

# 성공적인 지식경영 시스템구현을 위한 조직문화요소에 대한 연구

## Assessment on Successful Implementation of KM Technology by Key Attributes of Organizational Culture

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### 초 록

본 논문은 많은 기업들이 지식 공유를 위하여 성공적인 지식경영 시스템 도입을 추진하는 과정에서 조직문화 요소와 관계에 대한 연구를 목적으로 한다. 최근 논문에서 언급된바와 같이 기업이 지식경영 시스템을 도입하는데 많은 문제점이 발견되고 있다는 것을 알 수 있다. 발견된 문제점 중 조직문화 요소에 대한 연구가 미흡하여 성공적인 지식경영 시스템 구현을 위한 장애가 되고 있다. 본 연구는 특정한 조직문화 요소가 지식경영 시스템 구현에 미치는 관계를 살펴보기 위해 OCP 와 KMTP tool을 사용하여 26개의 미국 기업을 대상으로 설문조사를 한 결과를 기반으로 성공적인 지식경영 시스템 구현에 관계가 있는 기업 조직문화 요소를 연구 조사하였다.

### ABSTRACT

Many organizations are implementing Knowledge Management(KM) technologies to promote knowledge sharing. An extensive review of recent articles and journals about such implementations reveals that one of the main barriers to implementation of KM technology is the absence of an organizational culture that supports knowledge sharing. The purpose of this research is to explore the possible relationship between the successful implementation of knowledge management technology and specific organizational culture attributes. The Organizational Culture Profile(OCP) and the Knowledge Management Technology Profile(KMTP) instruments were used to identify and rank the most critical organizational culture attributes and KM technology implementation successes. Data were collected from twenty six US organizations involved in a KM efforts.

키워드 : Knowledge Management, Organizational Culture, Knowledge Management Technology Profile, Organizational Culture Profile

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## 1. Introduction

An extensive review of recent articles and journals about KM implementation reveals that one of the main barriers to implementation of KM technology is the absence of an organizational culture that promotes knowledge sharing.[1] The result from a recent survey conducted by the Knowledge Management Review demonstrates the main challenges KM practitioners faced when launching their KM initiative. The two main challenges are "Encouraging cultural adoption of KM" mentioned by 37.8% of the respondents and "Encouraging people to share" mentioned by 27.7%. "Managing information" was only mentioned by 8.1% of the respondents which indicates that Information Technology is far to be one of the main barriers to KM initiative success.[7] It seems that currently the IT tools designed to facilitate knowledge creation, capture, storage and distribution are available (even though no vendor currently offers an integrated enterprise wide KM solution) but the efficient use and acceptance of those tools are constrained by organizational culture. After having primarily focused efforts on IT, practitioners are now realizing the importance of the "soft" aspect of KM initiatives.[4]

There is a general agreement that organizational culture supporting knowledge sharing must be present or nurtured in order to succeed with a KM initiative. However, few

academic researches have been conducted defining the key organizational culture attributes that support more effective utilization of KM technologies and knowledge sharing. The purpose of this research is to define these key cultural attributes. Once defined, one can measure them within organizational cultures and focus a cultural change initiative on these values. The purpose of this paper is not to describe how to implement this cultural change but one needs to be aware that the development of the social infrastructure which supports knowledge sharing is a much stickier and more contingent affair whereas the acquisition of technology is a relatively speedy process.[2] Chances of success are low if the culture is strong, if the purpose of the culture change is not well understood and not well accepted by employees. A strong communication campaign as well as the use of story telling can help to facilitate such changes.[10]

## 2. Research Attribute Findings and Measurements

There is almost an agreement among researchers concerning the definition and core components of organization culture. Unfortunately, this agreement is not so strong when we look at how to measure organizational culture. Qualitative and quantitative methods are complementary approaches to the study and

〈Table 1〉 Attributes of the OCP

Trust	Problem Solving	Demanding of employee
Flexibility	Being exact	Supportive of employees
Adaptability	Team oriented work	Having a good reputation
Stability	Decisiveness	Sharing information freely
Predictability	Being competitive	Socially responsible
Being innovative	Being aggressive	Being different from others
Compliance	Being result oriented	Security of employment
Experimentation	Fairness	Praised good performance
Risk taking	Informality	Fitting in at work
Being careful	Tolerant of failure	Confront conflict directly
Freedom of action	Taking initiative	Develop friends at work
Rule oriented	Being thoughtful	Enthusiasm for the job
Attention to detail	Being easy going	Working closely with others
Take advantage of opportunity	Respect for individuals' right	Being calm
High expectation for performance	Low level of conflict encouraged	

assessment of organizational process and attributes. The advantages of qualitative methods include the use of focal unit's own terms to describe itself, the intensive and in-depth information that can be obtained about a unit, and the amenability of the method for exploratory research on issues and processes about which little information exists.[3] The advantages of quantitative methods include the ease of cross-sectional assessments and comparisons, the ability of assessment replication in different units and by other researchers or organizational development professionals, and

common articulated frame of reference for interpreting the data. Although both methods share the potential for producing cumulative bodies of information for assessment and theory testing, quantitative approach may be more practical for purposes of analyzing data-based change in organizations.[3]

One of the quantitative methods, the OCP developed by Harper was used for this research to obtain a global perception of the culture of an organization.[6] The OCP contains 44 attribute statements as shown in Table 1 that can generically capture individual and

organizational attributes. The set of attribute statements was developed on the basis of an extensive review of academic and practitioner-oriented writings on organizational attributes and culture. One aspect of this review was to identify a comprehensive set of attributes that could be used to characterize organizations. An attempt was made to find items that (1) could be used to describe any organization, (2) would not be equally characteristic of all organizations, and (3) would be easy to understand.[6] Respondents were asked to sort the 44 items into 8 categories, ranging from most to least desirable or from most to least characteristic, and to put a specified number of statements on each category.[6] Items judged to be less characteristic or uncharacteristic were placed into middle categories. While sorting the deck, the respondents were asked how to describe the culture of a focal organization. To develop a profile of an organization's culture, respondents familiar with the organization were instructed to sort the 44 attributes according to the extent to which the items were characteristic of the organization. With such a procedure, separate groups of individuals can be used to assess a firm's culture.

### 3. Research Questions and Hypotheses

Research in the field of Knowledge

Management reveals that companies are adopting more KM technologies to maximize the benefit of KM than ever, but they don't take full advantage of them. Is successful implementation of knowledge management not just a combination of new technology, but also organizational culture? If so, which cultural attributes do have positioner negative correlation with the successful KM technology implementation and knowledge sharing?

In determining the relationships between organizational culture attributes and a successful implementation of knowledge management technology, two basic hypotheses will be developed and tested.

Hypothesis I:

H<sub>0</sub>: There is no positive correlation between the successful implementation of knowledge management technology and organizational cultural attributes (trust, sharing information freely, working closely with others, or developing friends at work) for that organization.

H<sub>a</sub>: There is a positive correlation between the successful implementation of knowledge management technology and organizational cultural attributes (trust, sharing information freely, working closely with others or developing friends at work) for that organization.

Hypothesis II:

H<sub>0</sub>: There is no positive correlation between knowledge sharing and organizational cultural attributes (trust, sharing information freely, working closely with others, or developing friends at work) for that organization.

H<sub>a</sub>: There is a positive correlation between knowledge sharing and organizational cultural attributes (trust, sharing information freely, working closely with others, or developing friends at work) for that organization.

#### 4. Research Methodologies

For this research, the KMTP was developed to assess the success of knowledge management technology implementation and effective knowledge sharing by modifying the Information Technology Investment Performance (ITIP) survey instrument developed by National Research Council.[9] The ITIP was developed to assess and understand patterns of behavior that could help explain why some organizations were, or were not, realizing greater payoffs from the investment in information technology. Methods of determining success on knowledge management technology implementation were researched and it was decided to use a modification to the ITIP survey instrument.

To gauge the momentum of the KM movement, International Data Corp. and Knowledge Management Magazine undertook an extensive electronic survey of U.S. user organizations and individuals familiar with KM. The results of the study demonstrating the most important reasons for adapting KM and the most common challenges to implementing KM were used in modification to ITIP. Once individual KMTP surveys were grouped by organization, overall KMTP score was determined by averaging the responses to each of the nine questions (from the question 1 to 9 in KMTP survey instrument) and summing the average of each question. This gives each organization a single KMTP score, indicating its success in implementation of KM technology.

As mentioned in research attributes findings, the OCP, the survey instrument developed by Harper, was used in investigating person-culture fit. The OCP uses the 8-category 44-item Q-sort scale with distribution {3-5-7-7-7-7-5-3}, which meets the general Q-sort distribution decisions based on symmetry of distribution, the number of judgment categories, and the essential shape of the symmetrical distribution.

In this research, reliability is not a leading concern because of the changing nature of both organizational culture and the way knowledge management technology is utilized across an organization. This research presents only a snapshot of the organization under study and

the employees' feeling and perceptions about organizational culture and the implementation of knowledge management technology. An organization is a dynamic entity; conditions surrounding the operation of the business are constantly changing and thus the results from a reliable test instrument would be expected to vary in reflection of those changing conditions.

The questionnaire on OCP and the ITIP, slightly modified for this research, have been validated by many researchers in their previous researches.

The content validity of the KMTP was evaluated by 23 professional members of related area. The KMTP utilized in this research was screened identifying items that were redundant, irrelevant, or difficult to understand.

The concurrent validity of the KMTP survey instrument was evaluated only for two of nine questions in the KMTP which were slightly modified for this research because of the adherence to the ITIP survey instrument. To test concurrent validity of the KMTP, those two questions in the final set of nine questions derived from several iterations of content validity test were distributed to employees knowledgeable about the use of knowledge management technology across the organization. Respondents included 12 IT managers from 2 software development companies 9 IT managers from 3 consulting firms; and 1 executive, 2 IT managers and 5 information technologists from 3 financial/accounting service companies. Once

individual sets of two questions were grouped by organization, they were averaged. Using the Spearman-Brown prophecy formula, it was found that the coefficient alphas emerging from these averages are ranged from 0.69 to 0.83. Each coefficient provides an estimate of how likely one would be to get the same mean profile if everyone in the organization had taken the KMTP survey instrument rather than a sample of informants. Such reasonably high scores indicate that those two questions in the KMTP captured a representative knowledge management technology profile for each organization about the project evaluation of KM technology investment. The 27 sets of two questions from 8 organizations were also evaluated for how closely any two respondents in an organization view the implementation of knowledge management technology. The average pair-wise correlation across all pairs of individual raters within each organization was calculated. The median within-firm correlation among rates within an organization ranged from 0.31 to 0.62 and the median within-firm correlation for the entire data set was 0.51. Taken together, the alpha coefficient and the average pairwise correlation reflect a high level of agreement in perceptions of KM technology implementation. The validation study of ITIP undertaken previously by National Research Council (National Research Council 1994) and the validation of KMTP conducted for this research would support the use of

KMTP survey instrument in gathering reasonable data for the determination of an organization's KM technology profile.

### 5. Research Findings

The purpose of this research has been to determine the correlation, if any, between

<Table 2> Summary of Participating Organization

Trust	Industry Type	Sample Size of KMTP	Sample Size of OCP
Org. A	Consulting	3	13
Org. B	Software Development	3	7
Org. C	Financial/Banking/ Accounting	3	9
Org. D	Consulting	3	10
Org. E	Manufacturing	3	8
Org. F	Financial/Banking/ Accounting	4	10
Org. G	IT/ Telecommunication	2	7
Org. H	Government	3	13
Org. I	Consulting	3	9
Org. J	IT/ Telecommunication	3	11
Org. K	Software Development	4	8
Org. L	Consulting	3	22
Org. M	Software Development	3	7
Org. N	Government	3	7
Org. O	IT/ Telecommunication	3	11
Org. P	Consulting	3	11
Org. Q	Software Development	2	9
Org. R	Education	2	4
Org. S	Financial/Banking/ Accounting	3	18
Org. T	Consulting	3	7
Org. U	Software Development	3	5
Org. V	IT/ Telecommunication	1	3
Org. W	Consulting	1	5
Org. X	Consulting	1	4
Org. Y	Financial/Banking/ Accounting	1	5
Org. Z	Financial/Banking/ Accounting	1	4
<b>Total</b>	<b>Number of organizations</b> 26	<b>67</b>	<b>227</b>

organizational culture attributes and the successful implementation of knowledge management technology. Data used to test the two hypotheses derived for this research were obtained from 227 respondents from the OCP survey instruments and 67 respondents from the KMTP. The KMTP survey instruments was represented on 26 separate organizations. A total of 1060 OCP survey instruments and 212 KMTP survey instruments were distributed across 44 organizations.

The KMTP survey instruments was represented on 26 separate organizations. A total of 1060 OCP survey instruments and 212 KMTP survey instruments were distributed across 44 organizations. The OCP survey instruments were distributed to employees within the organization regardless of employees' function and level. The KMTP survey instruments were distributed to managers who were in a position to be knowledgeable about knowledge management technology across the organizations. A total of 236 OCP survey instruments were completed and returned from 27 organizations with the response rate of 22.3 percent. A total of 67 KMTP survey instruments were completed and returned from 26 organizations with the response rate of 31.6 percent. One organization that returned only the OCP survey instruments was excluded out of sample organizations. Table 2 provides detailed information as to the number of respondents to the OCP and the KMTP survey

instruments from each of 26 participating organizations and the industry types of these organizations. The alphabet (A to Z) was assigned to each of 26 organizations randomly to protect confidentiality of participating organizations.

## 6. Data Analysis

The Pearson Product-Moment correlation coefficient was considered as a method of determining linear relationship between two quantitative variables measured in interval scales organizational culture and the successful implementation of knowledge management technology. However, nonparametric alternative to Pearson Product-Moment correlation, Spearman's correlation coefficient, was used with replacing the data values for each variable by ranks because the variables are not normally distributed. The fact that variables are not normally distributed is due to the sample size.

### 6.1 Relationship between KMTP Score and OCP Cultural Attributes

The correlations between 44 OCP cultural attributes and the KMTP success score were examined using Spearman's correlation coefficients (see Table 3).



<Table 3> Correlation between OCP Cultural Attributes and KMTP Score

OCP Attributes	Correlation	OCP Attributes	Correlation
Sharing information freely	0.83	Security of employment	0.01
Working closely with others	0.78	Low level of conflict encouraged	-0.05
Team oriented work	0.69	Being careful	-0.08
Trust	0.69	Socially responsible	-0.09
Fairness	0.63	Stability	-0.09
Enthusiasm for the job	0.63	Confront conflict directly	-0.09
Autonomy	0.47	Fitting in at work	-0.13
Flexibility	0.45	Respect for individual's right	-0.14
Supportive of employees	0.44	Being different from others	-0.14
Tolerance of failure	0.44	High expectations for performance	-0.17
Rule orientation	0.41	Informality	-0.18
Praised good performance	0.37	Being innovative	-0.18
Experimentation	0.33	Being result oriented	-0.24
Demanding of employees	0.32	Predictability	-0.33
Take advantage of opportunity	0.31	Taking initiative	-0.34
Having a good reputation	0.31	Being easy going	-0.42
Being exact	0.29	Compliance	-0.46
Decisiveness	0.28	Risk taking	-0.49
Problem solving	0.17	Attention to detail	-0.53
Adaptability	0.16	Being competitive	-0.63
Developing friends at work	0.09	Being aggressive	-0.68
Being thoughtful	0.04	Being calm	-0.79

This non-parametric correlation analysis reveals a number of cultural attributes having moderate to high positive correlation with the KMTP success score. These attributes include sharing information freely, working closely with others, team oriented work, trust, fairness, and enthusiasm for the job. A number of cultural

attributes having a moderate to high negative correlation with the KMTP score were also identified. These attributes include being calm, being aggressive, and being competitive.

## 6.2 Relationship between Successful Knowledge Sharing and OCP Cultural Attributes

From the KMTP survey instruments grouped by organization, a portion of the assessment included the respondents' judgment on KM

technology investment in sharing key talent and knowledge within the respective organizations. The average KMTP score for knowledge sharing for each of participating organizations was tallied and normalized. A non-parametric correlation analysis was used to determine the correlation between the score of successful

〈Table 4〉 Correlation between KMTP Score for Knowledge Sharing and OCP Cultural Attributes

OCP Attributes	Correlation	OCP Attributes	Correlation
Team oriented work	0.72	Respect for individual's right	0.15
Working closely with others	0.68	Enthusiasm for the job	0.10
Sharing information freely	0.62	Tolerant of failure	0.06
Trust	0.61	Security of employment	0.01
Supportive of employees	0.58	Demanding of employee	-0.09
Take advantage of opportunity	0.52	Being different from others	-0.14
Flexibility	0.46	Low level of conflict encouraged	-0.15
Confront conflict directly	0.44	Risk taking	-0.24
Autonomy	0.44	Being careful	-0.28
Having a good reputation	0.41	Taking initiative	-0.34
Fairness	0.38	Being aggressive	-0.38
Being innovative	0.37	Rule oriented	-0.38
Developing friends at work	0.35	Being exact	-0.38
Adaptability	0.31	Being easy going	-0.39
Experimentation	0.31	Being result oriented	-0.41
Fitting in at work	0.29	Being competitive	-0.41
Praised good performance	0.27	Predictability	-0.43
Being thoughtful	0.24	Decisiveness	-0.44
Problem Solving	0.20	Attention to detail	-0.48
Socially responsible	0.19	Stability	-0.61
Informality	0.17	Compliance	-0.61
High expectation for performance	0.15	Being calm	-0.75

implementation of KM technology on knowledge sharing and the 44 OCP attributes. Table 4 summarizes the correlation between these two variables produced by the Spearman's Correlation analysis.

A number of attributes were found to have moderate to high positive correlation with the KMTP knowledge sharing score. These attributes include team oriented work, working closely with others, sharing information freely, trust and supportive of employees. These attributes produced correlation of 0.72, 0.68, 0.62, 0.61, and 0.58 respectively while developing friends at work produced correlation of 0.35. Such findings would suggest that organizations successfully implementing KM technology to share key talent and knowledge across the organization would value team oriented work, working closely with others, sharing information freely, and trust within the organizational culture, but not necessarily developing friends at work. Similarly, correlation analysis reveals a number of cultural attributes having a moderate to high negative correlation with the successful KM technology implementation on

knowledge sharing. These attributes include being calm ( $r = -0.75$ ), compliance ( $r = -0.61$ ), and stability ( $r = -0.61$ ).

### 6.3 Analysis of Hypotheses

The Spearman's Rank Correlation coefficient (Rho) was used to determine the relationship between two quantitative variables measured in interval scale with replacing the data values for each variable by ranks because the variables are not normally distributed. The Pearson Product-Moment correlation could be used with the sample size larger than 30 if the variables are approximately normally distributed. However, the sample size of this research ( $n = 26$ ) is not sufficiently large to use the Pearson Product-Moment correlation coefficient. The hypotheses were tested based on the findings from the correlation analysis with 99% confidence interval.

The research hypothesis I postulates that organizations indicating a higher overall success for knowledge management technology implementations, would find that employees

<Table 5> Testing Hypothesis I

OCP Attributes	Correlation	t - value
Trust	0.69	t : 3.45 > 2.79(t(0.005, 25))
Sharing information freely	0.83	t : 4.15 > 2.79(t(0.005, 25))
Working closely with others	0.78	t : 3.90 > 2.79(t(0.005, 25))
Developing friends at work	0.09	t : 0.45 < 2.79(t(0.005, 25))

〈Table 6〉 Testing Hypothesis II

OCP Attributes	Correlation	t - value
Trust	0.61	t : 3.05 > 2.79(t(0.005, 25))
Sharing information freely	0.62	t : 3.10 > 2.79(t(0.005, 25))
Working closely with others	0.68	t : 3.15 > 2.79(t(0.005, 25))
Developing friends at work	0.35	t : 1.75 < 2.79(t(0.005, 25))

rank attributes such as trust, sharing information freely, working closely with others, or developing friends at work more positively in their assessment of organizational culture attributes than employees within companies whose knowledge management technology implementations indicate a lower overall success. The t values calculated against Spearman's Correlation coefficients of attributes trust ( $r = 0.69$ ), sharing information freely ( $r = 0.83$ ), and working closely with others ( $r = 0.78$ ) found from the data analysis are sufficient to reject null hypothesis (see Table 5).

The hypothesis II postulates organization indicating sharing knowledge, would find that employees rank attributes such as trust, sharing information freely, working closely with others, or developing friends at work more positively in their assessment of organizational culture attributes than employees within companies whose investment in knowledge management technology indicate less return on sharing key talent and knowledge. The t values calculated against Spearman's Correlation coefficients of attributes trust ( $r = 0.61$ ), sharing information

freely ( $r = 0.62$ ), and working closely with others ( $r = 0.68$ ) found from the data analysis are sufficient to reject null hypothesis (see Table 6).

## 7. Conclusions and Recommendations

The results of the data analysis revealed sufficient evidence to establish a correlation between cultural attributes and the successful implementation of knowledge management technology. And also, there is sufficient evidence to establish a correlation between cultural attributes and knowledge sharing. Before an organization launches a knowledge management technology initiative, it should deal with cultural issues. The success of KM technology implementation is mediated by human behavior. The research identifies cultural attributes, which have moderate to high positive correlation with the success of KM technology implementation such as sharing information freely, working closely with others, team-oriented work, trust,

fairness, and enthusiasm.

Many organizations are actually implementing KM strategies and technologies that are giving them real benefits in terms of knowledge sharing. The results of this research which support the supplemental hypothesis II indicate that knowledge management technology in sharing knowledge has moderate high correlation with cultural attributes such as team-oriented work, working closely with other, sharing information freely, trust, and supportive of employees.

The findings of this research could help KM researchers and practitioners to develop a better understanding of the role of organizational

culture in the successful implementation of KM technology and knowledge sharing initiatives. The findings provide some key cultural attributes that practitioners will be able to focus on and to pay particularly attention to during cultural change initiatives. This research concentrates on finding the positive relationship and negative relationship between KM and organizational culture. For the future research, it is necessary to research on whether there is possibly no effective relationship between two variable attributes.

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