The Research on the Impact of Top Management Teams of Transactive Memory System on Organizational Improvisation

Liu Zhihong and Zhang Han
Dhurakij Pundit University, Thailand
Corresponding Author, E-mail: liuzhihong@zzife.edu.cn

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Abstracts

Based on the realistic background of cross-industry competition, this paper commences with the cognitive structure of enterprises, takes organizational memory that influences corporate decision as the intermediary bridge, regards complementary assets as the innovation resources provided by enterprises, and discusses the influential mechanism of the top management team of transactive memory system on organizational improvisation through the method of combining theoretical and empirical research.

This paper has important practical significance for theoretical workers to enhance the in-depth understanding of the role and value of the top management team of transactive memory system, and the top management team effective use of improvisation to industry competition and improve the core competitiveness has important practical significance.

Keywords: Improvisation; Transactive Memory System; Organizational Memory; Complementary Assets

Introduction

In the era of VUCA, the business environment of Chinese enterprises is full of variability, uncertainty, complexity and ambiguity. Mounting number of enterprises around the commanding heights of science and technology innovation competition are unprecedented fierce, cannot help but with the brand image, the cost structure, sales channels and industry models are completely different from the non-peers to become competitors, that is, cross-industry competition (Lai et al., 2010 : 983-995). Enterprises need novel thought of strategic logic to guide them through the "vacuum zone" in strategic planning (Guo Yongfeng, 2013 :1).

Improvisation is an effective behavior in which an enterprise perceives sudden changes in the environment and has to make a response and immediate action plan in a ephemeral period of time (Zheng Jianguo, Zhang Ya, 2019:1). Since the occurrence of improvisation emphasizes the synchronization of planning and execution, the time requirement is very urgent, and the existing capacity and resources at hand is the cardinal factors affecting the decision and must be take into account first (Rosenbloom & Christensen, 1994: 655-685). What are the capabilities and resources of the enterprise that promote the effective use of improvisation? When where and how? Can we clarify the relationship between the influencing factors Enterprises urgently need a theoretical framework to identify and summarize the rules in their improvisation practices and carry out improvisation actions to figure out unexpected opportunities or crises under the guidance of these rules.

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Research Objectives

This theme systematically combs and summarizes the concepts, influencing factors and measurement dimensions of the three variables of the transactive memory system, organizational memory and complementary assets. In the context of cross-industry competition, the top management team of transactive memory system is taken as the independent variable, organizational memory is taken as the intermediary variable, and complementary assets are taken as the moderating variable, and their influence paths and mechanisms on organizational improvisation are analyzed, and the research hypothesis and theoretical model proposed in this paper are constructed. In this paper, we designed questionnaires to accumulate data from various enterprise top management teams. We conducted descriptive statistical analysis on the valid data and tested the reliability and validity.

In this paper, 543 registered enterprises in China are investigated, and the following conclusions are obtained through empirical research:

1. The top management team of transactive memory system plays an important role in promoting improvisation, explorative improvisation and exploitative improvisation.

2. Organizational memory has a partial mediating effect between the top management team of transactive memory system and improvisation;

3. Complementary assets negatively regulate the influence between organizational memory and improvisation;

4. Cross-industry competition situation positively moderates the influence of top management team of transactive memory system and organizational memory;

5. In the context of cross-industry competition, enterprises are more likely to respond to emergencies by improvisation.

Literature review

1. Organizational improvisation

This paper refers to the description of organizational improvisation by Cunha (2003) and Leyboume (2006), which is defined as the act process of an enterprise's immediate reaction, immediate collaboration, intention creation, and resource integration when faced with a specific situation.

2. Top management team of transactive memory system

Top management team of transactive memory system (hereinafter referred to as "transactive system"), is an important cognitive factor contributing to the occurrence of improvisation. The perception of volatile and changeable environment and strong competitive pressure of non-peers encourages enterprises to respond quickly to environmental changes in cross-industry competition situations and becomes the guarantee for the top management team to make timely and accurate responses in the strategic decision-making process.

3. Organizational Memory

Organizational memory evolved from a series of concepts and studies proposed by sociology and psychology. Durkhetm (1895) In the field of sociology, the formation of organizational memory generally follows the following path: starting from social facts, forming collective consciousness, then collective memory, and finally becoming organizational memory (Weick & Karl, 1993 ; 628-652). Organizational memory is the historical information of the enterprise, which occurred in the past but has an impact on the

future, and the storage and transfer of organizational memory depends on personal memory and organizational environment. Organizational memory falls into two broad categories procedural memory and declarative memory.

4.Complementary assets

Complementary assets are the by-products produced in the development process of enterprises and are also the additional assets required by enterprises to carry out innovative activities. In 1986, Teece proposed the concept of complementary assets for the first time in the PFI theoretical model. Complementary assets are usually affected by factors such as the enterprise scale, scholarship assets, industry experience, and research and development capabilities (Rothaermel&Thursby, 2005 : 305-320).

5. Cross-industry competition situation

Cross-industry competition, as the name implies, is that enterprises that are not engaged in this industry cross industry boundaries to join this field to compete. Definition of improvisation in terms of context: The conscious integration of the design of new solutions and implementation activities by decision makers/top management teams through timely identification of opportunities and challenges arising from the introduction of new technologies into the industry or high capital injection outside the industry.

Research Methodology

Based on cross-industry competition, this paper studies the conditions and factors that induce the improvisation of enterprises. On the basis of theoretical analysis, the theoretical framework is constructed, the research hypothesis is proposed, and the data is analyzed through the literature analysis, the questionnaire survey, the empirical analysis, etc. Statistical software (such as SPSS26.0, AMOS24.0, Mplus8.0) is used in the process of data analysis to verify whether the hypothesis is valid.

Through the questionnaire survey of 760 enterprises in 13 provinces, which lasted for 3 months, a total of 760 questionnaires were distributed, 619 were recovered, 543 were valid, and the recovery rate was 71.45%. Control variables included industry distribution, age of team members, team size, gender, education level, diversity of industry experience and total work experience, and enterprise size. In the analysis of recovered data, individual characteristics were gender different, male 86%, female only 14%, female less; age difference affected senior executives maturity of 41-50, accounting for about 79.37%; the respondents were generally educated above junior college, and the working years were mainly concentrated between 11-20 years, accounting for 83.8%, and the distribution of senior executives was relatively scattered. In terms of enterprise characteristics, the enterprise life is mainly between 6-20 years, with a certain proportion of new and new enterprises; the enterprise size is mainly small and micro, accounting for more than half, may be more flexible in the face of environmental changes; the sample size of each industries is balanced, covering almost all industries. In terms of cross-industry competition, enterprises outside the industry are merged or occupied through innovative technology or high capital. The number of enterprises with cross-industry competition accounts for 80.11%, and 19.89%. The sample data basically met the normal distribution, and the Cronbach's α coefficient of each variable was above 0.8, and the α coefficient of the overall total table was 0.956. The content validity, structure validity, aggregation validity and differentiation validity were well verified.

Research Scope

Research hypothesis

1. Transactive systems positively influence organizational improvisation

In the top management team, the transactive memory system is usually needed to help team members quickly acquire and effectively integrate scholarship (Brandon& Hollingsh-EAD,2004: 633-644.). In the face of emergencies or non-peer competition, the top management team lacks readily available execution plans and needs to make immediate decisions according to specific situations, which is conducive to the trust, professionalism, and coordination of the top management team to quickly obtain these resources and integrate them to make immediate actions resolve or seize opportunities (Yoo & anawattanachai, 2001; 187-208). Therefore, transactive systems enhance team members' creativity and spontaneity, search for technical scholarship in a wide range (Nevow &Wand,2005), experiment with fresh ideas or ways of working, and promote explorative improvisation (McKnight&Bontis, 2002). At the same time, it is also conducive to introducing existing products and services squeezed by non-peers into the local market to improve supply efficiency of existing products and services and create feasible conditions for exploitative improvisation.

Based on this, the following theoretical hypotheses are proposed:

H1: The more mature the top management team of transactive memory system is, the more likely the enterprise is to engage in improvisation

H1a: The more mature the transactive system is, the more likely the enterprise is to engage in explorative improvisation

H1b: The more mature the transactive system, the more likely the enterprise is to carry out exploitative improvisation

2. Mediating effects of organizational memory

Various activities of enterprises involve a large amount of information, and the process of obtaining and reextracting this information depends on the bridge of declarative organizational memory, which is the memory related to facts, the personal memory and common interpretation of the members of the enterprise top management team, and the execution of decisions results are stored, forming precise and standardized methods for the enterprise. The transactive memory system can not only strengthen scholarship acquisition ability of the team, but also effectively enhance the declarative organizational memory, which improves the novelty and effectiveness of organizational improvisation, but reduces the speed (Lewis&Herndon,2011: 1254-1265). Taking advantage of the new challenges brought by cross-industry competition helps to enhance creativity and carry out explorative improvisation to cope with market shocks and challenges.

Therefore, this paper proposes the following hypotheses:

H2: Organizational memory has a significant mediating effect between the top management team of transactive memory system and the enterprise's improvisation

H2a: Procedural organizational memory plays a mediating role in the top management team of transactive memory system affecting the process of exploitative improvisation

H2b: Declarative organizational memory plays a mediating role in the process that the top management team of transactive memory system influences explorative improvisation

3.The moderating effect of complementary assets

From the perspective of resources, improvisation cannot be separated from the support of resources. Explorative improvisation means searching for new resources, while exploitative improvisation means improving existing resources. For enterprises with sufficient

complementary assets, in the face of emergencies or opportunities, enterprises can effectively abbreviate the time for decision makers to refine organizational memory, and win a fuller time gap between planning and execution. It is clear that complementary assets and organizational

memory complement each other in influencing improvisation. In addition, the clearer and more familiar an enterprise is with its past achievements or habits, the more ambiguous its cognition of the present will be. In addition, there are sufficient complementary assets that can be used to leverage, which may contribute to organizational rigidity and make the enterprise stay in the psychological comfort valve for a long time (Hopkins&Nightingale,2006: 355-374). Organizational memory may cause to consider set and single-cycle learning, and will not take actions blindly. Enterprises will follow the principle of minimum cost and loss, and the influence of organizational memory on improvisation by virtue of complementary assets will be significantly weakened. Vice versa, it means that in order to cope with emergencies, complementary assets and organizational memory must meet one of the two conditions, suggesting that complementary assets have an impact on organizational memory and the occurrence of improvisation has a substitute role in specific situations. At this time, organizational memory, as a resource alternative for complementary assets, plays a more obvious role in improvisation.

Therefore, the following hypothesis is proposed in this paper:

H3: Complementary assets play a negative moderating role between organizational memory and improvisation. The more complementary assets a firm can leverage, the lower positive role of organizational memory in promoting firm improvisation, and vice versa

H3a: Complementary assets negatively between procedural organizational memory and exploitative improvisation

H3b: Complementary assets negatively between declarative organizational memory and explorative improvisation

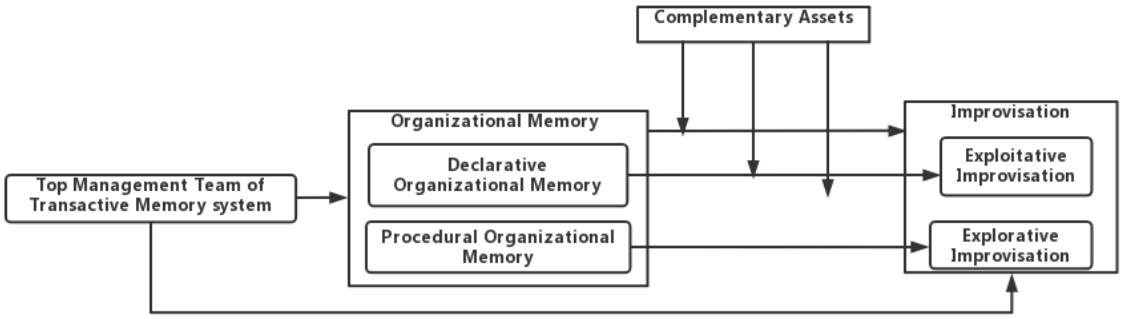
4.The different analysis of improvisation in the context of cross-industry competition

In China, some emerging industries due to the tilt of national policies, so that some enterprises can achieve great success and tremendous profits in a certain industry, so that other enterprises have a sense of crisis, and subsequently a threat to them. The emergence of these competitors has shifted the dwelling environment of traditional enterprises with price as the main means of competition and quality as the main means of competition, resulting in changes in the market structure and market relations between enterprises. Now that cross-industry competition enters, it intends that there are great differences between competitors, and enterprises require doing adjustments to existing products or services in a very transitory time. In the face of enterprises outside the industry suddenly enter the industry to compete with enterprises, enterprises must react and attack immediately. Numerous studies have represent that improvisation can help you respond effectively and quickly to sudden, dramatic changes in the environment and time constraints.

Based on this, we propose the following reasonable hypothesis:

H4: In the face of other enterprises entering the industry competition through cross-industry competition, compared with enterprises without cross-industry competition, improvisation is more subject to occur.

Therefore, the research model of this paper is shown in the figure below:



Picture 1 Research model

Research Design

All variable studies in this paper adopted Likert 7-degree scale to measure the maturity scale. Based on the quantitative and qualitative scale development method, the organizational improvisation was measured from two dimensions of explorative improvisation and exploitative improvisation with 5 items each. The measurement of the top management team of transactive memory system refers to the scale developed by Lewis(2003; 587), which measures the competitiveness of the transactive memory system of the team from three aspects: professionalism, credibility and coordination.To measure organizational memory, Miner&Moorman(1998: 698-723) measured three items from each aspect of procedural organizational memory and declarative organizational memory, and examined the work flow, technical level, and scholarship of members within an enterprise. Measurement of complementary assets According to Christmam(2000) and Sarkar et al. (2001; 358-373), three items were used to measure specific complementary assets and two items were used to measure general complementary assets. Taking cross-industry competition as a nominal variable, this paper uses analysis of sample differences and statistical test to test whether enterprises face the significance of cross-industry competition difference (universal existence rather than accidental), and analyzes the moderating effect of cross-industry competition situation on improvisation.

Empirical analysis

1. Reliability and validity analysis

SPSS software was used to conduct explorative factor analysis on the scale, and the Cronbach's α coefficients of variable improvisation, transactive system, organizational memory, and complementary assets were 0.923, 0.893, 0.808, and 0.83, respectively, all reaching 0.8. Cronbach's α coefficients of each dimension of the variables were also above 0.7. At the same time, deletion of any item could not significantly improve Cronbach's α, indicating that the measurement results of each variable and dimension had high stability and consistency.The Cronbach's α coefficient of the total volume table is 0.956, which indicates that the total volume table has good reliability.The Bartspherical test results showed a high level of significance (Sig.=0.000). The KMO values of improvisation, transactive system, organizational memory, and complementary assets in each variable are all greater than 0.7; the

KMO values of explorative improvisation and exploitative improvisation in related dimensions are also greater than 0.7; the KMO values of procedural organizational memory and declarative organizational memory are slightly lower, but close to 0.7. The Bartspherical test results of each variable and dimension were significant (Sig.=0.000). The common factors extracted in this paper have explanatory rate more than 50% for the variance of the original scale items, which is a high explanation energy, and preliminarily proves that this study has a good validity. Therefore, the scale designed in this paper has better reliability and validity, which can be further studied.

2. Correlation analysis

The correlation analysis of each variable is carried out in Figure 1(the symbols D, I, J, C, F, F1, F2, and H are used to represent the variables, respectively Improvisation,Explorative Improvisation, Exploitative Improvisation, Transactive System, Organizational Memory, Procedural Organizational Memory, Declarative Organizational Memory, Complementary Assets), and the results of the correlation coefficiency among each variable are summarized. It can be seen from the table that independent variables at each level are significantly correlated with improvisation at the 0.01 level, which is based in line with the above hypothesis. The preliminary judgment shows that there is some internal relationship between each variable, which is also in line with the above theoretical hypothesis. Further regression analysis can be performed for further verification.

Figure 1 Correlation coefficient matrix

	D	**I**	**J**	**C**	**F**	**F1**	**F2**	**H**
D	1							
I	0.949**	1						
J	0.956**	0.716**	1					
C	0.757**	0.739**	0.705**	1				
F	0.618**	0.611**	0.568**	0.675**	1			
F1	0.559**	0.546**	0.520**	0.602**	0.910**	1		
F2	0.564**	0.565**	0.512**	0.625**	0.907**	0.650**	1	
H	0.726**	0.703**	0.682**	0.761**	0.622**	0.595**	0.534**	1

Note: n=543, ** in the 0.01 level (double-tailed), the correlation is significant.

Hypothesis testing

It can be seen from the correlation analysis that the correlation coefficient among some variables is high, so we conduct the multicollinearity test. With the improvisation as the dependent variable, the multicollinearity quiz was carried out for each independent variable. The variance expansion coefficient VIF of each variable is less than 3. In general, the criterion for adjudging this value is less than 5. This shows that there is no multicollinearity in the model. We use AMOS to add method factors to test common method bias.

Figure 2 Comparison of AMOS model before and after adding common method factor

Model	χ2/DF	RMSEA	SRMR	CFI	TLI
M1	1.814	0.039	0.032	0.960	0.958
M2	1.605	0.033	0.027	0.976	0.969
Index change	-0.209	-0.006	-0.005	0.016	0.011

It can be seen from Figure 2 that compared with the original M1, the standard residual root mean square (SRMR) of M2 model added with method factors decreased by 0.005, the Chi-square degree of freedom ratio (χ2/DF) M1 of M2 decreased by 0.209, and the approximate root mean square error (RMSEA) also decreased slightly by 0.006. However, the fitting index (CFI) and non-normal fitting index (TLI) increased slightly, to 0.016 and 0.011 respectively, but they were both lower than the standard of 0.1 (Wen Zhonglin, Ye Baojuan, 2014) and did not exceed the threshold in sense, indicating that there was no serious common method in the questionnaire.

Research Findings

1. The role of transactive system in organizational improvisation

The regression analysis is carried out with organizational improvisation as the dependent variable and transactive system as the independent variable. For the purpose of research, gender, age, education level, years of work, the executive category, establishing time of company, scale of company, the industry category, and team size were added to the model as control variables. In Figure 3, models M3, M5 and M7 represent the regression of control variables to improvisation, explorative improvisation and exploitative improvisation. transactive system variables are added to them, and models M4, M6 and M8 are obtained successively, showing that regression data can be found. The interaction system has a significant positive effect on improvisation (β=0.820), explorative improvisation (β= 0.809) and exploitive improvisation (β= 0.831). Control variables and explanatory variables can explain 57.2%, 54.5% and 49.7% variance of improvisation, explorative improvisation and exploitive improvisation, respectively. Assume that H1, H1a, and H1b are confirmed.

Figure 3 Results of regression analysis between transactive memory system and improvisation

Variable	Improvisation		Explorative Improvisation		Exploitative Improvisation	
	M3	**M4**	**M5**	**M6**	**M7**	**M8**
Sex	0.074	-0.037	0.125	0.015	0.023	-0.09
	(0.66)	(-0.506)	(1.099)	(0.191)	(0.192)	(-1.027)
Age	0.063	-0.023	0.084	-0.001	0.043	-0.044
	(0.697)	(-0.375)	(0.913)	(-0.012)	(0.433)	(-0.625)
Educational Level	-0.021	0.001	-0.015	0.007	-0.027	-0.004
	(-0.542)	(0.045)	(-0.389)	(0.247)	(-0.633)	(-0.142)
Working Years	-0.067	-0.021	-0.094	-0.048	-0.041	0.007
	(-1.266)	(-0.587)	(-1.748)	(-1.31)	(-0.701)	(0.164)

Executive Categories	0.023 (1.047)	0.015 (1.054)	0.025 (1.144)	0.017 (1.177)	0.02 (0.862)	0.013 (0.747)
Company Establishment	0.084* (2.697)	0.031 (1.517)	0.072 (2.271)	0.02 (0.908)	0.097 (2.847)	0.043 (1.771)
Enterprise Scale	0.02 (0.623)	0.026 (1.217)	0.014 (0.421)	0.02 (0.876)	0.027 (0.753)	0.033 (1.289)
Industry Category	-0.047 (-1.681)	-0.025 (-1.331)	-0.059 (-2.088)	-0.037 (-1.917)	-0.035 (-1.15)	-0.012 (-0.562)
Team Size	0.029 (0.716)	0.007 (0.246)	0.011 (0.268)	-0.011 (-0.399)	0.047 (1.066)	0.024 (0.77)
Transactive System		**0.820** (26.37)		**0.809***** (24.934)		**0.831***** (22.678)
R^2	0.03	0.58	0.031	0.553	0.028	0.012
Adjusted R^2	0.014	0.572	0.014	0.545	0.506	0.497
Value of F	1.858	73.386	1.883	65.839	1.732	54.491

Note: "()" is the T value: ***, **, * represents a significant correlation at the level of 0.1%, 1%, 5%, respectively.

2. Mediating effects of organizational memory

In the Figure 4, the overall direct effect coefficient of organizational memory between transactive memory system and improvisation was ab=0.0406, p<0.001, and the 95%Bootstrap confidence interval for deviation correction and improvement was [0.6021,0.7616], excluding zero, indicating that the overall direct effect was significant. The indirect effect coefficient BootSE=0.0324, and the 95%Bootstrap confidence interval for deviation correction and improvement was [0.0837,0.2101], excluding zero, indicating that the indirect effect was also significant. Thus, hypothesis H2 is verified. Similarly, the deviation correction and improvement of 95% Bootstrap confidence interval between procedural organizational memory and transactive memory system and explorative improvisation between declarative organizational memory and transactive memory system did not include zero. Hypothesis H2a and H2b were also verified.

Figure 4 Test of mediation effects of organizational memory and different types of organizational memory

Intermedi	Direct Effect	Effect	se	t	p值	LLCI	ULCI
Organizational Memory	Transactive System →Improvisation	0.6819	0.0406	16.7882	0.000	0.6021	0.7616
Procedural Organizational	Transactive System →Exploitative Improvisation	0.7303	0.0447	16.3239	0.000	0.6425	0.8182
Declarative Organizational	Transactive System →Explorative Improvisation	0.6996	0.0403	17.3795	0.000	0.6205	0.7787
	Indirect Effect	**Effect**	**BootSE**	**BootLLCI**	**BootULCI**		
Organizational Memory	Transactive System →Improvisation	0.1453	0.0324	0.0837	0.2101		
Procedural Organizational	Transactive System →Exploitative Improvisation	0.1075	0.0329	0.0445	0.1738		
Declarative Organizational	Transactive system →Explorative Improvisation	0.1169	0.0287	0.0608	0.1726		

Note: The Bootstrap sample size is 5000 and the confidence interval is lay to 95%.

3. The regulatory effect of complementary assets

In the process of measuring moderating variables, this paper takes improvisation as the dependent variable, introduces control variables, independent variables organizational memory and complementary assets for centralization, and adds the interaction term of organizational memory and complementary asset variables for the regression analysis, as shown in model M9-M14 in Figure 5. The results showed that the interaction terms of organizational memory and complementary assets (β=-0.053, p=0.048<0.05) had a negative influence effect on explorative improvisation, that is, hypothesis H3 of this study is valid. Furthermore, complementary assets (β=0.562, p<0.001) had a significant, but reverse, moderating effect on procedural organizational memory (β=0.197, p<0.001) and exploitative improvisation at 5% level. Therefore, hypothesis H3a of this study is valid. Finally, the interaction terms of declarative organizational memory and complementary assets (β=-0.034, p=0.229>0.05) had no significant

effect on explorative improvisation. In other words, the hypothesis H3b in this paper is not valid, that is, the relationship between complementary assets, declarative organizational memory and explorative improvisation can complement and promote each other without obvious inhibition.

Figure 5 Test of the moderating effect of organizational memory and its dimensions

Variable	Improvisation		Explorative Improvisation		Exploitative Improvisation	
	M9	M10	M11	M12	M13	M14
Complementary assets	0.567***	0.558**	0.560**	0.554**	0.574**	0.562***
	(16.162)	(15.815)	(15.352)	(15.074)	(14.019)	(13.658)
Organizational Memory	0.210***	0.198**				
	(5.736)	(5.366)				
Procedural Organizational Memory					0.213***	0.197***
					(4.982)	(4.571)
Declarative Organizational Memory			0.207***	0.199***		
			(5.442)	(5.185)		
Interaction Terms for Organizational Memory *Complementary Assets		**-0.053***				
		(-1.982)				
Interaction Terms for Declrative Organizational Memory *Complementary Assets				-0.034		
				(-1.205)		
Interaction Terms for Procedural Organizational Memory *Complementary Assets						**-0.072***
						(-2.323)
R^2	0.548	0.551	0.523	0.524	0.478	0.483
Adjusted R^2	0.539	0.542	0.514	0.514	0.468	0.473
Value of F	64.432	59.255	58.255	53.136	48.741	45.167

Note: "()" is the T value: ***, **, * represents a significant correlation at the level of 0.1%, 1%, 5%, respectively.

Introducing complementary assets in cross-industry competitive situations can lead to new investment opportunities and experiences that drive and enrich the content of declarative organizational memory. At the same time, through explorative improvisation, the top management team can flexibly and creatively apply existing scholarship and experience, as well as exploring new methods and strategies to further expand and optimize the response to emergencies. Therefore, the inverse moderating effect of complementary assets on declarative organizational memory and explorative improvisation is not necessarily significant, and the specific effect may depend on the cognitive and behavioral characteristics of the top management team, as well as the specific business environment and context. In practice, companies can achieve better improvisation through the flexible use of complementary assets and the active interaction and adjustment of declarative organizational memory and explorative improvisation.

4.The difference analysis of cross-industry competition situation

In terms of research variables, whether improvisation is carried out under cross-industry competition and whether there are differences between different types of improvisation, we use ANOVA to test. At the significance level of 0.01, the P-values of one-way ANOVA is all less than 0.01, that is, there are significant differences between improvisation, explorative improvisation and exploitative improvisation in cross-industry competition situations. Because the difference is due to the mean.

Discussion

Pentland and Reeves (2006) found that information sharing and knowledge integration in senior management teams had a positive impact on the ability of improvisation. In addition, Kuratko et al. (2012) also noted that the cognitive diversity of senior management teams can promote the innovation of uncertainty, and thus improvisation. The cognition and communication style of the senior management team of the interactive memory system have an impact on the organization. This view is supported by many studies. For example, Henderson and Johnson (2004) found that information sharing and knowledge integration in top management teams help improve an organization's ability to innovate. In addition, Smith and Tushman (2003) also noted that the perception and communication of senior management teams can affect an organization's ability to adapt and innovate in the face of uncertainty.

A study by Chen et al. in 2020 explicitly examined the modulation of complementary assets on the relationship between organizational memory and organizational improvisation. They define complementary assets as "the interaction and association of enterprise-owned assets with the assets, capabilities and resources owned by other enterprises and institutions" (Chen et al., 2020). In this study, they found that complementary assets had a significant modulatory effect on the relationship between tissue memory and tissue improvisation. Specifically, organizational memory promotes organizational improvisation with rich complementary assets, perhaps because these assets provide more resources, capabilities, and partners for the organization to better respond to emergencies. However, when organizations have fewer complementary assets, the facilitation of organizational improvisation may weaken or become insignificant, because the organization may lack the necessary resources and capabilities to respond to emergencies (Chen et al., 2020). In addition, a study conducted by Lopez-Carillo et al. in 2019 explored the impact of different types of complementary assets

(i. e., technology complementarity, market complementarity, and knowledge complementarity) on the relationship between organizational memory and organizational improvisation (Lopez-Carillo et al., 2019). Technology complementary assets and market complementary assets can significantly enhance the promotion effect of organizational memory on organizational improvisation, while knowledge complementary assets have no such effect. This may be because technology complementary assets and market complementary assets can provide practical technical support and market information, enabling organizations to better use their memory when responding to emergencies.

Our study found that the interactive memory system of executive teams had a significant positive impact on organizational improvisation. This result is consistent with the existing literature that the cognitive and knowledge structure of the executive team affects the organization's ability. This finding reveals the important role of the executive team in the organization and its potential role in organizational improvisation. Our study reveals the mediating role of the organizational memory between the interactive memory system and the organizational improvisation of the executive team. Specifically, the interactive memory system of executive teams indirectly influences the improvisation ability of organizations by promoting the formation and sharing of organizational memories. This finding fills a gap in the existing literature on the relationship between organizational memory and organizational improvisation. The results of the study show that the complementary assets have a reverse regulation effect between the tissue memory and the tissue improvisation. Specifically, when an organization has rich complementary assets, its ability to improvis limited. This finding is contrary to existing ideas that complementary assets promote an organization's ability to innovate. However, our study finds that when organizational memory conflicts with complementary assets, the influence of organizational memory will dominate, thus limiting the ability to improv. Our study also found that organizational improvisation does not occur in all situations. Specifically, organizational improvisation is limited when organizations face a highly complex, highly uncertain task environment. This finding fits with the existing literature that organizations need to be adequately stable and predictive in facing highly complex environments to be effectively improvised.

Recommendations

1. The top management team of transactive memory system can effectively promote improvisation. Top managers should be fully aware of the importance of constructing the top management team of transactive memory system. In order to carry out organizational improvisation effectively, it is necessary to strengthen the construction of top management team of transactive memory system. A good top management team should have a reasonable scholarship structure and pay attention to those with differentiated and complementary expertise when selecting members. At the same time, in the process of team operation, it is necessary to fully promote the communication among the members of the top management team, establish mutual trust and cooperative relations, and strengthen the coordination and cooperation ability of the team as a whole. This study verifies the important role of the transactive memory system, fully affirms the practical value of the complete transactive memory system, provides an important theoretical reference for enterprises that are or will be facing crises or opportunities at any time, provides new ideas for enterprises to realize survival and development, and points out the direction for enterprises to maintain core competitiveness under the new business model.

2. This paper clarifies the important role of organizational memory and provides effective theoretical support for the improvisation of enterprises. In the process of dealing with emergencies, enterprises must recognize the important role of organizational memory. Organizational memory is separated into procedural organizational memory and declarative organizational memory. Procedural organizational memory affects the occurrence of improvisation, while declarative organizational memory affects the degree of improvisation. The mediating role of organizational memory in the transactive memory system suggests that while improving the transactive memory system, organizational memory will be strengthened to help enterprises reduce the influence of changing environment. Encourage companies to react quickly to the environment and improvise. Those who pay attention to the "internal and external repair" of the resilient enterprises will be more actively concerned about the overall situation and evolution of the industry and the market, in addition to early warning of possible problems, you can also try to "leverage the force", through the use of external professional forces, quickly open up technical and resource barriers, to make up for their own resources and capabilities of the vacancy. Therefore, this study provides effective theoretical support for enterprises in the new era of business environment.

This paper analyzes the influence of complementary assets on improvisation. Thus, it can be seen that complementary assets, organizational memory and procedural organizational memory play an alternative role for a certain extent, which helps enterprises accumulate and allocate different resources in a changing environment, carry out different types of improvisation, and reduce erroneous decisions or excessive improvisation. In addition, considering the cross-industry competition situation and comparing enterprises with or without cross-industry competition situation, the difference analysis is made, and it is found that enterprises' improvisation is indeed more likely to occur in cross-industry competition situation, which has directive significance for enterprises facing cross-industry competition situation to carry out improvisation. At the same time, cross-industry competition has a positive moderating effect on both transactive memory system and organizational improvisation. Therefore, this study is helpful for the managers of enterprises under the background of cross-industry competition or enterprises preparing to enter other industries to carry out improvisation.

Future studies can improve the accuracy and universality of the study in three aspects:

1. Increase the area and number of the survey samples, and conduct differential analysis to improve the accuracy and universality of the study;

2. Carry out a longitudinal research on the influencing factors of enterprise improvisation behavior, and compare and analyze the problems and influence mechanisms faced by enterprises at different development stages;

3. Explore other context-specific research models, and further explore the action process of variables such as absorption capacity and tissue toughness.

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