Tacit Knowledge Transfer Model and Incentive Strategies in Innovative Enterprises

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Abstract
Because tacit knowledge is hard to transfer in innovative enterprises, we propose a new method which combines knowledge transfer and incentives together to improve the knowledge share in innovation enterprises. According to the characteristics of the innovative enterprises, based on the two key elements (knowledge bodies and knowledge recipients) in the enterprises, we point out the relationship between the tacit knowledge transfer and incentives. Then we establish the tacit knowledge transfer model for innovative enterprises. Based on the model, the tacit knowledge transfer process and cost are analyzed, and the value formula is proposed which takes knowledge bodies and knowledge recipients into consideration. We give the incentive strategies from the perspectives of knowledge bodies and knowledge recipients and the enterprises. Through the experiment and empirical analysis, we can see that our research can improve the effect of tacit knowledge transfer in innovative enterprises by the model analysis.

Keywords: Tacit Knowledge, Knowledge Transfer Model, Incentive Strategies, Innovative Enterprises

1. 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 hided in the organizations. Tacit knowledge is considered as a source of competitive advantage for the enterprises [1]. 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 [2]. The researches show that the tacit knowledge acquisition, transfer and effective integration are major sources of competition [3].

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 [4]. 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&Wang [5] 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&Lyon[6] 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.

2. The 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 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 figure 2.

Figure 2. The relationship between the tacit knowledge transfer and incentive

In figure 2, there are three kinds of tacit knowledge transfer, as follows.

1) 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 [7].

2) 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 [5]. 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 [8].

3) 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.

3. 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, etc). The staffs are the main carriers of knowledge transfer. Based on the above elements, we establish the tacit knowledge transfer model shown in figure 1.

Figure 1. Tacit knowledge transfer model in innovative enterprises

The model shown in figure 1 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 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. By teaching and the day-to-day work, 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. The staffs learn from each other to complete the transfer of tacit knowledge by exchanging and communicating with 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. The employees become the main bodies of knowledge transfer and achieve the effective tacit knowledge transfer.

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 staff training process. 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 can contribute to tacit knowledge transfer.
We propose the function: \( \text{Cost} = F(KB, EC, TP, KR, CEI) \) to calculate the cost of tacit knowledge transfer. The explanations of the elements are as below.

\text{Cost} —— the cost of tacit knowledge transfer;
KB —— knowledge bodies;
EC —— exchange and communication;
TP —— training platform;
KR —— knowledge recipients;
CEI —— culture externalization and internalization.

<table>
<thead>
<tr>
<th>Relationship</th>
<th>knowledge bodies (KB)</th>
<th>exchange and communication (EC)</th>
<th>training platform (TP)</th>
<th>knowledge recipients (KR)</th>
<th>culture externalization and internalization (CEI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cost decrease</td>
<td>Active</td>
<td>Many channels</td>
<td>Yes</td>
<td>Have more demands for tacit knowledge</td>
<td>Strong</td>
</tr>
<tr>
<td>The cost increase</td>
<td>Non-active</td>
<td>No channels</td>
<td>No</td>
<td>No demands</td>
<td>Weak</td>
</tr>
</tbody>
</table>

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.

\[
\text{value} = \int (p - s(p)) f_H(p) dp
\]

\( \text{subject to} \)

\[
\begin{align*}
&s(p)f_H(p)dp - c(H) \geq k \\
&s(p)f_L(p)dp - c(L) \geq s(p)f_L(p)dp - c(L)
\end{align*}
\]

In formula (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 formula (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 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 figure 3.

![Figure 3. The illustration of tacit knowledge transfer and incentive](image)

In figure 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.

4. The incentive strategies for the tacit knowledge transfer

Because tacit knowledge has monopolization character and the enterprises have rigorous management, Enterprise’s managers are considerably centralized and technical experiences are concentrated in the hands. 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.

1) Self-incentives

Self-incentives include positive attitude, strong responsibility, sense of group honor, etc. The knowledge bodies have the self-incentives which play an important role in improving tacit knowledge transfer. Self-incentives are the foundational and effective incentives. Employees do not need external reward as the incentive; they set a target and achieve it by hard work. The enterprise has the duties to train the staffs to obtain the ability of self-incentives; so that the staffs can be full authorization and communication. If the staffs do not have authority, they do not have effective development and the enthusiasms and the initiatives, let alone self-incentives. If all the employees have good self-incentives, the tacit knowledge will be better transferred among the knowledge bodies and knowledge recipients and the enterprises.

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.

2) The recipients’ dominant incentives

To obtain the knowledge from the knowledge bodies, the knowledge recipients are willing to give incentives to knowledge bodies. And the incentives are realized by co-activities. It can work because
it meets demands of personal relationships and completed knowledge.

The good relationships and co-believe can improve the tacit knowledge transfer between knowledge bodies and the knowledge recipients. And knowledge recipients and knowledge bodies are relative, when the recipients accept the tacit knowledge from knowledge bodies; they can also feedback tacit knowledge. Then the tacit knowledge transfer can make the recipients improve their self-abilities and competition, it also motivate knowledge bodies to transfer tacit knowledge.

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.

3) The enterprise dominant incentives

The tacit knowledge transfer is good for enterprises’ development and innovation. The enterprises inevitably encourage the activities of tacit knowledge transfer and the dominant incentives. The enterprise dominant incentives include the fair incentive environment and opportunities, etc. The enterprises dominant incentives are made for knowledge bodies’ incentives and recipient incentives. For example, the incentives may be material incentives, spirits incentives and environment incentives. The material incentives include economical and stock incentives, etc. The spirits include improving the employee’s job and honor. Environment incentives include giving the comfortable environment to the staffs, which can help the knowledge bodies to transfer the tacit knowledge.

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

① Enterprises’ culture training

The enterprise’s culture is gradually formed by all managers and employees in their daily work. The employees must continue to accept corporate culture and to work accordingly [9].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, such as the interaction between the knowledge bodies and the knowledge recipients. Further more, it needs a variety of exchanges with new employees, so as to continuously transfer tacit knowledge to them. The enterprise should establish a reasonable and comprehensive mechanism for training and knowledge networks, and also establish a training incentive mechanism.

② Job rotation

For both managers and ordinary employees, if they resident in a post for long time, they are bound to become bored and even form a complex interests relationship or forces groups, and seriously affect the corporate work and affect the tacit knowledge transfer. In this case, the enterprise can be targeted for 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. Through the rotation process, the transferring of tacit knowledge is happened. Secondly, the internal competition between departments may make inter-section not want their own talents to rotate to other departments. The enterprises should strengthen job rotation, and they should also strengthen the coordination and cooperation between the departments.

③ Reward incentives should be given when knowledge bodies teach other employees.

New employees in the enterprise lack of understanding and recognition of the corporate culture, and they also lack of job skills and experience. They could not meet the requirements of jobs. Therefore, it requires the enterprise to have effective training mechanisms for new employees. It is easy for knowledge bodies to pass skills and experience to new employees, so that tacit knowledge transfer is happened. But the effect entirely depends on knowledge bodies; and the dependence of variety of tacit knowledge transfer path. In addition, for the knowledge bodies’, they may be afraid of an apprentices
mastering all their tacit knowledge, and which makes their face the loss of technical experience and
important tacit knowledge. Dealing with this problem, 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 (such as bulletin boards, the report), the enterprises can propagate
these deeds in the internal enterprise. So that it can promote tacit knowledge the socialization [4].

④ Incentives should be given when they improve communication.
Internal miscommunication is inevitably a serious impediment to the tacit knowledge transfer. Whether tacit knowledge is difficult to specific written and transferred, it more often relies on
communication between people. Tacit knowledge can be better transferred only based on smooth
communication. The Enterprises should build channels for communication. When communication issue
becomes a problem, the internal communication mechanism is a complex thing. Whatever it is complex,
the enterprise must try to improve the channels for communication 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 communication. 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 [10].

⑤ 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 [11]. 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.

From the above analysis, the self-incentives are often related to the enterprise dominant incentives
and the recipients’ dominant incentives. If the enterprise dominant incentives are perfect, it will help
improve the recipients’ incentives and the self-incentives. And good self-incentives can help the
recipients’ dominant incentives. Because tacit knowledge transfer has the reciprocity, the good
recipients’ dominant incentives are good for self-incentives. [12]

5. Conclusions

Research has established that 42 percent of the organizational knowledge resides in the brains of the
employees but the organization loses it and when they leave the organization [8]. The result is that
these employees have more tacit knowledge. How to draw and share the tacit knowledge is a key
problem. The same problem exists in innovative enterprise also. To solve the problem, we need to
transfer tacit knowledge from these staffs as much as possible. In this paper, 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.[13]

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6. References


