The Interaction Between Organizational Culture and Knowledge Sharing via Socialization in a Technology Company

Completed Research

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Abstract

This research examined the interaction between organizational culture (OC) and knowledge sharing (KS) in detail. The findings of recent studies on the topic have been inconsistent. By focusing on socialization adopted from the organizational knowledge creation theory and itemizing KS into knowledge contributing and knowledge seeking, new findings were discovered. A multi-method case study was conducted within a Fortune 15 technology company. Data were collected through company records for the year of 2017, 82 surveys, 23 observations, and 23 interviews. The data were analyzed through multivariate analysis of variance (MANOVA), descriptive statistics, qualitative analysis, and triangulation. A statistically significant interaction between OC and KS via socialization was discovered. Moreover, distinct from previous studies, competitive OC was positively related to knowledge contributing with knowledge seeking as a potential moderating variable, but negatively related to knowledge seeking when mixed with bureaucratic OC, and positively related to KS when mixed with clan OC.

Knowledge Management, Knowledge Sharing, Organizational Knowledge Creation Theory, Organizational Culture, Competing Values Framework

Introduction

Knowledge management (KM) has been recognized as an integral subset of information systems (IS), and knowledge sharing (KS) has been identified as one of the most vital components of KM. Research findings regarding the interaction between organizational culture (OC) and KS have been contradictory in recent literature. For example, there were incongruent results for competitive and bureaucratic culture impacts on KS (Wiewiora, Trigunarsyah, Murphy, and Coffey 2013; Suppiah and Sandhu 2011; Cavaliere and Lombardi 2015). The incongruencies may have been due to the limitations of the research studies. The contradicting results posed a research problem to examine the interaction between OC and KS in detail to extend the current literature findings, and to help organizations in making prudent decisions regarding OC and KS.

Literature Review

Knowledge Sharing

KS includes two or more parties who act as knowledge transporters and knowledge requestors, hence KS is considered as not only the contributing of knowledge but also the seeking of knowledge (Wu and Haasis 2013). Certain researchers have examined KS without differentiating between knowledge seeking and knowledge contributing, while others have identified the two variables (Cleveland and Ellis 2015). It is recommended to differentiate between the two variables, because dissimilar results have been showcased for knowledge seeking, and knowledge contributing, on various IS variables, such as symbolic action in social-media enabled electronic networks (Beck, Pahlke, and Seebach 2014). OC types also showcased distinct impacts on knowledge seeking and contributing (Cavaliere and Lombardi 2015).
In addition to operationalizing KS into seeking and contributing, one of the most dominant KM theories in IS literature is the organizational knowledge creation theory (Nonaka and Konno 1998), which has been recognized by multiple researchers (Lievre and Tang 2015; Scheibe and Gupta 2017). The organizational knowledge creation theory is based on socialization, externalization, combination, and internalization, referred to as the SECI model. Socialization refers to tacit to tacit knowledge conversion and externalization refers to tacit to explicit knowledge conversion. While combination refers to explicit to explicit knowledge conversion, and internalization refers to explicit to tacit knowledge conversion. KS research should specify from which SECI lens is the investigation being conducted from, because IS research has shown distinct results between the impacts of tacit, and explicit KS on various variables; such as organizations' performance and team innovation (Wang, Wang, and Liang 2014; Hu and Randel 2014).

Furthermore, tacit knowledge is regarded as a major part of knowledge. Per the knowledge ice berg theory, tacit knowledge is the bulk of the knowledge iceberg, while explicit knowledge is only the tip of the iceberg (Nonaka and Takeuchi 1995). For example, it was reported that “90 percent of knowledge in an organization is embedded in people’s heads” (Smith 2001, p. 311). Therefore, although tacit knowledge is more difficult to capture than information, IS and KM researchers should focus on tacit knowledge due to its richness in context and value (Wang, Wang, and Liang 2014; Hu and Randel 2014; Cavaliere and Lombardi 2015).

Organizational Culture

Based on the organizational culture theory, culture is itemized into three layers: (1) Basic assumptions, (2) espoused values, and (3) artifacts (Schein 2010). The competing value framework (CVF), suggests four culture types that are paradoxical to each other within a four-quadrant chart (Cameron and Quinn 2011). The four-quadrant graph has flexibility opposite of stability on the Y axis, and external focus opposite of internal focus on the X axis. Each cultural type in the CVF model falls within a quadrant and is identified with its own characteristics. Clan or developmental culture falls on the top left quadrant of the chart, which represents high flexibility, discretion, internal focus, and integration, characterized by strong personal relationships between employees, mentoring, and a family-like atmosphere. Adhocracy or innovative culture falls on the top-right quadrant, which represents high flexibility, discretion, external focus, and differentiation, characterized by risk-taking and entrepreneurship. Hierarchal or bureaucratic culture falls on the bottom-left quadrant which represents high stability, external focus, and differentiation, characterized by structure, control, and efficiency. Market or competitive culture falls on the bottom-right quadrant, which represents high internal focus, integration, stability, and control, characterized by results orientation, competition, and achievement (Cameron and Quinn 2011).

Research Problem

Research studies have been conducted to examine the relationship between OC and KS, however the results have been inconsistent. For example, it was showcased that perceived competitive culture was negatively related to KS, but insight was not provided for knowledge seeking nor knowledge contributing (Wiewiora et al. 2013). Then it was hypothesized that there was a negative relationship between competitive OC and knowledge contributing, and a positive relationship between competitive OC and knowledge seeking, but empirical results did not support the following hypotheses (Cavaliere and Lombardi 2015). Therefore, due to the contradicting results, there was lack of understanding of the interaction between OC and KS. Moreover, an empirical study that examines the details of the interaction between OC and KS (knowledge seeking and knowledge contributing) through the lens of the organizational knowledge creation theory was not found.

Per the organizational knowledge creation theory, socialization is the starting point of knowledge conversion, concentrated on the most valuable type of knowledge (tacit). Hence it is vital to fully understand socialization before findings are concluded for the other four quadrants in SECI. Socialization is one of the most effective way to share tacit knowledge (Nonaka and Konno, 1998). Due to the importance of tacit knowledge, and socialization being the quadrant that focuses on tacit-to-tacit knowledge conversion, it is critical to shed light on the details of the interaction between OC, and knowledge seeking and knowledge contributing via socialization.
Methodology

A multi-methods study within an organization consisting of 189 knowledge workers within a Fortune 15 technology company was undertaken to examine the interaction between OC and KS via socialization. Two research questions were investigated: (1) What is the interaction between OC and knowledge seeking via socialization, and (2) What is the interaction between OC and knowledge contributing via socialization. Figure 1 showcases the theoretical framework of this research.

Figure 1: Conceptual Framework (Integrating OC via CVF, Knowledge Ice Berg Theory, and KS via Socialization from the Organizational Knowledge Creation Theory (SECI).

Data were collected from company records of an IT application used for KS for the calendar year of 2017, alongside 82 surveys, 23 observations, and 23 interviews. Multiple data sources were necessary to shed light on the abstract variables (OC and KS via socialization). For OC, the survey instrument used to measure OC was the OCAI (Organizational Culture Assessment Instrument) by Cameron and Quinn (2011), after permission was granted by the copyright holder. The survey was supplemented with interview questions, and data collected from company records. For KS via socialization, survey and interview instruments were developed through the Delphi Technique, supplemented with observations, and company records.

To establish validity, the survey and interview instruments were evaluated by a panel of seven IS experts through the Delphi process (Skulmoski, Hartman, and Krahn 2007). Each of the seven experts that participated in the panel had a Ph.D. in IS and worked in various roles ranging from Chief Information Officer to Project Manager.

After the instruments were validated and deemed reliable, total of 146 surveys were issued. A minimum sample size of 75 is recommended for a population of 200 with a confidence level of 95%, and margin of error of 3% (Barlett, Kotrli, and Higgins 2001). In this research 82 usable responses were captured from a population of 189 which was sufficient to conduct the quantitative analysis. The response rate was 56%, which was also consistent with similar studies that showcased 42% response rate of 102 useable responses from 244 issued surveys (Rutten et al. 2016)

After data were collected, the survey results were analyzed via multivariate analysis of variance (MANOVA), which was used to examine the differences between the means for knowledge seeking and knowledge contributing via socialization for each culture type. There were several assumptions that had to be met before the MANOVA was conducted. After the assumptions were met, the MANOVA was conducted. The design of the MANOVA is displayed in Figure 2.
The data of the survey were also analyzed through descriptive statistics and visualization. The OCAI survey data were analyzed via radar plots to showcase the dominant culture type of the organization, and through bar charts to showcase the differences in the means between knowledge seeking and knowledge contributing. The company records data were analyzed using descriptive statistics by showcasing the means for each KS via socialization event. While the observation and interview data were analyzed qualitatively through content analysis, open coding, axial coding, and selective coding (Al Saife et al. 2016). The selective codes were analyzed using descriptive statistics as well. The results from each data point were compared against each other for validation and theme development. Then the quantitative and qualitative results were triangulated to reach the conclusions for this study.

Results

For the survey instrument, after two rounds with the Delphi team, the validation results displayed that every question met the requirements of having a mean of above five, and no individual score below three. For reliability of the survey instrument, Cronbach’s Alpha results also met the criteria of having an alpha between 0.7 and 0.9.

After collection of the survey data, the MANOVA was conducted to test the interaction between OC and KS via socialization. The first assumption for having categorical independent variables was met and the following codes were the final output for dominant OC types: (1) Competitive, coded as Comp; (2) Competitive-Clan, coded as Comp-Clan; (3) Competitive-Mixture, coded as Comp-Mix; (4) Competitive-Bureaucratic, coded as Comp-Bur; (5) Clan-Mixture, coded as Clan-Mix; (6) Clan-Competitive coded as Clan-Comp (7) Bureaucratic, coded as Bur, and (8) No Dominant OC, coded as No-D-C. Each code was used as a group for the independent variable (OC) in the MANOVA. The second assumption for independence of observations was also met as each group had different participants with no participant being in more than one group. The third assumption for adequate sample size was also met, because for OC, each group contained more than five cases, which was larger than the number of dependent variables. For the fourth assumption, the results for the maximum Mahalanobis distance was 22.585. The maximum Mahalanobis distance must be smaller than 13.82 due to the number of variables in this study (Dattalo 2013). Therefore, the data were sorted in descending order, and the outliers were removed to meet the assumption. For the fifth assumption, normality of each of the dependent variables for each of the groups of the independent variables was used to assess multivariate normality, in conjunction with frequency table analysis to visually inspect the normal distributions (Dattalo 2013). The Shapiro-Wilk test of normality must be higher than 0.05 to assume normality (Dattalo, 2013). The results of the Shapiro-Wilk test were higher than 0.05 for many of the items in each group and did not violate the assumption. However, for 10 items in the OC survey, the Shapiro-Wilk test results were smaller than 0.05, which violated the assumption of normality. The visual inspection of the frequency charts also showed that they were negatively skewed, which was a sign of a non-normal distribution. The data were transformed in order to normalize the variables that did not meet the Shapiro-Wilk standard and the normal distribution test (Templeton 2011). Then the frequency charts were inspected again after the transformation. The frequency charts after transformation showcased normal distribution, hence the assumption was met, and multivariate normality was not violated. Figure 3 showcases the frequency charts for knowledge seeking and knowledge contributing via socialization after transformation.
Organizational Culture and Knowledge Sharing via Socialization

Figure 3: MANOVA Assumption Testing: Frequency Charts for Knowledge Seeking and Knowledge Contributing via Socialization after Transformation for Normality.

The sixth assumption of linear relationship and the seventh assumption for multicollinearity were also not violated, as correlations between the dependent variables were between 0.2 and 0.9 (Dattalo 2013). Table 1 showcases the correlations between knowledge seeking and knowledge contributing via socialization. Likewise, the last assumption for homogeneity of variance-covariance matrices was also not violated as the Box’s M test of equality of covariance was 0.149, which is higher than 0.05. The results for the Box’s M test of equality of covariance are displayed in Table 2.

<table>
<thead>
<tr>
<th></th>
<th>K Seeking</th>
<th>K Contributing</th>
</tr>
</thead>
<tbody>
<tr>
<td>K Seeking</td>
<td>Pearson Correlation 1</td>
<td>.483**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N 78</td>
<td>78</td>
</tr>
<tr>
<td>K Contributing</td>
<td>Pearson Correlation .483**</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N 78</td>
<td>78</td>
</tr>
</tbody>
</table>

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

Table 1. MANOVA Assumption Testing: Correlation Table for Linear Relationship and Non-Multicollinearity Tests

<table>
<thead>
<tr>
<th>Box’s Test of Equality of Covariance Matrices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Box’s M</td>
</tr>
<tr>
<td>F</td>
</tr>
<tr>
<td>df1</td>
</tr>
<tr>
<td>df2</td>
</tr>
<tr>
<td>Sig.</td>
</tr>
</tbody>
</table>

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.
a Design: Intercept + OC

Table 2. MANOVA Assumption Testing: Box’s Test of Equality of Covariance Matrices

After the assumption testing was complete, the MANOVA was conducted and the results showed that perceived OC had a statistically significant interaction with KS via socialization based on the survey results and was responsible for 15% of the effect, Wilk’s Lambda = 0.526 (F = 1.593, p = 0.035, ηp² = 0.148). The results of the MANOVA are displayed in table 3.
Table 3: Results of MANOVA for OC and KS via Socialization

However, for knowledge contributing via socialization, Levene’s Test of Equality of Error Variances showed a significant value for the variable. Therefore, the in-between-subjects effect was not interpreted for knowledge contributing, as it violated the Levene test. However, for knowledge seeking, Levene’s test was not violated, hence the in-between-subjects effect was interpreted and showcased that there was not a statistically significant effect of OC on knowledge seeking via socialization based on the MANOVA (F = 1.088, p = 0.381). But based on the bar chart in Figure 4, there was a meaningful interaction between OC and knowledge seeking via socialization. As the graph shows, knowledge seeking via socialization was lowest when the employees perceived the culture as competitive-mixture and competitive-bureaucratic, but perceived competitive OC on its own had the second highest mean for knowledge seeking via socialization.

The results of the OCAI survey showcased that the organization’s dominant culture type was competitive. Figure 6 showcases a radar plot of the organization’s culture based on the survey results. Furthermore, the company records data also supported the findings for OC as the organization had a ranking system in place to encourage performance and competition. The organization also had a reward program for top performers that drove internal competition which further supported the survey findings.
The company records data for KS via socialization showcased that the mean for coaching sessions was the highest in the organization with a mean of 6.78 monthly coaching sessions per employee, followed by one-on-one meeting with a mean of 3.3, and group meetings with a mean of 2.71. While, training, mentoring, and shadow sessions had the lowest means, all under 0.36 monthly sessions per employee. Moreover, the observation data uncovered that the first three KS via socialization events identified in company records (coaching sessions, one-on-one meetings, and group meetings) were low in tacit knowledge with a mean of 10 minutes spent on tacit knowledge per one-hour session (16.66% of the time dedicated to tacit knowledge sharing). While training, mentoring, and job shadow sessions were on the higher end of tacit knowledge with a mean of 30 minutes of tacit knowledge sharing observed during a one-hour session (50% of time dedicated to tacit knowledge sharing). The observation data also showcased that there were more knowledge contributing behaviors than knowledge seeking behaviors, with about a 60% to 40% split. Table 4 showcases the data display for observation codes for KS via socialization.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Count of Codes</th>
<th>Percent of Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Contributing Via Socialization</td>
<td>25</td>
<td>62.5%</td>
</tr>
<tr>
<td>Knowledge Seeking Via Socialization</td>
<td>15</td>
<td>37.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Table 4: Data Display for Codes of Observation Analysis for KS via Socialization Between

The interview analysis showcased that employees who perceived the culture to be bureaucratic were less likely to seek knowledge via socialization, and would only contribute knowledge if another party seeks it from them. For example, one respondent was asked in what situation do you contribute knowledge? and they stated: “I don’t, only if a person asks, because I’m usually busy doing my job”. They also sought knowledge when it was their first time encountering an issue. For example, one respondent stated: “I ask when it is my first time encountering a problem for an issue that I have not seen before”. While employees who perceived the culture to be competitive showed comparable results for seeking, but for not for contributing. They were more likely to contribute when another person sought knowledge, and were likely to contribute and give advice for best practices when they noticed a person was struggling. For example,
one respondent who perceived the culture to be competitive stated: “If I see someone is struggling in an area, I offer my help and share what I would do in that situation to solve a similar problem”. For knowledge seeking, they were more likely to observe for best practice rather than ask. For example, one respondent replied: "I don’t ask per say, I just observe and pick up best practices". Employees who perceived the OC to be clan dominant were more likely seek knowledge by asking questions. For example, one respondent replied: “If I see someone doing great in an area, I ask them to see if they are doing something differently, and if I can pick up what they are doing I may improve my way”. While for knowledge contributing, they were more likely to contribute knowledge without being asked. For example, one respondent replied: “I always share what I know, every day if I can help someone, I’d go to them and share best practices, or idea, or brainstorm on new ways we can apply in our transactions”. There were limited findings regarding innovative OC as there were limited number of respondents who perceived the OC as innovative.

Distinct from previous studies, the triangulation showcased the following results: 1) Competitive OC was positively related to knowledge contributing when knowledge was sought (knowledge seeking as potential moderating variable), while negatively related to knowledge seeking via socialization if mixed with bureaucratic culture. Supported partially by the MANOVA, fully supported by descriptive statistics, interview analysis, observation analysis, and company records. 2) Bureaucratic OC was negatively related to KS via socialization (seeking and contributing), partially backed by the MANOVA, fully backed by the descriptive statistics, and interview results. The result was consistent with the findings of Suppiah and Sandhu (2011) but inconsistent with the finding of Cavaliere and Lombardi (2015). 3) Clan culture was positively related to KS via socialization (seeking and contributing) backed partially by the MANOVA, fully supported by descriptive statistics, and interview results. The finding regarding clan OC was consistent with previous studies (Cavaliere and Lombardi, 2015; Suppiah and Sandhu, 2011; Wiewiora et al. 2013).

Conclusion and Discussion

For organizations, it is recommended to carefully foster competitive culture, because although it may enhance knowledge contributing, it may negatively impact knowledge seeking, especially when mixed with bureaucratic culture. Therefore, if a company has a competitive dominant culture, mixing clan characteristics would be prudent to promote knowledge sharing. It is recommended to build clan or developmental culture rather than bureaucratic or hierarchal culture, as clan culture fosters overall KS via socialization, while bureaucratic culture hinders overall KS via socialization. Moreover, knowledge seeking was discovered to potentially moderate knowledge contributing, hence institutionalizing a knowledge seeking system would help to encourage knowledge seeking within a competitive organization, which would increase knowledge contributing, and enhance KS.

This study had limitations, one of which that the data were collected from one organization in the United States of America, and the organization was within a Fortune 15 technology company. Future research may examine the interaction between OC and KS by conducting research within multiple organizations and in different regions or industries. It was also limited to the CVF approach of measuring OC. Future research may measure OC from a unique perspective such as the toolkit theory perspective. A larger sample size may also produce more robust results for the multivariate test to shed light on the details of the interaction between OC and KS via socialization.

Future research that examines OC and KS should explicitly identify through which SECI lens the problem is being examined through. Socialization, externalization, internalization or internalization. Furthermore, knowledge seeking, and knowledge contributing should be itemized as each variable may produce different results. Examining KS without explicitly identifying its dimensions may lead to problematic results.

REFERENCES


