



The Study of Improving the Flexibility of Enterprises Patents Strategy by Patents Options Growth Matrix

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Abstract

Because the changing need of customers and the technology continues to develop, we must improve the flexibility of the enterprise business strategy. Enterprise patent strategy plays an important role in maintaining competitive advantage. Improving the flexibility of enterprise patent strategy contribute to achieving business goals. Firstly, we comprehensively analyze the previous relevant study of strategic flexibility Promotion Strategy. Also, we point out the need for improvement. According to the characteristics of the patent option, it must combine with patent strategy goal. The patent option growth matrix allows us to dynamic program the Enterprise patent strategy. We deeply analyze how to improve the flexibility of enterprises patents strategy.

Key words: Patents options growth matrix; Flexibility of enterprise patent strategy; Improve

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INTRODUCTION

With the new economy era, enterprises in our country are facing economic restructuring. The business environment is full of uncertainty and dynamics. Also, competition is exacerbated. The need of consumer is constantly changing. It is difficult to maintain long-term competitive advantage. Wang (2007) thought that the environment was

not completely unknown. We can analyze it, and can take some action to response. Strategic flexibility enables us to better adapt to the changing environment, and can help us to revise the strategy. This is essential for the development of enterprises. Enhancing enterprise strategic flexibility has also been more attention.

1. THE RESEARCH OF ENHANCING THE FLEXIBILITY OF ENTERPRISE STRATEGIC

1.1 Definition of Strategic Flexibility

The flexibility is originated from flexible manufacturing systems. According to the authoritative scholar Ansoff, flexibility is the enterprise's ability to respond to the uncertainty environment and adaptability, including production systems, financial systems, technology systems, enterprise resource management systems and organizational aspects of adaptation. Scholar Wang (2003) analyzed the corporate flexible study, and summarize the Enterprise Flexibility in three levels, namely the corporate level, function level and resource level, and indicates the company level is the flexibility to change their organization's strategic positioning leaving the functional strategies the ability to maintain consistency. Therefore, the highest level enterprise Flexibility is the company's strategic flexibility.

Strategic flexibility concept first appeared in the 1950s in the literature and in strategic management, organizational management theory, and marketing management theory has been developed.

The scholars were studied from different perspectives of strategic flexibility. Combining Aaker and Macarenhas (1991), Harrigan (1985), Baharami (1992), Hitt, Keate and De Marie(1998), Matusik and Hill (1998) as well as domestic scholars Hou Yulian, Long Zhengping is equal research, summed strategic flexibility for enterprises is the ability to respond quickly to market changes, and maintain a competitive advantage.

1.2 Tactics Study of Promoting Strategic Flexibility

Foreign scholars Ansoff (1965) established a hierarchical model of flexible goal, he proposed a offensive flexibility, defensive flexibility and reactive flexibility to enhance the Strategic Flexibility.

Aaker and Macarenhas (1991) advocated from the “product, market and channel diversification” to improve flexible; Das (1995) thought that the strategic flexibility enhancements include internal approach (such as the manufacture of flexible, modular flexibility, flexible organizational structure, etc.) and externally (such as suppliers, alliance partners and transnational operations, etc.).

Domestic scholars Wang (2008) was based on CAS Theory of evolution that focuses on the turnover degree of information, anxiety suppression level, the right degree of difference; Shi (2004) studied from a resource, he pointed that inside activities include manufacturing processes, human resource management and product development and design can enhance the strategic flexibility. Also he pointed that we can use external means to enhanced strategic flexibility. It is mainly consist of strategic alliances and virtual organizer. Jiang (2012) studied from the organizational structure, culture flexible and the ability to enhance the flexibility of the flexible; Tan (2009) studied from the strategic Leadership. He thought that it is important to enhance the strategic thinking ability; Zhao (2009) studied from the perspective of the creative economy, he emphasized that the full range of integrated, open collaboration that build entrepreneurial economy era sharing platform is a major strategic flexibility path; Liu (2012) thought that it was need to change the traditional linear thinking style, we must develop mesh thinking style.

Overview can be seen from the above, the exiting study of strategic flexibility to enhance existing research was mainly from the inside and outside of the enterprise, and focus on function level to enhance the flexibility of strategy. Flexibility is the strategic nature property and improving the flexibility of the strategy itself can truly improve the strategic flexibility. Functional level and basic level flexibility mainly service in the implementation of the strategy. Also it is sufficient condition to achieve strategic flexibility. How to improve the flexibility of strategic planning are a serious problem, and also the starting point of this study.

2. TEAL OPTIONS GROWTH MATRIX

2.1 Enterprises Patents Strategy

The patent is a tool to enhance the competitiveness of enterprises. It gets more attention now. The Patent strategy is to use the patent protection provided by the patent system to obtain and save the competitive advantage in market. And it is a plan that obtain the best overall economic effect. We think patent strategy incorporates of the thought of enterprise patent strategy, the goal,

the program, the dynamic adjustment mechanism of enterprise patent strategy, and the patent policy legal status. We define it as same as Feng (2007). In various stages of the implementation process of the patent strategy, we need to make a decision of patent investment options continued. The investment of patents is made up of R&D, international licensing agreements, patents commercialization activities and so on. The flexibility of the investment of patents affects the market adaptability of the enterprise patent strategy. We focus on enhancing the flexibility of patent commercialization to improve the flexibility of patent strategy.

2.2 Characteristics of Patents Options

It was defined that you can buy or sell an agreed asset in accordance with the scheduled price on a specific date or before. If the option can be exercised before the expiration date, it called the American option; if it can be implemented on the due time, then it called the European option by Kester (1984).

The right to the patent gives by the law refers that the patentee can enjoy making, using, selling the technology. Also, through licensing, other one can use it. The value of patents fluctuates with the volatility of the underlying asset investment. The greater the volatility is, the higher its value is. This is the bullish characteristic of patent.

The term refers to the use of the patent is the validity of patent. And over the validity of patent, it is no value. So, the patent has the characteristic of timeline.

The investment process of patent must withstand the challenges of technology, market, and the business risk. It is full of dynamic factors and it needs long time. The value of investment of patent is fluctuant. This explains that the patent has the characteristic of risk.

Patent assets have no specific physical form. In order to bring considerable economic benefits, we must reinvest. The enterprise can choose whether to invest following or not. Also, they can expand or terminate the investments that had happened. This is the optional characteristic of patent.

From the above analysis, characteristics of patent include bullish characteristic, timeline, risk and optional features. Based on the above criteria, it is considered a option characteristics. If they have the patent, they have a certain right to choose. These options include the right to deter the development, interrupt investment due to unexpected events and the investment scale option. We can make full use of this flexibility to make right decisions that according with the change of environment. For favorable environment, we can take full advantage of it. And for the unfavorable, we can avoid efficient.

2.3 Real Options Thinking Mode in Enterprise Strategic Planning

Yang (2003) thought that the real options are the flexibility when managers make investment decisions of owned asset. Johnathan (2005) thought that the real options

method is results that managers use the multiple decision-making route to make optimal strategy, he will linked highly uncertain with the management flexibility. Also it is the result that managers have choice to take advantage of new information in the process of development. Haanapple and Smit (2007) thought that in the dynamic environment, the ability to adapt to the strategic advantage of favorable future investment opportunities or to make a reasonable action to respond to competition aspect is essential. Because competitive advantage is shorter, companies need to take positive action to maintain a competitive advantage. It must take measure to protect the future growth options will not be damage by other competitors copying. In the uncertain and changing environment, maintaining competitive advantage means that the company must continue to create positively and take advantage of future growth options. And that the investment decisions should be based on an expanded NPV standard, which includes not only the immediate commercialization of expected cash flows generated by the NPV, the flexibility option values implicit in the combined project also includes, such as (2.1) formula.

$$\text{Expanded NPV} = \text{passive NPV} + \text{flexibility (option) value} \quad (2.1)$$

2.4 Real Options Growth Matrix

Option growth matrix creates by Smit and Trigeorgis (2006), it is applicable for the Classic short-term profitability and long-term growth potential of the trade-offs. Options growth matrix major follows with interest in company's existing investment (or called in use assets) and its future growth value of the option. The Horizontal axis is the net present value, which represents the current profitability that commercializing the patent immediately. it is the result that immediate commercial value minus the cost of commercial value. The ordinate means the present value of future growth opportunities which is the combination of longitudinal volatility and resilience (PVGGO). Also it is namely the value of flexibility which the enterprise obtains. PVGO is the standardization of the percentage of the enterprise's stock price, and we can usually get the date from the financial market. It is the value of the stock market minus the value that estimated from the standard discounted cash method (DCF). The value of DCF includes the static value of continuing and exiting operations and the non-growth-related components. At any stage of project development, the general value of the project can be seem as the value of the cash flow that bringing immediate by the investment plus the value bringing by the new growth opportunities.

Based on the real option grow matrix structured by Smit and Trigeorgis (2006), we take the characteristics of patent and the patent' option characteristics into account, and then we structure the patents option growth matrix. Also, we analyze the function of this matrix in improving

the flexibility of enterprise patent strategy. The horizontal axis indicated the net present value (NPV) of the patent investment, $NPV=V-I$, V indicated the value of the patent asset, I indicated the strike price; the ordinate indicated the patent value degree (PVD). PVD contains the judgment of the future status of the patent. Show in Figure1.

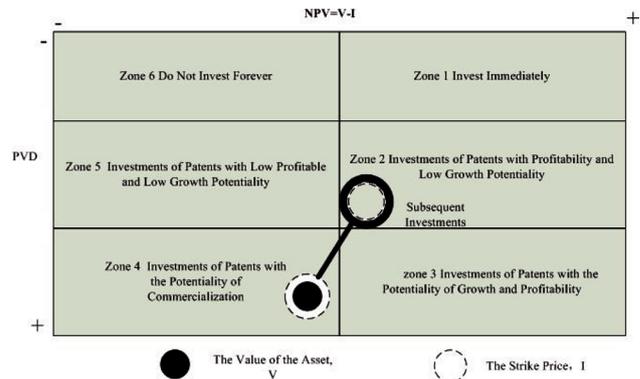


Figure 1
Patents Options Growth Matrix

From Figure 1 we can get the following. First, the value of patents was extended which increased the acceptability; Second, the assessment of patent value beyond short-term earnings limit thinking, which put more attention in the future interest the enterprise can get. Also, it is focus on the combination of the short-term corporate earnings and long-term development. Third, we can decide whether to commercialize or license, when commercialize or license, the manners of licensing according to the changes in market conditions. It enhanced the flexibility of patent strategy resistance and the strategic flexibility.

3. ANALYZING THE MECHANISM OF ENHANCING THE FLEXIBILITY OF ENTERPRISE PATENT STRATEGY WITH PATENTS OPTIONS GROWTH MATRIX

As described in the previous analysis, the essence that options can enhance the flexibility of corporate patent strategy planning lies in the choice of investments and implementation. We will research the mechanisms of enhancing the flexibility about the selection of patents commercialized and the management aspects.

3.1 Identifying the Opportunities in the Patents Options Growth Matrix

Companies need to put the patent into the matrix different zone based on profitable (NPV) and relative growth potential (PVD) Options grow, and then we are based on the growth process to make investing planning, which is the process of improving adaptability of patent strategy.

The bottom left of the option-value space (zone4) comprises the patent that are currently unprofitable but have high potential and may be commercialized

later. These “strategic” investments or acquisitions may generate other investment opportunities, and as such often represent “options on options”. This region contains opportunities that are similar to the “question marks” in the BCG matrix and have typical compound (growth) option characteristics – they are at an innovation stage and have not yet proven themselves in the marketplace. At this stage, management focuses on the innovative activity and on defining what the customers want.

The economic value of such a patent (represented by the small solid circle in figure 1 derives primarily from its future potential, since current assets have a negative NPV, probably due to high investment outlays. Maybe, because of too much uncertainty, we estimated them too conservative. Development of such opportunities involves a process analogous to developing or exercising a chain of options. Firstly, the project in line typically faces higher uncertainty, and must be exercised before proceeding to the next stage of the sequential investment chain. R&D expenditures or strategic acquisitions of high-tech research ventures in volatile industries typically appear to generate a low return when considered in isolation, but may have considerable strategic option value due to such follow-on opportunities. These strategic patents can no longer be looked at as independent investments, but rather as links in the ones to follow.

Bottom right of Figure 1 (zone 3) comprises the patent which is now profitable ($NPV > 0$) and unlimited future potential. Such patent has a higher current yield and the capacity of growth in earnings. It can not only generate higher profits in the current, but also has good long-term earnings prospects and the growth potential. It can bring the growth of profit. Also it can bring further investment and market opportunities. Advantage of such patent technology is obvious. It has a long protected time by law, a steady state, better technical extension and transitivity, long economic life. These patents should be commercialized immediately to occupy part of the market. Such technology is not yet form a standard, and it can be expand larger. Enterprises can focus on the technical standardization direction. Having the patents which present the technical standards, companies have more flexibility to commercialize itself or license. And businesses can enjoy exclusive benefits.

The option value space zone 2 and zone 5 in Figure 1, with the remaining options expiring or decreasing in the accumulation of uncertainty, the growth option value will be reduced. In this area, current yield and capacity of earnings growth of patent is relatively low. Mainly due to the patent is not high tech and it is short of features and monopoly advantage compared with similar or alternative technologies. Also it is short of market competitiveness. Maybe it existences large deviation between market demand situation and prognosis which be make before developing the technology, the patented products market

space is very small; probably it is the patented which represents the technology in a mature industry products, and it is facing the risk of recession. For such patents, companies should squeeze every last profit, then give up.

Upper left area (zone 6) represents the patent that is not generating revenue for the enterprise, and low growth option value. In worse case, these patents may still consume valuable resources. In other words, it is no commercial value but need to pay fees on annual. These patents may be just obtained, or may develop by zone 2 or 4. It is probably the rapid development of technology. Maybe, the time it maintained a monopoly is short, and its ductility is poor. For such patents, we must commercial or license immediately to get more cash.

The zone 1 indicated patents which are profitable now, but it is no potentials in growth. It is because of the rapid development of technology, or the time that it maintained monopoly is short. Also, its ductility is poor. For such patents, we should commercial and license immediately to get more cash.

3.2 Balancing the Mix of Operational Opportunities and Strategic Opportunities in the Options Portfolio

Management of firm’s “bundle of opportunities” requires a balance between exploiting current cash-generating advantages and generating new options. The starting point for the portfolio management of options and the strategic analysis of project interactions is the proper definition of patent categories. The first strategic question management must address concerns the value characteristics of the patent: does this patent realize its value primarily through direct measurable cash inflow, or does its have strategic growth option value?

For the patent realize its value primarily through direct measurable cash inflow, enterprise must commercialize it immediately. Also enterprise can determine the timing and manner of commercialization according to the external environment and internal capabilities and corporate strategy. Strategic technology should focus on the development of related around patents to prevent competitors’ patents surrounding. Firms can pay more attention to develop technical standards.

The overall value of the portfolio of options depends on the mix of operational and strategic projects and their correlations and interactions. It is important to recognize that different stages in the option chain may have distinctly different risk characteristics.

Current operating investment reflects the full use of on the existing revenue-generating opportunities, and the current strategic options investment is to generate more strategic growth options. Current strategic options will become new operating investments over time. From the current investment opportunities to the future opportunity, it is a continuous cycle process. Also it is a continually rolling forward. The cycle process is a positive process

rather than a negative waiting process. The process is a continuous cycle of market-oriented selection process. It enhances the company's adaptive ability. Adaptability is mainly reflected strategic flexibility, also enhance the strategic flexibility.

3.3 Actively Manage the Opportunities of Patents Investments in the Patents Options Growth Matrix

In the patent options growth matrix, the state of patents move over time from zone 4 to the top of the matrix as illustrated via the linkages (and arrows) in Figure 1, because of the influence of development of the technology and the changes of customer demand and other factors. However, the changes of patent position are random in option space. The growth options that have strategic value need positive guidance. It can increase the ability to respond to adverse market conditions. Under favorable market conditions, the value of options will continue to increase, eventually rising to Area 1 in Figure 1. But, in adverse market conditions, it may eventually fall into the area 6 in Figure 1.

With the help of this matrix, managers can manage patents investment more actively. Firstly, we classify patents investment. We know the value of each patent investment is focus on a long-time strategic value or on the current interest. It makes for seizing the investment that is bankable. Secondly, with the development of technology and changes of consumer demand, the value of investment is changing. And the uncertainty of some original investment is resolved gradually. We have the right to postpone, expand, contraction or abandon the investment strategy. Thirdly, after making patents investment classification, managers can guide positively to create good environment for future investment. We realize the goal that making decision in multi-stage. Also, the choice of investment is more flexibility.

CONCLUSIONS

Under the complex and changeable market environment, it is necessary to enhance the flexibility of the strategy to improve the market adaptability. In this paper, we analyze the option characteristic of patent and combine with the real option growth matrix to classify patents. Also, we must consider the value that may get from investing immediately and the value of future growth patents may bring. Then, we can make full use of these patents to enhance the competitiveness.

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