identify the most prominent inhibiting factors.

4.4.1. Groups

The knowledge management maturity of various groups is discussed in the following sections.

Group G1: The group has achieved a maturity of Level1+, in 'People' Key Area, since it has achieved 'Low' performance in 'Communities of Practice' and 'Re which pertains to level 2 performance. It is in Level 1 maturity in 'Process' Key Area. The group is in Level 1+, in 'Technology' Key Area, since it has achieved ' maturity in 'Knowledge' Key Area. The group has achieved an over all KM maturity of Level 1.

The strongest inhibiting factor is 'lack of feed back', with a mean of 4.56, standard deviation of 0.53 and 100% positive responses.

Group G2*:* The group has achieved a maturity of Level1++, in 'People' Key Area, since it has achieved a 'Medium' performance in 'Awareness', 'Participation' performance in 'Communities of Practice' and 'Reward and Recognition Scheme' , which pertains to level 2 performance. It is in Level 1 maturity in 'Process' Ke in 'Technology' Key Area, since it has achieved 'High' in ' Network', 'Medium' in 'Explicit KM' and 'Low' in 'KE Techniques'. It is in Level 1 maturity in 'Kn achieved an over all KM maturity of Level 1.

The strongest inhibiting factor is 'lack of integration of the process of contribution with day to day work', with a mean of 4.09, standard deviation of 0.70 and 86%

Group G3*:* The group has achieved a maturity of Level1+, in 'People' Key Area, since it has achieved a 'Low' performance in 'Communities of Practice', and 'F which pertains to level 2 performance. It is in Level 1 maturity in 'Process' Key Area. The group is in Level 1+, in 'Technology' Key Area, since it has achieved ' maturity in 'Knowledge' Key Area. The group has achieved an over all KM maturity of Level 1.

The strongest inhibiting factor is 'lack of awareness of the process of contribution', with a mean of 4.08, standard deviation of 0.72 and 84% positive responses.

Group G4: The group has achieved a maturity of Level1+, in 'People' Key Area, since it has achieved a 'Low' performance in 'Reward & Recognition Scheme' which pertains to level 2 performance. It is in Level 1 maturity in 'Process' Key Area. The group is in Level 1+, in 'Technology' Key Area, since it has achieved ' maturity in 'Knowledge' Key Area. The group has achieved an over all KM maturity of Level 1.

The strongest inhibiting factor is 'lack of integration of the process of contribution with day to day work', with a mean of 4.44, standard deviation of 0.73 and 87%

Group G5: The group has achieved a maturity of Level1++, in 'People' Key Area, since it has achieved a 'Medium' performance in 'Awareness', 'Participation' performance in 'Communities of Practice' and 'Reward & Recognition Scheme', which pertains to level 2 performance. It is in Level 1 maturity in 'Process' Key 'Technology' Key Area, since it has achieved 'High' in 'Network' and 'Medium' in 'Explicit KM'. It is in Level 1+ maturity in 'Knowledge' Key Area, since it ha 'Knowledge Classification'. The group has achieved an over all KM maturity of Level 1.

The strongest inhibiting factor is 'lack of integration of the process of contribution with day to day work', with a mean of 4.38, standard deviation of 0.63 and 82%

Group G6: The group has achieved a maturity of Level1+, in 'People' Key Area, since it has achieved a 'Low' performance in 'Reward& Recognition scheme' a pertains to level 2 performance. It is in Level 1 maturity in 'Process' Key Area. The group is in Level 1+, in 'Technology' Key Area, since it has achieved 'High' i in 'Knowledge' Key Area. The group has achieved an over all KM maturity of Level 1.

The strongest inhibiting factor is 'lack of awareness on the significance of contribution to the organization', with a mean of 4.43, standard deviation of 0.49 and 1

Group G7: The group has achieved a maturity of Level1++, in 'People' Key Area, since it has achieved a 'Medium' performance in 'Awareness', 'Participation' performance in 'Reward& Recognition scheme' and 'Communities of Practice', which pertains to level 2 performance. It is in Level 1 maturity in 'Process' Key A 'Technology' Key Area, since it has achieved 'High' in 'Network', 'Medium' in 'Explicit KM', and 'Tacit KM'. It is in Level 1++ maturity in 'Knowledge' Key A performance in 'Knowledge Classification' and 'Knowledge Capability Area'. The group has achieved an over all KM maturity of Level 1.

The strongest inhibiting factor is 'lack of awareness of knowledge requirements', with a mean of 4.28, standard deviation of 0.67 and 88% positive responses

Group G8: The group has achieved a maturity of Level1++, in 'People' Key Area, since it has achieved a 'Medium' performance in 'Awareness', 'Participation' performance in 'Reward& Recognition scheme' and 'Communities of Practice', which pertains to level 2 performance. It is in Level 1 maturity in 'Process' Key A 'Technology' Key Area, since it has achieved 'High' in 'Network'. It is in Level 1 maturity in 'Knowledge' Key Area. The group has achieved an over all KM ma

The strongest inhibiting factor is 'lack of awareness on the significance of contribution to the organization', with a mean of 4.32, standard deviation of 0.98 and 8

Group G9: The group has achieved a maturity of Level1++, in 'People' Key Area, since it has achieved a 'Medium' performance in 'Awareness', 'Participation' performance in 'Reward & Recognition Scheme' and 'Communities of Practice', which pertains to level 2 performance. It is in Level 1 maturity in 'Process' Key 'Technology' Key Area, since it has achieved 'High' in 'Network', 'Medium' in 'Explicit KM'. It is in Level 1 maturity in 'Knowledge' Key Area. The group has Level 1.

The strongest inhibiting factor is 'lack of awareness of the process of contribution', with a mean of 4.14, standard deviation of 0.53 and 93% positive responses.

Group G10: The group has achieved a maturity of Level1+, in 'People' Key Area, since it has achieved a 'Low' performance in 'Reward & Recognition Scheme which pertains to level 2 performance. It is in Level 1 maturity in 'Process' Key Area. The group is in Level 1+, in 'Technology' Key Area, since it has achieved ' maturity in 'Knowledge' Key Area. The group has achieved an over all KM maturity of Level 1.

4.4.2 Organization

The overall organizational KM maturity is determined by the lowest level achieved by any of the groups. Hence the KM maturity of the organization is Level1+, 'Process' Key Area, Level 1+, in 'Technology' Key Area and Level 1 maturity in 'Knowledge' Key Area. The organization has achieved an 'Employee Satisfac However as per the model ROI is not evaluated for Level 1 maturity. The organization has achieved an overall KM maturity of Level 1. The inhibiting factors of t mean is depicted in table 5.

Sl.No.	Inhibiting Factors	Mean	SD	PR
1	Lack of user friendly technology infrastructure	4.10	0.81	77.
2	Lack of integration of the process of contribution with day-today work	4.08	0.85	78.
3	Lack of awareness of knowledge requirements	4.03	0.87	82.
4	Lack of awareness on the significance of the contribution to the organization	4.01	0.99	75.
5	Lack of feedback	4.00	0.85	77.
6	Lack of awareness of the process of contribution	3.89	0.80	73.
7	Lack of time	3.72	1.00	68.
8	Lack of assurance against negative reverse impact	3.71	1.02	64.
9	Lack of expertise in organizing the available Knowledge	3.71	0.92	64.
10	Lack of awareness of the utility of the contributions	3.68	0.95	64.

11	Lack of assurance on meeting the knowledge requirements by the organizational knowledge repository	3.58	0.98	56.
12	Lack of protection of intellectual property	3.50	1.17	53.
13	Lack of recognition	3.35	1.12	48.
14	Lack of weightage for contribution in performance appraisal	3.34	1.19	51.
15	Lack of assistance in contribution	3.31	1.12	48.
16	Lack of directive from the reporting officer	3.27	0.98	40.
17	Lack of gratefulness	3.17	1.10	37.
18	Lack of tangible reward	3.12	1.14	36.
19	Lack of mandatory organizational policy on contributions	3.09	1.16	37.
20	Lack of contributions from colleagues	3.09	1.07	34.
21	Lack of assurance against belitting by colleagues	3.00	1.05	31.

Table 5: Inhibiting Factors Of The Organization (SD – Standard Deviation; PR – Positive Response)

The most predominant inhibiting factors based on mean (mean >=4.0) are 'lack of user friendly technology infrastructure' (mean=4.10), ' lack of integration of th day work' (mean=4.08), 'lack of awareness of knowledge requirements' (mean=4.03), 'lack of awareness on the significance of the contribution to the organizatio feedback' (mean=4.00). The organization need to formulate and implement an action plan to eliminate or at least minimize the inhibiting factors, to achieve higher

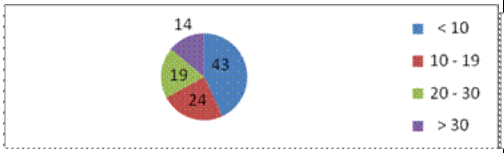
The demographic variables of the participants are shown in the pie chart 1. Though the organization is predominantly Research & Development, the highest numb development work (31%), followed by research (27%). The participants were mostly graduates (44%), followed by postgraduates (29%). The discipline of engine compared to science (27%). The participants were middle level officers (68%). Gender distribution was male 83% and female 27%. More of younger generation p <10=43%) in the study.

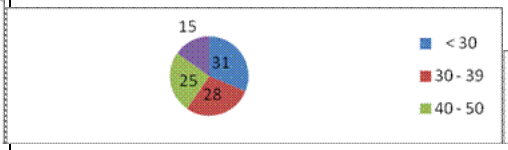
Type of Work	%
Research	27
Development	31
Project	21
Technical	21

Qualification	%
Diploma	18
Graduate	44
Post Graduate	29
Ph.D.	9

Discipline	%
Science	27
Engineering	73

Design /Grade	%
Upto SO/B	15





SO/C-E	68
SO/F-G	15
SO/H & Above	2

Gender	%
Male	83
Female	17

Age	%
< 30	31
30 - 39	28
40 - 50	25
> 50	15

Service	%
< 10	43
10 - 19	24
20 - 30	19
> 30	14

phic Variables Of The Participants

e construct validity, internal validity, external validity and reliability
in the following sections.

Construct Validity:

It is concerned with identifying correct operational measures for the concepts being studied. A pilot study was conducted across the cross section of the org
received were implemented in the case study. This case study used multiple sources of evidences like focus group discussion, structured interview, questio
organizational annual report etc. Also, the case study was conducted by a team of investigators. The key informants of the organization have reviewed the
study satisfies the construct validity.

Internal Validity:

It is concerned with establishing causal relationship in which certain conditions are believed to lead to other conditions. Since this case study is an explora

External Validity:

It is concerned with generalization of the studies findings. Since the case study has embedded sub units of analysis, the findings of the study can be analyt
organizations.

Reliability:

It is concerned with demonstrating that the operations of the study can be repeated with the same results. The goal of reliability is to minimize the biases i
conducted by a team of investigators and it used multiple sources of evidences, the reliability can be ensured.

In addition to the above four tests, the study also satisfies discriminant validity (Trochim, 2006). Different groups of the organization are at different levels of mat
areas. This indicates that key areas are distinct and not correlated, providing evidence of discriminant validity. Also the 'absolute test' specified by Kulkarni and F
For every key area, achieving a lower level maturity is a prerequisite for achieving next level maturity (Kulkarni and Freeze, 2004). The results indicate that none
without satisfying the lower levels. Hence the study validates the Knowledge Management Maturity Model

5. Conclusion and Future Work

The case study was used to identify the current KM maturity of the organization and its individual groups. Though the organization is in Level 1 in the over all m
'People' and 'Technology' Key Area. The organization need to focus more on 'Process' and 'Knowledge' Key Areas to move to Level 1+. For the organization to
qualitatively improve on the various parameters identified in the model. Also it needs to have a mechanism to monitor and take corrective actions on the qualitativ
it needs to eliminate the inhibitors of KM maturity, identified by the study.

Following are some of the suggestions made by the participants that indicate the areas that need to be improved. "some persons from each section should be made
information available"; "all organizational publications should be made available in the portal"; "provision for marks for documents and contributors should be av
be made available"; "in addition to approved knowledge documents, unapproved knowledge documents, blogs are also to be made available"; "search capability n
credit should be given to the knowledge sharer"; "submission of knowledge documents should be made mandatory"; "record of important discussions and talks sh

The active participation of the employees and the suggestions received from them indicate that the awareness and interest in KM activities have significantly impr

Similar study can be repeated at periodic intervals to evaluate the improvement in KM maturity and identify other inhibiting factors if any. Also it is possible to de
with a mix of case study and survey approach spread across a period of about five years. Many parameters like improvement in the usage, contribution, participa
derived from the portal itself.

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