# Organizational Culture and the Adoption of Knowledge Management Technologies

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## Abstract

Organizational culture is increasingly recognized as a major facilitator or barrier to leveraging intellectual assets. Early works have shown that there are various technologies that can support knowledge management. This research presents an empirical study designed to explore and define the sophisticated relationships between organizational culture and the adoption of KM technologies. According to literature, organizational culture could be decomposed into five dimensions: rational, group, development, hierarchical, and ethical culture. Considering the basic processes of knowledge management, KM technologies can be categorized into five major types: creation, storage/retrieval, application, and platform technology. The result of correlation analysis shows the rational, group, and development cultures have positive relationship with storage/retrieval and platform technologies. Although the majority of corporations started to recognize the value and importance of KM, there exists a huge gap between getting aware of KM and formally adoption of KM systems. This study contributes to the further understanding of how organizational culture affects and interacts with KM technologies and in what ways.

## 1. Introduction

Knowledge management (KM) has been recognized to be the best way to gain sustainable and unique competitiveness in the economics of knowledge. From early days, Human beings reserved their knowledge by all means. Along with the advanced of information technologies (IT), the usage of IT to help KM has become a popular research issue. In recent years, many literature and empirical studies indicate that organizational culture is a key factor for KM implementation, i.e. organizational culture will affect their behavior and willingness in KM activities. This has led to a research issue that how organizational culture will affect the IT usage in KM activities. Example is Ruppel and Harrington (2001), demonstrated the effects of organizational culture on Intranet implementation for knowledge sharing.

Numerous studies on the utilization of technologies as tools for implementing KM have been conducted; others have proved that organization culture can be the facilitator or barrier to KM. However, very little is known about the influence of organization culture on the usage of information technologies in various KM activities. This study aims to future explore this problem by diagnosing what, how, why organizational culture type would affect KM via the application of various technologies.

Managers can diagnose the culture type of their organization, and adopt the appropriate technologies to enhance the KM activity they are concerned with. Another way, managers may choose to change the organization culture for a better KM implementation environment.

## 2. Literature Review

### 2.1 Knowledge Management

We are now in a knowledge economics society. In fact, knowledge is the only meaningful resource today (Drucker, 1995). More and more, business leaders and consultants talk about knowledge as the chief asset of organizations and the key to a sustainable competitive advantage (Davenport and Prusak, 1998).

KM is largely regarded as a process involving various activities. Slight discrepancies in the delineation of the processes appear in the literature, namely in terms of the number and labeling of processes rather than the underlying concepts. At a minimum, one considers the four basic processes of creating, storing/retrieving, transferring and applying knowledge (Alavi and Leider, 2001).

There are a lot IT that can support KM activities in processes. Firms are becoming aware both of the potential of this technology to enhance knowledge work and of the fact that the potential can be realized only if they understand more about how knowledge is actually developed and shared (Davenport and Prusak, 1998).
Early works on KMS have shown that there are various technologies that can support KM (Frappaolo and Capshaw 1999, Alavi and Leider 1999, Bowman 2001). Other works mapped these technologies to KM activities (Skyrme 1998, Carayannis 1999, Reyes and Raisinghani 2002, Alavi and Leider 2001, Bose and Sugumaran 2003). For example, Alavi and Leider 2001 used four processes to describe the KM activities and listed some mapped information technologies. See Table 1.

**Table 1: KM activities and mapped IT**

| KM Process and the Potential Role of IT | | | | |
|---|---|---|---|---|
| KM Process | Knowledge Creation | Knowledge Storage/Retrieval | Knowledge Transfer | Knowledge Application |
| Supporting IT | Data Mining<br>Learning tools | Electronic bulletin boards<br>Knowledge repositories<br>Databases | Electronic bulletin boards<br>Discussion forums<br>Knowledge directories | Expert systems<br>Workflow systems |
| Platform Technologies | Groupware and communication technologies<br>Intranets | | | |

(Alavi and Leidner, 2001)

## 2.2 Organizational Culture

Culture has been defined as: "A pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems (Schein, 1992)." Culture is reflected in values, norms, and practices, and will influence the behaviors and social interaction. (Delong and Fahey, 2000) Knapp and Yu (1999) also indicate that every social group, from family to corporate enterprise, has its own unique culture: a set of shared beliefs, stories, rules and values. Research on culture in the early 1980s concentrated on explaining the concept and diagnosing culture, while later research began on changing culture and evaluating the extent and success of change, then culture has been associated with TQM, BPR, organizational learning, and KM (Lewis, 2002).

There are various methods to diagnose organizational culture. Hofstede (1980) brought the field of cross-cultural studies to the forefront of social science research. Denison (1990) and Denison and Mishra (1995) posited the strength of culture as described by four primary traits (involvement, consistency, adaptability, and mission). Goffee and Jones (1998) classified the cultures into taxonomy of four corporate culture classes.

Quinn and Rohbraugh (1981) developed the Competing Value Approach for organizational effectiveness. This competing value framework was developed with two attributes. One attribute reflects whether an organization focuses its attention inward toward its internal dynamic or outward toward its external environment. The other attribute reflects preference for flexibility versus control in organizational structuring. This results in a framework containing four quadrants:

- One with an external focus which values flexibility(developmental),
- Another with an external focus which values order(rational),
- Another with an internal focus that values order(hierarchical), and
- The last with an internal focus which values flexibility (group).

Ruppel (2001) adjusted the Competing Value Approach with one more dimension: ethical and trusting culture because none of the four dimensions of the competing values framework specifically address these values of ethics and trust. See Figure 1.

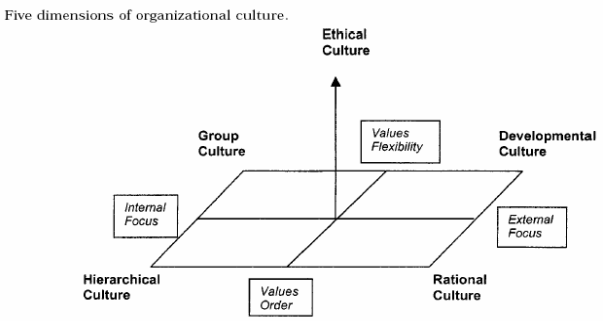


**Figure 1: Five dimensions of organizational culture** (Ruppel and Harrington, 2001)

## 2.3 Organizational culture and KM

Descriptive studies have identified culture as a major catalyst, or alternatively a major hindrance, to knowledge creation and sharing. (Alavi and Leidner 2001) Delong and Fahey (2000) had found that organizational culture is widely to be the major barrier to creating and leveraging knowledge assets. They also proposed four frameworks linking culture and knowledge: (1) Culture shapes assumptions about which knowledge is important. (2) Culture mediates the relationships between levels of knowledge. (3) Culture creates a context for social interaction. (4) Culture shapes creation and adoption of new knowledge.

There also exists some diversity to knowledge management when the organizational cultures are difference. Transferring best practices from one organization to another often fails because the cultures are so different. (Marr, 2003) Some specific features of the Russian national and organizational culture reinforce many of the general problems of knowledge sharing. (Husted and Michalova, 2002) The famous SECI model of Nonaka and Takeuchi is contended that each of the four modes can only be understood with reference to their embeddedness in Japanese social and organizational culture and related value systems. (Gliby and Holden, 2003)

The inertial impact of culture on IT implementation had been discussed. Cooper (1994) used the competitive values approach to demonstrate some theoretical linkages among various cultures and different ITs. And how about the technologies used in KM? Ruppel and Harrington (2001) adjusted the competitive values approach to demonstrate the linkage among organizational culture and intranet implementation, because intranet facilitates sharing of employee knowledge. However, as discussed above there should be many technologies that can support KM activities.

# 3. Research Model and Research Hypotheses

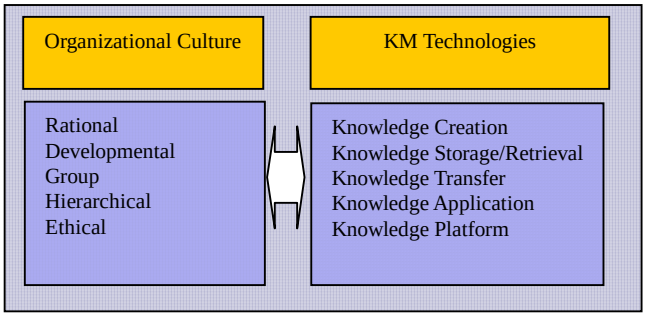


**Figure 2: Research model**

A research model was developed according to the literature discussed above. The model is intended to examine the relationship between organizational cultures and KM technologies. We want to explore whether organizational culture can facilitate (or inhibit) the implementation and usage of KM technologies.

### 3.1 Dimensions of Organizational Culture

The organizational cultures are classified according to the adjusted competing value approach. Ruppel and Harrington classified the organization culture into five dimensions: rational, development, group, hierarchical and ethical cultures.

### 3.2 Dimensions of KM Technologies

The technologies are classified along with KM process. Alavi and Leidner (2001) classified the KM processes into creation, storage/retrieval, transfer, and application. The four processes are very simple and can explain the underlying concepts of KM.

Thus four kinds of supporting information technologies were mapped to support the four processes. And there are the platform technologies to support all the knowledge processes and mapped technologies. So there are five dimensions of KM technologies and more technologies were concluded to make it more complemented. See Table 2.

Table 2: KM activities and complementary IT

| KM Process and the Potential Role of IT | | | | |
|---|---|---|---|---|
| KM Process | Knowledge Creation | Knowledge Storage/Retrieval | Knowledge Transfer | Knowledge Application |
| Supporting Information Technologies | Data Mining<br>e-Learning<br>CAD<br>Model simulation<br>Collaborative filtering<br>Intelligent Agents<br>Search engine | Newsgroup (or BBS)<br>Knowledge base<br>Databases<br>Data warehousing<br>Document Management | Newsgroup (or BBS)<br>FAQ<br>Video-conferencing<br>Mapping tool<br>Knowledge map<br>Expert yellow page<br>Virtual reality system<br>e-Mail | Case-based reasoning<br>Decision support system<br>Expert systems<br>Workflow systems<br>Enterprise information portal |
| Platform Technologies | Groupware、Intranets、Internet、Collaborative commerce、Group decision support system | | | |

### 3.3 Hypothesis

Organizations with rational culture affect and react to its environment in pursuit of profit maximization. Contemporary organization would be best if its high-level organizational development goal is to promote a learning organization. Therefore, similar to the role of information systems used to play, knowledge management systems is to provide better mechanisms to promote such concept and consequently optimizing the ever-growing organization in a coherent and rational manner. In the implementation of knowledge management, for instance, e-learning provides an efficient means for large corporations to provide employee training. This is particularly powerful for global companies which have multinational employees and the numbers of employee is large. Global companies with hundreds of newly recruited employees in a day could save millions through such knowledge management technology application. This definitely will lead to our first hypothesis as following.

*H1：There is a positive relationship between KM technologies and rational culture in an organization.*

Organization with group culture emphasizes human resource, cohesive relationships and individual commitment and contribution. Fundamentally, the generation of knowledge cannot do without highly motivated employee dialogue and participation. For example, groupware provides a number of functions to better streamlining the dialogue among employees as well as provides a more user-friendly environment for employees to participate in corporate activities. This leads to our first hypothesis as following.

*H2：There is a positive relationship between KM technologies and group culture in an organization.*

Organization with development culture promotes insight and innovation in order to increase the chance for organizational survival and growth. In this kind of organization climate, innovation will be seen as the key to gain sustainable competitive advantage. KM technologies can provide functions like organizational learning, collaborative design, and knowledge transfer to support the process of product or service innovation. This will lead to our third hypothesis as following.

*H3：There is a positive relationship between KM technologies and development culture in an organization*.

The hierarchical culture emphasizes the stability and equilibrium of the organization. Since this culture is concerned with an internal focus and order, it identifies ways to bring order to the internal organization. It is easier

to promote business practices in this kind of organizational climate because the characteristics of this culture are to highlight internal focus and order. People are used to following the rules, and organizational practices can be executed more efficiency. When implementing KM in such a hierarchical organization, employees will follow the instruction from superior managers and behave in a united way. Therefore, we assumed that the hierarchical culture would be positively correlated with KM systems.

*H4 : There is a positive relationship between KM technologies and hierarchical culture in an organization.*

In essence, the ethical culture emphasizes ethics and trust. The trust in an organization is internalized and embedded within the long-term development of organization. Trust is fundamentally important for employees willing to share knowledge. Thus, organizations that encourage a caring, trusting environment, while discouraging self-interests, would be more likely to implement KM technologies successfully. This will lead to our fifth hypothesis as following.

*H5 : There is a positive relationship between KM technologies and ethical culture in an organization.*

## 4. Results

The questionnaire is developed based on literature review. There is one pair of instruments adopted in this study. First, the adjusted competing value framework (Ruppel and Harrington, 2002) was adopted to diagnose the culture types of an organization. Another set, KM technologies was modified form Alavi and Leidner (2001) to see the implementation level of KM technologies. The first construct includes thirteen measurement items with a seven-point Likert scale; and the second construct includes thirty measurement items with a five-point scale: form never considered to fully implementation.

First, for enhancing the validity of the questionnaire, an EMBA class at National Central University was chosen to implement a pilot test. The formal sample frame was drawn from the directory of TOP 5000, The Largest Corporations in Taiwan (China Credit Information Service, 2004). The questionnaire was targeted at MIS managers because they are more familiar with the overall development of organizational IT infrastructure and applications of IT. A total of 500 questionnaires were sent and 97 valid responses were collected. A quantitative-based analysis on the survey data has been conducted and displayed in the following tables from Table 3 to Table 11.

### 4.1 Demographics

The characteristics of the sample are shown in Table 3 to Table 6. Out of 97 companies, a major portion of them (42.3%) came from the manufacture industry, followed by the information service industry (18.6%) and finance (16.5). There are only 17.5% companies have already implemented KM. A major portion of them (34.0%) are on developing their KM activities. And the rest of them (43.3%) are just considering or not yet considering to implementing KM. The numbers of employees in most of the companies are ranging from 100 to 300, representing 33% of the total sample companies. The numbers of IT employees are quite small. About 61.9% companies have less than 20 IT employees. Only 4.1% companies have more than 300 IT employees.

**Table 3: Industry Group**

| Company Characteristics | Category | Frequency | Percent | Cumulative Percent |
|---|---|---|---|---|
| Industry Group | Manufacture | 41 | 42.3 | 42.3 |
| | Transportation | 2 | 2.1 | 44.4 |
| | Public Utility | 1 | 1.0 | 45.4 |
| | Retail | 2 | 2.1 | 47.5 |
| | Constructers | 1 | 1.0 | 48.5 |
| | Communication | 3 | 3.1 | 51.6 |
| | Information service | 18 | 18.6 | 70.1 |
| | Finance | 16 | 16.5 | 86.6 |
| | Education | 5 | 5.2 | 91.8 |
| | Others | 8 | 8.2 | 100.0 |
| | Total | 97 | 100.0 | |

**Table 4: KM stage**

| Company Characteristics | Category | Frequency | Percent | Cumulative Percent |
|---|---|---|---|---|
| KM Stage | Already implemented | 17 | 17.5 | 18.1 |
| | On developing | 33 | 34.0 | 53.2 |
| | On considering | 26 | 26.8 | 80.9 |
| | Not yet considering | 16 | 16.5 | 97.9 |
| | Others | 2 | 2.1 | 100.0 |
| | Total | 94 | 96.9 | |
| Missing | System | 3 | 3.1 | |
| Total | | 97 | 100.0 | |

**Table 5: Number of total employees**

| Company Characteristics | Category | Frequency | Percent | Cumulative Percent |
|---|---|---|---|---|
| Num. of total employees | Less than 100 | 24 | 24.7 | 25.0 |
| | 100-300 | 32 | 33.0 | 58.3 |
| | 300-500 | 8 | 8.2 | 66.7 |
| | 500-1000 | 9 | 9.3 | 76.0 |
| | 1000-3000 | 12 | 12.4 | 88.5 |

| | | | | |
|---|---|---|---|---|
| | 3000-5000 | 4 | 4.1 | 92.7 |
| | 5000-10000 | 4 | 4.1 | 96.9 |
| | 10000-20000 | 2 | 2.1 | 99.0 |
| | More than 30000 | 1 | 1.0 | 100.0 |
| | Total | 96 | 99.0 | |
| Missing | System | 1 | 1.0 | |
| Total | | 97 | 100.0 | |

**Table 6: Number of IT employees**

| Company Characteristics | Category | Frequency | Percent | Cumulative Percent |
|---|---|---|---|---|
| Num. of IT employees | Less than 20 | 60 | 61.9 | 63.8 |
| | 20-30 | 7 | 7.2 | 71.3 |
| | 30-50 | 9 | 9.3 | 80.9 |
| | 50-100 | 6 | 6.2 | 87.2 |
| | 100-300 | 8 | 8.2 | 95.7 |
| | 300-500 | 3 | 3.1 | 98.9 |
| | 500-1000 | 1 | 1.0 | 100.0 |
| | Total | 94 | 96.9 | |
| Missing | System | 3 | 3.1 | |
| Total | | 97 | 100.0 | |

## 4.2 t-test Significance

Descriptive statistics and significance of organizational culture measurements were presented in Table 7. All of the thirteen variables are significant at two levels and strongly significant at 0.01 level. If we aggregate and take average of those thirteen variables by the five dimensions they belong to, those five dimensions (1. rational culture, 2. ethical culture, 3. group culture; 4. development culture, 5. hierarchical culture) are all strongly significant at 0.01 level(tavg1 =18.393, p = 0.000; tavg2 =8.606, p =0.000; tavg3 =8.061, p = 0.000; tavg4 =13.095, p = 0.000; tavg5 =16.247, p = 0.000).

**Table 7: One-sample statistics and significance (Organizational Cultures)**

| Items of organization cultures | Mean | Std. Deviation | t | Sig. (2-tailed) |
|---|---|---|---|---|
| Rational Culture 1 | 5.69 | 1.05 | 15.79 | .000(**) |
| Rational Culture 2 | 5.79 | .98 | 18.06 | .000(**) |
| Avg. Rational | 5.74 | .94 | 18.39 | .000(**) |
| Ethical Culture 1 | 4.59 | 1.41 | 4.12 | .000(**) |
| Ethical Culture 2 | 4.90 | .99 | 8.88 | .000(**) |
| Ethical Culture 3 | 4.98 | 1.04 | 9.27 | .000(**) |
| Avg. Ethical | 4.82 | .94 | 8.61 | .000(**) |
| Group Culture 1 | 5.09 | 1.28 | 8.39 | .000(**) |
| Group Culture 2 | 4.78 | 1.30 | 5.93 | .000(**) |
| Avg. Group | 4.94 | 1.15 | 8.06 | .000(**) |
| Development Culture 1 | 5.23 | 1.16 | 10.42 | .000(**) |
| Development Culture 2 | 5.57 | 1.14 | 13.48 | .000(**) |
| Avg. Development Culture | 5.49 | 1.05 | 13.10 | .000(**) |
| Hierarchical Culture 1 | 5.53 | 1.12 | 13.43 | .000(**) |
| Hierarchical Culture 2 | 5.64 | .98 | 16.46 | .000(**) |
| Avg. Hierarchical Culture | 5.58 | .96 | 16.25 | .000(**) |

** is significant at the 0.01 level(2-tailed)
* is significant at the 0.05 level (2-tailed)

Descriptive statistics and significance of KM technologies were presented in Table 8. There are twenty-six variables among a total of thirty variables are significant at two levels. Twenty-five are strongly significant at 0.01 level and 1 are significant at 0.05 level. Those boldface items with a positive t value present the technologies that are significant being used in the sample organizations. If we aggregate and take average of those in use technologies variables by the five dimensions they belong to, those five dimensions (1.knowledge creation technologies; 2. knowledge storage/retrieval technologies, 3. knowledge transfer technologies; 4. knowledge application technologies; 5. knowledge platform technologies) are all strongly significant at 0.01 level(tavg1 = 9.761, p = 0.000; tavg2 = 15.788, p =0.000; tavg3 = 14.811, p =0.000; tavg4 = 11.793, p = 0.000; tavg5 =25.436, p = 0.000).

**Table 8: One-sample statistics and significance (KMS Implementation)**

| Items of technologies implementation level | Mean | Std. Deviation | t | Sig. (2-tailed) |
|---|---|---|---|---|
| Data Mining | 2.23 | 1.23 | 1.88 | .063 |
| **e-Learning** | **2.77** | **1.25** | **6.03** | **.000(**)** |
| Computer Aided Design | 2.20 | 1.50 | 1.34 | .181 |
| Model Simulation | 1.75 | 1.23 | -1.99 | .050(*) |
| Collaborative filtering | 1.51 | .90 | -5.28 | .000(**) |
| Intelligent agent | 1.65 | 1.05 | -3.16 | .002(**) |
| **Search engine** | **3.39** | **1.40** | **9.749** | **.000(**)** |
| Avg. Knowledge create technologies | 3.08 | 1.08 | 9.76 | .000(**) |
| **Newsgroup** | **2.84** | **1.43** | **5.81** | **.000(**)** |
| **Knowledge base** | **2.78** | **1.16** | **6.58** | **.000(**)** |
| **Database** | **4.18** | **1.02** | **21.02** | **.000(**)** |
| **Data Warehousing** | **3.00** | **1.47** | **6.62** | **.000(**)** |
| **Document Management** | **3.51** | **1.16** | **12.81** | **.000(**)** |
| Avg. Knowledge storage/retrieval | 3.26 | .79 | 15.78 | .000(**) |
| **Newsgroup** | **2.66** | **1.38** | **4.65** | **.000(**)** |
| **Frequent Asked Questions** | **2.81** | **1.27** | **6.27** | **.000(**)** |
| **Video conferencing** | **2.78** | **1.36** | **5.66** | **.000(**)** |

| | | | | |
|---|---|---|---|---|
| Mapping tool | 1.38 | .78 | -7.77 | .000(**) |
| Knowledge map | 1.65 | .96 | -3.46 | .001(**) |
| Expert yellow page | 1.54 | .95 | -4.66 | .000(**) |
| Virtual Reality System | 1.22 | .62 | -12.26 | .000(**) |
| **Email** | **4.74** | **.63** | **42.61** | **.000(**)** |
| Avg. Knowledge transfer technologies | 3.26 | .83 | 14.81 | .000(**) |
| Case Best Reasoning | 1.53 | .97 | -4.66 | .000(**) |
| Decision Support System | 2.02 | 1.14 | .17 | .860 |
| Expert system | 1.69 | 1.07 | -2.83 | .006(**) |
| **Workflow system** | **3.28** | **1.33** | **9.54** | **.000(**)** |
| **Enterprise Information Portal** | **3.35** | **1.33** | **9.99** | **.000(**)** |
| Avg. Knowledge application technologies | 3.31 | 1.10 | 11.79 | .000(**) |
| **Groupware** | **2.47** | **1.51** | **3.10** | **.003(**)** |
| **Internet** | **4.67** | **.68** | **38.22** | **.000(**)** |
| **Intranet** | **4.60** | **.89** | **28.66** | **.000(**)** |
| Collaborative commerce | 2.21 | 1.28 | 1.66 | .100 |
| Group Decision Support System | 1.49 | .84 | -5.90 | .000(**) |
| Avg. Knowledge platform | 3.92 | .74 | 25.43 | .000(**) |

** is significant at the 0.01 level(2-tailed)
* is significant at the 0.05 level (2-tailed)

An independent samples test is conducted to see the effect of KM condition on KMS implementation. The results are shown in Table 9 and Table 10. According to results, the effect of implementing KM is very obvious. The mean implementing KMS level is significantly large than those companies which may just consider to implementing KM.

**Table 9: Independent samples test (KM condition on KMS implementation)**

| Type of KM Technologies | KM condition | N | Mean | Std. Deviation |
|---|---|---|---|---|
| Knowledge Creation Technologies | Form already implemented to on developing | 43 | 2.68 | .96 |
| | From considering to not yet considering | 50 | 3.47 | 1.03 |
| Knowledge Storage/Retrieval Technologies | Form already implemented to on developing | 44 | 2.85 | .74 |
| | From considering to not yet considering | 50 | 3.65 | .63 |
| Knowledge Transfer Technologies | Form already implemented to on developing | 44 | 2.88 | .74 |
| | From considering to not yet considering | 50 | 3.61 | .76 |
| Knowledge Application Technologies | Form already implemented to on developing | 44 | 2.69 | 1.00 |
| | From considering to not yet considering | 50 | 3.85 | .91 |
| Knowledge Platform Technologies | Form already implemented to on developing | 44 | 3.72 | .80 |
| | From considering to not yet considering | 50 | 4.15 | .61 |

**Table 10: Independent samples test (KM condition on KMS implementation)**

| | t-test for Equality of Means | | |
|---|---|---|---|
| Type of KM Technologies | t | Sig. (2-tailed) | Mean Difference |
| Knowledge Creation Technologies | -3.77 | .000 | -.78 |
| Knowledge Storage/Retrieval Technologies | -5.57 | .000 | -.80 |
| Knowledge Transfer Technologies | -4.65 | .000 | -.72 |
| Knowledge Application Technologies | -5.81 | .000 | -1.15 |
| Knowledge Platform Technologies | -2.88 | .005 | -.43 |

4.3 Correlation

The correlations between KM technologies and organizational culture are presented in Table 11. From the table we found both knowledge storage/retrieval and platform technologies are positively correlated with rational, group and development cultures in a low but significant level.

**Table 11: Correlations between KMS implementation and organizational cultures**

| Organization culture types / Type of KM Technologies | | Rational Culture | Group Culture | Development Culture | Hierarchical Culture | Ethical Culture |
|---|---|---|---|---|---|---|
| Knowledge Creation | Pearson Correlation | .192 | .178 | .113 | .111 | .152 |
| | Sig. (2-tailed) | .061 | .082 | .274 | .281 | .138 |
| Knowledge Storage / Retrieval | Pearson Correlation | **.209(*)** | **.210(*)** | **.247(*)** | .126 | .091 |
| | Sig. (2-tailed) | .040 | .039 | .015 | .217 | .376 |
| Knowledge Transfer | Pearson Correlation | .112 | .037 | .163 | .057 | .107 |
| | Sig. (2-tailed) | .276 | .717 | .110 | .581 | .298 |
| Knowledge Application | Pearson Correlation | .134 | .045 | .152 | .152 | -.004 |
| | Sig. (2-tailed) | .190 | .664 | .136 | .137 | .965 |
| Knowledge Platform | Pearson Correlation | **.295(**)** | **.230(*)** | **.271(**)** | .185 | .151 |
| | Sig. (2-tailed) | .003 | .023 | .007 | .070 | .140 |

** is significant at the 0.01 level(2-tailed)
* is significant at the 0.05 level (2-tailed)

# 5. Conclusion

From the results we can tell that the currently KM is just on developing. Only 17.5% companies claim that they have implemented KM in their organizations. And from the in used KMS technologies (see Table 12), we can find currently KMS technologies are those mature and long history technologies. In other words, companies use their own existing technologies to support KM activities. The adoption of new or advanced KM technologies is quite

few.

**Table 12: KMS technologies that are currently in used**

| Knowledge create technologies | Mean |
|---|---|
| e-Learning | 2.77 |
| Search engine | 3.39 |
| Knowledge storage /retrieval technologies | Mean |
| Newsgroup | 2.84 |
| Knowledge base | 2.78 |
| Database | **4.18** |
| Data Warehousing | 3.00 |
| Document Management | 3.51 |
| Knowledge transfer technologies | Mean |
| Newsgroup | 2.66 |
| Frequent Asked Questions | 2.81 |
| Video conferencing | 2.78 |
| Email | **4.74** |
| Knowledge application technologies | Mean |
| Workflow system | 3.28 |
| Enterprise Information Portal | 3.35 |
| Knowledge platform | Mean |
| Groupware | 2.47 |
| Internet | **4.67** |
| Intranet | **4.60** |

As shown in table 11 above, we found that both knowledge storage/retrieval and platform technologies are positively correlated with rational, group and development cultures in a low but significant level. It could be explained that information technology has been evolved from data management, information management, and now knowledge management. And such result may be due to that the adoption of KM systems is just in its early stages, i.e., data and information management. The use of information technologies is still in the data and information management level. In terms of percentage, there is few companies already adopted advanced KMtechnologies (basic KM technologies are like Internet, Intranet, and email) and the majority of corporations just started to recognize the value and importance of KM. There is a huge gap between getting aware of KM and formally adoption of KM systems. Basic KM technologies are more likely correlated with organizational culture since they are already there and ready to be used as tools to implement KM. For instance, platform and knowledge storage/retrieval technologies such as Intranet and database systems, they are already widely adopted and used in current corporations and still plays an important role as we move on to the era of KM.

According to the result we found rational, group and development cultures have positive correlations with knowledge storage/retrieval and platform technologies, but the hierarchical culture doesn't have any significant positive correlation with KM technologies. This could be explained as KM success cannot just rely on following the instructions, it may also need some factors like enthusiasm or voluntarily.

Lastly, the ethical culture does not show any significant correlation with KM technologies. It may due to that the trust among employees does not automatically translate into the willingness to adopt KM technologies.

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