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Library Resources and Information Services for Innovation of Enterprises: A Case Study of SMEs in China

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Abstract: The background and development process of China's intellectual property rights(IPRs) is reviewed and current plight of China's IP is analyzed. A way out of the IP dilemma is proposed based on library resources and information services. The study focuses on the awareness, creation, protection, utilization and management of IPRs for enterprises with the purpose to reduce and avoid the risk of IPR violations, to help promote the competitiveness of self-owned IPRs, to establish next R and D strategies correctly and to increase international market competition abilities. The abundant information resources in the library, the complete and accurate information retrieval services and the specialist in patents analysis in the university can be developed for the innovation of small-and-medium-sized enterprises (SMEs), which could save money and time on the construction of IPRs for the companies which have insufficient funds and financing difficulties.

Key words: Library resources, information services, intellectual property, medium-sized enterprises, SMEs, innovation strategy

INTRODUCTION

The national and international innovation environment, to which the small-and-medium-sized enterprises (SMEs) are exposed, keeps changing. The knowledge-based economic environment makes Intellectual Property (IP) management attract increasing attention. This tendency is strengthened through the internationalization of markets and the rapid development of information technology. IP protection is considered to be the crucial appropriability mechanism for some SMEs in order to survive and to appropriate benefits from their innovations in the market. As Tran Viet Hung said in his "SMEs and Supply Chains", IP enhances the market value and the competitiveness of SMEs, IP is an investment and is crucial for marketing the products and services of SMEs (Hung, 2007). The strategic utilization of IP assets can substantially enhance the competitiveness of SMEs (De Rassenfosse, 2012). With the main objective to investigate the relevance of IP systems for British SMEs, "Intellectual Property and Innovation Management in Small Firms" reveals a clear correlation between company size and the use of an IP system (Blackburn, 2003). SMEs have a huge innovation potential and furthermore are increasingly affected by global competition, but rarely make use of any intellectual property rights (IPRs) (Friesike *et al*., 2009).

Essentially being a closed economy since Mao Zedong Era, the Communist state of China experienced a transition from a planned economy to a market economy when Deng Xiaoping came to power in 1978. China joined the World Trade Organization (WTO) in 2001, which is an event of great significance in world trade history. Now China has experienced manifold changes in its economic system after over 30 years of reforms and opening-up. But, China still needs to adopt the policy of the market economy 'heart and soul' as one Chinese government official said. China has a long way to go in a market economy. Also, China experienced an evolution of a China patent system. China joined the WIPO in 1980, passed the Patent Law in 1984 which came into force in 1985, acceded to the Paris Convention in 1985, to the Budapest Treaty in 1986, the Patent Cooperation Treaty (PCT) in 1994 and joined the WTO in 2001, which necessitated acceding to TRIPS. China amended the China patent law in 2001 and again in 2008. China's IP construction is more than 100 years later than developed countries, so, it is hard for China to Operate Intellectual Property (IP) very well and catch up with them. China's enterprises are facing opportunities and challenges to IPRs. Much work has been done facing the opportunities and challenges to IPR (Kochhar, 2011).

To arouse the Chinese awareness of IP protections, China's government launched some incentive and

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compulsory certification regulations to require companies to submit their patent applications for approval to do business. This, to some extent, brings about some negative effects including huge increases in patent applications with a decline in the quality, like low grant rate of invention patent applications. Utility patents are easy to be invalidated because utility patents only need a normal examination, not a substantive examination in China. All these induce IP conflicts with other countries, although it is not the original intention of China's government.

"For the United States, the No. 1 problem with China's economy is probably intellectual property theft." said the New York Times on Jan 11, 2011, with the title "China and Intellectual Property Theft". Chinese companies submit massive numbers of applications for intellectual property protection and these can exert pressure on foreign competitors (Nack, 2010). China's political system permits violation of intellectual property rights and encourages employees to forge academic credentials, companies to manufacture counterfeit products and researchers to publish fake study results (Gilboy and Heginbotham, 2013). This is not the case in fact, since IP violation more or less exists in various countries. No nation has a suicidal political system to permit or encourage their people to do these bad things. China's government has taken a variety of measures to stop such bad behaviors. It is a long and hard process. It is imperative to accelerate the construction of IP protection to support technological innovation in China and to better handle relationship with other countries in the IP area. This paper focuses on some ideas for China's enterprises to make good use of IP, the double-edged sword in worldwide competition.

SMEs have less IP aware than lager companies and that promoting IP awareness to smaller companies is vital to the IP system's success (Pitkethly, 2012).The SMEs have played a vital role in the development of China's economy. The number of SMEs makes up 99% of the total enterprises in China, generating about 60% of gross domestic product, accounting for 65% of patents, 75% of technological innovations and 80% of new product developments according to Zhu Hongren, chief engineer from the Ministry of Industry and Information Technology. SMEs now account for nearly 60% of all non-government employment.

In this globalizing, knowledge-based economy, SME development in China has been severely affected. Innovation is now a critical force to retain an enterprise's competitive strengths, but SMEs face several limitations in carrying out innovation activities.

Their comparatively weak financial and technological backgrounds cannot sustain enormous R and D costs and the fast pace of technology development cycles. It is generally difficult for SMEs to invest in long-term innovations. Many SMEs don't use patents because of the costs, including both patent application costs and the costs for defending a patent. During the early period of China's IP construction, SMEs face the challenges of new and emerging technologies and IP traps in national and international competitive markets. They suffer from a lack of innovation facilities and resources including information resources to provide information support, which came at high costs. The uncertainty and the continuing changes in the legal framework require significant efforts to keep the companies informed about the IP framework, which smaller companies tend to fail to do owing to their often limited IP resources. The ability of R and D personnel to search and utilize information should be improved, which is a long process. Many small companies don't have their own specialist patent analyst. They also suffer from the lack of experiences in IP business.

What should China's SMEs do? A firm can speed up or intensify its generation of intellectual property right assets by introducing well-developed management practices, even without reorienting its intellectual property strategies (Li and Ni, 2012). Building IP awareness is the first step. Everyone should know that violation of IPR is illegal and must be heavily punished by IP laws in the future. Many IP infringement issues happened and the practical lessons from IP cases should be learned by those enterprises. To avoid going bankrupt, avoid IP theft because chances are that your behaviors may be discovered by the IP owners or your competitors resulting in a high cost patent infringement suit. So, China's SMEs need information resources and human resources from outside to step out of the dilemma as soon as possible.

METHODS

Policy of China's government encourages co-operation in terms of production, education and research. Universities abundant academic information resources, professionals in various disciplines, information retrieval experts and patent information analysts should be well used in the construction of SMEs' IP. Actually, universities can provide enterprises with IP outsourcing services and high value-added personalized information service products based on the above resources. The professional service is helpful for enterprises to overcome some difficulties, to turn to a

right path and to have a healthy and rapid development in the journey of IP business. Moreover, this kind of outsourcing service solves the problem of shortage of funds in purchasing of resources and personnel training and speeds up the process of IP building.

Services around the creation of IP: On the creation of enterprise intellectual property, Universities can provide the following services. Analysis of the product and technological lifecycles, technological development path, the technological development trends and prospect forecast, offering insights to enterprises on opportunities and challenges; Analysis of the key (core) technology, technological structures and performance as reflected by patent indicators (Frietsch and Schmoch, 2006), current technology gaps, related patent technologies and providing technical references; To speculate the R and D investment trends of the new products or new technologies; To know the technological trends and active periods; To mine the more active technologies or technical fields at a standstill in a given period; To explicit technology-intensive areas, intellectual property landmines and the possibility of design around, or to sign IP cross-licensing agreements; To analyze the profitable areas that have not been developed; To find the location of an enterprise's technology and to look at whether there are other competitors patents, which can be used as a preliminary basis for tort judgments; To provide enterprises with a basis to build technological development strategies; To know the promising new technologies and new products at home and abroad in short and long terms. The specific idea of the above service is shown in Fig. 1 and 2.

Services around the protection of IP: Avoid infringing other IPR and being sued for IP infringement. Presently, the competition of enterprises in brand and technology has become increasingly prominent. More and more companies choose to cooperate with R and D to introduce technology, to OEM (original equipment manufacturer) to form a complete production network and other ways to achieve objectives of production and operation. IP has been the focus of conflict of business interests and the fuse of business disputes

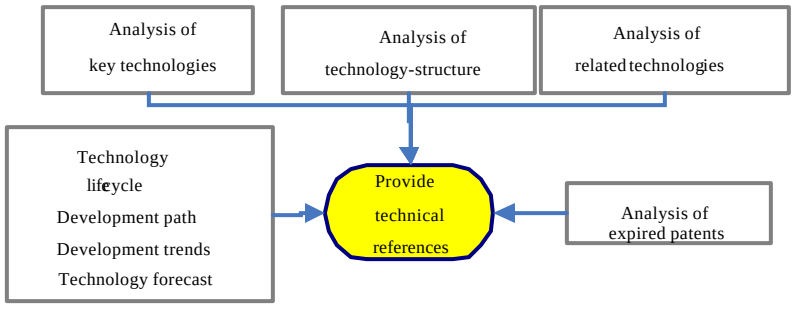

Fig. 1: Technical references for enterprise's decision makers

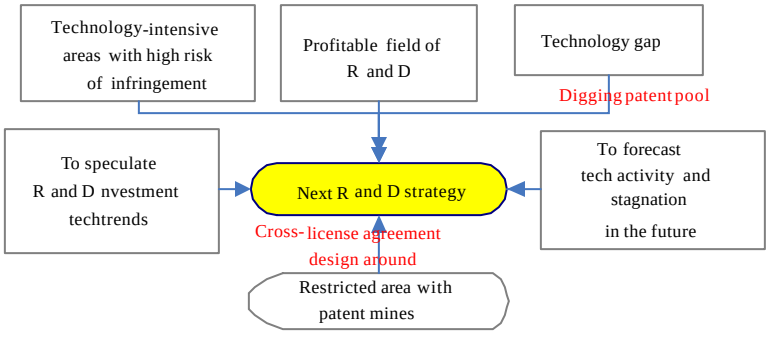

Fig. 2: Next R and D strategy counseling for enterprise's decision makers

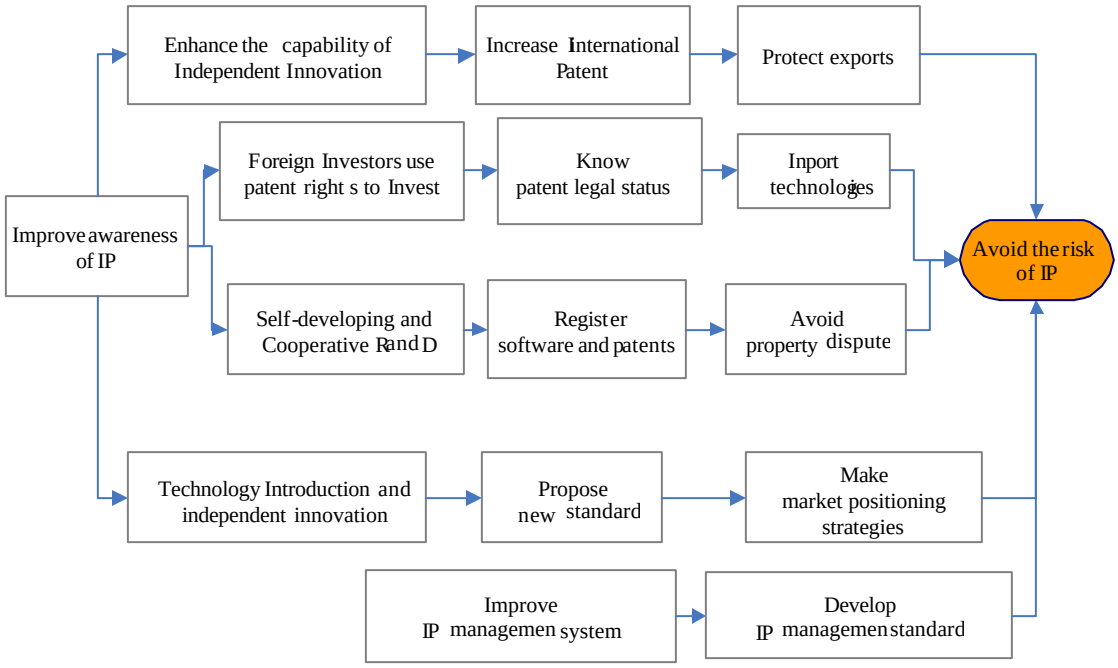

Fig. 3: Analysis of avoiding the risk of IP infringement for enterprises

(Chen and Cao, 2006). Universities can provide enterprise with services to avoid being infringed and infringing in IP based on retrieval and analysis of patent information as follows: to study the IP risks of enterprise during its R and D activities, production and trade based activities; to study how to avoid the risk of IP infringement during the business process of export products, technology transfer, R and D disputes and market occupation; to analysis of the situation of patent applications, legal status, rights of patent holders and the state of transfer to ensure keeping away competitor's minefields during the production and business process. The specific process of avoiding infringement is shown in Fig. 3.

Making patent protections a part of the patent applications: It is important to do an information searching before patent applications. There are abundant academic resources, including patent documents and non-patent literature such as journal articles, conference papers, dissertations, books, etc. in the University libraries, which can be used to provide a patent agent with a reasonable basis for the demarcation when he writes a patent application for the enterprise. A good demarcation in a patent application will enhance the probability of authorization, expand the scope of patent protection, reduce the probability of an authorized patent invalidated and improve the stability of utility model patents.

Don't be cheated by IP lies: Before the introduction of technology, import and export, technology transfer or patent licensing, retrieve evidence of existing technologies to make the verification of the validity or invalidity of the alleged intellectual properties. Besides these, it is also important to invite qualified patent attorneys when the enterprise experiences the IP litigation. Also, it is necessary to examine the patents involved in the finished project by others, or to check the authenticity, legal status, ownership and validity of the patents, which can provide a reference for decision makers before acceptance of the enterprise project or achievement transformation.

Service around the use of IP: Use the IP "sword" to see competitors clearly and arm yourself. Universities can provide enterprises with the basis to make overarching plans on defensive or offensive patent strategies to get the competitive advantage, long-term survival and continued development. It can be conducted by analysis business competitors.

To analyze competitors to decide whom to avoid, cooperate with, or for benchmarking; to know the specific technical orientation which is required, advanced or blank; to design the patent layout before the patent application to choose the areas to build barriers and implement patent defense strategies; to provide decision

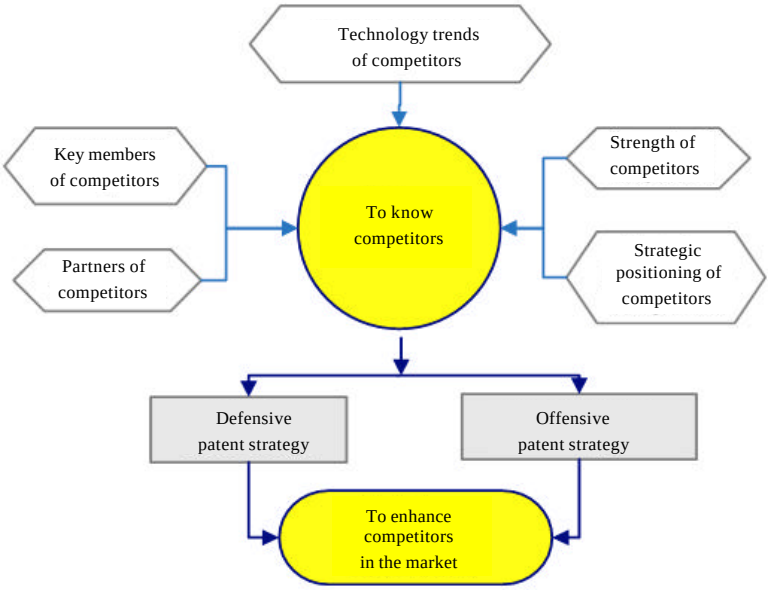

Fig. 4: Way to enhance competitiveness in the market

makers in the enterprises with the basis for putting forward strategic measures to implement counterattack patent strategies to enhance corporate competitiveness in the international markets. Specific idea is shown in Fig. 4.

CONCLUSION

It is necessary to improve the awareness, creation, protection and utilization of intellectual property rights for China's SMEs to overcome the challenges and difficulties and step out of the IP dilemma. Library resources and information services play an important role in the innovation of enterprises in China. With the help of universities' offering IP information services and IP strategy analysis, China's SMEs could reduce IP violations and protect themselves through IP laws, enhance the ability of independent innovations and core competitiveness and know their competitors clearly. In this way SMEs could make reasonable IP strategies and win in the national and international markets.

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