Assessing the Success of Knowledge Management Technology Implementation as a Function of Organizational Culture Orientations

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Abstract

The purpose of this research is to explore the possible relationship between the successful implementation of knowledge management technology and specific organizational culture orientations. Data used to test hypothesis derived for this research were obtained from 227 responders from the Organizational Culture Profile (OCP) survey instruments and 67 responders from the Knowledge Management Technology Profile (KMTP) survey instruments representing 26 separate organizations. The OCP provides a profile of an organization's culture orientation while the KMTP provides a profile of the organization's degree of the KM technology implementation success. The results of this research suggests that employees of organization which are more successful in implementing KM technology have identified organizational culture that embodies a healthy mixture of both production-oriented and people-oriented attributes indicative of the [9,9] culture orientation.

Keywords:

Organizational Culture Orientation, Knowledge Management Success, OCP, KMTP

I. The Role of Organizational Culture in KM Efforts

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 (KPMG Consulting 2000). 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 (IT) is far to be one of the main barriers to KM initiative success (Knowledge Management Review 2001). It seems that currently the IT tools designed to facilitate knowledge creation, capture, storage and distribution are available but

the efficient use and acceptance of those tools are constrained by organizational culture (Davenport and Prusak 1998). After having primarily focused efforts on IT, practitioners are now realizing the importance of the "soft" aspect of KM initiatives (Davenport and Prusak 1998).

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 organizational culture orientation that supports more effective utilization of KM technologies and knowledge sharing. The purpose of this research is to define this organizational culture orientation. Once defined, one can measure it within organizational culture and focus a cultural change initiative on this value.

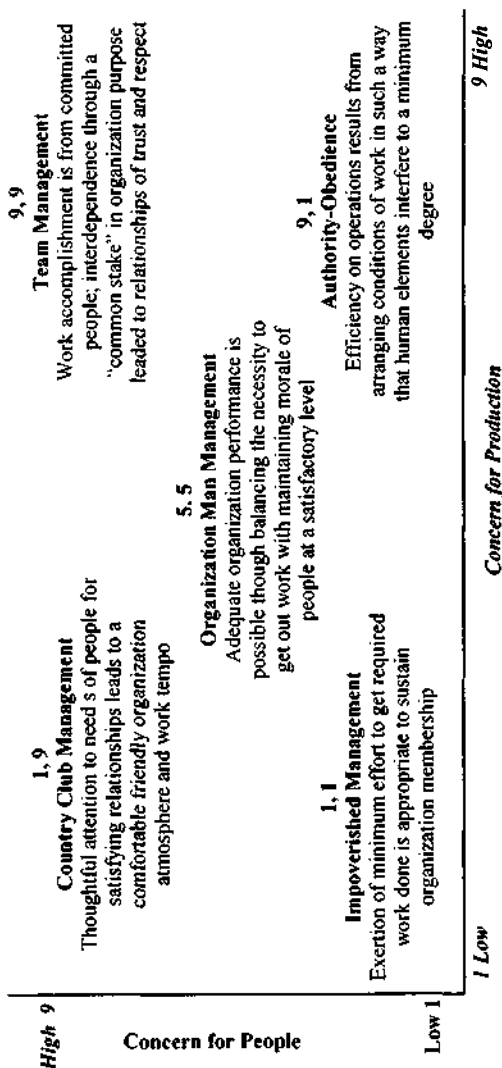## II. Identifying Organizational Culture Orientation

Organizational Culture Profile (OCP) developed by Harper (Harper 2000) was used for this research to obtain a global perception of the culture of an organization. The OCP contains 44 attribute statements as shown in Table 1 that can generically capture individual and organizational attributes. 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.

Table 1 – 44 Attributes of the OCP

Adaptability	Being calm
Attention to detail	Being different from others
Autonomy	Being easy going
Being aggressive	Being thoughtful
Being carefulness	Confronting conflict directly
Being competitive	Decisiveness
Being exact	Demanding of employees
Being innovative	Developing friends at work
Being result oriented	Enthusiasm for the job
Compliance	Fairness
Experimentation	Fitting in at work

Flexibility	Having a good reputation
High expectations for performance	Low level of conflict encouraged
Informality	Praise for good performance
Predictability	Respect for the individual's right
Problem solving	Security of employment
Risk taking	Socially responsible
Rule orientation	Supportiveness of employees
Sharing information freely	Team oriented work
Stability	Tolerance of failure
Taking advantage of opportunity	Trust
Taking initiative	Working closely with others

Figure 1 - Managerial Grid

In order to define organizational culture orientations, Harper (2000) mapped a total of 44 OCP attribute statements against the "Managerial Grid" organization characteristics sets developed by Blake and Mouton (1978).

Harper viewed the Managerial Grid as a set of cultural orientations for distinct organization types. The original use of the Managerial Grid is to analyze interactions between significant variables of management – production and people – as consultant to understand a basic conflict in a top management group. The two dimensions of the Managerial Grid include *Concern for Production* and *Concern for the People*. In each case, the term "concern for" is not addressing so much with the degree to which employees' needs being considered, but rather the degree of interest that is presented and demonstrated by the organization's management. What is significant is how management concerns itself about production and people and how they interact. The Managerial Grid, depicted in Figure 1, shows these two concerns and a range of possible interactions between them. The horizontal axis indicates a concern for production while the vertical axis indicates concern for people. Each is expressed as nine-point scale of concern, with the number 1 representing minimum concern and the number 9 representing maximum concerns. The process of mapping the 44 OCP attribute statements done by Harper (2000) revealed around the sets of organization characteristics, identified by Blake and Mouton (1978), which exhibit each of major management orientations such as [1,1], [1,9], [5,5], [9,1], and [9,9].

III. Research Questions and Hypotheses

In determining the relationships between organizational culture and a successful implementation of knowledge management technology, the following hypothesis will be developed and tested.

Hypothesis:

H_0: There is no positive correlation between *the successful implementation of knowledge management technology* and organization with *culture type* of [9,9].
H_1: There is a positive correlation between *the successful implementation of knowledge management technology* and organization with *culture type* of [9,9].

IV. Research Methodology

For this research, the Knowledge Management Technology Profile (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 (National Research Council 1994). 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 (National Research Council 1994). 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 (Dyer 2000). 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 section II., the Organizational Culture Profile (OCP), the survey instrument developed by Harper, was used in investigating person-culture fit. 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. Items judged to be less characteristic or uncharacteristic were placed into middle categories (Harper 2000). Once individual OCP surveys were grouped by organization, the OCP attribute statements with their scored points were mapped against the major organizational culture orientations [1,1], [1,9], [5,5], [9,1], and [9,9].

For the purpose of 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 (Anastasi 1950).

The questionnaire Organizational Culture Profile (OCP) and the Information Technology Investment Performance (ITIP), slightly modified for this research, have been validated by many researchers in their previous researches. The 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 mangers 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 pairwise 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.

V. Findings

V.1. Discussion of Data

The purpose of this research has been to determine the correlation, if any, between organizational culture orientations and the successful implementation of knowledge management technology. Data used to test the hypothesis derived for this research were obtained from 227 respondents from the Organizational Culture Profile (OCP) survey instruments and 67 respondents from the

Table 2 – Summary of Participating Organization

Org.	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

Knowledge Management Technology Profile (KMTP) survey instruments representing 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.

V.2. 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.

V.2.1. Relationship between KMTP Score and Five Cultural Orientations

Individual OCP survey instruments were grouped by organization. Then, the tally was made of the number of OCP attribute points scoring in the five cultural orientations of the Managerial Grid. Table 3 summarizes the percentage of total OCP attribute points of each organization for each of the five major cultural orientations.

Table 3 - OCP Percentage of Organization Culture Orientation

Org.	KMTP Score	9,9 Score	9,1 Score	5,5 Score	1,1 Score	1,9 Score
I	64.0	34%	20%	13%	14%	19%
F	63.2	35%	22%	15%	13%	16%
O	61.0	34%	16%	14%	15%	21%
S	56.0	33%	18%	14%	15%	21%
X	49.6	20%	18%	18%	15%	29%
L	44.0	16%	18%	21%	11%	34%
G	41.0	16%	19%	21%	12%	33%
U	40.9	20%	20%	24%	12%	24%
A	40.7	15%	17%	24%	14%	30%
N	40.7	20%	23%	25%	18%	14%
P	40.6	32%	20%	16%	14%	18%
Z	40.2	17%	18%	26%	18%	21%
R	40.0	22%	21%	24%	15%	17%
C	39.3	16%	17%	27%	20%	20%
E	37.7	21%	21%	23%	16%	18%
V	35.5	18%	13%	18%	31%	20%
W	34.5	15%	27%	14%	17%	27%
B	34.0	16%	22%	26%	20%	16%
K	33.7	18%	31%	20%	17%	14%
J	31.7	13%	20%	28%	22%	17%
D	27.7	12%	17%	27%	25%	17%
H	25.6	13%	24%	25%	21%	18%
M	25.3	13%	24%	24%	23%	17%
Q	24.5	15%	19%	33%	19%	14%
T	19.8	15%	29%	24%	17%	15%
Y	19.2	11%	23%	24%	17%	25%

After data are sorted by descending KMTP Success Score, a relationship between this score and the percentage of 9,9 cultural orientation is the most evidence. The organizations I, F, O and S indicating the highest overall KMTP success scores demonstrate the highest percentage of 9,9 cultural

orientation. A non-parametric correlation analysis indicates a Spearman's coefficient of 0.80 between the KMTP success score and cultural orientation 9,9 in the sample. The scatter plot in Figure 2 shows the evidence that an obvious linear relationship exists between them.

Figure 2 - Correlation between KMTP Score and 9,9 Cultural Orientation
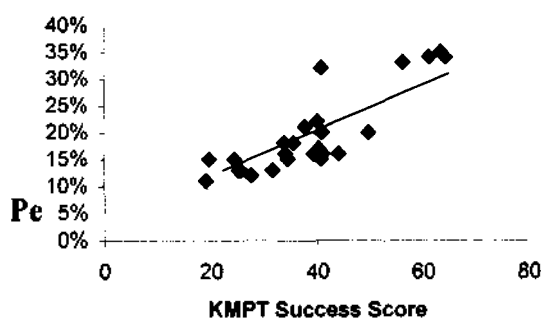
V.2.2. Analysis of Hypothesis

The overall research hypothesis postulates that organizations whose sampled employees highly rank attributes that lie within the [9,9] OCP value set will find their KMTP score indicates a higher overall success for knowledge management technology implementations than those organizations whose sampled employees highly rank attributes that lie within another OCP value set. The Spearman's Correlation coefficient (r: 0.80) between two variables – the successful implementation of KM technology and the culture type of [9,9] is sufficient to suggest a positive correlation between overall KMTP score and the percentage of values in the [9,9] cultural attribute set. The t - value calculated against Spearman's Correlation coefficient of 0.80 is sufficient to reject the null hypothesis shown in the table 5.17 with 99% confidence interval. The hypothesis of interest is $Ho : \rho = 0$ versus $H1 : \rho > 0$. The necessary t critical value for a level .01 test is $t_{005,25} = 2.79$ and $t = .80\sqrt{26-1} = 4$. Since $t \geq t_{005,25}$, we rejected Ho and conclude that two variables are positively related in the population.

VI. Conclusions and Recommendations

Before an organization puts knowledge management technologies for a successful KM implementation, it should deal with cultural issues. The success of KM technology implementation is mediated by human

behavior. While this research focused on establishing a correlation between organizational culture orientations and the successful implementation of KM technology, evidence suggests that the specific cultural orientation are the drive for or barriers to the successful KM technology implementation. Although focusing on organizational culture and change may extend the time it takes to prepare a KM program, the benefits of doing so include being better prepared for implementation and being more able to leverage existing technology (Dyer, 2000).

The results of this research support the overall hypothesis. Organizations, which are more successful in KM technology implementation, have identified organization cultures that embody a mixture of both production-oriented and people-oriented attributes that lie within the [9,9] OCP value set. If a culture does not have high components of both orientations, those cultures with a higher people-oriented component have the second best chance of successful implementation. The non-parametric correlation analysis reveals the people-oriented attributes are more constantly related to the successful implementation of KM technology.

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 finding provides an appropriate cultural orientation that practitioners will be able to focus on and to pay particularly attention to during cultural change initiatives.

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