An Investigation of Organizational Culture Factors That May Influence Knowledge Transfer

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Abstract

This research asked the following question: is there a correlation between types of organizational culture and factors influencing knowledge transfer? It hypothesized that organizations scoring high on the cultural factors of openness to change/innovation, and task-oriented organizational growth would tend to be fertile to knowledge transfer. Second, it hypothesized that organizations scoring high on the factors of bureaucratic and competition/confrontation would tend to be infertile to knowledge transfer.

The research looked at Air Force squadrons, surveying members of 22 squadrons with a 62-item, 5-point Likert-type instrument. The research concluded that there appears to be a correlation between organizational culture and factors influencing the transfer of knowledge that warrants further investigation.

1. Background

With the realization of the importance of knowledge and learning, organizations have begun looking at how to increase organizational knowledge to gain a strategic advantage [4,8,20]. Much interest has centered on knowledge creation [25]. However, recent interest has increased in exploring knowledge transfer, because it provides a lower-cost alternative to the creation and codification of new knowledge. One practitioner put it this way; "We used to say knowledge is power. Now we say sharing is power" [22]. Increased sharing of knowledge might create the benefits of increased organizational knowledge without having to expend the energy or cost associated with creating, codifying, or capturing more knowledge.

Increasing the amount of knowledge transferred within an organization has the potential to save an organization's money while positioning it better to face future challenges; however, organizational culture is a strong force—one that may hinder the implementation of knowledge management in an organization. Specifically, organizational culture may affect an organization's ability to transfer knowledge because that culture may encourage individuals either to resist searching out and receiving knowledge or to resist efforts to move knowledge out of their heads. To the extent that this is true, it would be helpful to know what organizational cultures are more likely to be supportive of knowledge transfer. To explore this issue, this study asks the following research question.

2. Research Question

Is there a correlation between types of organizational culture and factors influencing knowledge transfer?

3. Review of the Literature

3.1 Knowledge

The question, "what is knowledge," is not new. In the realm of philosophy, the study of knowledge has its own name, epistemology. In epistemology, the traditionally accepted definition, attributed to Socrates and Plato, is that knowledge is a "justified true belief" [29]. This definition, though it enjoys wide distribution, does not enjoy wide acceptance [20].

According to much current literature, knowledge is not information, nor is it data, but it is comprised of them both [8,30,32]. Data is commonly defined as facts at the atomic level, devoid of both structure and context, or stripped of previously existing structure and context [32]. Information is commonly defined as data endowed with meaningful structures. Knowledge, on the other hand, is information endowed with context. Therefore, knowledge, while being comprised of data or information, is something more. Additionally, many definitions of knowledge add that it must be in the mind of a human [8,23]. In other words, whereas a computer can store and transmit both data and information, only a human can store and transmit knowledge.

Another view of knowledge sees it as either explicit or tacit. First described by Michael Polanyi [23,24], explicit knowledge is knowledge that can be explained, whereas tacit knowledge cannot be explained. Both Polanyi and more recently, Ikujiro Nonaka and Hirotaka Takeuchi [20] point out that knowledge may be either explicit or tacit or a combination of the two. Further, knowledge may become either more tacit or more explicit as an individual learns or is better able to articulate what is in his or her head [24,20].

Finally, it is useful to understand the personal nature of knowledge. In fact, Polanyi [24] described all knowledge as inherently personal. The way he described it, all knowledge has a tacit component when it resides in the mind of a person. Therefore, he argued, when transferring this knowledge from one person to another, the knowledge changes in the sense that the other individual must interpret the knowledge in the context of his or her own person. Nonaka and Takeuchi [20], using this same framework, argue that the traditional philosophical definition of knowledge as a justified true belief becomes irrelevant in practice because knowledge means different things to different people. They argue for a revised definition, "Knowledge [is] a dynamic human process of justifying personal belief toward the 'truth'" [20].

3.2 Knowledge Management

Davenport and Prusak [8] suggest that there are three main components of knowledge management: knowledge generation, knowledge codification and coordination, and knowledge transfer. While knowledge transfer is just one of three aspects of knowledge management, it is a very important one, because the wider use of information already inside the organization can be a highly profitable use of resources [1]. One of the phenomena related to knowledge is that, "unlike material assets, which decrease as they are used, knowledge assets increase with use: ideas breed new ideas, and shared knowledge stays with the giver while it enriches the receiver[8]. Knowledge transfer, then, is a corollary to knowledge creation. Once knowledge is created, it acts as an economy of scale as it is shared—both because more than one individual can use knowledge at the same time, and because shared knowledge stimulates the creation of new knowledge. Further, knowledge transfer appears to reduce overall organizational costs by preventing a second group of individuals from repeating the mistakes of a first group of individuals [12]. In fact, it appears that increased knowledge transfer contributes to overall organizational success [3]. For these reasons, it appears that knowledge transfer is every bit as important as knowledge generation—perhaps even more so if one considers overall organizational costs.

3.3 Factors Affecting Knowledge Transfer

Four factors were found that appear to influence knowledge transfer. They include: relational channels [26], partner similarity [2,6], organizational self-knowledge [26], and divergence of interests [1,14,9].

The quality of the knowledge to be transferred (tacit versus explicit) affects knowledge transfer [20]. Specifically, the more tacit the knowledge is, the more difficult it will be to transfer that knowledge. However, if all knowledge has a tacit component, as Polanyi argues it does, then some form of relational channel, defined broadly as two-way human-to-human contact, is necessary to transfer knowledge effectively.

An organization with many relational channels for transferring knowledge might expect more knowledge to be transferred than one that has few. Relational channels provide the human-to-human connection necessary to support the transfer of tacit knowledge. In this case, it is likely that more relational channels represent more and varied sources of shared information. For this reason, an organization that fosters many relational channels for transferring knowledge might be considered a knowledge transfer fertile organization.

One might imagine that, much like the tacit-explicit continuum, the complexity of the knowledge to be transferred influences its transfer. In fact, it is more likely that the similarity of individuals attempting the transfer will influence the transfer [2]. A recent study showed partner similarity to be a strong predictor of knowledge transfer between organizations—especially strategic similarity [6].

An organization with many similar partners might expect more knowledge to be transferred than one that has few similar partners, because it reduces the complexity of achieving understanding of complex concepts. In an organization in which all members

have similar backgrounds, education levels, and experiences, it is likely they will have the same understanding of a mission and share a strategic similarity [6]. Strategic similarity among all members of an organization is likely to reduce barriers to sharing and therefore increase knowledge transfer. For these reasons, an organization encouraging membership by many similar (strategically aligned) partners might be considered a knowledge transfer fertile organization.

The concept of organizational self-knowledge refers to the degree to which individuals have knowledge of what they, as individuals, know, and likewise for those individuals surrounding them. It is a key prerequisite to knowledge transfer because without this self-knowledge, the knowledge sender and receiver will most likely never meet to make a transfer [26].

An organization whose members have organizational self-knowledge might expect more knowledge to be transferred than one whose members have little organizational self-knowledge. Their shared understanding of what each knows, and what the others knows, facilitates the connections necessary for knowledge transfer. For this reason, an organization that encourages members to maintain or increase their organizational self-knowledge might be considered a knowledge transfer fertile organization.

It seems clear that any breakdown on the part of the sender or receiver of the knowledge to be transferred with respect to the will to transfer the knowledge will preclude the occurrence of a knowledge transfer. It has been established that individual interests and organizational interests tend to diverge [1,9,14]. Based on this line of reasoning, it may be that divergence of interests will tend to inhibit knowledge transfer.

An organization whose members' interests diverge can expect less knowledge to be transferred than one whose members have converging interests. A divergence of interests seems to increase the likelihood of self-serving behavior at the expense of overall organizational performance—because individuals either do not understand how organizational performance benefits them personally, or do not care. For these reasons, an organization that does not encourage members to recognize and compensate for the costs of transferring knowledge might be considered a knowledge-transfer infertile organization.

3.4 Organizational Culture

From an organizational perspective, the collective values and beliefs of the individual members of that organization represent a phenomenon called, "organizational culture". It constitutes a pattern of basic assumptions held by the people in the organization that it uses to address its problems of adaptation and integration [27]. Xenikou and Furnham, [35] identified a number of factors related to organizational culture. Four of these factors can be seen as a type of organizational culture. Following is a discussion of these factors.

Openness to change/innovation culture types group the following concepts together: humanistic orientation, affiliation, achievement, self-actualization, task support, task innovation, and hands-on management (further defined as: managers should not just plan, but participate) [35]. An organization scoring high on this factor might be considered "friendly," and "open to change."

Task-oriented organizational culture types group the following concepts together: being the best, innovation, attention to detail, quality orientation, profit orientation, and shared philosophy [35]. The authors compare this to the "Kaisen" philosophy espoused by successful Japanese companies that stress cautious, incremental improvement. An organization scoring high in this factor might be considered "task-oriented" versus "people-oriented."

Bureaucratic organizational culture types group the following concepts together: approval, conventionality, dependence, avoidance, and [lack of] personal freedom [35]. The authors describe this culture as formal, with centralized decision-making. An organization scoring high on this factor might be considered "conservative" or "prudent"

Competition/Confrontation organizational culture types group the following concepts together: oppositional orientation, power, competition, and perfectionism [35]. The authors describe this culture as one where perfection is the goal, and where individuals might tend to react negatively towards the ideas of others and/or resist new ideas. An organization scoring high on this factor might be considered a "perfectionist" organization. Put negatively, one might call this organization a "dog-eat-dog" organization.

Having explored organizational culture, we now may ask what specific types of organizational culture might be identified as "fertile" or "infertile" with respect to knowledge transfer. It is to this task that we now turn.

3.5 Factors Affecting Knowledge Transfer and the Fertility of Organizational Culture

Based on the factors affecting knowledge transfer, and the types of organizational culture discussed above, we can hypothesize the fertility to knowledge transfer of each of the organizational culture types. In the following paragraphs we will examine each of the four types of organizational culture for its likelihood of supporting each of the

identified factors that affect knowledge transfer. This will lead to our hypotheses for this study.

An organizational culture that is open to change, innovation, and achievement appears to be one in which there are likely to be more relational channels, because it is likely to support and nurture the human-to-human communications that comprise the relational channels. It is also likely to exhibit partner similarity, leading to reduced friction in the transfer of knowledge. Such an organization is also likely to exhibit organizational self-knowledge, which will support the seeking out and identification of those with knowledge to share. Finally, such an organization is likely to have low divergence of interests, as the openness and communication is likely to foster the type of communication that leads to shared understanding and therefore shared goals. Such an organizational culture is likely to be fertile to knowledge transfer.

An organizational culture that is interested in being the best and being innovative appears to be one which would be likely to support open relational channels, as a way to achieve its goals of excellence and innovation. Because of this, it is also likely to have partner similarity in the important area of common goals and interests. Such an organization is likely to promote organizational self-knowledge as a means to ensuring broad understanding of the ways to achieve organizational goals of excellence and innovation. In the broad areas of organizational goals, it is likely to have low divergence of interests, because such divergence would likely work against the achievement of organizational goals. An organizational culture that is task-oriented in this way might be considered a knowledge-transfer fertile organizational culture.

An organizational culture that is bureaucratic appears to be one in which relational channels are not well developed. The desire for conventionality and avoidance of originality will work against the establishment of such channels. It may also exhibit little partner similarity, particularly in the important areas of tacit knowledge development. Such development would work against the organizational culture of conformity and lack of personal point of view. Because the focus would be on conventionality and following of rules, there would likely be little support for development of organizational self knowledge. Finally, there would likely be wider divergence of interests, because personal interests would not play a major role in organizational operations. Therefore, personal interests would be less important, and there would be less reason to ensure commonality. Therefore, such an organization is likely to be relatively infertile to knowledge transfer.

An organizational culture that is marked by competition and confrontation appears to be one in which relational channels will be limited and guarded, to protect the individuals in the organization from the negative effects of competition and perfectionism. Partner similarity and organizational self-knowledge are also likely to be low for the same reason. Because of the need to guard against the confrontational approach of such and organization, there will be less development of the type of communication that develops partner similarity and organizational self-knowledge. In such an organizational culture, divergence of interests is likely to be high, as each member of the organization seeks to achieve personal goals within a competitive, perfectionist organization. Therefore, such an organizational culture is likely to be relatively infertile to knowledge transfer.

4. Hypotheses

From the discussion of factors affecting knowledge transfer, and types of organizational culture, we can create the following hypotheses.

H1: Organizations exhibiting an "openness to change/innovation" organizational culture will have:
    (a) more relational channels
    (b) higher partner similarity
    (c) more organizational self-knowledge
    (d) less divergence of interests than those not exhibiting an "openness to change/innovation" organizational culture.

H2: Organizations exhibiting a "task-oriented organizational growth" organizational culture will have:
    (a) more relational channels
    (b) higher partner similarity
    (c) more organizational self-knowledge
    (d) less divergence of interests than those not exhibiting a "task-oriented organizational growth" organizational culture.

H3: Organizations exhibiting a "bureaucratic" organizational culture will have:
    (a) fewer relational channels
    (b) lower partner similarity
    (c) less organizational self-knowledge
    (d) more divergence of interests than those not exhibiting a "bureaucratic" organizational culture.

H4: Organizations exhibiting a "competition/confrontation" organizational culture will have:
    (a) fewer relational channels

(b) lower partner similarity
(c) less organizational self-knowledge

(d) more divergence of interests than those not exhibiting a "competition/confrontation" organizational culture.

Table 1: Hypothesized Correlations between Operationalized Variables

	Relational Channels	Partner Similarity	Organizational Self-Knowledge	Divergence of Interests
Openness to Change/Innovation Task-Oriented	+	+	+	-
Organizational Growth Bureaucratic	+	+	+	-
	-	-	-	+
Competition/ Confrontation				
	-	-	-	+

5. Research Design

A cross-sectional survey design was selected to measure the correlation between the four types of organizational culture of interest in this research versus the factors that may influence the transfer of knowledge. The instrument was developed using a mixture of validated research questions and questions developed based on current research. The instrument was partially validated using both a pretest and a pilot study.

5.1 Population and sample

Recent research in the Air Force showed that the boundaries of organizational cultures are likely to coincide with the boundaries of squadrons—where individuals are likely to be similar, and missions are likely to be focused towards the same goals [28]. For this reason, the population of interest was defined as the 3,881 active duty Air Force squadrons. From this number, 50 squadrons were randomly selected for the study.

5.2 Survey Development

None of the four instruments listed by Xenikou and Furnham were available for use in this research [35]. For this reason, a previously validated instrument was sought with similar domains measured. The FOCUS questionnaire [33] captured two of the four types of organizational culture, Openness to Change/Innovation, and Task-Oriented Organizational Growth. To capture the other two types of organizational culture, Bureaucratic and Competition/Confrontation, questions were devised using the FOCUS questionnaire as a start, with heavy emphasis on the descriptions of those factors identified

in Xenikou and Furnham's research [35]. Finally, a third source of questions was consulted to assist in phrasing of specific questions to capture items not covered by the FOCUS questionnaire [13], though none of the questions were used verbatim.

To capture the four indicators of knowledge transfer, we used the descriptions of the indicators given in the literature. Questions on Relational Channels were based on Morey and Frangioso [19] and Rulke, Zaheer, and Anderson, [26]. Questions focused on Partner Similarity were based on the research of Almeida and Kogut, [2], and Darr and Kurtzberg, [6]. Questions focused on Organizational Self-Knowledge were based on Rulke, Zaheer, and Anderson [26]. Finally, questions focused on Divergence of Interests were based on Alchian and Demsetz [1,9,14,]

The initial survey consisted of 90 items using a 5-point Likert-type scale. The 5-point scale was chosen to keep the survey consistent with the FOCUS questionnaire, which used a 5-point Likert-type scale. The 90 items were randomly ordered to reduce any interaction between similar questions—reducing the ability of the respondent to guess the expected answers based on previous ones.

The survey was implemented using a web-based electronic format. Every response was input directly into a database that automatically inverted the responses to the negatively scored questions. Permission to conduct the survey was requested and received from the Air Force Personnel Center Surveys Branch.

Ten students enrolled in the Air Force Institute of Technology's Information Resources program pre-tested the survey. The pre-test was used to provide information about how long the survey took to complete, confusing or misplaced items, as well as misspellings and format errors.   Their input was

incorporated into the survey before conducting the pilot study.

A pilot study was conducted using one squadron before the survey was administered to the entire sample. The pilot test again identified any confusing or misplaced items, as well as misspellings and format errors, but also tested the reliability of each question as it measured the construct of interest. The goal was to achieve at least a .80 reliability coefficient for each construct, a common standard for academic research [31]. Reliability for all constructs except Bureaucratic (.6172) and Competition/Confrontation (.7179) were brought above .80 by eliminating 28 questions from the survey. Factor analysis indicated there were some problems with construct overlap—but these results could be partially explained if there were, indeed, high correlations between the constructs. After appropriate changes were made based on the results of the pre-test and pilot test, the survey was administered via email to the members of the selected squadrons.

6. Results

Results from 23 squadrons reached the threshold confidence level of .88. The survey data from these squadrons were analyzed using the squadron as the unit of analysis. Squadron mean scores were calculated for each of the 23 squadrons included for each of the eight constructs. The 23 squadrons included in this analysis, representing 1116 responses, were those that met or exceeded an 88 percent level of confidence. Table 2, below, contains the results of the survey.

and two (Task-Oriented Organizational Growth) were strongly positively supported for relational channels and Organizational Self Knowledge, and, negatively, for Divergence of Interests, as hypothesized. Hypothesis two was supported for Partner Similarity, though hypothesis one was not. Hypothesis three (Bureaucratic) was not supported for any of the factors. Hypothesis four (Competition/Confrontation) was

supported negatively for relational channels and positively for Divergence of Interests, but not for Partner similarity. While organizational Self Knowledge, with P=.053 was not supported at alpha=.05, the result was close enough to suggest that further exploration of this relationship is recommended.

7. Discussion

Upon completing the research, the answer to the research question, "is there a correlation between types of organizational culture and factors influencing knowledge transfer," appears to be yes, there is a correlation between some types of organizational Hypothesis one (openness to Change/Innovation) culture and some factors influencing knowledge transfer.

According to Kachigan [15], when it exists between two constructs, correlation provides the following three pieces of information. First, correlation serves a descriptive function, showing how things appear to be in reality. Second, correlation serves a predictive function, possibly allowing the measurement of a surrogate construct to predict an unknown second, but correlated, construct. Third, it provides the capability to examine how much of the variance of one variable accounts for variance in a second, correlated variable. One item he further notes, in caution, is that correlation, "does not imply causality" [15].

Having established a correlational relationship between types of organizational culture and factors influencing knowledge transfer, this research suggests a research direction for academics interested in the interaction between organizational culture and other variables. It also lays the groundwork for practitioners interested in possible ways to increase knowledge transfer in their organizations. Because the constructs of organizational culture and knowledge transfer appear to be correlated, the practitioner can attempt to

Table 2: Correlation of Organizational Culture to Factors Affecting Knowledge Transfer

N = 23 Squadrons with 1116 total responses				
	Relational Channels	Partner Similarity	Organizational Self-Knowledge	Divergence of Interests
Openness to Change/Innovation	R .942 P-value .000 (Expected +)	R .101 P-value .647 (Expected +)	R .803 P-value .000 (Expected +)	R -.934 P-value .000 (Expected -)
Task-Oriented Organizational Growth	R .895 P-value .000 (Expected +)	R .495 P-value .016 (Expected +)	R .954 P-value .000 (Expected +)	R -.942 P-value .000 (Expected -)
Bureaucratic	R -.171 P-value .436	R .030 P-value .893	R .006 P-value .980	R .075 P-value .734

	(Expected -)	(Expected -)	(Expected -)	(Expected +)
Competition/ Confrontation	R -.626 P-value .001 (Expected -)	R .269 P-value .215 (Expected -)	R -.409 P-value .053 (Expected -)	R .645 P-value .001 (Expected +)

measure one of the two constructs, and then make educated inferences about the state of the other construct in his or her organization. This can reduce the time and cost burden of measuring constructs of interest when considering implementing knowledge management projects.

This research appears to lend support to some practitioners' caution that, "Organizational learning is a long-term activity that will build competitive advantage over time and requires sustained management attention, commitment, and effort" [11]. Put another way, if a relationship exists between organizational culture and knowledge transfer, there may not be any "quick fixes" to an organization that does not have a culture fertile to knowledge transfer. Even if there is no direct causal relationship between knowledge transfer and organizational culture, one might argue a management change effort directed at changing an organization's culture is a good place to start—with potential trickle-down benefits in the area of knowledge transfer. Until such a causal relationship is proven, one might argue this is still the best place to start.

However, organizational culture is sometimes unwieldy to manage, and is therefore "frequently overlooked or misunderstood" [34]. Considering the long-term consequences of failing to properly manage an organizational culture, it is probably advisable to try; however, any attempt to manage organizational culture must begin with full management commitment to take the time and put forth the effort to understand it. Young advises, "The issue for senior management, then, is not choosing the 'correct' basic assumptions, but identifying those that will promote the most successful organizational performance" [36].

8. Conclusions

This research indicates a correlation exists between some types of organizational culture and some factors influencing knowledge transfer. Openness to change/innovation appears to relate positively to relational channels, and organizational self-knowledge and negatively to divergence of interests. Task-oriented organizational growth appears to relate positively to relational channels, organizational self-knowledge, and negatively to divergence of interest. Bureaucratic does not show a significant relationship to any of the four factors that may influence knowledge transfer. Finally, competition/confrontation

demonstrated a negative relationship to relational channels, and possibly organizational self-knowledge, and a positive relationship to divergence of interest.

In one sense, this research appears to confirm what both academics and practitioners alike have stated about the importance of considering organizational culture when implementing knowledge management projects. In another sense, the research asks new questions, such as, "If organizational culture and knowledge transfer are correlated, what can a manager do to make sure organizational culture is taken into account when proposing a knowledge management project?" Indeed, the answer to this question might prove as important to the academic as to the practitioner

9. Limitations of the Study

One limitation of correlational research is that it cannot prove causation. In this case, though there appears to be a correlation between organizational culture types and indicators of knowledge transfer, one can only guess if one of the constructs actually causes the other. It is also possible that a third construct or group of constructs causes both of the constructs to act the way they do.

Another limitation of the research performed is that even though a correlation is shown between organizational culture types and indicators of knowledge transfer, there is no empirical evidence to show that the indicators of knowledge transfer actually predict any significant level of transfer of knowledge. Only further confirmatory research can hope to show this essential link between theory and reality.

Another limitation to the research performed is the inherent problem with attempting to measure the constructs of organizational culture and knowledge transfer through a cross-sectional, self-report survey instrument. Previous culture research has shown anecdotal information suggesting a high correlation between culture scores and employee disenfranchisement [16]. In other words, the entire construct of culture is continually confounded in measurement by employee satisfaction. Again, only further confirmatory research separating culture from satisfaction can hope to show this essential link between theory and reality.

10. Future Research

This research suggests several areas for further research. First, a subsequent study might study the behavior of the two constructs of organizational culture and knowledge transfer in a longitudinal study, to establish a precedent for how to interpret the correlation shown in this research with respect to an actual organization. Second, a subsequent study might explore the two constructs of organizational culture and knowledge transfer in a qualitative study, to confirm the link hypothesized in this research between the constructs measured and the actual constructs of interest. Such a study might also revisit the constructs of Bureaucratic and Competition/Confrontation to establish a stronger sense of their correlations to knowledge transfer, as well as searching for a proper relationship between organizational culture and the construct of Partner Similarity.

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