

KNOWLEDGE MANAGEMENT IMPLEMENTATION: A COMPARATIVE STUDY BASED ON EMPLOYEES' CHARACTERISTICS IN MARINE GEOLOGICAL INSTITUTE

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ABSTRACT

Marine Geological Institute (MGI) Bandung recognizes that the implementation of Knowledge Management can provide benefits for the achievement of organizational success and sustainability. This study aims to find out how well the implementation of KM is in MGI and measure the significant differences in the implementation of Knowledge Management (KM) based on employee profiles. From the assessment results, the organization can formulate the strategy to improve the implementation of the next KM. This research uses the methods of maturity level model and quantitative descriptive. The focus of this research is the implementation of KM on the important elements of strategy, culture, technology, process, and people. Data were collected by distributing questionnaires to all employees of MGI Bandung. Data were analyzed using the techniques of descriptive statistics and inferential statistics.

The results of descriptive analysis reveal that the level of KM implementation based on the elements of people, strategy, process, culture and technology are categorized Quantitative Managed. The results also show that based on the characteristics of age, employee grades, working period and education level, there are significant differences in the implementation of KM. Therefore, in implementing KM, the four characteristics of the respondents should be differentiated.

Key Words: knowledge management, strategy, culture, process, technology, people, implementation

JEL Classification: C15, C83, D83

1. INTRODUCTION

The understanding of how important it is to develop and maintain a strong company from within in order to be able to continually adapt through rapid and precise responses to all the environmental changes it faces is a crucial thing to do by the company (Mulyadi and Sembiring, 2016).

One of the most strategic measures to sustain competitive advantage is knowledge, further more knowledge widely recognised as a strategic asset in improving organisational performance (Salwa and Susanty, 2016). Knowledge has a very important role for both short-term and long-term success and sustainability of an organization. Many successful organizations have excellence and uniqueness in terms of knowledge mastery which is actualized very diversely in the form of efficient work processes, more qualified products, excellent service and effective public policy (Nuraini, 2008). Knowledge also becomes a valuable organizational asset and strategic resource.

Even though some intellectual capital are transferable, internal knowledge is not easily copied because knowledge is anchored in peoples' (employees') mind. It is obvious that knowledge is slowly becoming the most important factor of production, next to labor, land and capital (Rasula et al., 2012). Knowledge as a competitive advantage of a company can not be seen and quantified (Salwa and Susanty, 2016). Knowledge is notional, intangible, inferred and to some extent, subjective (Dearnaley, 2013).

To gain the optimal benefits of knowledge, an organization must manage their knowledge. Through knowledge management, an organizations is able to identify their knowledge and use it to improve the performance and generate innovations. With the support of knowledge management, an organization can also actively identify and acquire the existing quality knowledge in the external environment of the organization (Munir, 2008).

Recognizing the importance of knowledge as an important asset and organizational strategic resource, the Agency of Research and Development for Energy and Mineral Resources (ARDEMR) has initiated the implementation of *knowledge management* through the organizational policies as outlined in the Strategic Plan year 2015 – 2019.

On the other hand, MGI still has problems in documenting the *knowledge*. This is because *knowledge* is very attached to the individuals. The knowledge is usually brought out at the time of employee mutations, rotations, and retirements. The policy in the framework of employee rotations and mutations is very influential for the employees who occupy new duties and positions. These employees usually take time to adapt when performing tasks in new places due to lack of supporting documentation. This will certainly cause problems for the organization in the form of delays in the completion of work in accordance with the deadline. Meanwhile, the transfers of knowledge from the retired employees to the next generation are still not optimally done.

Implementation of *Knowledge Management* can run well and successfully if the organization firstly assesses it. Based on a research of *British Telecommunication PLC*, the failure ratio of KM implementation within a company has reached an average rate of 70% (Tjakraatmadja et al, 2013). In order to avoid the failure, it is important for the organization to conduct a comprehensive assessment and in-depth study on the level of KM implementation it has run.

The present conditions faced by MGI are high rates of mutation, rotation and retirement (Figure 1). In the meantime, the organization has not effectively managed individual *knowledge* into the institution's

knowledge. This can hamper the long-term sustainability of the organization which will result in *knowledge loss* and impact on the decrease of organizational performance.

This study aims to measure how well the implementation of Knowledge Management is at MGI Bandung and to know the significant difference in the implementation of KM based on employee profile, so that the improvement strategy can be conducted for the implementation of *Knowledge Management* to improve the organizational performance.

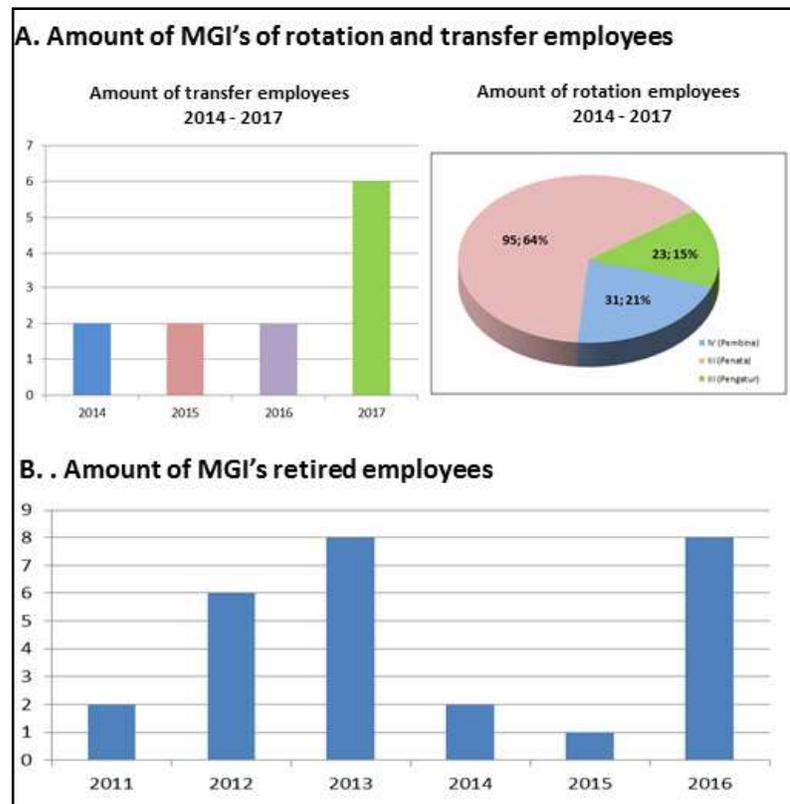


Figure 1. a. Amount of MGI's rotation and transfer employees, Year 2014 – 2017, b. amount of MGI's retired employees, Year 2011 – 2016 at MGI of Bandung

2. LITERATURE REVIEW

Knowledge management is the deliberate and systematic coordination of an organization's people, technology, processes, and organizational structure in order to add value through reuse and innovation. This coordination is achieved through creating, sharing, and applying knowledge as well as through feeding the valuable lessons learned and best practices into corporate memory in order to foster continued organizational learning (Dalkir, 2005).

Dalkir (2005) explains that knowledge content will be assessed in the transition from knowledge capture/creation to knowledge sharing and dissemination, knowledge content is assessed. Knowledge is then contextualized in order to be understood ("acquisition") and used ("application"). This stage

then feeds back into the first one in order to update the knowledge content. Ahmed *et al.* (2002) indicates that knowledge management is the coming together of organizational processes, information processing technologies, organizational strategies and culture for the enhanced management and leverage of human knowledge and learning to the benefit of the company (Figure 2).

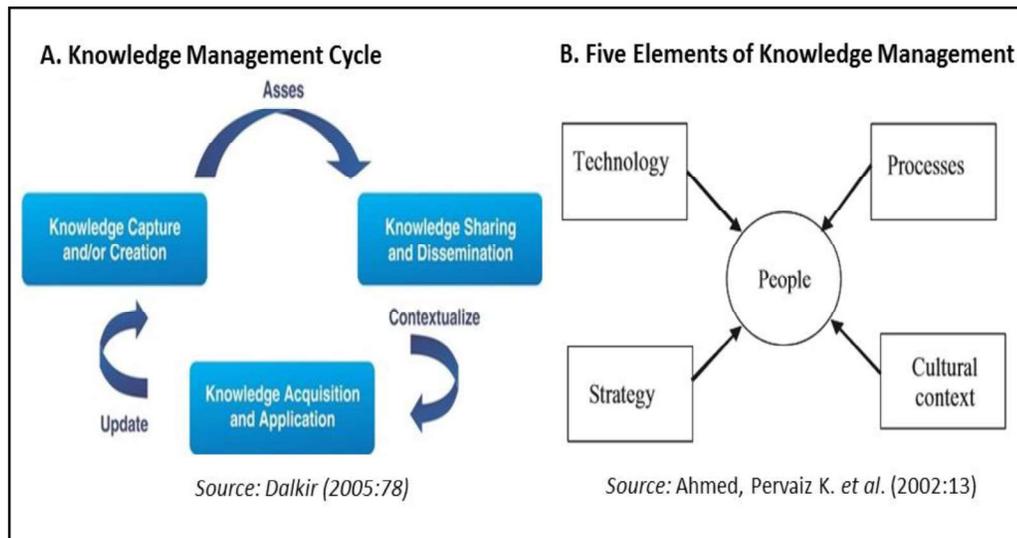


Figure 2. a. The Integrated Knowledge Management Cycle, and b. Key Elements of Knowledge Management

Knowledge Process Quality Model (KPQM) is one of the measurement models of maturity level of Knowledge Management application developed by Paulzen and Perc (Dalkir, 2005). KPQM has five levels i.e. Initial, Aware, Established, Quantitative Managed and Optimize (Table 1).

Table 1. The Level of Knowledge Management Maturity

Level	Name	Characteristics
1	Initial	Organizations have little or no intention at all to manage knowledge formally. In addition, knowledge management is not explicitly considered contributing significantly to long-term business achievement.
2	Aware	Organizations are aware or fully aware of the importance of knowledge management and intend to manage it formally, but they do not know how to do it. At this level, organizations often have various initiatives in the form of pilot projects to explore the potential of knowledge management.
3	Established	Organizations already have the basic infrastructure to support the implementation of knowledge management, where the management is actively promoting knowledge management initiatives by articulating knowledge management strategies, conducting training, and providing incentives. In such organizations, the processes of creating, capturing, sharing, and applying knowledge both formally and informally have been established. Some pilot projects are undertaken to explore the implementation of knowledge management at a higher level.

4	Quantitative Managed	The organization has linked KM to the organizational strategy and it is supported by enterprise-wide KM technology. Quantitative measurements have also been used to measure the effectiveness of ongoing KM implementations.
5	Optimize	The organization has already got a highly integrated KM system which supports the <i>key business activities</i> . The organization is characterized by the existence of a <i>knowledge sharing</i> culture in which every member of the organization is willing to share their unique and important knowledge for the achievement of organizational goals

Source: Adapted from Pee and Kankanhalli (2009) and recycled by Otkarina (2012)

Theoretical framework is the rationale of the synthesized research of the facts, observations and literary studies. Description in the frame of thinking explains the relationship and interrelationship between research variables.

The research variables are explained in depth and relevant to the problems studied so that they can be used as the basis for answering the research problem (Riduwan, 2014) as showned Figure 2.

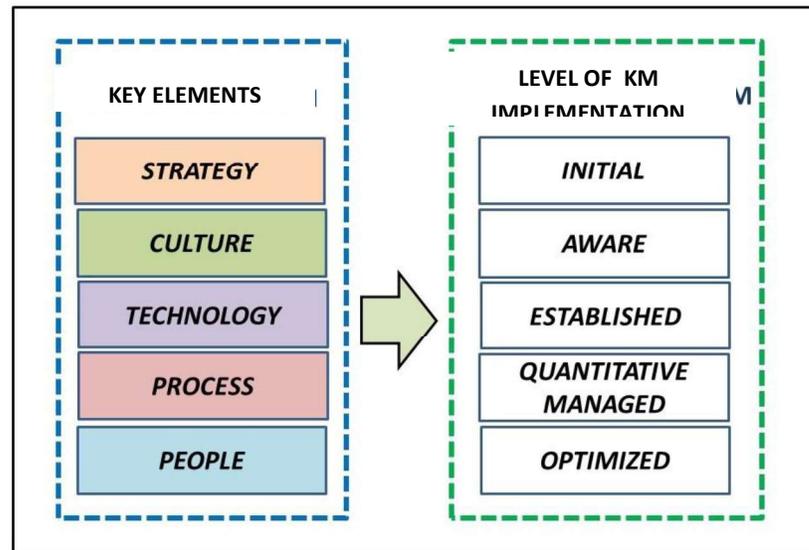


Figure 2. Theoretical Framework

The several previous studies conducted on the subject of Knowledge Management maturity level are as follows:

Ramadhani et.al (2012) have been studied at one of the largest global telecommunication hardware, software and service company in the world, which utilize APO's (Asian Productivity Organization) approach in assessing of KM maturity level through qualitative survey. The result shows the different maturity level for each type of gender, age, and job position, taken further to see the relation with the organization performance from its financial reports.

Kassim and Azmee (2014) have been researched at the telecommunication company in Malaysia that investigate the perception of KM maturity level focusing on KM strategy, leadership behavior, and people and network. The result shows no difference regarding KM strategy, leadership behavior, and people and network according to gender and working experience. The study also found that there are

positive, significant and moderate relationships between leadership behavior and people and network, between KM strategy and leadership behavior, and between people and network and KM strategy.

Bagheri et al (2013) have been studied at research organization in Iran which focuses on evaluating three areas of knowledge management development in organization. These areas include: people, process, and technology. This research have been done to investigate different job positions for vice president, managers, supervisors and technicians. The result of the study shows that the industry's KM maturity level was at level "2" for the people domain, at level "1" for the processes domain, and at level "2" for the technology domain. But the industry's total maturity level was at level "2". It is obvious that in order to promote the KM maturity level, it should be promoted in every empowering domain and given that the maturity level of the processes domain is lower than the other domains as well as KM's total level, therefore the priority should be for planning to promote this domain.

3. METHODOLOGY

Research methodology mainly use five key elements adopted by Ahmed (2002) such as strategy, process, culture, technology and people. Meanwhile maturity level of knowledge management application in the study using Knowledge Process Quality Model (KPQM) developed by Paulzen and Perc (Dalkir, 2005) that has five levels i.e. initial, aware, established, quantitative managed and optimize.

Knowledge Process Quality Model (KPQM) based on the major tenets of quality management and process engineering. The underlying premise is that knowledge processes can be improved by enhancing the corresponding management structures. The maturity model makes it possible to implement a systematic or incremental KM application (Dalkir, 2005). Related to MGI, KPQM is applied to improve organizational performance and R&D results quality including technology services and marine surveys.

Data analysis techniques used in this study are descriptive statistic and inferential statistic. Descriptive statistic is a statistic used to analyze data by describing them as they are without intending to make any general conclusion or generalization (Sugiyono, 2017). While, inferential statistic (inductive) is the method used to know the population based on the sample by analyzing and interpreting the data into a conclusion. Inferential statistic aims to draw conclusions from some people, events and times for overall or generalization (Gunawan, 2016).

Normality test

Normality test is taken to determine whether the distribution of data is normal or not. This is important for the accuracy of statistical test selection to be used (Somantri and Muhidin, 2006). Furthermore, Gunawan (2016) says that the normal distribution is a central distribution form (mean, mode, and median are positioned in the middle). According to Sudarmanto (Gunawan, 2016) that if the probability value is ≥ 0.05 then the data are considered to be normally distributed, otherwise if the probability value is < 0.05 then the data are declared abnormal.

Comparative Test

Ghozali (2014) describes the procedure for performing comparative test calculations:

- a. If each sample is normally distributed then it will be proceeded with the parametric statistical test, ie using T-test (for two-group comparative studies) or ANOVA Test (for comparative studies of more than three groups)
- b. If each sample group is not normally distributed, then nonparametric statistics is used, ie Mann Whitney U Test (for two-group comparative studies) or Kruskal Wallis test (for comparative studies of three or more groups)

In this study, the researchers use t-test, one-way ANOVA test and kruskal wallis

4. RESULTS AND DISCUSSION

Of the total questionnaires distributed to 150 respondents, only 132 questionnaires returned. The characteristics of respondents are divided into gender, age group, employee grade, period of work, and education level. Based on gender, most of the respondents or 74.24% are male employees, and the rest 25.76% are female employees.

By age group, most respondents or 62.88% are > 40 years old, 23.48% are 31-40 years old, and the rest 13.64% are < 30 years old. Based on grade, the majority 62.88% of respondents are in the category of grade III, then 25.76% are of grade IV, and the remaining 11.36% are of grade II. Based on period of work, 46.21% of the respondents have worked for > 20 years, then 31.06% have worked for 11-20 years, and the rest 22.73% have worked for <10 years. Based on education level, most of the respondents or 43,18% have S-1 (under graduate) education, 24,24% have S-2 (graduate) education, 18.94% have high school education, 8.33% have diploma degree, and the rest 5.30% are educated S-3 (post graduate/doctoral).

The actual score for strategy variable is 5351 and the ideal score is 6600 with the percentage value obtained of 81.08%. The actual score for culture variable is 3518 and the ideal score is 4620 with the percentage value obtained of 76.15%, this is included into the category of *quantitive managed* because it is in the interval range of > 68% - 84%. The actual score for technology variable is 1403 and the ideal score is 1980 with the percentage value obtained of 70.86%, this is included into the category of *quantitive managed* because it is in the interval range of > 68% - 84%. The actual score for the process variable is 5798 and the ideal score is 7260 with the percentage value obtained of 79.86%, this is included into the category of *quantitive managed* because it is in the interval range of > 68% - 84%. The actual score for people variable is 4860 and the ideal score is 5940 with the percentage obtained of 81.82%, this is included into the category of *quantitive managed* because it is in the interval range of > 68% - 84% (Table 2).

Table 2. Total Respondent Response Recapitulation

Variable	Total	Score Actual	Score Ideal	%	Level of KM Maturity
Total Strategy Variable	1320	5351	6600	81,08	Quantitive Managed

Total Culture Variable	924	3518	4620	76,15	Quantitive Managed
Total Technology Variable	396	1403	1980	70,86	Quantitive Managed
Total Process Variable	1452	5798	7260	79,86	Quantitive Managed
Total People Variable	1188	4860	5940	81,82	Quantitative Managed

There is no significant difference between male and female employees on the overall level of KM implementation based on gender variable. These results reflect that male and female employees have an equivalent level of ability in the implementation of KM. However, for the variables of *culture* and *process*, the KM implementation level based on gender show significant differences (Table 3).

In *culture* variable, female employees have a higher implementation level equal to 81,68% compared with male employees which is 74,23%. While, In *process* variable, male employees have a higher KM implementation level at 82.19% compared with female employees which is 73.16%. These results indicate that male employees are better at implementing KM processes in their work activities.

Table 3. Level of KM Implementation based on Gender and The Difference Test Results

Variable	Level of KM Implementation based on Gender		The Difference Test Results
	Male (%)	Female (%)	
Strategy	80,45	82,88	p-value: 0,109
	quantitative managed	quantitative managed	Not Significant
Culture	74,23	81,68	p-value: 0,000
	quantitative managed	quantitative managed	Significant
Technology	71,02	70,39	p-value: 0,916
	quantitative managed	quantitative managed	Not Significant
Process	82,19	73,16	p-value: 0,000
	quantitative managed	quantitative managed	Significant
People	81,63	82,35	p-value: 0,238
	quantitative managed	quantitative managed	Not Significant
KM	79,40	78,94	p-value = 0,648
	quantitative managed	quantitative managed	Not Significant

The results of the overall KM implementation level assessment which have significant differences. It is shown that the age group of above 40 years has the highest level of KM implementation equal to 77.76%. This indicates that employees in the age group of above 40 years have the best level of KM implementation compared with the age group of ≤ 30 years and age group of 31-40 years. Furthermore, a significant difference is also shown in *strategy* variable in which the highest implementation level of KM element of strategy is in the age group of > 40 years amounted to 81.23% (Table 4).

Table 4. Level KM Implementation Based on Age group and the Difference Test Results

Variabel	Level of KM Implementation based on Age Group			The Difference test results
	Age ≤ 30 year	Age 31-40 year	Age > 40 year	
<i>Strategy</i>	69,33	78,97	81,23	p-value: 0,000
	QM	QM	QM	Significant
<i>Culture</i>	72,86	74,38	75,66	p-value: 0,512
	QM	QM	QM	Not Significant
<i>Technology</i>	69,63	72,04	73,49	p-value: 0,665
	QM	QM	QM	Not Significant
<i>Process</i>	71,11	72,02	73,84	p-value: 0,539
	QM	QM	QM	Not Significant
<i>People</i>	71,11	79,93	81,74	p-value: 0,314
	QM	QM	QM	Not Significant
KM	70,86	75,95	77,76	p-value: 0,01
	QM	QM	QM	Significant

Note: QM is quantitative managed

There is a significant difference in the overall implementation rate of KM elements in which grade IV employees (administrator) have the highest KM implementation level of 82.50%. Then, in the variable of *technology* it is also found that a significant difference is in the group of grade IV employees (administrator) which has the highest KM implementation rate equal to 82.35% (Table 5).

Furthermore, there is also a significant difference in the variable of *process* in which grade IV employees (administrator) have the highest level of KM implementation amounted to 83.80%. Likewise in the variable of *people*, it is found a significant difference with the highest level of KM implementation by employees of grade IV (administrator) equal to 83.92%. While the results of difference tests for the elements of *strategy* and *culture* show there is no significant difference.

Table 5. Level of KM Implementation Based on Employee Grade and the Difference Test Result

Variable	Level of KM Implementation based on Employee Grade			The Difference Test Result
	Grade II (Supervisor)	Grade III (Superintend)	Grade IV (Administrator)	
<i>Strategy</i>	81,33	81,61	82,12	p-value: 0,907
	QM	QM	QM	Not Significant
<i>Culture</i>	73,52	75,87	79,24	p-value: 0,209
	QM	QM	QM	Not Significant
<i>Technology</i>	71,11	73,90	82,35	p-value: 0,037
	QM	QM	QM	Significant
<i>Process</i>	65,58	78,42	83,80	p-value: 0,000
	<i>Established</i>	QM	QM	Significant
<i>People</i>	66,07	82,73	83,92	p-value: 0,000

	<i>Established</i>	QM	QM	Significant
KM	71,43	79,40	82,50	p-value: 0,00
	QM	QM	QM	Significant

The results of KM implementation level assessment with all elements have significant differences such as in period of work, the highest level of KM implementation is by the employees with working period over 20 years of 80.58%. In the variable of *technology*, there is also a significant difference in which the highest level of KM implementation is by the employees with the working period of > 20 years equal to 80.33% (Table 6).

Table 6. Level of KM Implementation based on Period of Work and the Difference Test Result

Variabel	Level of KM Implementation based on Period of Work			The Difference Test Result
	≤ 10 Years	11-20 Years	> 20 Years	
<i>Strategy</i>	78,80	79,85	80,98	p-value: 0,464
	QM	QM	QM	Not Significant
<i>Culture</i>	74,00	78,95	80,19	p-value: 0,125
	QM	QM	QM	Not Significant
<i>Technology</i>	68,67	79,51	80,33	p-value: 0,004
	QM	QM	QM	Significant
<i>Process</i>	76,42	77,96	79,91	p-value: 0,278
	QM	QM	QM	Not Significant
<i>People</i>	76,00	80,49	81,35	p-value: 0,739
	QM	QM	QM	Not Significant
KM	75,92	79,29	80,58	p-value: 0,047
	QM	QM	QM	Significant

The results of KM implementation level assessment involving all the elements have shown significant differences as in case of education level, the highest level of KM implementation takes place in S3 (post graduate) education level at 82.86%. Furthermore, the level of KM implementation in *process* variable also has significant difference in which the highest score is in S3 (post graduate) level of education at 82.86%. In addition to the variable of *process*, the variable of *people* has also a significant difference for the S3 (post graduate) level of education which is equal to 83.17%. While for the variables of *strategy*, *culture* and *technology*, there is no significant difference (Table 7).

Table 7. Level of KM Implementation based on Education Level and The Difference Test Results

Variable	Level of KM Implementation based on Education Level					The Difference Test Result
	High School	Diploma	S1	S2	S3	
<i>Strategy</i>	76,96	77,09	80,98	81,56	82,29	p-value: 0,224 ;

	QM	QM	QM	QM	QM	Not Significant
<i>Culture</i>	71,31	73,25	77,94	80,63	83,27	p-value: 0,051 ;
	QM	QM	QM	QM	QM	Not Significant
<i>Technology</i>	69,33	72,12	73,10	78,33	82,86	p-value: 0,139
	QM	QM	QM	QM	QM	Not Significant
<i>Process</i>	64,00	67,60	74,23	80,51	82,86	p-value: 0,000
	<i>Established</i>	<i>Established</i>	QM	QM	QM	Significant
<i>People</i>	62,04	68,48	76,18	80,97	83,17	p-value: 0,000 ;
	<i>Established</i>	QM	QM	QM	QM	Significant
KM	68,48	71,50	76,92	80,73	82,86	p-value: 0,000;
	QM	QM	QM	QM	QM	Significant

Managerial Implications

Based on the results of descriptive analysis, it is found that the implementation rate of KM in MGI as a whole is rated *Quantitative Managed*. However, the organization still needs to make improvement strategy for the implementation of knowledge management in order to reach a higher level which is the level of *optimize*, because at the level of *optimize*, KM implementation will be more systematic and integrated with the *work process* and a stronger knowledge-based institution culture.

Based on the highest scores from the results of descriptive analysis on the five important elements of KM, the results obtained are: *People* (81.82%), *Strategy* (81.08%), *Process* (79.86%), *Culture* (76.15%), and *Technology* (70.86%). The highest rating result in MGI is on *People* element. This condition is a very strong basis for the successful implementation of KM because the in fact *People* is the heart of KM and KM is centered on humans (Tobing, 2016). The role of knowledge workers in the framework of knowledge-based organization has very high relevance to overall organizational performance (Kubo & Saka, 2002). The lowest result of KM assessment is the element of *Technology*. *Treatment* is needed to taken by improving the infrastructure of higher quality technologies such as providing access to information quickly, precisely and accurately for the parties in need, so that knowledge owned by the employees is always *up to date*. In addition, the use of technology infrastructure should be flexible and easy so that the communication processes among members of the organization in sharing knowledge can be more effective and efficient.

The level of KM implementation based on gender shows no significant difference between male and female employees. Meanwhile, the level of KM implementation based on age group, employee grade, working period, and level of education signify significant differences.

The implementation of KM by age group reveals that the lowest level is in the age group of ≤ 30 years. Therefore, it is necessary to more intensively disseminate KM to this age group in order to create the same perception, understanding and awareness about the importance of KM implementation for long-term organizational success.

The lowest level of KM implementation based on employee grade occurs in employee group of grade II (supervisor). Based on education level, the lowest level of implementation takes place in the level of high school education. This condition signifies that grade IV employees (administrator) should play an important role of becoming the *role models* for the subordinates, especially for those of grade II, and they also practically ought to provide exemplary examples of KM implementation in the workplace through *storytelling*, face-to-face meetings, and sharing knowledge through the utilization of information technology (*virtual*). As for the employees with high school level of education can be improved by providing educations and training on an ongoing basis formally and non-formally, technically and non technically, internally and externally which will be very useful to enhance and develop the knowledge, intellectuality and *skills* directly related to KM processes.

5. CONCLUSIONS AND RECOMMENDATIONS

Based on the formulation of the problem and the purpose of the research which was followed up with the analysis of data processing and discussion, it can be concluded that the implementation level of *Knowledge Management* in MGI Bandung on all elements of *strategy*, *culture*, *process*, *technology*, and *people* are in *Quantitative Managed category*. The results of the KM implementation assessment from the highest score to the lowest one are consecutively as follows: elements of *people* (81.82%), *strategy* (81.08%), *process* (79.86%), *culture* (76.15%) and *technology* (70.86%).

The difference of KM implementation based on employee profile is that it has generally no significant difference in the implementation of KM based on gender. But in *culture* element, there is a significant difference in which the rate of KM implementation of female employees is higher than that of male employees. Furthermore, in the *process* element, KM implementation rate of male employees is higher than female employees.

In general, there is a significant difference of KM implementation based on age group in which the highest rate of KM implementation is by the employees in the age group of > 40 years and the lowest one is in the age group of less than 30 years. In the element of *strategy*, the highest level of KM implementation is in the age group of > 40 years and the lowest is in the age group of less than 30 years.

There is a significant difference in the implementation of KM based on the employee grade in which the highest level of KM implementation is among the employees of grade IV (Administrator), while the lowest one is by the employees of grade II (Supervisor). In the element of *technology*, there is a significant difference in which the highest level of KM implementation is in the employee group of grade IV (Administrator) and the lowest is in the employee group of grade II (Supervisor). Similarly, on the elements of *process* and *people*, a significant difference is found in which the highest level of KM implementation is by the employees of grade IV (Administrator) and the lowest is by grade II (Supervisor).

Based on working period, there is a significant difference in KM implementation. The highest level of KM implementation is by the employees within a working period of over 20 years, the lowest is by the employees with tenure of less than 10 years. In the element of *technology*, there is a significant

difference in which the highest level of KM implementation is by the employees within a working period above 20 years and the lowest is by the employees with the tenure of less than 10 years

Based on the level of education, there is generally a significant difference in the implementation of KM in which the highest level is among the employees with the education level of S3 (post graduate), while the lowest level is among the employees with high school education level. Subsequently, there is also a significant difference in elements of *process* and *people* with the highest level of KM implementation by the employees with S3 (post graduate) education and the lowest level is by the employees with high school education.

This research is an initial identification to improve the implementation of KM. Further research can be carried out within different business fields such as manufacturing, service and others. Therefore, a more various results can be obtained to enrich the knowledge of KM. It is also necessary to conduct a *causal explanatory* research to examine the significant effects of important elements critically needed for successful implementation of KM on employee work motivation, performance, innovation, efficiency and effectiveness to improve organizational capability and *performance*.

From a practical aspect, the organization needs to give opportunity and authority to female employees in KM activities including as *knowledge leaders*. It is also needed to improve the quality of technology related to infrastructure and information system. The organization needs to create a *campaign* and promotional mechanism through *rewards* both financially and non-financially, and improve more intensive relationships between superiors and subordinates (verticals).

The organization needs to socialize the implementation of KM more progressively to the employees in age group of ≤ 30 years, grade II (supervisor), tenure years of ≤ 10 years and high school level of education to more equal perceptions about KM implementation in the workplace. Providing education and training related to KM both internally and externally for grade II (Supervisor) and high school level staffs to improve the knowledge and understanding on KM implementation.

References

- Ahmed, Pervaiz K., Lim, K.K., and Loh, A.Y.E. (2002). *Learning Through Knowledge Management. (First Edition)*. Oxford: Butterworth Heineman
- Badan Penelitian dan Pengembangan Energi dan Sumber Daya Mineral. 2015. *Rencana Strategis (Renstra) 2015-2019*. Jakarta: Kementerian Energi dan Sumber Daya Mineral Republik Indonesia
- Bagheri, R., Eslami, P., Mirfakhraee, S., Yarjanli, M. (2013). The Evaluation of Knowledge Management Maturity Level in a Research Organization. *Australian Journal of Basic and Applied Sciences*, Vol. 7, No. 2, pp. 11-20.
- Dalkir, Kimiz. (2005). *Knowledge Management Theory and Practice*. USA: Elsevier.
- Dearnaley, P. (2013). Competitive advantage in the new contrived social care marketplace: Do we need a new theoretical framework? *Journal of Housing, Care and Support*, Vol. 16, No. 3/4, pp. 125–135. Retrieved from <http://dx.doi.org/10.1108/HCS08-2013-0013>

- Ghozali, Imam. (2014) Aplikasi Analisis Multivariate dengan IBM SPSS 22.0 Semarang: Penerbit Universitas Diponegoro.
- Gunawan, Imam. (2016). *Pengantar Statistika Inferensial*. (First edition). Jakarta: PT. Raja Grafindo Persada.
- Kassim, Norliya A. and Azmee, Noreen N. (2014). Assessing Knowledge Management Maturity in a Telecommunication Company. *International Conference on Innovative Trends in Multidisciplinary Academic Research (ITMAR)* Vol. 1, pp. 21-32.
- Mulyadi, Y. and Sembiring, J. (2016). The Influence of The Factors of Organizational Culture by Denison on Learning Organization at PT Akses Nusa Karya Infratek Bandung. *E-Proceeding of Management*, Vol.3, No. 3, pp. 3056-3063.
- Munir, Ningky. (2008). *Knowledge Management Audit: Pedoman Evaluasi Kesiapan Organisasi Mengelola Pengetahuan*. Jakarta: PPM.
- Nuraini, A. B. (2008). *Analisis Penciptaan Pengetahuan Melalui Aplikasi Model SECI pada Direktorat Pengawasan Bank 3, Bank Indonesia*. Tesis. Jakarta: Universitas Indonesia.
- Oktarina, T. (2012). *Optimalisasi Fungsi Manajemen Pengetahuan dalam Manajemen Proyek melalui Intervensi Pengembangan Manajer Lini pada PT. XYZ*. Tesis. Jakarta: Universitas Indonesia.
- Paulzen, O., and Perc, P. (2002). A maturity model for quality improvement in knowledge management. In A. Wenn, M. McGrath, and F. Burstein (Eds.), *Enabling organizations and society through information systems*, pp. 243–253. Proceedings of the 13th Australasian Conference on Information Systems (ACIS 2002), Melbourne, Australia.
- Pee, L.G., and Kankanhalli, A.K. (2009). A model of organizational knowledge management maturity based on people, process, and technology. *Journal of Information and Knowledge Management*, Vol. 8, No. 2, pp. 79-99.
- Ramadhani, Sigit., Tjakraatmadja, Jann H., and Thoaha, Nurianna. (2012). Knowledge Management Maturity Level Assessment (Case Study of PT. XYZ), *The Indonesian Journal of Business Administration*, Vol. 1, No. 9, pp. 672-679.
- Rasula, J., Vuksic, V. B., & Stemberger, M. I. (2012). The impact of knowledge management on organizational performance. *Economic and Business Review*, Vol. 14, No. 2, pp. 147–168.
- Riduwan (2014). *Metode dan Teknik Menyusun Tesis*. (10th Edition). Bandung: Alfabeta.
- Salwa, M. and Susanty, A. I. (2016). Measuring Employee Readiness for Knowledge Management in PT. Mineral Indonesia. *Pertanika Journal of Social Science and Humanities*, Vol. 24 (S), pp. 27-34.
- Somantri, A. and Muhidin, Sambas A. (2006). *Aplikasi Statistika dalam Penelitian*. (First Edition). Bandung: CV. Pustaka Setia
- Sugiyono (2017). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. (10th Edition). Bandung: CV. Alfabeta.

International Seminar & Conference on Learning Organization
ISCLO 6th, 2018

Tjakraatmaja, Jann H., Rachman, Haitan., and Kristinawati, Didin. (2013). *Personal Knowledge Management*. (First Edition). Bandung : SBM ITB.