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Coordination Model of Tacit Knowledge Transfer Based on Incentives

^{1,2}XIE Rong-Jian and ²Liang Liang

¹School of Management, Anhui Polytechnic University, Wuhu Anhui, 241000, China

²School of Management, University of Science and Technology of China, Hefei, 230026, China

Abstract: Because tacit knowledge is hard to be coordination in innovative enterprises, we propose a new approach based on knowledge transfer and incentives. Aimed at the characteristics of the innovative enterprises, based on knowledge bodies and knowledge recipients, we give the coordination relationship of tacit knowledge transfer in innovation enterprise. Then we establish the tacit knowledge transfer coordination model. The tacit knowledge coordination transfer process is proposed and the corresponding formula is given with the coordination among knowledge bodies and knowledge recipients based on incentives. We give some incentive strategies based on the coordination model. Through the experiment analysis, the research can improve the tacit knowledge transfer in innovative enterprises.

Key words: Tacit knowledge, knowledge transfer, coordination model, innovative enterprises

INTRODUCTION

Today's society is the knowledge age, knowledge is increasingly important for enterprises. In general with respect to a variety of resources, knowledge is the most important resources for enterprises. Knowledge can be divided into explicit knowledge and tacit knowledge, explicit knowledge can easily be imitated and it really plays a central role. Tacit knowledge is hid in the organizations. Tacit knowledge is considered as a source of competitive advantage for the enterprises (Montazemi *et al.*, 2012). However it plays a key role it can be skills, or enterprise-specific experience *et al.* Three knowledge characteristics that affect organizational behavior for knowledge transfer. They are tacitness, difficulty and the importance of knowledge (Kang *et al.*, 2010). The researches show that the tacit knowledge acquisition, transfer and effective integration are major sources of competition (Mascitelli, 1999).

The innovative enterprises have their own cultures, constitutions and staffs with strict management and plenty of technology experiences. The managers prefer employees to toe the line, to complete the arrangement seriously and require employees to give full play to their own characteristics and their enthusiasms. In the innovative enterprises, inventors often apply and develop tacit knowledge in the process of creating commercial, scientific and technological inventions. Inventors' tacit knowledge, including their judgment, creativity, capabilities and understanding of how the invention works, can make own-use of their inventions more productive than transferring the inventions to existing

firms or specialized entrepreneurs. The inventor's tacit knowledge is important because it can overcome the competitive advantages in technology implementation that existing firms derive from complementary assets (Spulber, 2012). Inventors having more experience and more proficient skills will obtain more respect. But inventors are afraid of the rapid progress of new employees who will replace them. They often reserve some knowledge when teach young employees. Therefore, the transfer of tacit knowledge in innovative enterprises is difficult. Zhao *et al.* (2012) discuss the setting of incentive mechanism in order to promote tacit knowledge transfer and sharing among employees in the case of asymmetric information and they establish the incentive model applied double auction theory. Aydogan and Lyon (2004) point out that tacit knowledge transfer among knowledge trading coalitions is unverifiable and the spatial proximity is important.

Because tacit knowledge transfer and incentives have the natural fit characters, in this paper, we propose a method to promote the tacit knowledge transfer in innovation enterprises.

RELATIONSHIP BETWEEN THE TACIT KNOWLEDGE TRANSFER AND INCENTIVES

The knowledge recipients and knowledge bodies are the key elements of tacit knowledge transfer in innovative enterprises. The employees (act as knowledge recipients or knowledge bodies) have the demands of interpersonal relationships, self-realization as well as the economic benefits. These demands play a different role in the

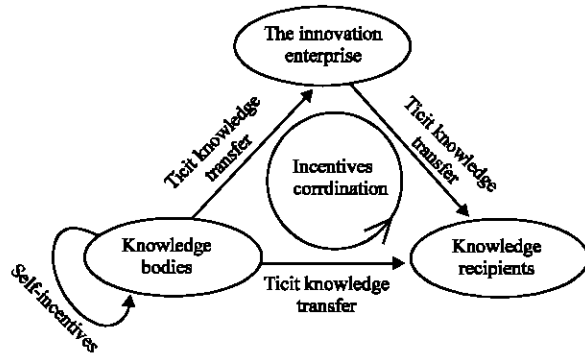


Fig. 1: Coordination relationship between the tacit knowledge transfer based on incentives

different types of knowledge source innovative environment. Based on these demands, we illustrate the relationship between the tacit knowledge transfer and incentives; it is shown in Fig. 1.

In Fig. 1, there are three kinds of tacit knowledge transfer, as follows.

Tacit knowledge transfer between knowledge bodies and knowledge recipients: When the knowledge recipients and the knowledge bodies having good relations, the mutual trust will promote the knowledge bodies to transfer tacit knowledge to the recipients. It also promotes communication and unity in innovative enterprises. Knowledge recipients and knowledge bodies are relative, the receiving party of tacit knowledge at the same time can also carry out tacit knowledge feedback and therefore they can continuously upgrade their qualities and competitiveness and drive knowledge bodies to transfer tacit knowledge. To acquire knowledge from knowledge bodies, knowledge recipients will be willing to motivate the knowledge bodies. The incentive is achieved by active activities between them; the knowledge bodies obtain the satisfactions of interpersonal relationships(Zhang *et al.*, 2010).

Tacit knowledge transfer between the enterprise and knowledge recipients: Tacit knowledge transfer and sharing can lead to synergy, both employees and enterprise can benefit from it (Zhao *et al.*, 2012). Because tacit knowledge transfer plays an important role in promoting the development and innovation of the enterprise, the enterprise is bound to encourage the tacit knowledge transfer activities. Because the asymmetric information between enterprise and knowledge bodies, the enterprises' tacit knowledge is non-structured and difficult to code, the tacit knowledge transfer and sharing

become difficult. Therefore, the enterprises should adopt incentives to promote the tacit knowledge transfer and sharing (Wijetunge, 2012).

TACIT KNOWLEDGE TRANSFER BETWEEN THE KNOWLEDGE BODIES AND THE ENTERPRISES

For knowledge bodies, interpersonal demands and self-realization are important motivating factors for improving tacit knowledge transfer in the enterprises. Good interpersonal relationships are the foundation of enterprises, only they have good interpersonal relationship, the knowledge bodies can do good works in the enterprise. In order to maintain good interpersonal relationship, the knowledge body sometimes needs to share their own experience skills of tacit knowledge, so that they can have a good interpersonal relationship and at the same time also have transferred tacit knowledge. The self-realization is the top level demand of Maslow's theory, the main working objective of employees' is to realize their values in the enterprise. Self-realization of employees is the most major factor for promoting the transferring of tacit knowledge. Knowledge bodies have a lot of tacit knowledge. Under the incentive of self-realization needs, they will strive to transfer enterprise tacit knowledge to promote the development of their own performance.

TACIT KNOWLEDGE TRANSFER MODEL IN INNOVATIVE ENTERPRISES

To do research on the mechanism of tacit knowledge transfer, we should know how the tacit knowledge transfer happen based on the internal characteristics and external transfer environment of tacit knowledge. Tacit knowledge transfer in innovative enterprises is affected by key elements: Knowledge bodies (such as inventors), knowledge recipients and the enterprise itself (such as corporate environment, corporate culture, communication platform *et al*). The staffs are the main carriers of knowledge transfer. Based on the above elements, we establish the tacit knowledge transfer model shown in Fig. 2.

The model shown in Fig. 2 expresses the elements of tacit knowledge transfer and incentives in innovative enterprises. S represents employees. S1 represents the knowledge bodies. S2 represents knowledge recipients (such as the general managers and new employees, etc). P represents positions. T represents platform, I represents the exchange. L represents communication. C represents the corporate culture. Ct represents training. (1)

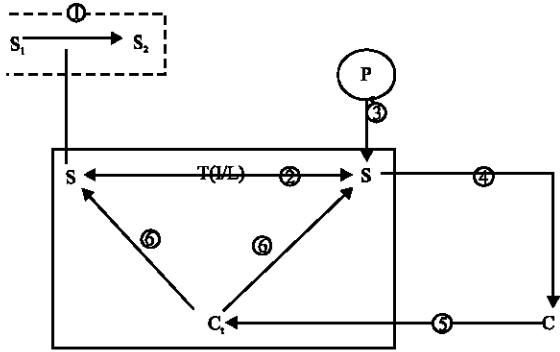


Fig. 2: Coordination of tacit knowledge transfer based on incentives

Represents the teaching process between the knowledge bodies and knowledge recipients. The knowledge bodies have worked for a long time in the enterprise and have many skills and experience and they master part of the business tacit knowledge; they are the main good bodies of tacit knowledge. Knowledge recipients mainly learn the skills and experience from the knowledge bodies and transfer the tacit knowledge from the inventors. (2) Represents the exchange and communication between employees. The enterprises develop communication and learning system or build a platform to encourage employees to use the appropriate platform to learn from each other (3) Represents staffs' job rotation. Tacit knowledge are scattered in various parts of the enterprises. The different positions in different departments have their own tacit knowledge and even some tacit knowledge is the determinants for business success. Therefore, through positions rotation, employees can learn the tacit knowledge of various posts in various departments and at the same time impart their own knowledge to the corresponding jobs. (4) Represents enterprises' culture externalization.(5) Represents enterprises' culture internalization. Enterprises' culture is the result of the co-activity of the enterprise itself. The company's core and the real essence of culture better carry out the tacit knowledge transfer and better utilize the tacit knowledge. (6) Represents coordination process during the training. According to enterprises' demand, the staffs are trained based on the enterprise's culture. So that they can understand and accept enterprise's culture and be able to go into the enterprise quickly. The training process based on coordination can contribute to tacit knowledge transfer.

We propose the function:

$$\text{Cost} = F(\text{KB}, \text{EC}, \text{TP}, \text{KR}, \text{CEI})$$

to calculate the cost of tacit knowledge transfer. The explanations of the elements are as below:

- Cost = The cost of tacit knowledge transfer;
- KB = Knowledge bodies
- EC = Exchange and coordinatio
- TP = Training platform
- KR = Knowledge recipients
- CEI = Culture externalization and internalization

The relationship between cost and main elements of tacit knowledge transfer is illustrated in Table 1.

Because the two key elements in tacit knowledge transfer are knowledge bodies and knowledge recipients, based on the two elements, we do research on the produced values of knowledge transfer. To maximize the effect of tacit knowledge transfer in innovation enterprises, we propose value formulas of the tacit knowledge transfer as follows.

In equation 1, the symbols are explained as below:

- p = The knowledge recipients obtain the value by knowledge transfer
- s = The compensation for knowledge bodies who have transferred tacit knowledge
- c = The cost of knowledge bodies who have transferred tacit knowledge
- k = The retention knowledge value of knowledge bodies
- H = Knowledge bodies have strong power to transfer tacit knowledge
- L = Knowledge bodies have weak power to transfer tacit knowledge
- f_H = Density distribution in H status
- f_L = Density distribution in L status

In equation 1, the produced value depends on the knowledge bodies and knowledge recipients. On one hand, the value come from the knowledge recipients who have absorbed tacit knowledge and output the corresponding value (p), on the other hand, the value should subtract the compensation cost (s, c) for the knowledge bodies. To maximize the value it needs to take multi-parts' advantages into consideration. Tacit knowledge is the private resource of knowledge bodies, during knowledge transfer process, the incentives mechanism should be considered. Knowledge bodies face a certain amount of cost (such as time, loss monopoly of knowledge value, etc), so the enterprises need to pay for a certain amount of cost compensation incentives for

Table 1: Relationship between cost and main elements of tacit knowledge transfer

Relationship	Knowledge bodies KB	Exchange and coordination EC	Training platform TP	Knowledge recipients KR	Culture externalization and internalization CEI
The cost decrease	Active	Many channels	Yes	Have more demands for tacit knowledge	Strong
The cost increase	Non- active	No channels	No	No demands	Weak

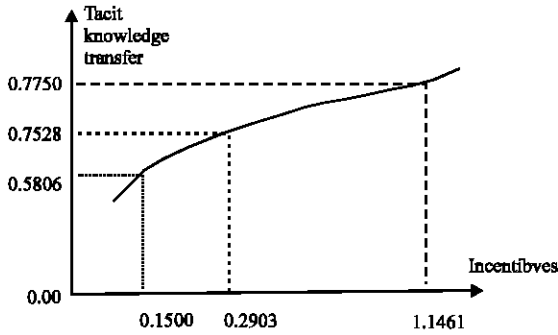


Fig. 3: Illustration of tacit knowledge transfer based on incentive

them. The knowledge recipients do not have the tacit knowledge before transferring but the tacit knowledge may produce a certain value after the knowledge recipients absorb it. Therefore, the enterprise need to pay for the value compensation incentives (such as material, monetary, knowledge, assets, honor, etc) for knowledge bodies and knowledge recipients.

If the incentives are suitable and appropriate it can enhance knowledge bodies to have strong power to transfer tacit knowledge (H) and it can strengthen the knowledge recipients to have the strong power to absorb the tacit knowledge (p). Therefore, more and more tacit knowledge is transferred and more and more values are produced (value). Based on the statistic values of initial data from 162 enterprises, the illustration of tacit knowledge transfer and incentive is established; it is shown in Fig. 3.

In Fig. 3, the types of major incentives are material incentives (such as reward incentives), by spirit inspiration (such as honorary titles) and environmental incentives (such as incentives of job rotation). Generally, the environmental incentives include environment (equipment of enterprises, enterprise system, organizational structure, etc). We can see that when the validity value of incentive is 0.15, the tacit knowledge transfer validity value is 0.5806. When incentives validity value reached 0.2903, tacit knowledge transfer validity value reaches 0.7528 while when the incentive validity value is strengthened and it reaches 1.1461, tacit knowledge transfer validity value is 0.7750. When the enterprises strengthen the tacit knowledge transfer incentive validity value, tacit knowledge transfer validity value gradually increased visible in internal enterprise.

We find that the enterprise incentive can promote the affect of tacit knowledge transfer.

INCNETIVE STRATEGIES FOR THE TACT KNOWLEDGE TRANSFER

Tacit knowledge transfer is happened among the enterprise and the knowledge bodies and the knowledge recipients. There are three kinds of incentives which improve the effect of tacit knowledge transfer: the self-incentives, the recipients' dominant incentives and the enterprise dominant incentives.

Self-incentives: To keep intrinsic incentive, on one hand, the employees should maintain a positive attitude and master his positive attitude, on the other hand, the managers should realize that initiative and enthusiasm and creativity of the employees are the survival and development of enterprises.

Recipients' dominant incentives: The knowledge transfer need the recipients have certain knowledge and suitable knowledge structure, so that they have the ability to receive the transferred tacit knowledge. The recipients should motivate themselves to learn more basic knowledge and improve their existing knowledge structure besides enterprises' training. The recipients should have the idea of lifelong learning. In addition, the recipients should try their best to keep good relationships with the employees who have rich tacit knowledge, because tacit knowledge transfer is inseparable from the harmonious atmosphere among the knowledge recipients and the knowledge bodies. It requires that the interpersonal relationships are not complex and the atmosphere among persons is harmonious. All these are good for the recipients' dominant incentives.

Enterprise dominant incentives: For tacit knowledge transfer, the enterprise dominant incentives strategies are as follow.

Enterprises' culture training: While the corporate culture is potential and it is difficult to be expressed; this requires a lot of time and effort to transfer tacit knowledge. Aimed at the problem, we change the simple form of school-based training and make it more flexible. The enterprise should establish a reasonable and

comprehensive mechanism for training and knowledge networks and also establish a training incentive mechanism.

Job rotation: Job rotation is carried among a number of different employees and managers. During the rotation process, the enterprise allows employees to receive and transfer tacit knowledge in the various departments of the company. It can realize effective tacit knowledge transfer and break the relationship chain. It also enhances the interest and freshness. But there are some problems existing during the job rotation process. Firstly, the objects and the timing of job rotation should be correct, otherwise it will produce much confusion. The enterprise achieves the suitable job rotation according to each person's abilities and characteristics. Secondly, the internal competition between departments may make inter-section not want their own talents to rotate to other departments. The enterprises should strengthen the coordination and cooperation between the departments.

Reward incentives should be given when knowledge bodies teach other employees: The enterprises should give a correct understanding to the knowledge bodies and eliminate the worries of them and strengthen their sense of belonging. If the apprentices can accomplish something, the enterprise should give some incentives to the master, so that they will be happier with other staffs when transferring their tacit knowledge. The enterprises should set up different award criteria; establish "Knowledge Contribution Award" and "knowledge contribution allocation" incentives. The enterprises may set up "Quarter of the Annual Intellectual Contributions Person of the Year" and "the Knowledge Contribution Fengyun team" *et al.* Through using the variety of media, the enterprises can propagate these deeds in the internal enterprise. So that it can promote tacit knowledge the socialization (Spulber, 2012).

Incentives should be given when they improve coordination: The Enterprises should build channels for coordination. When coordination issue becomes a problem, the internal coordination mechanism is a complex thing. Whatever it is complex, the enterprise must try to improve the channels for coordination by any means. This work requires the joint efforts from the managers and staffs. It needs to develop appropriate measures to encourage exchanges and gradually improve coordination. Suitable atmosphere incentive should be given. It is good for tacit knowledge transfer when the enterprise allow employees to accept and learn innovative corporate culture and further promote the transfer of tacit knowledge (Li, 2008).

A variety of knowledge management tools and technology should be used: A platform and technology can be adopted to promote the transfer of tacit knowledge (Chen, 2010). Today, by using of computers and the Internet, the contact among people is very convenient; accessing information has become very easy. Under the technological conditions, the employees interact with each other via LAN, knowledge maps, knowledge warehouse, web-based training system, e-mail and other tools. It can absorb tacit knowledge during the process of tacit knowledge transfer.

CONCLUSIONS

The employees have more tacit knowledge. How to draw and share the tacit knowledge is a key problem in innovative enterprise. In this study, we combine tacit knowledge transfer model and incentives together to improve the tacit knowledge sharing and transfer. We analyze the relationship among the innovation enterprises and the knowledge bodies (such as the inventors) and knowledge recipients. Based on them, we construct the tacit knowledge transfer model and propose the value formulas. We illustrate the relationship between the tacit knowledge transfer and incentives. Aimed at three key elements (knowledge bodies, knowledge recipients and the enterprise), three kinds of incentives are proposed and the corresponding strategies are proposed. Based on these strategies, the effect of tacit knowledge transfer can be improved in the innovation enterprises.

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