

The Relationship Between Organizational Culture Knowledge management and Innovation Performance in High-Tech Enterprises

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Abstract

Focusing on innovation performance in high-tech enterprises, analyzing the influencing factors, and modeling and verifying the two crucial factors of organizational culture and knowledge management among many factors affecting innovation performance, effective strategies and recommendations can be provided for enhancing technological innovation performance.

The objectives of this research were to study investigates the relationship between organizational culture, knowledge management, and innovation performance in high-tech enterprises based on the organizational culture model and two-dimensional knowledge management model within the dual S-cube framework.

The research method was a mixed method, including qualitative research and quantitative research. The sample was 620 people from population of this study includes national-level high-tech enterprise parks in China, This study used purposive sampling method, using the snowball method. Obtained by purposive sampling method. The instruments used for data collection was five-point rating scale questionnaires form. Statistics used for data analysis included frequency, percentage, mean, Standard Deviation, Confirmatory Factor Analysis, and Structural Equation Model was employed.

Research findings were: 1) This research explores the interplay between organizational culture, knowledge management practices, and innovation performance within high-tech enterprises. It investigates how organizational culture influences knowledge management processes and subsequently affects innovation outcomes. The study aims to provide insights into strategies that can enhance innovation performance through effective management of organizational culture and knowledge resources in high-tech settings. 2) The different organizational cultures of enterprises, their knowledge management methods have different ways and means of affecting the innovation performance of the organization. 3) According to the above empirical results, although the effect of chain mediation is significant, due to the greater direct effects of collective organizational culture on codified knowledge management and fragmented organizational culture on Inter personalization knowledge management, combining codification. The correlation coefficients from centralized knowledge management and Inter personalization knowledge management to knowledge socialization, knowledge internalization, knowledge combination, and knowledge internalization.

Keywords: Relationship; Organizational Culture; Knowledge management; Innovation Performance

Introduction

Despite China's rise to the 11th position in the 2022 WIPO Global Innovation Economy, its level of knowledge management still lags behind developed countries like the United States, Japan, and Singapore (Patra & Ghosh, 2022). A survey on the current state of knowledge management in Chinese enterprises reveals a low success rate due to cognitive deficiencies in various organizational aspects. Some researchers indicate that the failure rate of knowledge management projects may be as high as 50%, and the failure rate of enterprise knowledge management approaches close to 70%. The majority of knowledge management projects do not achieve their specified goals (De Bem Machado et al., 2022). According to a survey result from the "Knowledge Management Journal" in 2021, while 90% of organizations attach great importance to knowledge management, only 6% believe it is effective. Current statistical data indicates that the success rate of knowledge management projects in China is at most 15% (Dutta et al., 2022). A common and characteristic reason for knowledge management failure is the neglect of non-technical factors' significant potential role in knowledge management. Many organizations mistakenly believe that developing an advanced information system can achieve knowledge management goals. Consequently, they intensify the introduction of advanced technologies and equipment. However, the outcomes are not satisfactory because of the neglect of non-technical factors such as organizational culture, making it challenging for knowledge management to initiate and fulfill its intended role (Infatih, 2022). Based on this, the current study selects high-tech enterprises as the research focus. Through examining the relationship between organizational culture, knowledge management, knowledge innovation, and innovation performance, the aim is to provide practical insights for the growth of innovation performance in high-tech enterprises. Improving the innovation performance evaluation system for high-tech enterprises: Innovation performance of high-tech enterprises reflects their innovation capability, speed, and scale, affecting the increase in market competitiveness and the stable and healthy development of enterprises and regional economies. By focusing on innovation performance in high-tech enterprises, analyzing the influencing factors, and modeling and verifying the two crucial factors of organizational culture and knowledge management among many factors affecting innovation performance, effective strategies and recommendations can be provided for enhancing technological innovation performance in high-tech enterprises. This study investigates the relationship between organizational culture, knowledge management, and innovation performance in high-tech enterprises based on the organizational culture model and two-dimensional knowledge management model within the dual S-cube framework. How are relationship factors of organizational culture and knowledge management among many factors affecting innovation performance, effective strategies and recommendations can be provided for enhancing technological innovation performance in high-tech enterprises.

Research Objectives

This study investigates the relationship between organizational culture, knowledge management, and innovation performance in high-tech enterprises based on the organizational culture model and two-dimensional knowledge management model within the dual S-cube framework.

Research Methodology

1. Research methods

The research method was a mixed method, including qualitative research and quantitative research. The sample was 620 people from population of this study includes national-level high-tech enterprise parks in China, totaling parks. Due to research requirements and resource constraints, purposive sampling was employed in the selection process.

2. Population and sample

This study used purposive sampling method, using the snowball method, asking friends who know each other in the above-mentioned high-tech parks in Beijing, Shanghai, Shenzhen, Suzhou and Guangzhou and entrusting managers to randomly distribute questionnaires to the companies in the parks. Obtained by purposive sampling method.

Population

The population of this study includes national-level high-tech enterprise parks in China, totaling 220 parks (Ministry of Science and Technology of the People's Republic of China). Due to research requirements and resource constraints, purposive sampling was employed in the selection process. This study selected national-level high-tech enterprise parks in cities such as Beijing, Shanghai, Guangzhou, Shenzhen, and Suzhou for sampling. the target for effectively recovered questionnaire quantity was no less than 430. Based on the 70% sample recovery rate, that is, $430/70\%=614.28$

Samples, so the total sample size is about 620. Sampling method and procedures This study used purposive sampling method, using the snowball method, asking friends who know each other in the above-mentioned high-tech parks in Beijing, Shanghai, Shenzhen, Suzhou and Guangzhou, and entrusting managers to randomly distribute questionnaires to the companies in the parks.

3. Research tools

The instruments used for data collection was five-point rating scale questionnaires form. Statistics used for data analysis included frequency, percentage, mean, Standard Deviation, Confirmatory Factor Analysis, and Structural Equation Model was employed. Corresponding questionnaire items were designed for each dimension. A structural equation model was constructed to analyze the overall relationship between variables, and the fit of the research model was evaluated to provide a basis for the accuracy and effectiveness of the research results. Subsequently, hypothesis results of the study, including direct effects and mediating effects, were listed based on specific analysis of the structural equation model and verified. The study delved into their application status, organizational culture, knowledge management, and innovation performance.

Research Conceptual Framework

Therefore, the relationship between organizational culture and knowledge management, knowledge innovation, and enterprise innovation performance,. The constructed model is illustrated in Figure 2-1.

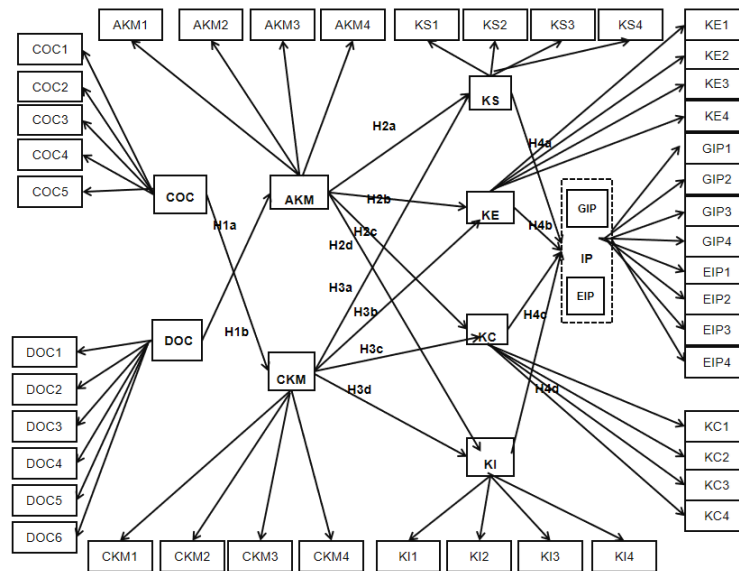


Figure 2- 1: Research conceptual framework

4. Data Analysis

This study, based on the research theme and hypotheses, selects appropriate scale items to measure various variables in the study. The questionnaire is designed and distributed, and the collected data are checked for omissions or input errors. Incomplete questionnaires or those with identical responses will be considered for exclusion as invalid questionnaires. Various methods can be employed to address missing or incomplete data, such as deletion, mean imputation, or using specific algorithms for estimation. If necessary, certain variables may undergo transformations, such as converting continuous variables into categorical variables or standardizing them. Encoding will be applied to categorical variables, using dummy variables if needed. The collected questionnaire data will be filtered, encoded, and statistically analyzed using statistical analysis software SPSS 25.0 and AMOS 26.0. This will include descriptive statistical analysis of the sample, analysis of the questionnaire's reliability and validity, exploratory factor analysis, correlation analysis, and structural equation modeling.

Research Result

In summary, the analysis of respondent units, years of establishment, company headcounts, and respondent positions provides a comprehensive snapshot of the surveyed business landscape. The prevalence of state-owned enterprises at 42.92% indicates a notable imbalance, while the diverse range of establishment years showcases a mix of emerging ventures and well-established entities. The normal distribution of company headcounts offers insights into the varying scales of operations, emphasizing the predominant representation of businesses within the 101 to 500 employee range. This multifaceted analysis enhances our understanding of the business demographics under study, contributing valuable insights into the dynamics of enterprises across different dimensions.

Table 4-1 Normality test

Items	<i>n</i>	Mean	Std.	Skewness	kurtosis	Kolmogorov-Smirnov test	
						Statistic <i>D</i>	<i>p</i>
COC1	487	3.815	1.097	-0.463	-0.833	0.219	0.000***
COC2	487	3.706	1.121	-0.440	-0.735	0.186	0.000***
COC3	487	3.717	1.157	-0.511	-0.679	0.195	0.000***
COC4	487	3.764	1.144	-0.522	-0.687	0.209	0.000***
COC5	487	3.690	1.186	-0.495	-0.770	0.196	0.000***
DOC1	487	3.957	1.004	-0.623	-0.460	0.224	0.000***
DOC2	487	3.797	1.082	-0.568	-0.507	0.205	0.000***
DOC3	487	3.828	1.071	-0.510	-0.684	0.206	0.000***
DOC4	487	3.883	1.049	-0.679	-0.255	0.212	0.000***
DOC5	487	3.754	1.098	-0.538	-0.546	0.203	0.000***
DOC6	487	3.752	1.108	-0.526	-0.600	0.199	0.000***
AKM1	487	3.910	1.032	-0.697	-0.242	0.219	0.000***
AKM2	487	3.891	1.097	-0.712	-0.359	0.220	0.000***
AKM3	487	3.965	1.053	-0.791	-0.159	0.227	0.000***
AKM4	487	4.000	1.089	-0.836	-0.260	0.254	0.000***
CKM1	487	4.043	0.992	-0.747	-0.318	0.247	0.000***
CKM2	487	3.977	1.061	-0.776	-0.232	0.241	0.000***
CKM3	487	3.932	1.117	-0.755	-0.423	0.241	0.000***
CKM4	487	3.889	1.106	-0.734	-0.331	0.218	0.000***
KS1	487	3.620	1.143	-0.497	-0.635	0.220	0.000***
KS2	487	3.708	1.125	-0.611	-0.464	0.233	0.000***
KS3	487	3.483	1.172	-0.378	-0.707	0.192	0.000***
KS4	487	3.559	1.146	-0.412	-0.768	0.219	0.000***
KE1	487	3.754	1.041	-0.505	-0.556	0.228	0.000***
KE2	487	3.682	1.096	-0.540	-0.466	0.222	0.000***
KE3	487	3.688	1.053	-0.551	-0.232	0.218	0.000***
KE4	487	3.610	1.120	-0.396	-0.707	0.197	0.000***
KC1	487	3.786	1.050	-0.550	-0.463	0.217	0.000***
KC2	487	3.752	1.063	-0.586	-0.413	0.235	0.000***
KC3	487	3.786	1.062	-0.601	-0.379	0.224	0.000***

Items	n	Mean	Std.	Skewness	kurtosis	Kolmogorov-Smirnov test	
						Statistic D	p
KC4	487	3.951	1.021	-0.751	-0.206	0.230	0.000***
KI1	487	3.926	1.032	-0.811	0.077	0.233	0.000***
KI2	487	3.873	1.038	-0.773	0.019	0.241	0.000***
KI3	487	3.934	1.026	-0.751	-0.222	0.238	0.000***
KI4	487	4.072	0.980	-1.107	0.969	0.251	0.000***
EIP1	487	3.729	1.095	-0.421	-0.706	0.189	0.000***
EIP2	487	3.844	1.010	-0.452	-0.655	0.196	0.000***
EIP3	487	3.817	1.068	-0.423	-0.811	0.215	0.000***
EIP4	487	3.852	1.053	-0.529	-0.600	0.209	0.000***
EIP5	487	3.719	1.083	-0.388	-0.832	0.194	0.000***
EIP6	487	3.729	1.128	-0.429	-0.830	0.199	0.000***
EIP7	487	3.655	1.085	-0.311	-0.857	0.185	0.000***
EIP8	487	3.684	1.105	-0.389	-0.810	0.192	0.000***

NOTE: * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

4.4.2.3.1 Measurement Model of Collective Organizational Culture Scale

Conduct confirmatory factor analysis on the individual measurement model to verify the structural fit between each latent variable and observed variables in this study.

4.4.2.3.8 Overall Measurement Model of the Scale

The formal overall confirmatory measurement model of the scale is illustrated in Figure.

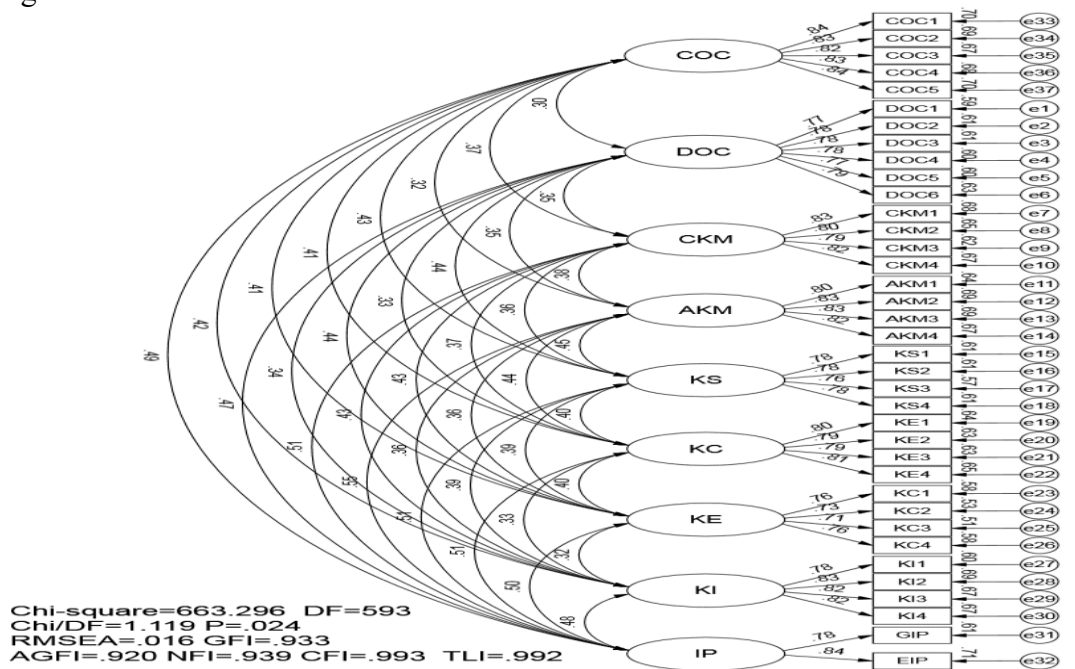


Figure 4-3 Overall Confirmatory Factor Model of the Scale

Source for reference: This study Drawing: compiled by the author of this article

The fit indices of the confirmatory factor analysis model for the overall scale are presented in Table. In terms of absolute fit indices, the RMSEA value is 0.016, below the threshold of 0.05, and the GFI value is 0.933, exceeding 0.9, indicating a good fit. Regarding parsimony fit indices, the CMIN/DF value is 1.119, falling between 1 and 3, within the acceptable range. Additionally, the incremental fit indices, including AGFI, NFI, CFI, and TLI, all exceed 0.9, suggesting that the established confirmatory factor model demonstrates acceptable fit. Therefore, the model fits well.

Table 4-2 Fit Results of the Overall Confirmatory Factor Model of the Scale

Index	Acceptable Values	Statistical Values
CMIN/DF	< 5.00 (Awang, 2012; Al-Mamary and Shamsuddin, 2015)	1.119
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.933
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.920
NFI	≥ 0.80 (Wu & Wang, 2006)	0.939
CFI	≥ 0.80 (Bentler, 1990)	0.993
TLI	≥ 0.80 (Sharma et al., 2005)	0.992
RMSEA	< 0.08 (Pedroso et. al., 2016)	0.016
Model summary		Acceptable Model Fit

Drawing: prepared by the author of this article

The convergence validity and composite reliability results of the variables in the overall scale are presented in Table. indicating good convergence validity and composite reliability for the overall scale. Shows the comparison between the square root of AVE values and the correlation coefficients between corresponding variables. The square root of AVE values for each variable is greater than the correlation coefficients between them, indicating good discriminant validity for the overall scale.

4.5 Hypothesis Testing

Based on the theoretical model and hypotheses, the dependent variable in this study is Economic Innovation Performance, and the independent variables are Collective Organizational Culture and Diffuse Organizational Culture. The mediating variables include Interpersonal knowledge management, Codified knowledge management, Knowledge Socialize, Knowledge Externalize, Knowledge Combinatorial, and Knowledge Internalization. To further examine the relationships between variables and the effects of paths in the theoretical model, this study employed Pearson correlation coefficient analysis to test the relationships between variables. Furthermore, a structural equation model (SEM) was constructed using AMOS software to examine the path effects between variables. Mediation effects were tested using the Bootstrap method.

4.5.2 Path Analysis

In the analysis of the relationships, various independent variables exhibit different degrees of correlation with the mediating variables and dependent variable. Therefore, it is possible to further examine the path effects among variables by constructing a structural equation model. The constructed structural equation model of the path effects is illustrated in

Figure.

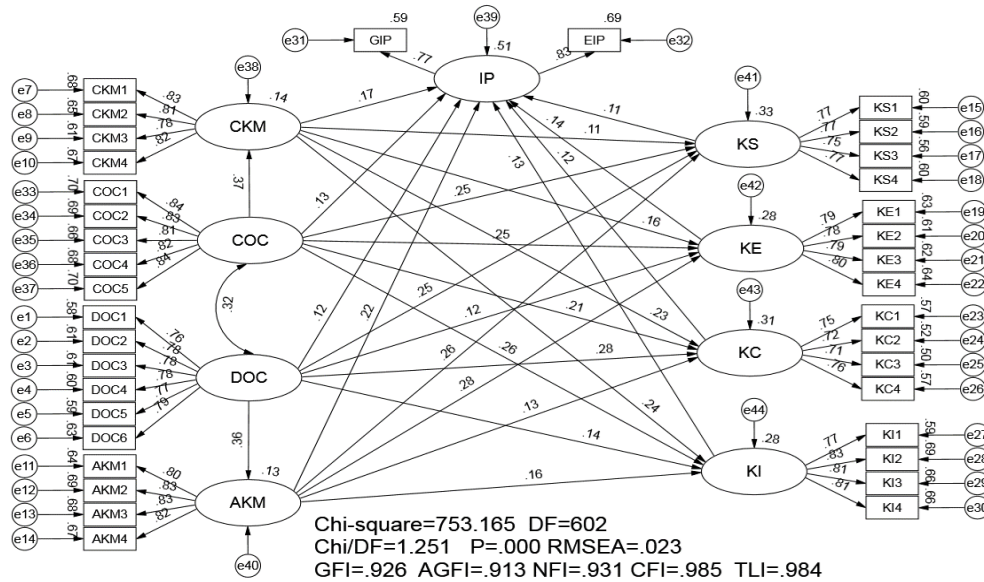


Figure 4-3: Standardized Path Diagram of Structural Equation Model
 Source for reference: This study Drawing: compiled by the author of this article

The fit indices of the structural equation model are presented in Table 4-41. In terms of absolute fit indices, the RMSEA value is 0.023 (<0.05), and the GFI value is 0.926 (>0.9), both falling within the acceptable range. Regarding parsimony fit indices, the CMIN/DF value is 1.251, within the range of 1-3, indicating acceptable fit. Moreover, the incremental fit indices such as AGFI, NFI, CFI, and TLI are all above 0.9, indicating that the constructed structural model fits well.

Table 4-4: Fit Results of the Structural Equation Model
 Drawing: prepared by the author of this article

Index	Acceptable Values	Statistical Values
CMIN/DF	< 5.00 (Awang, 2012; Al-Mamary and Shamsuddin, 2015)	1.251
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.926
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.913
NFI	≥ 0.80 (Wu & Wang, 2006)	0.931
CFI	≥ 0.80 (Bentler, 1990)	0.985
TLI	≥ 0.80 (Sharma et al., 2005)	0.984
RMSEA	< 0.08 (Pedroso et. al., 2016)	0.023
Model summary		Acceptable Model Fit

4.5.3.1 Mediating Effects of Interpersonal knowledge management and Knowledge Socialize in Diffuse Organizational Culture on Innovation Performance
 Hypothesis H6a is supported.

Table 4-6: Mediating Effects of Interpersonal knowledge management and Knowledge Socialization in Diffuse Organizational Culture on Innovation Performance

PATH	Estimate	Lower	Upper	P	Conclusion	Effect size ratio
Total effect						
STD_T_DOC	0.340	0.234	0.438	0.001		\
Direct effect						
STD_DIR_DOC	0.125	0.014	0.224	0.030		36.76%
Indirect effect						
DOC_AKM_IP	0.080	0.042	0.129	0.001	Partial mediation	23.53%
DOC_KS_IP	0.028	0.002	0.071	0.035	Partial mediation	8.24%
DOC_AKM_KS_IP	0.010	0.001	0.026	0.027	Mediators in series	2.94%

"Lower" refers to the lower limit of the 95% confidence interval, and "Upper" refers to the upper limit of the 95% confidence interval.

Drawing: prepared by the author of this article

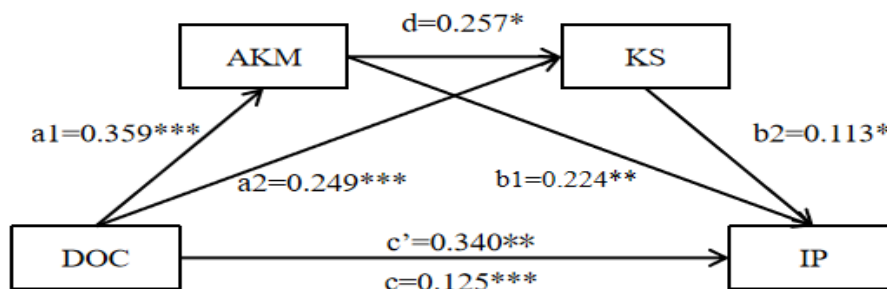


Figure 4-13: Chained Mediation of DOC⇒AKM⇒KS⇒IP

Source for reference: This study

Drawing: compiled by the author of this article

4.5.3.2 Mediating Effects of Interpersonal knowledge management and Knowledge Externalize in Diffuse Organizational Culture on Innovation Performance

This further confirms that the mediating variable "AKM" plays a partial mediating role in the 'DOC⇒AKM⇒IP' path, with the effect size ratio accounting for 23.53% (effect size divided by total effect size). Similarly, the mediating variable "KE" plays a partial mediating role in the 'DOC⇒KE⇒IP' path, with the effect size ratio accounting for 5%. Both mediating variables "AKM" and "KE" play a partial mediating role in the "DOC⇒AKM⇒KE⇒EIP" path, with a chained mediation effect present, with the effect size ratio accounting for 3.82%. Hypothesis H6b is supported.

Table 4-7: Mediating Effects of Interpersonal knowledge management and Knowledge Externalization in Diffuse Organizational Culture on Innovation Performance

PATH	Estimate	Lower	Upper	P	Conclusion	Effect size ratio
Total effect						
STD_T_DOC	0.340	0.234	0.438	0.001		\
Direct effect						
STD_DIR_DOC	0.125	0.014	0.224	0.030		36.76%
Indirect effect						
DOC_AKM_IP	0.080	0.042	0.129	0.001	Partial mediation	23.53%
DOC_KE_IP	0.017	0.003	0.045	0.010	Partial mediation	5.00%
DOC_AKM_KE_IP	0.013	0.004	0.029	0.002	Mediators in series	3.82%

"Lower" refers to the lower limit of the 95% confidence interval, and "Upper" refers to the upper limit of the 95% confidence interval.

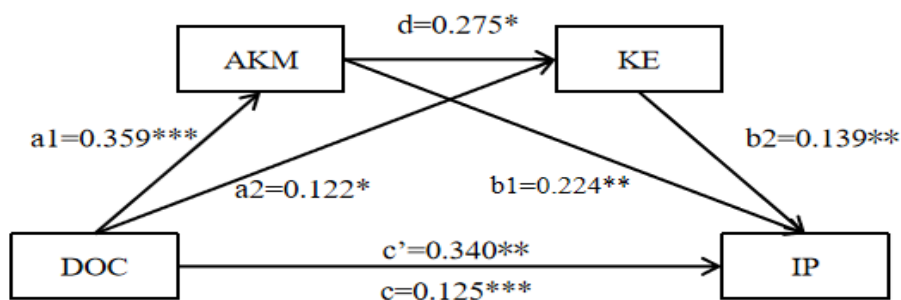


Figure 4-14: Chained Mediation of DOC⇒AKM⇒KE⇒IP
 Source for reference: This study
 Drawing: compiled by the author of this article

4.5.3.3 Mediating Effects of Interpersonal knowledge management and Knowledge Combinatorial in Diffuse Organizational Culture on Innovation Performance

Regarding the mediation path 'DOC⇒AKM⇒IP,' the 95% interval does not include the number 0 (95% CI: 0.042-0.129), indicating the existence of this mediation effect path, with a standardized effect size of 0.080. Similarly, for the path 'DOC⇒KE⇒IP,' the 95% interval does not include the number 0 (95% CI: 0.001~0.076), suggesting the presence of this mediation effect path with an effect size of 0.033.

Hypothesis H6c is supported.

Table4-8: Mediating Effects of Interpersonal knowledge management and Knowledge Combination in Diffuse Organizational Culture on Innovation Performance

PATH	Estimate	Lower	Upper	P	Conclusion	Effect size ratio
Total effect						
STD_T_DOC	0.340	0.234	0.438	0.001	\	
Direct effect						
STD_DIR_DOC	0.125	0.014	0.224	0.030		36.76%
Indirect effect						
DOC_AKM_IP	0.080	0.042	0.129	0.001	Partial mediation	23.53%
DOC_KC_IP	0.033	0.001	0.076	0.045	Partial mediation	9.71%
DOC_AKM_KC_IP	0.011	0.001	0.029	0.033	Mediators in series	3.24%

"Lower" refers to the lower limit of the 95% confidence interval, and "Upper" refers to the upper limit of the 95% confidence interval.

Drawing: prepared by the author of this article

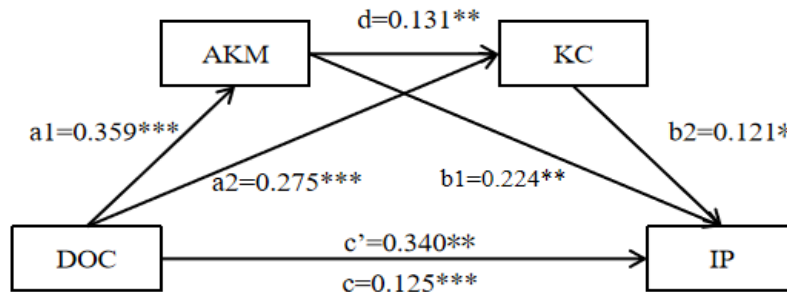


Figure 4-15: Chained Mediation of DOC⇒AKM⇒KC⇒IP

Source for reference: This study

Drawing: compiled by the author of this article

4.5.3.4 Mediating Effects of Interpersonal knowledge management and Knowledge Internalization in Diffuse Organizational Culture on Innovation Performance, path, with a chained mediation effect present, with the effect size ratio accounting for 3.53%. Hypothesis H6d is supported.

Table4-9: Mediating Effects of Interpersonal knowledge management and Knowledge Internalization in Diffuse Organizational Culture on Innovation Performance

PATH	Estimate	Lower	Upper	P	Conclusion	Effect size ratio
Total effect						
STD_T_DOC	0.340	0.234	0.438	0.001		
Direct effect						
STD_DIR_DOC	0.125	0.014	0.224	0.030		36.76%
Indirect effect						
DOC_AKM_IP	0.080	0.042	0.129	0.001	Partial mediation	23.53%
DOC_KI_IP	0.019	0.004	0.046	0.006	Partial mediation	5.59%
DOC_AKM_KI_IP	0.012	0.003	0.029	0.004	Mediators in series	3.53%

"Lower" refers to the lower limit of the 95% confidence interval, and "Upper" refers to the upper limit of the 95% confidence interval.

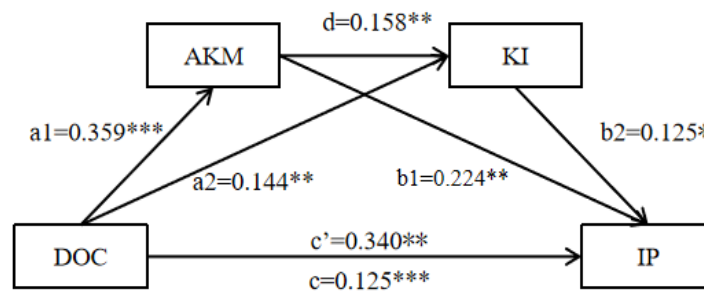


Figure 4-16: Chained Mediation of DOC⇒AKM⇒KI⇒IP

4.5.3.5 Mediating Effects of Codified knowledge management and Knowledge Socialize in Collective Organizational Culture on Innovation Performance

Regarding the mediation path 'COC⇒CKM⇒IP,' the 95% interval does not include the number 0 (95% CI: 0.024-0.111), indicating the existence of this mediation effect path, with a standardized effect size of 0.072. Similarly, for the path 'COC⇒KS⇒IP,' the 95% interval does not include the number 0 (95% CI: 0.002~0.067), suggesting the presence of this mediation effect path with an effect size of 0.029.

. Hypothesis H5a is supported.

Table 4-10: Mediating Effects of Codified knowledge management and Knowledge Socialize in Collective Organizational Culture on Innovation Performance

PATH	Effect	Lower	Upper	P	Conclusion	Effect size ratio
Total effect						
STD_T_C	0.347	0.24	0.448	0.001	\	
Direct effect						
STD_DIR_C	0.128	0.006	0.242	0.037		36.89%
Indirect effect						
COC_CKM_IP	0.072	0.024	0.111	0.001	Partial mediation	20.75%
COC_KS_IP	0.029	0.002	0.067	0.039	Partial mediation	8.36%
COC_CKM_KS_IP	0.005	0.001	0.016	0.036	Mediators in series	1.44%

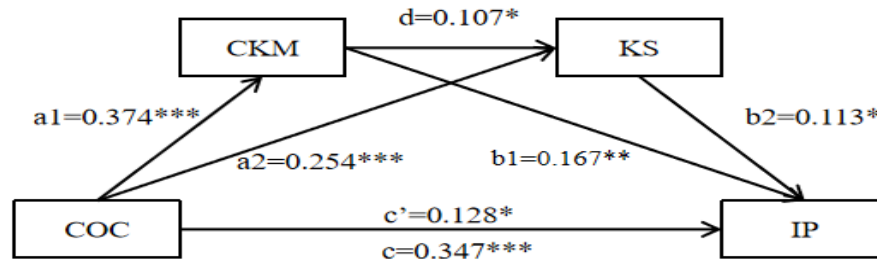


Figure 4-17: Chained Mediation of COC⇒CKM⇒KS⇒IP

Source for reference: This study

Drawing: compiled by the author of this article

4.5.3.6 The Mediating Role of Codified knowledge management and Knowledge Externalization in the Relationship between Collective Organizational Culture and Innovation Performance, For the mediation path Thus, hypothesis H5b is confirmed.

Table 4-11: The Mediating Role of Codified knowledge management and Knowledge Externalization in the Relationship between Collective Organizational Culture and Innovation Performance

PATH	Effect	Lower	Upper	P	Conclusion	效应占比
Total effect						
STD_T_C	0.347	0.24	0.448	0.001	\	
Direct effect						
STD_DIR_C	0.128	0.006	0.242	0.037		36.89%
Indirect effect						
COC_CKM_IP	0.072	0.024	0.111	0.001	Partial mediation	20.75%

COC_KE_IP	0.035	0.010	0.072	0.003	Partial mediation Mediators in series	10.09%
COC_CKM_KE_IP	0.006	0.001	0.019	0.018		1.73%

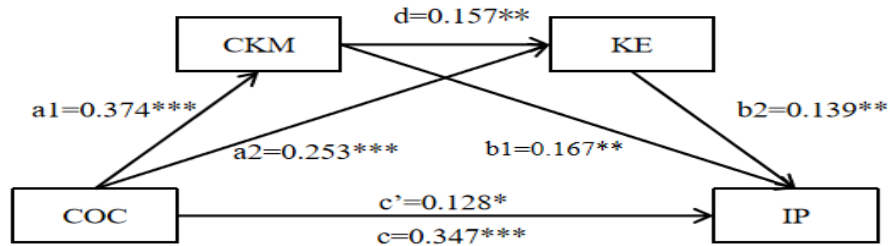


Figure 4-18: Chained Mediation of COC⇒CKM⇒KE⇒IP
 Source for reference: This study Drawing: compiled by the author of this article

4.5.3.7 Mediating Effect of Codified knowledge management and Knowledge Combinatorial between Collective Organizational Culture and Innovation Performance

In this path, the independent, and there exists a chain mediation, with the effect amount accounting for 1.44%. Thus, hypothesis H5c is confirmed.

Table 4-12: Mediating Effect of Codified knowledge management and Knowledge Combination between Collective Organizational Culture and Innovation Performance

PATH	Effect	Lower	Upper	P	Conclusion	效应占比
Total effect						
STD_T_C	0.347	0.24	0.448	0.001		\
Direct effect						
STD_DIR_C	0.128	0.006	0.242	0.037		36.89%
Indirect effect						
COC_CKM_IP	0.072	0.024	0.111	0.001	Partial mediation	20.75%
COC_KC_IP	0.026	0.001	0.064	0.039	Partial mediation	7.49%
COC_CKM_KC_IP	0.005	0.001	0.018	0.044	Mediators in series	1.44%

"Lower" refers to the lower limit of the 95% confidence interval, and "Upper" refers to the upper limit of the 95% confidence interval.

Drawing: prepared by the author of this article

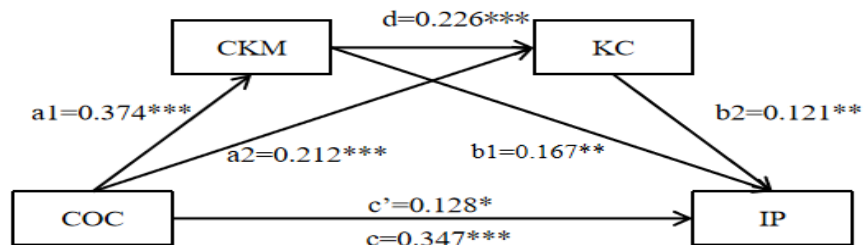


Figure 4-19: Chained Mediation of COC⇒CKM⇒KC⇒IP
Source for reference: This study Drawing: compiled by the author of this article

4.5.3.8 The Mediating Role of Codified knowledge management and Knowledge Internalization in the Relationship between Collective Organizational Culture and Innovation Performance

In regards to the mediation path 'COC⇒CKM⇒IP', the 95% confidence interval does not include the number 0 (95% CI: 0.024-0.111), indicating the existence of this mediation effect path, with a standardized effect value of 0.072.

In this path, the independent variable "COC" has a direct effect with a 95% CI confidence interval of (0.006, 0.242), Thus, hypothesis H5d is confirmed.

Table 4-13: The Mediating Role of Codified knowledge management and Knowledge Internalization in the Relationship between Collective Organizational Culture and Innovation Performance

PATH	Effect	Lower	Upper	P	Conclusion	效应占比
Total effect						
STD_T_C	0.347	0.24	0.448	0.001		\
Direct effect						
STD_DIR_C	0.128	0.006	0.242	0.037		36.89%
Indirect effect						
COC_CKM_IP	0.072	0.024	0.111	0.001	Partial mediation	20.75%
COC_KI_IP	0.033	0.007	0.069	0.008	Partial mediation	9.51%
COC_CKM_KI_IP	0.008	0.001	0.016	0.02	Mediators in series	2.31%

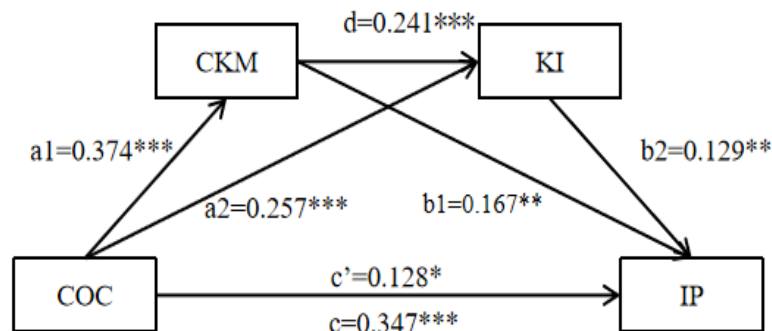


Figure 4-20: Chained Mediation of COC⇒CKM⇒KI⇒IP
 Source for reference: This study Drawing: compiled by the author of this article

Summary of hypothesis validation conducted through structural equation modeling, comprising 14 direct hypotheses and 8 mediating hypotheses. All hypotheses were found to be supported.

Discussion

This research explores the interplay between organizational culture, knowledge management practices, and innovation performance within high-tech enterprises. It investigates how organizational culture influences knowledge management processes and subsequently affects innovation outcomes. The study aims to provide insights into strategies that can enhance innovation performance through effective management of organizational culture and knowledge resources in high-tech settings.

As can be seen the standardization coefficient from collective organizational culture (COC) to coded knowledge management (CKM) is the largest, 0.374; meanwhile, the standardization coefficient from spastic organizational culture (DOC) to interpersonal knowledge management (AKM) is 0.359. It shows that the influence of collective organizational culture (COC) on coded knowledge management (CKM) and the influence of spallation organizational culture (DOC) on interpersonal knowledge management (AKM) are the most obvious among the direct effects of this study. These empirical results are consistent with previous research conclusions (Zack, 1999; Hussain, (2022; Upadhyay & Kumar, 2020; Lam et al., 2021), which shows that if the organizational culture is a collective organizational culture (COC), coded knowledge management (CKM) is the best choice for the knowledge management of the organization, because in a collective culture, the members of the organization have the characteristics of high solidarity and high sociability. Each member has a high willingness to share knowledge (Darroch, 2005; Suprapti et al., 2020; Qi Zhenxing and Zhu Bixiang, 2020), therefore, encoding the knowledge of an organization is the best way for an organization to manage knowledge. In addition, if the culture of an organization is spallation (DOC), interpersonal knowledge management (AKM) is necessary, because if the members of the organization have low solidarity and low sociability, then the organization must manage knowledge by encouraging interpersonal communication and sharing knowledge among people.

Similarly, it can be seen from Table 4-31 that Interpersonalization knowledge management (AKM) and codified knowledge management (CKM) have a positive impact on knowledge socialization (KS), knowledge externalization (KE), and knowledge combination (KC). The impact of knowledge internalization (KI) is also different. For example: Interpersonalization knowledge management (AKM) has a positive impact on knowledge socialization (KS) and knowledge externalization (KE) than Interpersonalization knowledge management (AKM) on knowledge combination (KC) and knowledge internalization (KI).) have a large impact, and their coefficients are (0.257, 0.275; 0.131, 0.158) respectively.

Corresponding to the above conclusion: Codified knowledge management (CKM) has a greater impact on knowledge combination (KC) and knowledge internalization (KI) than codified knowledge management (CKM), knowledge socialization (KS) and knowledge externalization. (KE) have a large impact, and their coefficients are (0.226, 0.241; 0.107, 0.157). Moreover, knowledge socialization (KS), knowledge externalization (KE), knowledge combination (KC) and knowledge internalization (KI) have almost no significant difference in the standardized coefficient of the dependent variable innovation performance.

To sum up, due to the different organizational cultures of enterprises, their knowledge management methods have different ways and means of affecting the innovation performance of the organization. Therefore, management must adopt different knowledge management methods according to the characteristics of their own organizational cultures to promote Organizations achieve innovative goals and performance through optimal means.

Judging from the results of the mediating effect the results also echo the previous empirical results, for example, fragmented organizational culture (DOC) through Interpersonalization knowledge management (AKM) The impact on innovation performance is the largest (0.08), while the chain mediation effect, that is, fragmented organizational culture (DOC) through Interpersonalization knowledge management and knowledge socialization (KS), externalization (KE), and combination (KC) and internalization (KI) are relatively low, respectively (0.010; 0.013; 0.011; 0.012).

Similarly, collective organizational culture (COC) has the largest impact on innovation performance through codified knowledge management (CKM) (0.072), while the chain mediation effect, that is, fragmented organizational culture (DOC) has the greatest impact through positive Knowledge management and knowledge socialization (KS), externalization (KE), combination (KC), and internalization (KI) are relatively low, respectively (0.005; 0.006; 0.005; 0.008).

According to the above empirical results, although the effect of chain mediation is significant, due to the greater direct effects of collective organizational culture on codified knowledge management and fragmented organizational culture on Interpersonalization knowledge management, combining codification

Recommendation

5.1 Theoretical Implications

Two-dimensional knowledge management methods are combined to construct a new theoretical framework to better reflect the complex impact mechanism of organizational culture, knowledge management, and knowledge innovation on corporate innovation performance, and then explore the impact of organizational culture, knowledge management, and knowledge innovation on corporate innovation performance, and then explore the impact

of organizational culture, knowledge management, and knowledge innovation on corporate innovation performance. In the context, the impact of knowledge management methods and knowledge conversion patterns on innovation performance.

5.2 Practical suggestions

1. Provide management with suggestions on which kind of knowledge management is more effective for innovation performance under different organizational cultural backgrounds.

2. Discuss the relationship between different knowledge management methods and knowledge conversion methods on enterprise innovation performance, so that enterprises have more choices for corresponding knowledge management methods and knowledge conversion combinations, and enable enterprises to adopt the routes which can maximize innovation performance.

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