



Patent strategizing

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Abstract

Purpose – The purpose of this paper is to further the development of strategic thinking, relevant for both academics and practitioners, about a key asset in the knowledge economy: patents.

Design/methodology/approach – This paper draws on existing insights on the strategic use of patents, presenting them in a coherent framework.

Findings – The paper discusses the different aspects to patent strategizing that need dedicated management attention, and discusses the key considerations to be taken into account. The paper also indicates at which levels in the organization patent strategizing needs to take place.

Practical implications – Practitioners will be much more aware of the strategic options for using patents to further a firm's competitive position.

Originality/value – The paper draws to some extent on existing knowledge about patents. Such knowledge has, however, been scattered across different domains. The strategic options for a firm of using patents have not been discussed at length or in the context of a comprehensive framework either in the academic literature or in that for practitioners.

Keywords Strategic management, Intellectual capital, Patents, Assets management

Paper type Viewpoint

1. Introduction

In recent years analysts and managers have become aware of the importance of knowledge for business and so their focus has moved to intellectual assets as strategic assets. Companies are increasingly aware of the competitive advantage a well-developed and strong portfolio of patents, copyrights, and trademarks may offer. Many firms' strategy towards patents is still haphazard, however, which might be due to the scant guidance offered by analysts and academics. The still sometimes limited possibility to search patent databases may be another reason (Ledergerber and Kurt, 2003). Granstrand (1999) and others do offer valuable insights and guidelines as to how firms should devise their patent strategy, but the literature still shows blind spots as relevant aspects are not covered, and no overarching perspective is offered under which the contributions about patent strategizing may be brought together. Such an umbrella would provide insight into how issues related to patent strategizing relate to one another. This paper aims to contribute to the construction of such an integrated insight of importance to both practitioners and academics.

Firms that develop a patent strategy face several degrees of freedom for which they can conceivably make a strategic decision. The paper provides a coherent list of these, and discusses each. This is not an exhaustive list, and the extent to which a particular firm in a particular industry indeed faces the degrees of freedom to the same extent as others do can vary. Nevertheless, we believe that a discussion of these degrees of freedom will assist management. In conjunction with this, we discuss the level within



the hierarchy of the company at which a decision related to a particular degree of patenting freedom should presumably be taken.

2. Patents

Patents and copyrights are the two most important examples of legal means to prevent the unrestricted and unconditional imitation of fruits of the intellect (Sullivan, 2000). Other intellectual property rights (IPRs) include trademarks, plant patents and design patents. Databases are also protected under copyright law (Maurer *et al.*, 2001), and of increasing strategic importance to firms (Dolfsma, 2006). Organizations can seek to protect their intellectual property in ways that do not rely on IPR law, however. Secrecy is an important additional means of protecting knowledge from being used by others than the person or organization that has developed it (Levin *et al.* 1987). Secrecy, however, needs to be enforced by other bodies of law such as labor or contract laws. Some knowledge may not be protectable by legal means, and what may be referred to as human capital, embodied in individuals is prime among that.

IPRs differ substantially in the kind and degree of protection that they offer, reflecting the different rationales for their existence. Duration, scope and thresholds for protection vary from IPR to IPR, vary over time, and vary between countries. IPR is statutory law, enacted by the legislator, and thus is national law. In general it can be said that the importance of IPRs for the global economy has increased over time. This is reflected in the increase in the number of applications for patents, but from international agreements such as the Trade Related Aspects of Intellectual Property Rights (TRIPS) and the importance gained by the World Intellectual Property Organisation (WIPO). Some measure of harmonization across countries has emerged in recent years.

The first patent was probably extended in the fourteenth century, while the first “patent law” dates from 1474 by the Republic of Venice (Machlup, 1958). Thus, the patentee was given the exclusive right to produce and sell within the boundaries of a jurisdiction for a limited number of years under certain conditions. Patents offer the more powerful protection from imitation compared with other IPRs as they protect the newly developed idea itself. Copyright rather protects the particular way in which an idea is expressed – moderations of the idea that are sufficiently different may be developed by third parties without further ado.

A person or an organization must apply for a patent. Applications are evaluated by patent offices using several criteria. The idea must represent a new, non-obvious development when compared with “prior art”. Prior art are the applications made and patents granted in the same field in the past. An application needs to offer an inventive step; incremental innovations do not qualify. The application needs to offer the possibility for industrial application. Finally, a physical component must be involved.

These criteria, used across most developed economies, are imprecise. The extent to which they are further clarified differs over time and across space. This is apparent in the discussions on the issue of whether software and business models warrant protection under patent law. US patent law now offers protection for the both of them, on the argument that both in many cases rely critically and cannot be separated from a physical component. This is an issue that relates to the question of the breadth or scope

allowed for patent applications. What may be included under a patent; how specific should the use of new knowledge be before a patent can be granted?

There are costs involved in applying for a patent, there are yearly costs for renewal of the application, there are costs to search for possible infringement, and there are costs for associated with the legal action needed to redress infringement. All of these costs need to be born by the applicant. Filing and maintaining a patent is costly, and subject to important procedural difference across jurisdictions that can have profound effects on organizations' strategic position (OECD, 1997). Unlike many other countries, for instance, the USA has a "first to invent" rule; if one is able to show one was first to invent, one can claim priority and be granted the patent even when another party filed for or was granted the patent earlier. The first to invent rule is administratively much more burdensome than the "first to file" rule. Even though in principle it could be claimed to benefit the actual creative party more, it invites strategizing and legal disputes. If and when proof of development is properly registered a focal firm could claim to have right to the knowledge described in a patent application by another firm, after the patent was actually granted. The other firm would have committed substantial resources in vain had it known that the focal firm had developed knowledge, and had it patented this knowledge as well.

Balancing public and private interests, patent laws typically limit exclusivity of the license given by society to a right holder. Discussion of the need for society of IPRs has waxed and waned. Notwithstanding such discussions, and given that much knowledge develops standing on the shoulder of giants (Scotchmer, 1991), the scope and duration of IPRs has increased over time, increasing the costs for parties involved who would use the protected knowledge to be creative subsequently themselves. Innovation may well be hampered as a result, especially when knowledge development is cumulative (Baumol, 2002).

Intellectual objects are non-exclusive, however; consumption or use by non-payers cannot be excluded. In addition, intellectual objects are partly non-rivalrous as well: they are not consumed by their use. This makes intellectual objects (quasi-) public goods, giving governments a reason to influence relevant processes to stimulate their development in society. As costs of imitating or communicating intellectual objects tends to be low, there is a tendency for these to be under-produced (see, e.g., Nelson, 1959; Romer, 2002).

Rationales for IPRs fall into four, partly related categories (Hettinger, 1989). Without IPRs actors would be less inclined or not inclined at all to develop and diffuse new knowledge. The prospect of a period of time in which one is able to commercially exploit the innovation will, in this view, offer an incentive to create and diffuse new knowledge in the first place. This rationale is founded in John Locke's argument for property rights in general. In his view, a person's gains that with which she "mixes her labor", provided that "enough and as good [is] left in common for others".

Relatedly, IPRs are said to be necessary for firms to invest in facilities for the production of goods based on the intellectual object protected under IPR. Without it, firms would face more than the usual business risk and refrain from the production of goods that would, presumably, benefit society as a whole.

The two other rationales are not related to such utilitarian considerations. The first is one of desert. If someone has produced an intellectual object, he deserves some kind

and measure of reward. The final rationale is personal/moral one. In creating an intellectual object, someone expresses one's personality.

Baumol (2002) has estimated that 20 percent of the benefits associated with an invention are appropriated by the parties directly or indirectly involved with the invention. Only partly will the appropriation of benefits be due to IPRs. The actual advantage for firms of being able to exploit an intellectual object commercially on an exclusive basis is disputed empirically. Of all US patents granted 55-75 percent lapse for failure to pay maintenance fees; if litigation against a patent's validity is a sign of commercial value of that patent, the fact that only 1.5 percent of patents are litigated and only 0.1 percent litigated to trial does not bode well (Lemley and Shapiro, 2005). Levin *et al.* (1987) present empirical data that indicate that patents are not considered the most important means to protect a firm's strategic position. This differs, of course, across industries, with firms in industries such as the pharmaceutical industry, where inventing-around is difficult, indicating that patents are important. These findings have also been replicated after Levin *et al.* for countries other than the USA (Arundel, 2001).

Economically, at a more macro level, the significance of IPRs is difficult to establish. Indirect measures will have to be relied on. While it has been acknowledged that some parties may benefit more than others, in relative terms a Pareto improvement will be the expected outcome (Langford, 1997). Welfare economic analyses show that the use of patent can be beneficial to society as a whole if and when their breadth is limited, even though their duration may be longer than it is now (see studies in Towse and Holzhauser (2002)), which increases the possibilities for inventing-around a patent. Such possibilities are as much dependent on the nature of the technology or patent law, as they are on the strategy of the firms (Granstrand, 1999).

Partly, too, the tremendous growth in the number of patents granted can be attributed to the increasingly strategic nature of patent applications (Kortum and Lerner, 1999). Patent strategizing, as discussed here, is not centered around the many legal tactics and maneuvers practiced in patent law by legal scholars, but with the broader strategic role played by patents in firms (Somaya, 2002, p.3). In this paper, the focus is on the strategic choices to be made once the patentable knowledge has been developed.

3. Degrees of freedom in patent strategizing

Firms are increasingly recognizing the strategic importance of patenting. Having a portfolio of patents allows a firm such as IBM or Nokia to position itself as an indispensable partner in an alliance of firms supporting the development of particular technologies (Bekkers *et al.*, 2002). These are issues of macro-strategizing between firms where patents can play an important role when setting standards, or when forming alliances. In addition to the macro-strategizing, there is the issue of micro-strategizing that a firm needs to consider too. Even though one has to acknowledge that the two are related, the strategic decision making with regard to specific patents –micro-strategizing- is the topic developed in this paper. The considerations for micro-strategizing in relation to patents are in large part independent of the subsequent decisions to commercialize the intellectual property. While the decision by an organization to use the knowledge to develop goods for a

market itself, to license the patents out to others, or to sell the patents is unrelated to the patent strategizing decisions discussed here, more appropriate patent strategizing is likely to increase the commercial value of the patents involved.

In deciding about if, when and how to apply for a particular patent, a firm must decide about a number of strategic micro issues. These include, but are not necessarily restricted to:

- market/jurisdiction;
- “location”;
- breadth;
- timing; and
- relation to complements.

Often, the decision to patent is taken keeping technical considerations in mind only. It is important, however, to decide where to patent, for instance. Which market or markets are the most important, strategically, for the firm? If a firm is in the business-to-consumer market, the most important market may well be the USA, and there is an obvious need to patent in the USA. There may be more of a tendency or need to patent in Japan, in particular as the breadth for patents allowed in Japan is more limited and more patents may have to be applied for to obtain the same degree of protection (Lerner, 1994). If the competitors a firm faces are all legally based in a particular country, a patent could only have to be applied for in that country. The global market for drenching is dominated by a few Dutch firms – patenting by them of newly developed knowledge may only be necessary in The Netherlands.

There is a metaphorical sense in which “location” for a patent is important as well. As the propensity to patent literature indicates (Arundel and Kabla, 1998), not all newly developed knowledge is actually patented. There are several reasons for this. Not all newly developed knowledge may be patentable as the legal and technical criteria discussed above are not met. In addition, strategically, a firm may decide not to (immediately) actually patent newly developed knowledge even when it may be patentable in principle (see Arora, 1997). Quite a few, particularly larger firms, actively search the databases that contain the patents granted to take cues from when considering their own R&D strategy (Ernst, 2003; Rivette and Klein, 2000). This decision not to patent knowledge that is patentable in principle is indicated in Figure 1.

Patents might also be applied for to protect knowledge that the focal firm will never use, just to mislead competing firm. Figure 2 develops this idea of location some more. A firm can decide to take out several patents for a single coherent set of newly developed, patentable knowledge, yet decide not to cover in patents certain areas of knowledge. Patents for areas A and B are applied for, but for the remaining terrain no patent is applied for. Taking a patent for the remaining terrain might jeopardize the firm’s strategic position and knowledge advantage. Filing for patents A and B classified in different international patent classification (IPC) categories would decrease the likelihood that other firms may learn from the focal firm’s patents even when the focal firm actually applied for a patent and was granted the patent. Patenting relatively unrelated (to an outsider) knowledge – leaving patents A and B

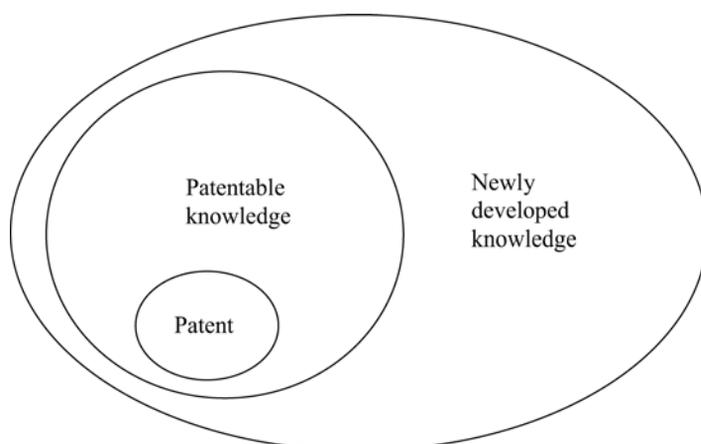


Figure 1.
Patent "location"

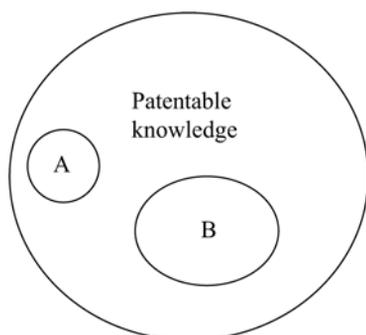


Figure 2.
Patent location and
breadth

disconnected – also decreases the chance of competitors piecing together the full picture of the focal firm’s R&D outcomes.

Patent A is more circumscribed than patent B is. There may be technical or legal reasons for this, but there may also well be strategic reasons for a firm to decide to opt for a narrower (A) rather than a broader (B) scope of a patent. A more narrowly defined patent may allow for application of more patent for the same set of knowledge. This could be advantageous in alliance negotiations or legal disputes.

Albeit more expensive, a large number of narrowly defined patents, rather than a single broadly defined one, may make backward engineering drawing on publicly available patents more difficult for competitors, especially for smaller or less sophisticated competitors. A single, rather broadly and perhaps because of that rather vaguely described patent such as is possible in the USA can also offer more protection than a single narrowly defined patent. A broad and imprecisely formulated patent also offers more protection than a number of narrowly described patents.

If and when a large number of narrowly defined patents do not, technically, touch, however, there might be “space” left for a competitor to file for a patent. A situation could even develop in which a competitor, drawing on the focal firm’s original patent,

surrounds the patent thus possibly extracting a large share of the benefits associated with the original innovative knowledge subsequently.

Determining the number of patents to apply for, as well as their location and breadth will, *ceteris paribus* legal and technical issues determining R&D isocost curves for inventing around, plays an important role in allowing a firm to fend off competing firms that seek to circumvent its patents in the way that Granstrand (1999) has discussed. Possibly the blunt and expensive behavior of flooding (Figure 3(c)) a knowledge terrain with patents can be avoided when thinking strategically about patent location. Few single patents can act as a tollgate as depicted in Figure 3(a), however (Glazier, 1997, pp. 34-5), and so many a firm is likely to have to apply for a number of patents strategically positioned such as in Figure 3(b).

Time is another strategic variable to think about as management of a firm involved in patenting in at least two different ways. A first, and more mundane one is an option only available in the USA as a firm does not need to disclose the information in a patent upon application and because a first-to-invent doctrine is in place there. A firm may apply for a patent in the USA and towards the end of the review process decide to change the application. The application enters the review process from the beginning and remains submerged like a submarine, invisible to competitors, in the meantime. A competing firm may continue to develop the same technology and also apply for a patent later. Review of the competing patent application involves checking for prior art. Prior art includes previously granted patents, but not pending patents. When the competing firm is granted a patent, the focal firm can surface its own patent and start a lawsuit against the competing firm for infringement of a patent. The focal firm, if and when it can prove it was first to invent, will be likely to be successful in court. The competing firm in the meantime will have invested resources to develop knowledge which had already been developed and could have been publicly available had it not been for the strategizing of the focal firm.

Especially for the pharmaceutical industry, which has a high propensity to patent as the knowledge developed there is highly explicit, there is a real possibility for a patent to offer protection from imitation for a shorter time than the innovation could be able to generate a positive cash flow. New medication, and functional food as well, will have to be approved by the Food and Drugs Administration and will thus be subjected to clinical trials that can involve claims to a substantial amount of resources and time. A patent will

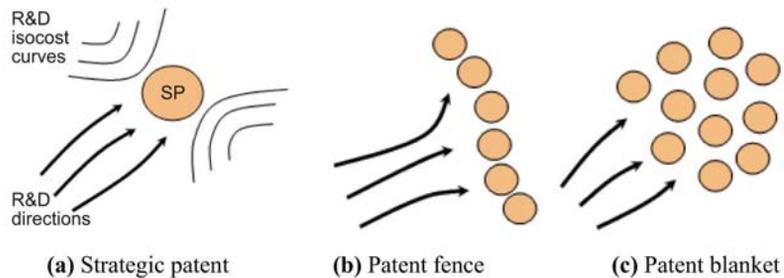


Figure 3.

Source: Granstrand (1999), reproduced courtesy of the publisher

have been granted before such trials, before the products can be brought to the market. The three-year extension of the length of time for patents pharmaceuticals, to 23 years currently, does not fully compensate for this. Firms in this industry will need to consider the strategy of timing patent application in particular.

The typical situation for innovations is pictured in Figure 4 (compare also Budworth (1996)). Initially, resources need to be invested to develop new knowledge as the basis for an innovation. Only when a product enters the market will cash start flowing in. For some time, resources may still need to be invested for instance in terms of R&D. The period of time from the moment when a patent is granted (indicated by an arrow) to when it expires (the “x”) may be shorter than the period that the product could conceivably generate cash flow and profit. It might make sense to patent only part of the knowledge developed early on (the left-most circle), and another part only later on (the circle in the middle, for instance) to extend the *de facto* legal protection for the full set of knowledge, “evergreening” the protection offered by the system of patent law. This subsequent patent may have a different breadth and may still not cover the full patentable knowledge terrain. A third patent may be taken out later (the right-most circle).

Not immediately patenting the knowledge developed may be risky, of course. Especially in a high tech market where a limited number of oligopolists keep a close watch of each other, a competing firm may be the firm to apply for the second or third patent, possibly taking cues from the first patent granted. Possibly the secrecy relied on by the focal firm to protect knowledge between the first and subsequent patents could not be maintained. This amounts to a classical trade-off.

A patent applied for later can be a patent in a technologically unrelated knowledge terrain, which is relevant for the earlier patent only from the perspective of the market. Obtaining a patent for a complementary product can also extend the period a focal firm benefits from legal protection. An example of this would be a patent for the way in which to administer a drug (Reitzig, 2004).

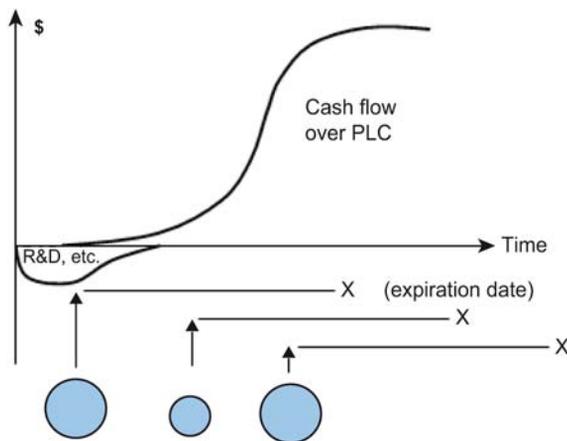


Figure 4.
Cash flow and patent timing

4. Concluding remarks: suggestions to management

Using the ideas of location and time allows for a more comprehensive and coherent view on patent strategizing integrating insights that have accumulated both in the academic literature as well as in firm practice. Thinking about the five degrees of freedom in patent strategizing should offer firms guidance, but may also stimulate academic work.

Patents are part of the intangible strategic assets of a company and they may be more difficult to manage than tangible assets. Firms are only in recent years turning their attention to strategically using their intangible assets (Granstrand, 1999). The difficulties of managing intangible assets should not, however, make management shy away from becoming involved. Implicit in the discussion so far is the suggestion that some of the strategic patenting issues are to be addressed by others than the scientists or Intellectual Property experts or department. Patent strategizing should not be by specialists, for specialists. Table I provides some suggestions of others from within a company to be involved in patent strategizing.

Within a company several departments are involved in making decision that relate to patenting, but not every department has the same knowledge or awareness of the strategic possibilities of patents. Specialized departments within a company that have developed areas of technical or legal expertise may be highly productive and generate much novel knowledge, but leaving all aspects of decision making in relation to patenting to these experts may result in a situation where effects on the firm as a whole are not taken into account. The decisions about different aspects of patenting must be taken at the appropriate levels in the organization. Individuals at a high level in the organization need to be involved in (corporate) decision making regarding patenting, at least with regard to some of the degrees of freedom involved. Certainly at a high level in the organization the macro-strategic issue of a company's patent portfolio is to be considered. The country to apply in for a patent, as well as the timing, requires an understanding of the particulars of the technical circumstances, but a sense for the strategic and commercial consequences for a firm as a whole is required as well. Even at more micro-levels of patent strategizing, input from top management must be incorporated. Location of a patent, however, is determined by in large part legal and technical considerations, whereas breadth mostly is a result of the particularities of patent law. These issues can be considered at the lower organizational levels of business units or IP departments.

Table I.
Devising patent strategy:
who does what

Decision-level	Market	Degrees of freedom		Location
		Timing	Breadth	
Board of directors	×	×		
Staff /IP department			×	×
Business unit	×	×		
Inventor/R&D laboratoru			×	×

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