Study on Patent Portfolio Strategy of Chinese Enterprises under Knowledge Economy Background

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Abstract. As the important part of enterprise technology innovation or research and development strategy, patent strategy has already became an important strategy which can tackle competition and intensify competitive advantages. Under the new normal of economy, Chinese enterprises have a significant impact in international competitions. Under the knowledge economy background, intellectual property management has already become the priority task in enterprise management. This paper analyses existing enterprise patent portfolio strategy from the angles of technology life cycle, patent alliance and patent quantity. Moreover, proposed patent portfolio suggestions for Chinese enterprises.

Introduction

Owing to the rapid development of globalization, information science and network technology, traditional industrial age has already been transformed into the era of knowledge economy. It is different from agricultural society and industrial society in the past[1-2]. With the continuous increase of knowledge content in production tools and labor object, talents and knowledge have become important resources, and knowledge-oriented labor has turned into the center of production and operation activities[3]. In the list of Global 500 in 2016, 97 Mainland enterprises are included. Faced with the severe economic situation, enterprises should pursue innovation continuously, so as to make a progress. With the strengthening of the effect of technology and knowledge on global economic development and company operation, more and more enterprises begin to focus on technology, knowledge and patent fields in competition gradually[4]. Whether enterprises master intellectual property such as key technology, knowledge or patent becomes the key to strategic competition [5].

As the important manifestation form of technology, patent is the reflection of technological innovation achievements[6]. In recent 20 years, the patent law system of various countries has improved a lot. Due to the strengthening of law enforcement efforts about patent protection, strategic management has been conducted for patent as a property of the enterprise gradually. Moreover, the value is fully utilized. In recent years, enterprises in countries like America and Japan have contained the competitive advantages of Chinese enterprises in international market by repeatedly utilizing their perfect patent system and mature patent strategy. These developed countries have formed a new barrier with patent. Chinese enterprises are in a vulnerable position in the aspect of international protection for intellectual property like patent. As a result, many Chinese enterprises are forced to pay very high patent royalties, and the corporate profit is reduced substantially. On the other hand, intangible assets such as patent have become the most important profit sources of many companies gradually. Many transnational corporations even set provoking of patent disputes as an operating strategy, thus a more extensive and flexible competitive advantage protection mechanism is formed [7].
Enterprise Patent Portfolio Strategy

In patent layout of enterprises, patent portfolio strategy is widely used. In order to protect key patent technology from being threatened, the enterprise will establish patent portfolio based on key patent technology field by centering on key patent. Therefore, the competitors unable to enter the market by avoiding the patent portfolio. Besides, the enterprise can occupy a monopoly position in the market of this field[8]. Patent portfolio refers to a single enterprise or multiple enterprises effectively combine several patents associated with but obviously different from each other into a patent aggregation, so as to express the effect that cannot be or can hardly be realized by a single patent[9]. Patent portfolio theory was proposed by the Holger Ernst who established the technology investment portfolio method by applying patent data[10]. In this way, excessive subjectivity of traditional portfolio methods is avoided and powerful supports are provided for the formulation of a reasonable patent strategy. With the enhancement of intellectual property protection in various countries, patent portfolio strategy has already became a new strategy form of enterprises.

Patent Portfolio Strategy Based on Technology Life Cycle

As for this strategy, patent portfolio strategy is formulated from the full life cycle angle of the enterprise product research and development to final marketing. Logistic growth model shows [11] that the path of technical progress develop is not random, it follows the life cycle track in the form of S curve. Patent activity will also present different trends according to different life cycles. Figure 1 displays the S-curve model of technology life cycle. The horizontal axis is time and the vertical axis is patent application amount. S-shape evolution will also appear in the description of technological development trend, which is called technology diffusion or technology adoption process [12]. Various market stages corresponding to technology life cycles are as follows: introduction stage, growth stage, maturity stage and decline stage. Introduction stage is also known as technology development stage, and the market clearing quantity is zero at this time. However, the enterprise cost invested in product research and development is the highest. Later, the enterprise will enter growth stage, i.e. the period of technology application. At this time, the manufacturer begins to launch on the market. Maturity stage is the period when market application begins to grow. Market penetration degree of technology depends on the speed of technological innovation and the degree of market demand for the technology. Finally, it comes to decline stage when emerging technology has already become basic technology of the market.

![Figure 1. S-curve model of technology life cycle.](image)

Patent Portfolio Strategy Based on Patent Alliance

Patent alliance is also an effective patent portfolio strategy. Patent alliance is the alliance formed by enterprises under the connection of a group of relevant patented technology on the basis of common interest. Enterprises provide a patent cross-licensing within alliance or use each other’s patented technology in a low cost. Meanwhile, a joint licensing statement is issued to organizations outside the
alliance. Since limited resource of a single enterprise, it is difficult to acquire absolute advantages in industrial technology. However, enterprises can gain extra supports in various aspects through patent alliance, and form more powerful technical strength. Patent alliance has achieved synergistic effect between different types of patented technology. Enterprises can change the competition status of the industry within a short time through patent portfolio or collocation. Therefore, multiple values can be brought to the enterprises. As a new form of cooperation and competition, patent alliance can effectively reduce the risks and cost. It becomes a new cooperation and competition form to develop the potential market together; a huge commercial profit can be achieved. The rise of patent alliance symbolizes an important change of patent competition field. It is transformed from tactical competition characterized by single patent into strategic competition characterized by patent portfolio. As for multi-invention products, a single enterprise cannot independently invent and have all the technical ownership due to the technical features. Upstream and downstream enterprises of the products can set up an alliance and establish patent portfolio which can be treated as a strategic isolation tool.

**Patent Portfolio Strategy Based on Patent Quantity**

This strategy mainly focuses on the perspective of the increase of patent quantity. The primary target is to increase the number of patent portfolio, so as to expand the product line and increase sales through patent quantity. Expenditure in patent application and maintenance is huge. According to Table 1, patent portfolio strategy based on quantity is often adopted by large-scale leading enterprises in developed countries. Owing to the huge quantity of patents, this strategy is obviously aggressive, and enterprises acquire patent royalties by instituting patent proceedings against other enterprises. Meanwhile, patent thicket can be constructed via plentiful patents, a barrier will be established for other enterprises, and access threshold of the industry can be increased. In this way, monopoly position of the enterprise in the field can be consolidated.

**Table 1. Top 10 US patent assignees in 2015.**

<table>
<thead>
<tr>
<th>RANK</th>
<th>Country</th>
<th>Assignee Name</th>
<th>US Patent Grants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>United States</td>
<td>IBM</td>
<td>7355</td>
</tr>
<tr>
<td>2</td>
<td>Korea</td>
<td>Samsung Electronics Co Ltd</td>
<td>5072</td>
</tr>
<tr>
<td>3</td>
<td>Japan</td>
<td>Canon KK</td>
<td>4134</td>
</tr>
<tr>
<td>4</td>
<td>United States</td>
<td>Qualcomm Inc</td>
<td>2900</td>
</tr>
<tr>
<td>5</td>
<td>United States</td>
<td>Google Inc</td>
<td>2835</td>
</tr>
<tr>
<td>6</td>
<td>Japan</td>
<td>Toshiba Corp</td>
<td>2627</td>
</tr>
<tr>
<td>7</td>
<td>Japan</td>
<td>Sony Corp</td>
<td>2455</td>
</tr>
<tr>
<td>8</td>
<td>Korea</td>
<td>LG Electronics Inc</td>
<td>2242</td>
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<td>United States</td>
<td>Intel Corp</td>
<td>2048</td>
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<tr>
<td>10</td>
<td>United States</td>
<td>Microsoft Technology Licensing LLC</td>
<td>1956</td>
</tr>
</tbody>
</table>

Data source: IFI CLAIMS 2015 Top 50 US Patent Assignees

**Patent Portfolio Suggestions of Chinese Enterprises**

Overseas large-scale enterprises have implemented patent portfolio strategy for a long time, while patent portfolio strategy is still a new thing for Chinese enterprises. Chinese enterprises need to not only keep continuous and huge investment in research and development, but also break through barriers in laws and language. They should pay attention to research and development and accumulation of high-quality patent portfolios at the same time. Moreover, they need to absorb beneficial experience of America and Japan, to get familiar with patent portfolio development history and lessons of well-known transnational corporations, and to be acquainted with and master patent strategy to tackle market competition. In this way, the international competitiveness of Chinese enterprises can be enhanced.
To Improve the Quality of Patent Application

In 2015, China was ranked third in international patent application quantity with 29.8 thousand applications, only second to America with 57.4 thousand applications and Japan with 44.2 thousand applications. Therefore, China’s patent application quantity is not low. However, the increase of patent application quantity does not mean the improvement of patent quality. According to China Valid Patent Report 2014 issued by State Intellectual Property Office in Nov. 2015, the structure of China’s valid patents is imbalanced. Invention patent involves the highest technological content and creation level, but China’s invention patent only occupies 17.6% of valid patents. Overseas valid patent in China has been dominated by invention patent for many consecutive years, and it took up 79.9% of total overseas valid patents. Chinese enterprises are in a relatively weak position in invention patent, which will result in a large number of patent litigation cases. In recent years, the intellectual property fee paid and charged by China increases year by year, but the fee collected is far lower than the fee paid. Hence, China still relies on foreign countries in use of patents to a large extent. This also shows that China’s innovation degree is insufficient. We cannot realize reduction of intellectual property expense paid and dependence on foreign countries by simply relying on the increase of patent application quantity.

To Acquire Patent Rapidly through Overseas Mergers and Acquisition

At present, most merger and acquisition behaviors of transnational groups are based on reflection of intellectual property like patent. Chinese enterprises have started large-scale overseas merger and acquisition since China entered World Trade Organization. However, the merger and acquisition purpose of Chinese enterprises is different from the most transnational groups. Chinese enterprises mainly aim to guarantee raw material supply and acquire internationally recognized marketing channels of famous brands through overseas merger and acquisition. Overseas merger and acquisition should become an effective methods for Chinese enterprises to accelerate accumulation of patent portfolios in a short time. We can complete our own patent layout gradually through merger and acquisition, so as to protect our economic interests. Enterprises can protect the existing products or products to be introduced through acquisition, so as to effectively avoid patent disputes. When the enterprise expands an emerging market, it should timely seek and purchase competitors’ patents that might involve infringement, so as to deal with possible patent litigation.

To Strengthen Cooperation between Different Enterprises

Most Chinese enterprises are faced the threat which from various patent portfolio strategies of foreign enterprises in either domestic or overseas market. Companies of some industries might be faced with compensation for a huge amount of patent royalties, which will cause huge losses to the enterprises. Generally speaking, a single enterprise cannot deal with such situations. In order to effectively handle and deal with potential aggressive patent portfolio strategies of foreign enterprises, domestic enterprises should strengthen cooperation between each other. In the formulation and implementation process of patent portfolio strategy, they need to strengthen theoretical research on patent portfolio strategy of different enterprises. Moreover, they should also effectively evaluate the patents of various enterprises by combining with the industry situations, and fully demonstrate contents and forms of the patent portfolio strategy, so as to realize the purpose of profit optimization for relevant enterprises forming the patent combination. If the patented technology of an enterprise is identified as international standard, it can help the enterprise establish monopolistic advantages and improve competitive strength rapidly. Generally speaking, patented technology able to become an international standard requires the enterprise to possess advanced technology, powerful patent portfolio and huge market share. Chinese enterprises do not have advantages in technology and patent, but Chinese market is huge. Therefore, Chinese enterprises can create patented technology which can become an international standard via huge market share. Therefore, domestic enterprises should establish cooperation and positively promote their patented technology to become an international standard.
Conclusion

As an enterprise management strategy, patent strategy is an important method for numerous enterprises to promote technological innovation and research and development strategy. It reflects overall development strategy of the enterprise to some extent. Moreover, it is also an important factor for enterprises to deal with competitors, achieve competitive advantages and maintain a competitive position. Continuous application and development are realized for patent portfolio strategy in practice. This paper analyzes the existing enterprise patent portfolio strategy from the perspectives of product life cycle, patent alliance, patent quantity. By combining with practical situations of Chinese enterprises, this paper suggests that enterprises should further improve the patent application quality and reduce dependence on foreign patents. Besides, they should acquire patents rapidly through overseas merger and acquisition, accumulate a large number of patent portfolios in a short time, and clear away the potential menace from competitors. In addition, cooperation between different enterprises should be strengthened and a patent alliance can be established to deal with the patent portfolio strategy of foreign enterprises.

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References


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