

# Knowledge Management Criteria among Malaysian Organizations: An ANOVA Approach

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**Abstract**—The Knowledge Management (KM) Criteria is an essential foundation to evaluate KM outcomes. Different sets of criteria were developed and tailored by many researchers to determine the results of KM initiatives. However, literature review has emphasized on incomplete set of criteria for evaluating KM outcomes. Hence, this paper tried to address the problem of determining the criteria for measuring knowledge management outcomes among different types of Malaysian organizations. Successively, this paper was assumed to develop widely accepted criteria to measure success of knowledge management efforts for Malaysian organizations. Our analysis approach was based on the ANOVA procedure to compare a set of criteria among different types of organizations. This set of criteria was exploited from literature review. It is hoped that this study provides a better picture for different types of Malaysian organizations to establish a comprehensive set of criteria due to measure results of KM programs.

**Keywords**—KM Criteria, Knowledge Management, KM Outcomes, ANOVA

## I. INTRODUCTION

THE current business environment is affected by a cutthroat competition, new launched products, and fast technology development [1]. The backward-looking performance indicators are not longer sufficient since the knowledge era has begun and organizations need forward-looking indicators to move nimbly [2]. According to [3], today's core competencies and high performance have two primary bases, which are knowledge and intellectual capital. In fact, sustainability of competitive advantage that has derived from special knowledge inside companies predominantly characterized by exhaustive competition among rivals and shortened product lifecycles [3]. Reference [4] stated that exploiting knowledge assets of a company is a crucial issue to creating sustainable competitive advantage. Hence, Sustainability of companies' competitive advantage in chaos and uncertain business environment highly relate on implementing special knowledge to their core business processes and activities [5].

Many organizations allocated such resources to implement knowledge management programs. However, latest research

surveys have represented that despite companies have claimed to implement KM programs, not many of them are tagged as KM's successful implementer [6]. For the sake of implementing successful KM program, considering performance measurement is an imperative and timely [7]. This is because not many of organizations developed a well-organized performance measures to appraise their knowledge assets [7]. Hence, to organize a well-developed and formal performance measures is a crucial need for KM implementation within organizations [6]. In order to determine outcomes, structuring criteria for knowledge management efforts is an essential task of organization [8]. Needless to stress, the importance of determining criteria of measuring knowledge management efforts is significant.

## II. BACKGROUND

Using knowledge management programs can be considered as an investment decision; therefore, organizations must realize its results and outcomes [9]. Reference [10] addressed the perspectives of [11] in measuring outcomes of knowledge management systems. The perspectives included three items; which were, developing a foundation for assessment, encouraging top management's attention on what is important, and evaluation the investments. The evaluation process does so by aiming at intangible attribute of such KM outcomes.

The organizations' balance sheets and financial statements do not convey inherent intangible attributes of intellectual capitals; thereby, significant obstacle to KM success measurement is presented [12]. Reference [2] also emphasized on shortage of perspectives on how to appraise effects of intellectual capital. This is a main barrier to translate investments on intellectual capitals as a source of core competencies [2]. Reference [2] also reported that evaluation of KM performance is the second most significant obstacle faced by organizations followed by challenge of changing employees' behavior.

This problem solves so by evaluating KM participation to business performance [13]. This idea is also supported by such main consulting organizations [10]. Reference [10] cited results of some studies that were to emphasize on linkage between balance score card and KM performance measures. Similarly, Reference [14] supported integration between KM efforts and organizational activities and mainly processes. As such, it is imperative to recognize these management activities and processes in order to promote KM contribution to these processes and activities [8]. All of the literatures reviewed

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above, approved that knowledge management outcomes are not easy to evaluate. Hence, similar to a project that needs to meet a set of criteria to be selected; KM projects can also be evaluated through a set of criteria [8]. As such, companies have to establish metrics that are associated with KM criteria. In order to address this management issue, this study paid serious attention on all following aims, which are; determining criteria of measuring KM programs, developing widely-accepted criteria to evaluate success of knowledge management programs among different types of organizations.

### III. RESEARCH METHODOLOGY

This part explains and discusses the research methodology of this survey.

#### A. Research Objective

The research objective is:

- To evaluate criteria for measuring KM success among Non-profit, For-profit, and Governmental organizations

#### B. Research Question

The research question is:

- What should be the criteria for measuring KM success among Non-profit, For-profit, and Governmental organizations?

#### C. Research Hypothesis

In order to respond to the above research question, following hypothesis was portrayed.

- H<sub>1</sub>: There is a significant difference in criteria for measuring knowledge management efforts among Non-profit, For-profit, and Governmental organizations.

#### D. Data Analysis

In this study, the SPSS 16.0 was used to analyze the questionnaire data. The ANOVA procedure was performed to examine the differences among three types of organizations.

#### E. Participants

The participants of the survey's target population consist of KM professionals, Malaysian executives, and Expat executives who activated in Malaysian organizations. These respondents were working in different types of organizations included Governmental, For-profit, and Non-profit sectors.

#### F. Data Collection Method

The data collection method for this survey was employed the mixed-mode approach. The first step of data collection was to choose a population to be sampled. Subsequently, the population framework was limited to email lists included survey's participants. Hence, generalizability across all Malaysian organizations is limited because of inherent constraints of the sample. The online questionnaire was then shared among all participants and finally 79 of respondents answered to the shared questionnaire. The questionnaire was published on Google Document platform.

#### G. Questionnaire

The research instrument for this survey was adopted from [10]. The main objective of the questionnaire was to discover criteria for measuring knowledge management success. Hence, 19 questions included 16 close-ended questions as well as 3 open-ended questions were inserted into survey questionnaire. All questions were divided to three sections included KM Criteria, Individual Background, and Organizational Background. All 26 criteria were represented in one page of the questionnaire due to browse questions rapidly. The KM outcomes included in this questionnaire were represented in Table I. The Table I, was adopted from [10] and [6].

TABLE I  
SUMMARY OF KNOWLEDGE MANAGEMENT OUTCOMES

KM Outcomes
Better decision making
Better customer handling
Faster response to key business issues
Improved employee skills
Improved productivity
Increased profits
Sharing best practices
Reduced costs
New or better ways of working
Increased market share
Creation of new business opportunities
Improved new product development
Better staff attraction/retention
Increased share price
Enhanced product or service quality
Creation of more value to customers
Enhanced intellectual capital
Improved communication
Increased innovation
Improved learning/adaptation capability
Return on investment of KM efforts
Increased market size
Entry to different market type
Increased empowerment of employees
Enhanced collaboration
Improved business processes

### IV. RESULTS

#### A. Most Favored Criteria

Question 1 of the survey provided a list of 26 KM criteria. Participants were requested to clarify whether they have employed any of 26 criteria to measure knowledge management efforts in their companies. Respondents were also demanded to identify importance and effectiveness of each criterion based on the Likert scale. Both Importance and Effectiveness have equal Likert scale with 5 showing very high and 1 indicating very low. In order to calculate favored criteria, the mean scores of both Important and Effectiveness were computed for each criterion. Hence, the values nearer to 5 represents the most favored criteria.

#### B. KM Criteria and Organization Types

The first step to examine the H<sub>1</sub> is to test normality assumption. According to [15], the Shapiro-Wilk test is valid when the sample size is greater than 3 and lesser than or equal to 2000. For this variable, the p-value for Shapiro-Wilk test of normality for all criteria among three types of organizations

were greater than 0.05. Hence, the normality assumption was met.

Table II, Table III, and Table IV are shown results of Analyze of Variance to test the difference in means of criteria favor for measuring knowledge management programs among three types of organizations. As shown in Table II, the p-value from One-Way ANOVA procedure for criteria included Faster response to key business issues, Sharing best practices, Reduced costs, New or better ways of working, Increased innovation, Increased market size, and Improved business processes equal .000, .000, .000, .000, .000, .000, .000 respectively, which all are lesser than 0.05. Thus,  $H_0$  is rejected and at least one pair of each mentioned criterion differs significantly in terms of organization's types. Moreover, the multiple comparisons are required to compare means of each criterion among three types of organizations. The Table III represents the results of homogeneity of variances for each criterion among three types of organizations.

According to Table III, for Sharing best practices and New or better ways of working, the Levene's test of homogeneity of variances gives p-values of 0.007 and 0.024 respectively, which are less than 0.05. Therefore, the variances cannot be assumed equal. On the other hand, for Faster response to key business issues, Reduced costs, Increased innovation, Increased market size, and Improved business processes; the Levene's test of homogeneity of variances gives p-values of 0.657, 0.199, 0.079, 0.173 and 0.504 respectively, which are more than 0.05. Therefore, the variances can be supposed to be equal.

The results of Post Hoc Analysis are shown in Table IV. According to Table IV, a set of criteria for each type of organizations is arranged from most favored criteria to least favored criteria. Only the criteria, which have the mean score greater than 2.5 were selected.

- For-Profit Organizations
  1. Sharing best practices (mean= 4.32)
  2. Improved business processes (mean= 4.32)
  3. New or better ways of working (mean= 4.13)
  4. Faster response to key business issues (mean= 3.81)
  5. Increased market size (mean=3.59)
  6. Increased innovation (mean=3.54)
  7. Reduced costs (mean=3.45)
- Non-Profit Organizations
  1. Sharing best practices (mean = 4.37)
  2. Improved business processes (mean= 4.16)
  3. Increased innovation ( mean= 3.47)
  4. New or better ways of working (mean=3.24)
- Governmental Organizations
  1. New or better ways of working (mean= 3.22)
  2. Faster response to key business issues (mean= 2.69)

TABLE II  
ONE-WAY ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Faster response to key business issues	Between Groups	35.948	2	17.974	21.277	.000
	Within Groups	64.204	76	.845		
	Total	100.152	78			
Sharing best practices	Between Groups	52.726	2	26.363	110.637	.000
	Within Groups	18.110	76	.238		
	Total	70.835	78			
Reduced costs	Between Groups	31.781	2	15.890	19.420	.000
	Within Groups	62.188	76	.818		
	Total	93.968	78			
New or better ways of working	Between Groups	15.979	2	7.989	14.693	.000
	Within Groups	41.325	76	.544		
	Total	57.304	78			
Increased innovation	Between Groups	28.594	2	14.297	16.962	.000
	Within Groups	64.058	76	.843		
	Total	92.652	78			
Increased market size	Between Groups	39.716	2	19.858	49.238	.000
	Within Groups	30.651	76	.403		
	Total	70.367	78			
Improved business processes	Between Groups	63.502	2	31.751	85.148	.000
	Within Groups	28.340	76	.373		
	Total	91.842	78			

TABLE III  
HOMOGENEITY OF VARIANCES

	Levene Statistic	df1	df2	Sig.
Faster response to key business issues	.422	2	76	.657
Sharing best practices	5.269	2	76	.007
Reduced costs	1.650	2	76	.199
New or better ways of working	3.927	2	76	.024
Increased innovation	2.622	2	76	.079
Increased market size	1.798	2	76	.173
Improved business processes	.691	2	76	.504

TABLE IV  
POST HOC ANALYSIS

Criteria	Post Hoc	Organization's Type			
		Sub Group	For-Profit	Non-Profit	Governmental
Faster response to key business issues	Duncan	1		2.29	2.69
		2	3.81		
Sharing best practices	Dunnett T3	1			2.39
		2	4.32	4.37	
Reduced costs	Duncan	1		2.29	2.08
		2	3.45		
New or better ways of working	Dunnett T3	1		3.24	3.22
		2	4.13		
Increased innovation	Duncan	1			2.08
		2	3.54	3.47	
Increased market size	Duncan	1		2.13	2.22
		2	3.59		
Improved business processes	Duncan	1			2.14
		2	4.32	4.16	

## V. DISCUSSION

ANOVA procedure was done to examine the differences in means among for-profit, non-profit, and governmental organizations in terms of favored KM criteria. According to results of Table IV, For-Profit organizations were more interested to select Faster response to key business issues for measuring KM outcomes while both Non-Profit and Governmental organizations were not interested to choose this criterion.

On the other hand, Sharing best practices was selected by both For-Profit and Non-Profit organizations to evaluate their KM results whereas Governmental organizations were not indicated this criterion for measuring their KM performance. These results are same for some criteria such as Increased innovation and Improved business processes. As shown in Table IV, those respondents who were working in For-Profit organizations had serious attention on Reduced costs, New or better ways of working, and Increased market size as KM criteria to measure KM outcomes whereas both Non-Profit and Governmental organizations were not interested to select these criteria for evaluating their KM efforts.

## VI. LIMITATIONS

Similar to each survey, this study has its limitations some of which are; time restriction and budget constraint. These limitations as well as transportation problem compelled researchers to select a medium sample size. This is why researchers limited survey's population framework to email lists, virtual communities, and Internet Forums. Hence, generalizability across all Malaysian organizations was limited because of inherent constraints of the sample. Furthermore, due to above-mentioned limitations, this research study concentrated on only 26 KM criteria.

## VII. FUTURE RECOMMENDATIONS

This paper assessed the criteria for measuring knowledge management outcomes inside Malaysian Organizations. The results and findings can present viable and practical area of researches for future studies. A survey can be conducted on the same topic with a larger pool of participants and broaden range of KM criteria. In addition, it is recommended to break down the most favored criteria into detailed measures of KM outcomes due to establish a strong foundation for measuring these criteria. It is also suggested to develop this study to other geographical regions in order to have multinational comparison. Focus serious attention on special industry type will get a better picture of investigation in that particular industry.

## VIII. CONCLUSION

This paper attempted to assess the criteria for measuring knowledge management outcomes inside Malaysian Organizations. The major contribution of this study was to present managers how to leverage KM assets toward business performance and organization's objectives. Hence, defining well-organized mission, goals, and objectives is an imperative task of top management. This may help organization to meet its expected results of KM programs. Analyzing the KM Criteria in terms of different types of organizations can help us to establish well-defined criteria, which are compatible with our company missions, goals, and objectives.

Since, these criteria have much impact on the KM system; it is therefore requested serious attention of top management. Consider to nature of each criterion in terms of tangible and intangible dimension is another important issue for all types of organizations. Hence, it is proposed that each criterion should be investigated from both implicit and explicit advantages. In conclusion, increasing the effectiveness of implementation KM programs and improving the quality of KM programs to leverage knowledge assets toward business performance and organization's objectives will be the main value of the study. This can lead in gaining competitive advantage in current chaotic business environment.

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