Assessment of knowledge management activities in manufacturing

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Abstract

Knowledge management is one of the most important factors in achieving competitive advantage. In this study, first of all knowledge and knowledge management concepts are discussed and then a set of criteria for assessing effectiveness of the knowledge management activities as well as an assessment model are then described.

Keywords: Knowledge management, information systems, knowledge management criterias

1. Introduction

Knowledge management is one of the main research topics aiming to improve the systems by providing ways to handle the knowledge in such a way that the knowledge to be at the right person, on the right time and at the right place. More information about the knowledge management can be found in Barutçugil [1] and Aksoy [2]. Note that, knowledge management is strictly related to utilizing the intellectual capacity of the enterprise [3]. It was stated that the knowledge management activities can activate motivation and intellectual capacity to be used more effectively for the sake of organizational goals. Due to the importance of knowledge, assessment of the activities carried out to manage the organizational knowledge has to be taken very seriously as it can be providing the baseline for the survival of the organization in highly challenging and competitive environments. Utilizing a knowledge management model may make it easy to perform assessment and create a formal assessment procedure. There has been several knowledge management models already developed [see for examples; 2,4,5, 6].

In this article, an assessment methodology for knowledge management activities within an organization is introduced. This methodology is believed to increase efficient and effective knowledge utilization. The paper is divided into 6 sections. The following section highlights knowledge management process and advantages. Following this, assessment criteria are defined in section 3. Prior to a case study presented in section 5, a proposed assessment model is explained in section 4. The paper ends with a conclusion and some recommendations for future studies.

2. Knowledge Management and Related Processes

There have been several advantages for formal knowledge management activities within an organization. Öztemel and Arslankaya [3] listed several advantages. However, It is always not easy to sustain all of these advantage yielding benefits for the overall enterprise. There is a need for systematic knowledge management practices and implementation for this. Efficient knowledge management requires open knowledge sharing and

utilization facilities. This requires basic infrastructure and knowledge culture to be developed at enterprise level. In order to realize some of the abovementioned advantages, knowledge management process need to be carefully designed and implemented. In order to take the attention of the reader to the importance of knowledge management, Cormican ve D.O'Sullivan [7] has created a similar classification of the knowledge management process including; knowledge generation, knowledge representation, knowledge storage, knowledge access and knowledge transfer. Although there has been several attempts and knowledge management models have been created there is little work going on creating assessment models to assure if the models proposed can be implemented very beneficially. This study presents a set of assessment criteria to contribute assessment procedures is or will be developed.

3. Evaluation Criteria for Effective Knowledge Management

Assessment of "knowledge management" can be described as making sure that the knowledge related activities are carried out in such a way that the knowledge is utilized as much effectively as possible. Several criteria need to be satisfied in order to assure this as described by Öztemel and Arslankaya, [3]. Some of the proposed criteria are listed below.

1. Defining knowledge sources and following the changes
2. Providing knowledge sharing and accessibility facilities
3. Improving the knowledge and providing adaptation and flexibility in knowledge utilization
4. Creating a positive value to the organization through knowledge utilization
5. Protecting intellectual capital and intellectual property right through procedures
6. Establishing organizational roles of the knowledge workers and measuring the organizational change
7. Generating knowledge culture
8. Determining knowledge management strategies and implementing them
9. Applying a systematic management approach
10. Setting up knowledge management processes and improving them
11. Making use of information technology and knowledge management devices
12. Utilizing knowledge based management devices
13. Describing Enterprise Intelligence (EQ) and measuring it
14. Developing a learning organization
15. Experimenting leadership on knowledge management
16. Being open-minded and following the change
17. Improving competitive advantage
18. Managing the risks
19. Building a measuring and evaluation system

Note that the above list is can be considered as checking up knowledge management activities as much comprehensive as possible taking all managerial aspects into account. Besides it could be applicable for all organization with any type of the knowledge management model implemented. The criteria are set up in such a way that it can handle the remedies of all models.

4. Proposed Assessment Model

Figure 1 shows the basic components of the assessment model so called assessment units. Each assessment unit which is described in detail below is based on the criteria listed in the previous section.

A. Assessment of Knowledge Culture: This includes measuring the employee behaviors, knowledge based approaches; their believe in using the power of knowledge and updating the knowledge bases. Criteria 6, 7 and 15 are used to measure this capability.

B. Assessment of Knowledge Strategies: In order to assure that the right knowledge is to become available to the right person at the right times, the enterprises need to define knowledge handling and utilization strategies. Criteria 8,16 and 18 which are listed above are used to measure this. There are mainly 4 different aspects of knowledge strategies including;

1. To become the guidance in creating the right knowledge
2. To store the knowledge in the right place

3. To transfer the right knowledge at the right time.
4. To analyze and use the knowledge with proper procedures.

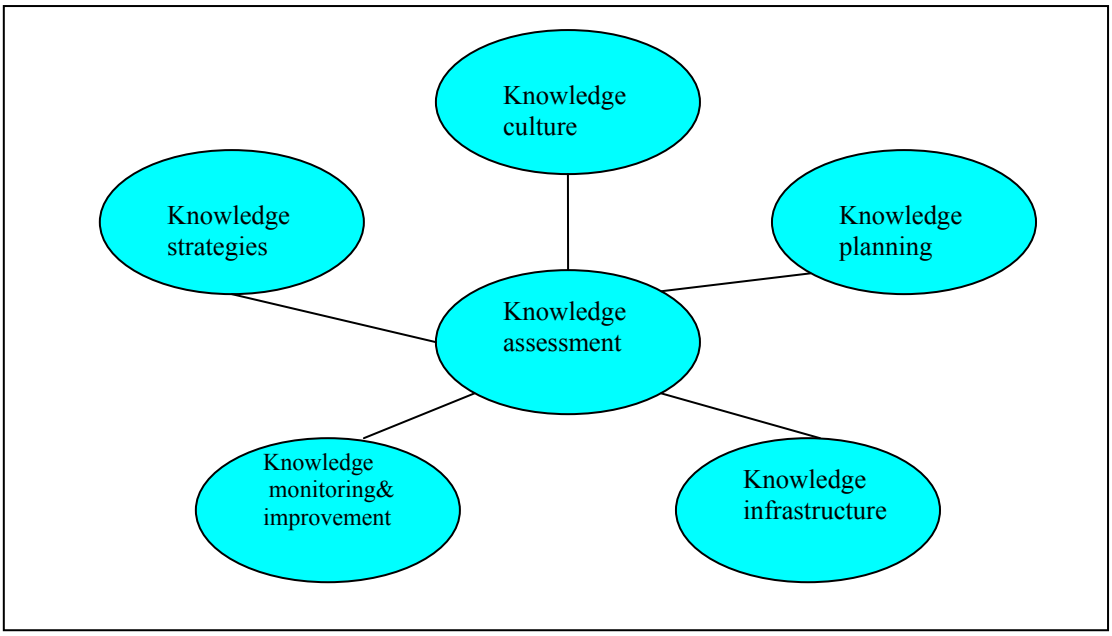

Figure 1 Proposed knowledge assessment model

C. Assessment of Knowledge Planning: knowledge planning includes generating the action plans on implementing knowledge strategies if any. Criteria 3, 4, 9 and 10 listed above are used to measure this.

D. Assessment of Knowledge Infrastructure: Knowledge infrastructure consists of creating related hardware and software which make it easy to manage the knowledge in such a way that, corporate level knowledge bases can interact with one another and required knowledge can be situated easily. Utilizing management information systems and related IT technologies could be a good example for this. Criteria 1,2 and 5 listed above are used to measure this.

E. Assessment of Knowledge Monitoring and Improvement: This indicates a certain procedures to be implemented at enterprise level allowing the practitioners to monitor and evaluate knowledge related activities and perform necessary improvements. Criteria 11,12 ,13, 14, 17 and 19 listed above are used to measure this.

Scoring procedure

Each assessment unit is scored from three different aspects as effecting different levels of enterprise such as

- Operational level: This includes utilizing knowledge at operational activities within an enterprise.
- Tactical level: This includes utilizing knowledge at managerial activities within an enterprise.
- Strategical levels: This include managing knowledge for making strategic decision making

A series of interviews with some experts and academics are conducted to define the scores for each level in terms of respective criteria. Table 1 indicates the results the study performed for scoring. Note that the importances of assessment units are supposed to be equal. However, the effect of the criteria is taken as different at different levels. The same procedure could, any case, be implemented when the assessment units to be weighted.

Table 1
Scores for the assessment factors

KM factors	Operational	Tactics	Strategic	Total
1	50	50	100	200
2	50	50	100	200
3	50	75	75	200
4	50	75	75	200
5	100	50	50	200
Total	300	300	400	1000

5. A Case study

The proposed assessment methodology is been experimented in one of the door manufacturing company which is so called XYZ. The level of knowledge management in Company XYZ is measured thorough the scoring procedure developed using the set of criteria explained above. The scores given in Table 1 are used for each criterion. The following procedure is implemented for the assessment.

Each employee of the Company is asked to rank his score about the level of departmental competencies in terms of the related criteria following the maximum scores given in the table 1. The scores given by each employee are summed up and average value is generated for each criteria and in turn for the assessment units.

As a result of the assessment, Company XYZ received 104,9 points over 200 in terms of generating a knowledge culture (see Table 2). This

Same comments for other knowledge assessment units are valid for infrastructure utilization capabilities and knowledge monitoring and improvements. There seem to create a knowledge environment in the respective company and "knowledge awareness sessions" to be hold to get the employees and managers attention on the importance of knowledge management capabilities.

Overall assessment score of knowledge management activities in Company XYZ is given in Table 3. As seen in the table the company is below means the activities to create a knowledge culture was at the middle level as only 52,45 % of the expected score is satisfied.

Similarly, as indicated in Table 2, only 54,95% of the capability of implementing knowledge management strategies was found to be applicable for the company in question. This clearly indicates the need for defining explicitly well accepted knowledge management policies and strategies within the company.

Table 2 indicates the assessment results and respective scores for knowledge planning which was 54,27% infrastructure utilization which was 67% and for knowledge evaluation (monitoring the knowledge management activities and performing improvements) 43,97% of the expected records respectively.

It can easily be concluded that the company is not actively planning the corporate knowledge and as nearly 70% of the time expected activities are not performed or inefficiently implemented.
the average level (54,48%) in terms of knowledge management activities and knowledge utilization. The company managers should study the criteria which resulted less scores and make improvements towards satisfying the requirements expected by those specific criteria. It is certain that a lot of knowledge spreaded around within and outside of the company however, the company seem to get only %50 of the expected benefits. The improvement in the lacking areas will definitely increase the knowledge efficiency therefore departmental effectiveness and promote employees to contribute better.

Table 2
Assessment of activities of the components of the proposed model

	Criteria	**Operational**		**Tactical**		**Strategic**		**Total**	**%**
Knowledge culture	6	**15**	8,75	**20**	11	**30**	12	31,75	15,9
	7	**15**	9	**15**	10	**30**	14,75	33,75	16,9
	15	**20**	8,15	**15**	9,25	**40**	22	39,4	19,7
		Total						104,9	52,45
	Total	**50**		**50**		**100**		**200**	
Knowledge strategies	Criteria	**Operational**		**Tactical**		**Strategic**		**Total**	**%**
	8	**15**	5,75	**20**	10	**35**	28,25	44	22
	16	**20**	10,25	**15**	8,13	**30**	23,63	42,01	21
	18	**15**	5	**15**	5,25	**35**	13,65	23,9	11,95
				Total				**109,91**	54,95
	Total	**50**		**50**		**100**		**200**	
Knowledge planning	Criteria	**Operational**		**Tactical**		**Strategic**		**Total**	**%**
	3	**15**	5,10	**15**	8	**15**	13	26,1	13,1
	4	**10**	7	**20**	10,11	**20**	11,25	28,36	14,2
	9	**15**	4,15	**20**	5,25	**20**	12,15	21,55	10,8
	10	**10**	7	**20**	14,11	**20**	11,42	32,53	16,3
		Total						108,54	54,27
	Total	**50**			**75**	**75**		**200**	
Infrastructure utilization capabilities	Criteria	**Operational**		**Tactical**		**Strategic**		**Total**	**%**
	1	**15**	8,25	**25**	10,87	**25**	20,5	39,62	19,8
	2	**15**	10,12	**25**	19,13	**25**	18,73	47,98	23,99
	5	**20**	6,15	**25**	20,10	**25**	20,15	46,4	23,2
		Total						134	67
	Total	**50**		**75**		**75**		**200**	
Assessment of activities for evaluation	Criteria	**Operational**		**Tactical**		**Strategic**		**Total**	**%**
	11	**15**	7	**8**	5,18	**8**	5	17,18	8,59
	12	**20**	5,13	**8**	4,12	**8**	4,15	13,4	6,7
	13	**15**	5,8	**9**	3,25	**8**	4,12	13,17	6,6
	14	**15**	6	**8**	5,6	**9**	3,85	15,45	7,7
	17	**20**	5,18	**8**	4,25	**9**	4,12	13,55	6,8
	19	**15**	6,19	**9**	4	**8**	5	15,19	7,8
		Total						87,94	43,97
	Total	**100**		**50**		**50**		**200**	

Table3
Assessment of knowledge management activities in Company XYZ

	Operational		**Tactical**		**Strategic**		**Total**	**%**
1	**50**	25,9	**50**	30,25	**100**	48,75	104,9	
2	**50**	21	**50**	23,38	**100**	65,53	109,91	
3	**50**	23,25	**75**	37,47	**75**	47,82	108,54	
4	**50**	24,52	**75**	50,1	**75**	58,88	133,5	
5	**100**	35,3	**50**	26,4	**50**	26,24	87,94	
						Total	**544.79**	**54,48**
Total	**300**		**300**		**400**		**1000**	

Conclusion

Knowledge management and importance of knowledge are much more important than ever before, especially in transferring the society from industrial era to knowledge era. Managing knowledge is as much important as generating the knowledge. Knowledge management includes creating, storing, implementing, improving, sharing and recording the knowledge. Organizations need to create assessment methods to measure the level of effectiveness in knowledge management activities. This paper presented an assessment model based on 19 criteria which are categorized into 5 groups called assessment units. A possible score for each unit, in turn for each criterion is defined. Scores defined should indicate the maximum scores each units or criteria could get. A case study is conducted in order to confirm the applicability of the proposed study. The results of the case study confirmed the benefit of the proposed model as some improvement activities are already generated for the company in question.

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