

An Empirical Study on the relationships between social capital, rational cognition and knowledge sharing in product development team: the role of collective value

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Abstract Taking into account individual behavior is always embedded in organizations based on theory of rational cognition and social capital in product development, this article explored the mechanism impacting on knowledge sharing behavior in Chinese product development team. The results showed that knowledge sharing behavior in the product development team was impacted not only by personal attitudes, but also by the relational capital between individuals in a group. The results showed that enhancing the management capacity of social capital and collectivism culture could promote knowledge sharing behavior between individuals.

Keywords: social capital; knowledge sharing attitude; collective value; knowledge sharing

1. Introduction

In order to carry out product development more effectively, it is necessary to enhance the process of knowledge transfer and sharing, which would significantly increase the sources of individual knowledges, and promote the absorption and application of individual knowledge. Some researches have explored some factors impacting on knowledge sharing. However, few researches explored the impact of collectivism value on China's enterprises. Considering collective value is still among the mainstream values in China's enterprises, we constructed the theoretical model of knowledge sharing and explored the impact of cultural concept of collective value, based on the cognitive and social capital theory

2. Theoretical Background

Theory of Reasoned Action (TRA) claimed that the individual behaviors were influenced by the combined effect of individual attitudes and subjective norms. Planned Behavior theory (PBT) developed on the basis of the previous theory and thought that individual attitudes, subjective norms and perceived behavioral combined affect individual behavior [1]. Later studies found that the sole consideration of the structure of capital was not a better description of social capital, neither was it a comprehensive explanation of collaboration and organizational performance. In-depth study found that the quality of contact and individual cognition of the network could also be able to describe the intrinsic properties of social capital. As putnam (1995) thought that social capital was held by individuals which was embedded in the network and deserve the sum of the actual and potential resources from the relationship [2].

3. Hypotheses and theory model

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According to Theory of Reasoned Action, whether an individual shares his knowledge or not is significantly affected by his attitude to knowledge sharing. If an individual recognizes knowledge sharing would bring benefits to the product development team, and his attitude towards knowledge sharing maybe positive. He may perform the action to share his own knowledge and skills with other people. Thus, this article assumes that:

Assumption 1: Individual attitude toward knowledge sharing positively influences the behavior of knowledge sharing in product development team.

Compared with the subjective norm made by theory of planned behaviour, social capital theory is more reasonable to interpret the external influence. Because social capital is formed through the communication between individuals and other members and everyone has different social capital, it is more effective to interpret the individual cognition about organization norm through social capital. In the product development team, the more contact individuals and other members have, the more dominant is his position in the entire product development network. While an individual makes frequent communications with other members and coordinates the works accordingly, he also increases the possibility of exchanging experiences and skills. Thus, this article assumes that:

Assumption 2a: Individual structural capital positively influences knowledge sharing in product development team.

Relational capital reflects the quality of connection, which means higher trust and friendship. Under the context, individuals are more willing to exchange information, knowledge and experiences. Furthermore, high-quality connection will bring more reciprocal benefit, which makes individuals more intended to share knowledge, therefore, relational capital can further promote knowledge sharing behaviors. When Mooradian (2006) studied the role of trust in knowledge sharing, he found that trust had a positive impact on knowledge sharing [12]. Thus, this article assumes that:

Assumption 2b: Individual relational capital positively influences knowledge sharing in product development team.

Nahapiet (1998) thought cognitive capital should include the shared language and professional vocabulary, because the shared language and vocabulary facilitated the mutual exchange of information, and similarity of understanding the basic concepts facilitated the exchange of knowledge [3]. In product development team, individuals and other members share similar experiences and skills, and when facing with the same problems, they can settle these with other members' experiences after a long period of interaction. They need to share the experiences and skills. Thus, this article assumes that:

Assumption 2c: Individual cognitive capital positively influences knowledge sharing in product development team.

Organizational culture reflects the common values and norms of the team members. These collective ideas and norms can distinguish an organization from another. The role and value of the organizational culture in knowledge sharing also have been confirmed in related researches. As a special facet, collective value culture in enterprises play a significant role in collaboration and citizenship behavior [4]. Xie and Jinhong's(2003) study also found that companies with the collective-value culture put greater emphasis on the importance of team and collaboration, and the staff have a higher loyalty [5].

If an individual processes collective value, he usually thinks about problems from organizational perspective and considers himself as a part of the organization. Thus, collective value is a more sophisticated intrinsic motivation, which directly affects individuals' attitude. In addition to the impact of social capital, collective value also induces individuals to share knowledge when individuals consider that knowledge sharing is beneficial to the whole team. Thus, this article assumes that:

Assumption 3: Individual collective value positively impacts on knowledge sharing behavior in product development team.

4. Research Method

We constructed the initial set of items by analyzing the literature on the proposed theoretical model. All the measuring items in this study's principal constructions were adopted from existing measurements. Collective value was from Hwang[6]. Structural capital, Relational capital Cognitive capital were from Chow[7]. Knowledge sharing was from Hwang[8]. All the items were measured on a 7-point Likert scale.

The participants were employees in Chinese enterprise product development team. The participants were required to answer the questionnaire according to their current product development project. There were 350 participants in the study. After removing invalid questionnaire, 125 effective questionnaires were used in the following analysis.

5. Common Method Variance Assessment and Measurement Model

Common method bias using Harman's one-factor test was also examined in this study. According to the suggestions of Hsieh(2008)[9], factor analysis including all items were conducted for each groups of respondents, and there was no sign of a single factor accounting for the majority of covariance, indicating no evidence of common method bias.

The assessment of the measurement model includes the estimation of internal consistency for reliability, and tests of convergent and discriminant validity for construct validity.

Internal consistency was calculated by Cronbach's alpha and Fornell's composite reliability. According to the result showed in table 1, the Cronbach reliability coefficients of all variables was higher than the minimum cutoff score of 0.60[10]; All composite reliabilities of constructs had a value higher than 0.7. The result indicated adequate internal consistency. Additionally, all Average Variance Extracted (AVE) values of constructs were higher than the minimum cutoff score of 0.50, which indicated that more than 50% of the variance of the measurement items could be accounted for by the constructs[11].

Table 1 Reliability indices for constructs

Construct	Alpha	Composite reliability	AVE
Structural capital	0.79	0.88	0.71
Relational capital	0.79	0.88	0.7
Cognitive capital	0.8	0.87	0.71
Knowledge sharing attitude	0.95	0.96	0.77
Collective value	0.67	0.82	0.6
Knowledge sharing	0.84	0.91	0.78

Construct validity was examined by assessing convergent validity and discriminant validity[11]. All item loadings are greater than 0.50, indicating Convergent validity was considered as acceptable.

Discriminant validity can be checked by the means of examining whether the correlations between the variables are lower than the square root of the average variance extracted. Table 2 indicates that all the square roots of each AVE value are greater than the off-diagonal elements. This indicates discriminant validity among variables.

6. Structural Model and Mediated Effect

The assessment of the structural model includes estimating path coefficients and R squared values. According to the results of assessment and hypothesis testing, two hypothesized paths, Relational capital→ Knowledge sharing, Knowledge sharing attitude→ Knowledge sharing, were significant at the 0.001 level. One hypothesized paths, Relational capital→ Knowledge sharing attitude was significant at the 0.05 level. The R2 for knowledge sharing (R2=0.52) reflect that the model provides strong explanation of the variance in knowledge sharing.

Table 2 Inter-construct correlations of latent variables

	Structural capital	Relational capital	Cognitive capital	Knowledge sharing attitude	Collective value	Knowledge sharing
Structural capital	0.84					
Relational capital	0.56	0.84				
Cognitive capital	0.44	0.59	0.84			
Knowledge sharing attitude	0.27	0.43	0.2	0.88		
Collective value	0.67	0.51	0.3	0.51	0.77	
Knowledge sharing	0.43	0.53	0.35	0.72	0.44	0.88

Note: Diagonal elements are the square root of average variance extracted

7. Discussion

Although some researches put more attention on social capital in recent years, few researches focus on why and how to build social capital. The paper explored the role of collective value in Chinese product development team and gets some valuable conclusions and inspiration.

Firstly, the attitude towards knowledge sharing is the most important antecedent variable which affects knowledge sharing, but the external effects can not be ignored. The research shows that relational capital is also a direct antecedent variable of knowledge-sharing, which shows that the behavior of individual knowledge sharing in the organization is considered as not simply individual behavior, but individual behavior which is embedded in organizations. Secondly, relational capital can significantly affect the knowledge sharing in product development team, managers should fully consider the impact of relational capital when developing the strategy of knowledge management in product development process. For example, providing not only a platform for communication and discussion simply, but also how to promote the trust between individuals would be more effective in knowledge management. Thirdly, collective-value culture had a significant direct impact on social capital. Therefore, collective value not only induced knowledge sharing attitude directly, but also impacted on knowledge sharing through social capital construction. Collective value was the origin of individual attitude and social capital construction. The staff of enterprises holding the collective-value culture should be considered as playing a greater role.

8. Limitation and Future Research Directions

The paper explored the antecedent variables which affected the knowledge sharing within product development team. This paper also provided a theoretical model which combined the influence of individual motivation and external network. Furthermore, the function of the collective-value culture was analyzed by the paper. Compared with western organization culture, the collective-value culture in knowledge sharing

played a significantly different role in China's enterprises; and it functioned as well as an important factor which can not be ignored in Chinese business practice.

There are some limitations in this study, the constructs of social capital is only considered as structural capital, relational capital and cognitive capital in the paper. how to describe the social capital more fundamentally, particularly the characteristics of cognitive capital remain to be further studied. In addition, the mechanisms which affect knowledge sharing are complex, such as, the product' s own characteristics and atmosphere of the team, the business environment and external competitiveness are also important factors affecting knowledge sharing of the product development team. These all are future directions for further researches.

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10. References

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