

THE CONSTRUCTION OF OPEN INNOVATION PARADIGM

A Perspective from the Knowledge Management

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Abstract: In a highly competitive time, innovation is the foundation and necessary conditions which keep the ability of manufacture competition and survival. But innovation is a high failure rate and high-risk activity with market and technical uncertainties. With the rapid development of science and technology and rapid change of customers' demand, the traditional closed innovation paradigm can not maintain the competitive advantage of company. In this situation, a new innovation paradigm-open innovation comes out and compensates the disadvantages of closed innovation. In the open innovation paradigm, companies can obtain external knowledge resources to improve the ability of knowledge management. From the perspective of knowledge management, this paper analyzes the characteristics of open innovation paradigm and the relationship between open innovation and knowledge management. According to the analysis result this paper will put forward some useful suggestions about how to construct of an effective open innovation paradigm.

1 INTRODUCTION

For years, the logic of closed innovation was tacitly held to be self-evident as the "right way" to bring originality to market and successful companies all played by certain implicit rules (Chesbrough, 2006). But With the rapid development of science and technology and rapid change of customers' demand, the traditional closed innovation paradigm can not maintain the competitive advantage. Only depending on a company's own ability to accumulate knowledge to innovate can be hardly to adapt to the rapid changed demand of market. Most innovation resulted from borrowing rather than invention (Cohen, 1990). The ability to acquisition external knowledge has been the key factor of successful operation for companies (James, 1996).The traditional closed innovation paradigm has been already difficult to continue functioning in a lot of industries. In this situation, a new innovation paradigm-open innovation which can attract external knowledge and originality flow into a company comes out and has gradually taken the place of closed innovation paradigm.

The open innovation paradigm is brought out by the American scholar Henry Chesbrough and has received increasingly attention in scientific research.

But so far most of the research basically focuses on the nature and the influencing factors of open innovation drawing on in-depth interviews and case studies (e.g. Chesbrough, 2003; Kirschbaum, 2005). Few studies have demonstrated that the open innovation paradigm has its special application scope. Because of the differences in nature, products and environment, not all of the companies are suitable for open innovation paradigm. So it is meaningful to analyze the scope of application of open innovation paradigm to instruct the choice of appropriate innovation paradigm.

Moreover, all of the research focuses on very specific industries, for example open source software (Henkel, 2006) or tabletop role-playing games (Lecocq and Demil, 2006). Whenever large samples of enterprises are explored, the focus is on specific issues rather than the full open innovation paradigm (e.g. Laursen and Salter, 2006; Chesbrough, 2003). With the increasing role of knowledge in the innovation process, to realize the relationship between open innovation and knowledge management and put forward generally applicable method to construct open innovation paradigm for most companies are problems that needed to be solved at present.

So this paper will analyze the application scope of open innovation and the relationship between open innovation and knowledge management. According to the analysis result this paper will put forward some useful suggestions about how to construct of an effective open innovation paradigm to develop knowledge management.

2 OPEN INNOVATION

2.1 The Principle of Open Innovation

Open innovation has been proposed as a new paradigm for the management of innovation (Chesbrough, 2003; Gassmann, 2006). It is an opposite innovation paradigm of the traditional innovative independent model which now is called closed innovation paradigm. It is defined as “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and to expand the markets for external use of innovation, respectively.” (Chesbrough teal., 2006).

Open innovation means that companies can use external knowledge and originality as well as internal knowledge and originality, and internal and external paths to market as well. Open innovation emphasize the role of other departments besides internal R&D department, emphasize R&D collaboration with outside business units, emphasize integrating internal and external knowledge, and also emphasize outside distribution to market (Jin Chen, 2005). Open innovation principles therefore describe how to deal best with strategic assets in order to meet market demands and company requirements (Oliver Gasman, 2004).

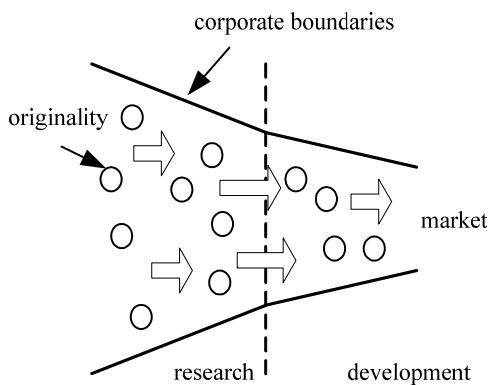


Figure 1: The closed innovation paradigm.

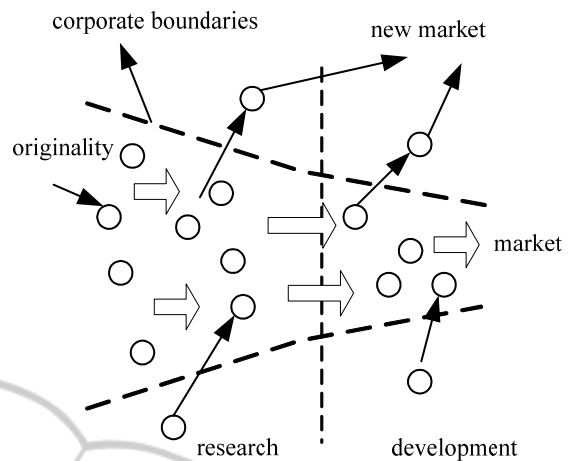


Figure 2: The open innovation paradigm.

In order to make further analysis about the nature and characteristic of open innovation paradigm, we compared the two paradigms to let the readers understand the basic meaning of open innovation paradigm. Figure 1 and Figure 2 display the structures of two paradigms.

Under the closed innovation paradigm the originality comes from inside and flow only by the inbounds of the enterprise. Under the open innovation paradigm, the originality may come from inside and outside because the boundary of companies will no longer be closed. The originality will not flow unidirectional inside of the enterprise, but interpenetration between the internal and external world. This originality may enter the market through internal channel or may enter other markets through external channel too. Table 1 shows the difference between two paradigms and it will help us know open innovation more clearly (Henry Chesbrough, 2003). With open innovation paradigm, companies can acquire all kinds of resources they needed from outside and advance the innovation capabilities. Enterprise becomes open, cooperative, dynamic integration more and more to make full use of resources internally and externally (Jin Chen, 2005). So it is very useful for most enterprise to understand this new innovation paradigm and construct open innovation paradigm successfully.

Table 1: Differences between closed innovation and open innovation.

Characteristics of closed innovation	Characteristics of open innovation
All of the smart staffs work for us in this field.	All of the smart staffs work for us in this field.
To obtain interest from R&D we must create and invent by ourselves	To obtain interest from R&D we must create and invent by ourselves
If we carry on the innovation research, we will be the first to bring our new products into market.	If we carry on the innovation research, we will be the first to bring our new products into market.
The companies that turn technology into the products first will be winning in the competition.	The companies that turn technology into the products first will be winning in the competition.
If our originality is the best in our industry, we can prevail over competition unquestionably.	If our originality is the best in our industry, we can prevail over competition unquestionably.
If we keep our intellectual property firmly, our rivals will be unable to get profit from our innovation.	If we keep our intellectual property firmly, our rivals will be unable to get profit from our innovation.

2.2 Scope of Application of Open Innovation Paradigm

With the development of economic globalization, the communication and cooperation among companies become more and more frequent, so the open innovation paradigm seems to have advantages compared with closed innovation paradigm. But not all industries should abandon the closed innovation paradigm and not all industries are suitable to construct open innovation paradigm. Although under the present economic environment, the applicable scope of the open innovation paradigm is more extensive than the closed innovation paradigm, open innovation is not useful for all industries. Different industries are suitable for different innovation paradigm according to their characteristics of R&D and innovative environments.

The external environment and the research characteristic of an enterprise determine whether it is suitable for the open innovation paradigm. The key factors that influence the selection of innovation paradigm of companies are showed in figure3 (Darrell K. Rigby, 2002). It includes power of innovation, capital resources of innovation, universality of innovation, fluidity of knowledge workers, competitive pressure of industry, fluctuation of the market.

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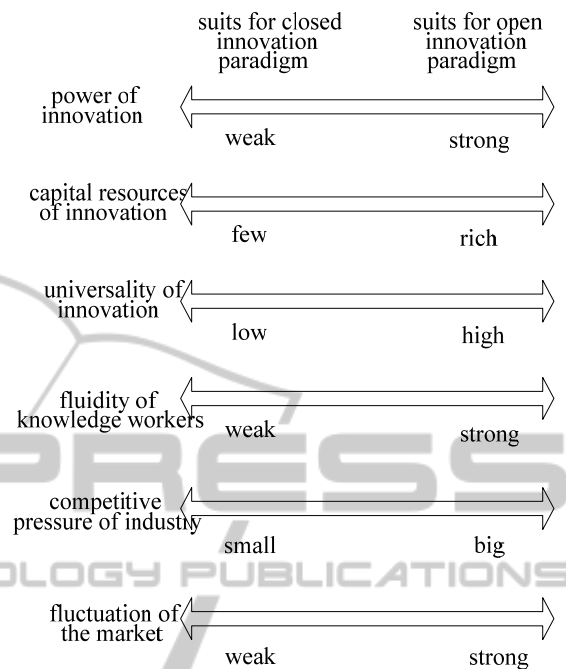


Figure 3: Six factors of the selection of open innovation.

From Figure3 we can find out that the scope of application of open innovation is limited certainly. The companies or industries that suit for this paradigm have certain similar characteristics. For example, if one industry has many capital resources of innovation and the universality of innovation among this industry is high, the companies in this industry are suitable for applying the open innovation paradigm. Therefore when companies choose innovation paradigm they must first consider these six factors from their own industries so that to sum up their own characteristics and choose the innovation paradigm that fits best.

3 OPEN INNOVATION AND KNOWLEDGE MANAGEMENT

3.1 Innovation and Knowledge

Companies rely on their ability to create new techniques or to improve their business processes in order to succeed in the market. This ability is based on the knowledge within the company represented as the individual knowledge of every employee and the culture within the organization. The organization

structure, the culture and the people determine the way a company does business and thus the company's knowledge. Different approaches deal with knowledge representation and knowledge transfer within a company.

A basic result in this field of research is the unease of spreading or reusing knowledge as a basis for innovation. This applies not only to diffusion processes within organizations, but is even more important on an inter-organizational level. The concept of "cognitive distance" has been developed to deal with this problem. Companies which do not already share any knowledge about markets or technologies must make great efforts to communicate and to exchange originality. Spill-over effects as an unwanted form of sharing knowledge between different organizations are facilitated by having the same historical background or a kind of "cultural" closeness (Hullmann, 2001). Under the aspect of an evolving company as part of an evolutionary economy, bounded rationality and cognitive distance lead to a determined development of their knowledge assets. Organizations stay in their "track" as a result of these constraints and the development is specified as path-dependent. This does not warrant successful decisions "while coping with surprises in the unfolding of history" (March, 1991).

3.2 Open Innovation and Knowledge Management

Open innovation follows along tradition of studying the processes of innovation and stands on the shoulders of many previous scholars. Acquisition external knowledge is a very important component of knowledge management. To obtain external knowledge can maintain a competitive position on the long term radical innovation. To develop new product or service, companies must to accumulate enough knowledge and the open innovation is a very efficient way to acquisition external knowledge.

Nathan Rosenberg asked the question, why do companies conduct basic research with their own money (Rosenberg, 1994), and answered that this research enhanced the firm's ability to use external knowledge. There are four main external sources of useful knowledge in the open innovation paradigm: (1) suppliers and customers; (2) university, government and private laboratories; (3) competitors and (4) other nations. Companies can construct cooperate network with these organization and persons as a mean of incorporation external knowledge into the innovation processes. So we can

say that: the external knowledge plays at least equal role to internal knowledge in the open innovation paradigm of companies. The open innovation paradigm can help companies to acquisition useful external knowledge effectively.

4 CONSTRUCTION OF OPEN INNOVATION PARADIGM

At present, the open innovation gets more and more attention from many countries all over the world. But at the same time, the malignant competition among companies and the phenomenon of repeated R&D input are universal. The traditional closed innovation occupies the leading position in most companies. The closed innovation paradigm leads to waste of innovation input. Much originality is died inside of organization and do not make any profit for the organization. Therefore it is urgent for companies to develop the open innovation paradigm to obtain external knowledge and to improve the present situation of knowledge management and innovation.

With regard to the real conditions of innovation in China, the open innovation paradigm provides a good opportunity to improve technological innovation capabilities and competitiveness. However, open innovation does not just happen. It requires changes in corporation culture and must be driven from the top (Henry Chesbrough, 2004). This article will put forward some suggestions of how to construct the open innovation paradigm in the Chinese companies.

4.1 Establish Open Psychology among Organization Members

Once companies decide to develop the open innovation paradigm, they must first make the internal members of organization understand and approve this new paradigm. Only when the organizational members realize the real essence and advantage of this paradigm can the open innovation paradigm be construct and develop successfully. The barriers that handicap the fluxion of originality will be clear up when the organization members' open psychology established.

In order to establish open psychology among organization members, companies should first realize the essential organizational diversification at first, for instance the diversification of organization structure and the scope of R&D. The essential

diversification will help the enterprise cope with the flexibility and complexity of the competition environment by integrating the information rapidly and insure that the innovation of organization can reach the requirement of the levity environment. The originality will flow freely inside and outside the organization and the enterprise will not falling into the self-close state.

Secondly, the top manages should impel staff to study external knowledge constantly by all useful methods. Because only by studying, can the staff understand the complexity and levity of the external environment? With the new knowledge and information the staff can make correct forecasting of the environment and can develop more innovations correspondingly. In order to create superior study and R&D environment for staff, companies should not only offer material conditions and learning opportunities for them, such as meeting room, laboratory, relevant materials database, but also need encourage them constantly to promote the initiative of study and research.

4.2 Set up the Special Innovation Group

The companies that choose constructing open innovation paradigm must set up one powerful central organization which can be used to train some experts engaged in innovation trade. This central organization is call special innovation group. The experts that are elaborately trained by innovation group need the skills and knowledge about laws, contract, patent authorization, making investment and strategic alliance. All of the knowledge is necessary for open innovation construction and development. Innovation group takes charge of the collection of originality whether they come from inside or outside. Another responsibility of the special innovation organization is to evaluate technicality and commerciality of this originality. If the originality have good market prospect the organization should serve relevant resources such as manpower, fund, technology, and apparatus for the further development of these originality. In addition, special innovation group is also responsible for transferring the inside intellectual properties that are not adopted temporarily to whom need the originality, so these intellectual properties can also bring profit for enterprise.

The special innovation group should use rational and proper method to evaluate this originality. The effective method is that the group should first carries on the assessment carefully to each originality and

has a long talk with the originality initiator to master the basic idea of the originality, then refers the originality and essential implementation to relevant top managers. By this way the possibility that the originality is accepted by top managers will be greater.

4.3 Set up Open Innovation Operating Mechanism

The companies which implement the open innovation strategy should define their own key ability and developing direction consistently. According to the developing direction, companies can make one's own long-term Innovation Road Map. Secondly, the implementation of Innovation Road Map must adopt open originality which absorbs strength to accelerate the realization of Innovation Road Map without considering the strength comes from inside or outside. This open originality will help the enterprise invent the open innovation paradigm quickly. Third, open innovation operating mechanism must have the relative organization mode to support this operating mechanism. The main organization modes that companies can apply are showed in Figure4.

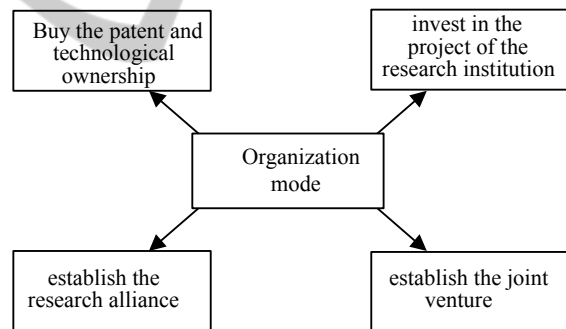


Figure 4: The main organization modes of open innovation operation mechanism.

4.4 Implement the Control Measures of the Risks

Because the open innovation paradigm is a loose, flexible innovative paradigm and is implemented under the relatively open environment, it possesses the risks that the closed innovation paradigm doesn't have. Therefore it is necessary for the companies which choose constructing the open innovation paradigm to take essential measures of risk avoidance to prevent this kind of risks from taking place. We can avoid the emergence of this kind of risks from several following respects. The first

measure is to improve the management of internal human resources and standardize the personnel rules and regulations. This measure will be helpful to the stability of organization structure and will prevent the loss of core research staff. Secondly, the companies should strengthen their early assessment ability of originality' commercial potentiality and evaluate all potential commercial potentiality of "flows out" and "flows into" originality, so that they can avoid the commercial losses. Third, enterprise should establish Venture Capital Company engaged in the investment management of new "flow out" and "flows into" originality. Finally, in the environment of knowledge diffusing quickly, the companies should improve their management ability of intellectual property to promote the control ability of leakage risk about enterprise's knowledge and technology and obtain certain profit through technological transfer and protection of intellectual property right.

5 CONCLUSIONS

Open innovation paradigm can improve the ability of knowledge management and construct competitive advantages of a company. Open innovation brings many benefits to promote external knowledge acquisition capability and innovation capability of most companies. Compared with the traditional closed innovation paradigm, it has much wider application scope in present economic environment. But we must remember that not all industries and companies are suitable for the open innovation paradigm, this paradigm has its special application scope which is influenced by many factors. Therefore when companies choose innovation paradigm they must first consider these factors from their own perspective.

Once companies choose the open innovation paradigm they should take a series of measurements to construct and develop the innovation paradigm. These measurements include: establish open psychology among organization members, set up the special innovation group and open innovation operating mechanism and implement the control measures of the risks. Besides these measures that the companies need take by themselves, the government should improve the legal environment to benefit the construction of open innovation and provide a proper environment for the development of open innovation paradigm.

This paper analyzes the application scope of open innovation and the relationship between open

innovation and knowledge management. According to the analysis result this paper forwards some generally applicable suggestions about how to construct of an effective open innovation paradigm to develop knowledge management. So this paper made up the research deficiency currently in technological innovation.

Because of limitations of space and time, we have not analyzed the repetitive R&D in technological innovation process, so how to apply the open innovation paradigm to resolve the problem of repetitive R&D will be an important direction for our future studies.

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