IP Strategy

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ABSTRACT

This chapter gives an overview of the aims of an IP (intellectual property) strategy and discusses management issues involved in implementing such a strategy. Other chapters in this *Handbook* provide more-detailed information about managing intellectual property; the purpose of this chapter is to provide an integrated framework for giving IP rights the balanced consideration they deserve.

1. INTRODUCTION

IP (intellectual property) strategy can mean many things. In order to understand the relevance and implications of the term, we first need to look at what is meant by the terms *intellectual property* and *strategy*, how they work in combination, and the implications of an IP strategy for organizations. For some people, it means the tactics used to manage an IP rights program, with detailed attention to licensing, filing, and litigation strategies. For others, the term refers to a general business strategy that uses IP rights to manage technology. Still others might assume that an IP strategy is only a concern for large for-profit corporations and irrelevant to smaller or not-for-profit organizations. However, an IP strategy, and the informed use of IP rights, is important to organizations of all sizes.

2. INTELLECTUAL PROPERTY

IP rights are commonly regarded as simply a means of protecting innovation, with the assumption that this protection benefits the innovator.[1] However, such a view emphasizes too strongly the private benefits that can accrue to IP rights holders while neglecting the important public benefits provided by an IP system. Viewed broadly, an IP rights system has several components that contribute to the system's overall effectiveness. These roles need to be kept in balance, so that private interests do not dominate the public interest. Nor should public interests, considered in the short term, dominate the long-term private interests that drive the system.

IP rights are beneficial in a number of ways. By providing incentives or rewards for innovation, by packaging or defining intellectual assets, and by diffusing technical information and controlling intellectual assets, they are a powerful engine for innovation. In contrast to these utilitarian functions, IP rights also can be seen to protect a natural, even moral, right of inventors to their creations, a view that has its origins in Lockean conceptions of property.[2]

Whatever theoretical justifications are used to support them, the difficulty with IP systems is in striking the optimal balance between private rights and public benefits. From a public-policy perspective, this goal is elusive, and even after several hundred years of debate by economists, political leaders, and inventors, a precise way of balancing these competing concerns has yet to be found.

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IP systems play a significant but uncertain role in policy measures used to encourage investment in innovation. Fritz Machlup is often cited, for example, to support the view that the uncertainty inherent in the patent system makes that system difficult both to implement and to abolish.[3] But Edith Penrose made this same point seven years earlier in her study of the international patent system: "*If national patent laws did not exist, it would be difficult to make a conclusive case for introducing them; but the fact that they do exist shifts the burden of proof and it is equally difficult to make a really conclusive case for abolishing them.*"[4] Penrose was referring to the 19th century debate about patents, and Machlup and Penrose's earlier discussion of the 19th century patent system controversy dealt, in large part, with the debate over its abolition.[5] However, they observed in the same article that "*little, if anything, has been said for or against the patent system in the 20th century that was not said equally well in the 19th.*" That statement is also likely to be true for the 21st century.

Indeed, despite the longstanding theoretical uncertainty about IP rights systems, they have proved remarkably resilient in the countries that have implemented them. It is arguable that IP rights systems are, so far as we can tell, better than any of the alternatives that have been proposed over the years. Of course, this raises the possibility of interpreting IP strategy as that at the national not corporate level. In fact, there are many interesting examples that could be studied in support of this claim.[6] The U.S. Constitution, for example, provided for IP rights from its inception.[7] And Japan's rapid modernization from a feudal society in the 1850s to an industrialized nation by the early 1900s included the relatively rapid adoption of an IP rights system.[8] Even in the United Kingdom, the gradually evolving patent system had a role to play in the first industrial revolution.[9] Patent systems are known to support the interests of industrialized nations, and in most cases such systems also played a role in encouraging early industrialization efforts. This suggests that some form of IP strategy, at a national level, is relevant to all nations regardless of their level of industrialization.

2.1 *Organizational roles of IP rights*

Although the different justifications for IP systems and the different national strategies for implementing them are worthwhile topics, this chapter has a more pragmatic goal, to help provide an understanding of the practical implications of the various IP systems. Accordingly, it considers the four practical roles of an IP system. These are (1) acting as an incentive system for innovation, (2) packaging intellectual assets, (3) diffusing technical information, and (4) controlling intellectual assets.

An IP system's role of providing incentives or rewards for innovation is achieved through protecting that innovation by restricting use by others. The restriction, by protecting the inventor, enables them to command monopoly prices and benefit from the innovation to a greater extent than would be possible without such protection. This has implications for strategy in that potential restrictions on use confer control, and that control can be exercised not just to limit but also to expand the market for an innovation.

With technology-based innovation, IP systems also help package and define intellectual assets. Intellectual assets, by definition, start as tacit ideas, literally embodied in the inventor. IP rights, and particularly patent specifications, facilitate these tacit inventions by providing a more easily transmissible and protectable embodiment for these intellectual assets. This ability to enable previously tacit or secret information to be identified and made the subject of transactions and communications is a critical function of Intellectual property, and this dimension of IP rights has strategic implications. For example, this function facilitates licensing. Kenneth Arrow's information paradox, where transactions in confidential information are made more difficult where trust is absent, can be eased by the use of IP rights and the laws of contract.[10]

An IP system—especially a patent system—plays a key role in diffusing technological information. The threat of free riders and competition may tempt an innovator to keep an invention secret. Historically, there have been cases, notably the Chamberlen family's secret use of obstetric forceps in their medical practice for more than 130 years, where society has been denied

life-saving technologies because an invention was kept secret.[11] Modern analytical methods and job mobility make such tactics less likely today, but an IP system still has an important role in both facilitating the publication of inventions and making information easier to find. The challenge is, of course, that an IP system must be arranged so that the rights granted to innovators do not end up costing the rest of society more by unduly hindering access to other innovations.

Finally, intellectual property rights may be thought of as a means of, not just protecting, but, *controlling*, the underlying intellectual assets. This is particularly critical when IP rights are considered from the point of view of organizations or individuals with a concern for the public interest. The fact that IP rights give the power to prevent use means that they also give the right to license use, which enables IP rights holders to exert significant control over their innovations. The extent of that control will depend on a number of other factors (see section 4 below). If an organization ignores or fails to obtain IP rights, it risks abdicating control over an invention. In the case of a fundamental invention, this may have major strategic implications.

This point is illustrated by the different ways in which penicillin and the subsequent cephalosporin antibiotics were protected by patents. When penicillin was discovered in 1929, chemical product patents were not available in the United Kingdom. At the time, some felt that the discovery and work associated with penicillin's production should not be subject to patent protection. As a result, neither penicillin itself nor the initial production methods were patented by the discoverer, Alexander Fleming, in London and the developers in Howard Florey's team in Oxford. In contrast, the crucial factor in the widespread use of penicillin in the latter part of the 1940s turned out to be the development of bulk fermentation methods of production, and these were patented by their inventors in the United States.[12] As a result, the potential for control over the commercialization of penicillin largely belonged to the U.S. companies involved. Several years later, scientists from Florey's research group in Oxford discovered and developed the cephalosporin group of antibiotics. Patents were obtained by the National Research and Development Organization (NRDC), which was then responsible for commercializing university-based inventions.[13] Using the royalties derived from licensing these patents, the two main inventors, Guy Newton and Edward Abraham, set up two charitable trusts, the E. P. Abraham Research Fund and the Guy Newton Trust, which still today support medical, biological, and chemical research in Oxford.

The point behind these two stories is that, in the first case, control and financial benefit were effectively ceded to subsequent developers of critical enabling technology. In the second case, patents were used to not only retain that control but also to put financial proceeds under the inventors' control—in this case, for charitable purposes. A similarly significant financial decision was made by the NRDC many years later when it did not patent the initial discovery of monoclonal antibodies by Georges Köhler and César Milstein. In retrospect, this arguably forfeited several million British pounds of potential royalty income. However, it is worth noting César Milstein's comment about his approach to patenting and licensing his laboratory's work:

Within our laboratory we established a set of principles. The public interest should come first, the scientific interest of the inventors, second, and making money should be considered only in the light of the first two priorities.[14]

But did the first two principles receive the priority they could have had if there had been more interest in the commercial aspects of the laboratory's work? Indeed, such principles do not preclude the use of IP rights. They simply suggest how the rights might be used. More importantly, the public may benefit when those who are obliged to be concerned with the public interest exercise control over their innovations. Intellectual property represents one of the few means of control available to scientific and research establishments, even for those organizations not directly involved in commercializing their research.

More generally, it is much more useful to consider IP rights as a means of control,

rather than as a barrier to be placed in the path of the competition.

3. STRATEGIC MANAGEMENT THEORY

Having considered the roles that intellectual property can play, the nature and scope of IP strategy should be considered. There are many definitions of *strategy* from a business perspective. A common, widely applicable definition is provided by business historian Alfred Chandler:

Strategy can be defined as the determination of the long-run goals and objectives of an enterprise and the adoption of courses of action and the allocation of resources necessary for carrying out these goals.[15]

The word *objectives* is used in the plural, and it is important to realize that organizations may have multiple objectives. Businesses tend to be thought of as unidirectional, as devoted solely to the pursuit of profit, or maximizing shareholder value. In reality, most organizations have multiple objectives and pursue more than just profit. In the case of not-for-profit organizations, this is usually explicit. Objectives such as widening access to medicines, eradicating disease, and improving social conditions may constitute primary objectives for organizations, and these objectives may make profit seeking impossible. However, whatever the organization and whatever the objectives it sets for itself, the resources it has under its control must still be managed to best effect. For a company to say it will forego profit by not bothering to exploit a resource may sound acceptable, if financially inefficient. For an organization to say it will forego the chance to save lives by not bothering to exploit a resource can hardly be seen in the same light. Indeed, if not-for-profit organizations opt out of the global IP system, they may not be the biggest losers. This point once again highlights the importance of intellectual property and of understanding its challenge, which lies in the need to balance the management, control, and use of resources with the achievement of the organization's objectives. Intellectual property is a resource. As such, it should not be thrown away—even with the best of intentions. As with many aspects of intellectual property, it is no surprise that the choices may not always be clear and are almost always controversial; the challenges should be expected to be unexpected.

A conventional view of business strategy might divide the subject into a consideration of the *external* environment, in which the business competes, and the *internal* resources it uses to compete. In the early 1980s, studies of strategy tended to concentrate more on external environment, including work originating in industrial organization economics. This work, emphasizing barriers to entry, by authors such as Bain[16] and Mason,[17] eventually led to Porter's work on industry structure analysis.[18] Porter considered IP rights primarily as examples of barriers of entry, though they also form "isolating mechanisms" necessary to preserve competitive advantage.[19] However, concentration on such external issues as the choice of where to invest and compete made the strategic analysis of the day less directly relevant to IP issues. In the latter half of the 1980s and 1990s, the development of the resource-based view of companies, with their internal focus on managing the resources of an organization, gradually drew the field of strategy closer to that of IP management.[20]

The resources of the organization essentially comprise the organization's staff, its financial resources, any tangible assets, and the intangible or intellectual assets that the organization controls. The aim of strategy is to manage the resources available in order to achieve the objectives set. Since in most cases resources are tradeable assets, any organization in possession of valuable resources is obliged to put those resources to the best use possible, even if they lack direct relevance to the organization's immediate objectives.

A publicly acknowledged failure to make the best use of a company's assets may result in a bid for control of the company by those who feel they can extract more value from resources than managers have. Even with not-for-profit organizations, not making the best use of the resources available is a serious failure.

IP rights are one of an organization's intangible resources, and thus they need to be exploited to the fullest extent consistent with the organization's objectives. How this should be done may

not always be clear, but what is certain is that no resource should just be given, or thrown, away.

One final aspect of general strategic-management theory that is relevant to the study of intellectual property is the concept of managing added value. In any business where resources are employed and processed through a value chain of parties—each adding some small amount of value before the product reaches the end customer—the relationship between the organization and those with whom it buys and sells is crucial. Just as important is how the value created by the entire chain of parties is distributed among the parties in, or closely associated with, the chain. If the innovator tries to capture the entire added value in the business, perhaps by using particularly effective IP rights, the innovator may find it impossible to get any distributors to sell the product. The innovator might then be forced to rely on direct sales, resulting in a loss of competitiveness. Equally, if each business or licensor involved in a production chain insists on a substantial proportion of the final retail price, the royalty stacking produced may make the goods concerned uncompetitive. While the concept of the value chain is inherent in a number of strategic models, whether at the industry level[21] or business-unit level, the "value net" advocated by Brandenburger and Nalebuff deals nicely with the issue of how value added is distributed over a network of parties involved directly, or indirectly, with a business.[22]

In considering how to exploit and appropriate the benefits of a given piece of intellectual property, consideration must always be given to how the dynamics of an industry, the access to complementary assets, and the strength of IP rights will affect the ability of any one party to appropriate the benefits of the innovation.

4. IP STRATEGY

Having identified IP rights and how they fit into the larger scheme of strategic management, the immediate question is what exactly an IP strategy requires beyond the general exhortation to make the best use possible of the resource.

A simple taxonomy of IP strategy to divide the field is needed, just as the larger field of strategic management is divided into internal and external resources. On the one hand, there are activities external to the organization that involve interaction with other parties. On the other hand, there are internal activities concerned with management within the organization. The word *strategy* tends to invoke images of competitive action, but the internal perspective on IP strategy must not be neglected in favor of the external, since both are directly concerned with the value and allocation of resources.

A further distinction to be drawn is that between IP *strategy* and IP *management*. This might be likened to the difference between strategy and tactics; the difference is between the general principles and aims that govern the courses of action (strategy) and the actual implementation of those courses of action (management).

4.1 *External IP strategy*

The key components of an external IP strategy are the issues of exploitation and what might be termed litigation, licensing, and learning. In a sense, litigation and licensing are opposites, since one denies and the other allows what would otherwise be an infringement of IP rights. The fact that both are choices within an IP rights holder's range of strategies illustrates the power of control provided by an IP strategy. The possessor of an IP right has the power to stop, allow, or even encourage the use of that right, depending on the strength of the IP rights concerned.

Regarding litigation, perhaps the main distinction to be drawn is between litigation tactics, for example, deciding in which country to litigate against multiple infringers or deciding which arguments to use. In contrast, litigation strategy involves, for example, deciding whether to resist or grant licenses to infringers, so that litigation can be settled before it reaches court. Especially where IP rights held overseas are infringed, IP rights holders may be persuaded to solve infringement by granting licenses to convert local infringers into licensees. This may not, however, always be the best course of action; certainly the best licensees may not always be found among former infringers. The infringers may have deliberately infringed with the aim of

acquiring licenses on advantageous terms. Indeed, a focus on litigation strategy may encourage the IP rights holder to make poor decisions about whom to grant a license. Moreover, while a patentee's options may be more limited when operating overseas, a litigation strategy should not be decided by the infringers but by the IP rights holder. Wherever possible, any decision about licensing should be driven by licensing considerations rather than by a desire to avoid litigation. For institutions and organizations whose main aim is to maximize the use of their innovations, litigation should be secondary—far behind exploitation and licensing.

When seeking to exploit intellectual property, an organization has at least three main options. First, it can sell the technology outright and exit from the field (except perhaps for providing technical advice during a transitional period). Or it might choose to exploit the technology in-house, using its resources to develop and market products and services. Finally, an organization could choose to license-out the technology.

In all cases, the implications of each approach must be considered. The organization aims to make the greatest use of resources under its control. In the case of intellectual assets, such as a patented technology, a key question must be what resources are required to successfully exploit the technology. Teece has suggested that firms need more than IP rights: success in a competitive market requires strong IP rights plus access to "complementary assets."[23] For most technologies, getting from laboratory to market or to the patient, recipient, or other beneficiary of the technology requires much more than just inventing and announcing the technology. Process development, testing, trials, approval, production engineering, production facilities, distribution chains, and marketing skills are just some of the resources required to exploit a technology. Not all organizations have the needed resources. Even those that do have the resources may only possess them in limited markets, putting international exploitation beyond their reach. So, if we assume that a new technology is well protected using IP rights, then the question remains as to whether the organization has the complementary assets needed to exploit the technology. Leaving aside the question of whether the innovator keeps most of the benefits from the innovation, the key issue is whether the innovation can be exploited to the fullest extent by the organization at which it was invented.

Indeed, if a new invention gives substantial advantages over existing technologies, it can be assumed that the invention will be a technological success. What cannot be known is whether the organization inventing it will be more successful than its competitors in making the invention widely available. Organizations with limited resources, the case for all but the very largest multinational firms, are very unlikely to be able to exploit new products or services quickly. This means that the organization's assets will have to be used or traded in order to acquire the needed resources. Especially for smaller organizations with limited staff, finances, and physical assets, the only resource likely to be sufficiently scaleable to expand to meet the resources needed for overseas exploitation will be the intellectual property associated with the invention.

The returns from out-licensing technology are inevitably less than the potential proceeds from exploiting those assets in-house. But licensing can make access to markets and technical fields possible. Thus, the cost of such licensing may be well worthwhile, since the amount of value added will likely be substantial, relative to costs. Even for a not-for-profit organization, some form of contract that effectively trades returns for opportunities to exploit is all but unavoidable.

There are, however, two potential concerns with licensing agreements. Licensing is just one option on a continuum of possible interactions between organizations, ranging from sale, purchase-through-licensing, and joint ventures and alliances to full acquisition and merger of the organizations. These options should be considered as alternatives to licensing if in-house exploitation or outright sale of the technology is impossible. For an organization with limited resources, licensing may be the easiest option, but it may not necessarily be the most efficient for maximizing control and returns available to the innovating organization.

Outright sale involves loss of control and, more importantly, may fix the returns available. As an alternative to an outright sale, some form of exclusive license may be preferable, since contracts can be written to include options enabling the innovator to benefit from unexpected increases in revenue and new opportunities to exploit the invention. This approach essentially applies the concept of real options to help the organization limit its downside risk, while still allowing the organization to take advantage of any unexpected upside advantage. Another way of achieving this real option effect is to license technology to a spinout company formed by the organization to develop the technology independently. Forming a spinout, however, requires raising additional financing from other sources, with the original organization recouping its investment from the eventual capital appreciation of its shares in the company. But the demands on those involved in the spinout are arguably greater than those involved with exploitation either through licensing or sale. That is true because the interests of investors, industry, and those in the organization must all be reconciled. Such a spinout strategy may, however, provide higher returns to the organization and, because outside investment could be generated, the strategy may enable exploitation on a scale that would have been impossible either by licensing or by selling the technology to existing companies. Spinouts can be used by any organization, including public sector organizations such as universities. Indeed, there are many examples of their use by technology transfer offices (TTOs).[24]

The objective of all licensing or sale of intellectual assets is for the organization to extract the maximum benefit from the innovation so that it can achieve its objectives. This means seeking the maximum benefit not just for immediate opportunities but also for future opportunities, such as overseas expansion. IP strategy cannot be short sighted, in terms of either markets or time. Just as a patent attorney drafting claims will frame them as broadly as the prior art allows, enabling the full scope of patent protection to be obtained and not unnecessarily restricted as new uses of the invention develop, means a TTO should construct contracts and licensing arrangements to take advantage of all possibilities. In fact, such practices should be a normal part of the responsible strategic management of an organization's intellectual assets.

One final aspect of licensing, equally important to not-for-profit organizations, is the issue of learning, or technology diffusion. In a competitive market, out-licensing by a technological leader will give access, not only to the technology licensed, but to learning opportunities.[25] Where the aim is to diffuse technology as widely as possible, such dual access may be a positive advantage. On the other hand, where the aim is to maintain a competitive advantage over those who might learn by licensing-in, it may prove a considerable disadvantage that is not outweighed by the income that licensing brings. Licensors of intellectual assets may need to balance the effects of learning with the potential revenue from licensing.

Finally, one sometimes neglected aspect of licensing concerns network externalities where the worth of a technology to users increases the more users it attracts. In such cases, even in a competitive situation, it may be preferable for an organization to license-out or otherwise make the technology available even at low or below cost, since this will generate a large user base and encourage further adoption of the technology. (An organization should, of course, be aware of any competition law restrictions that might be relevant.) In such cases, the reluctance to license-out the technology may actually lead to a competitive disadvantage, even though it is thought that the innovation is being protected and exploited. Once again, the lesson here is that the control that IP rights give is more important than the mere ability to prevent exploitation by others; too restrictive an attitude toward IP rights can act to an organization's disadvantage.

4.2 *Internal IP strategy*

IP strategy involves not just external issues but a variety of internal issues related to resources within an organization. A few of these issues that are particularly relevant to IP strategy are: valuation, information, coordination, and education, including the management of researchers in their

roles as creators and preservers of intellectual property within an organization.

4.2.1 *Valuation*

The valuation of intellectual property reflects the nature of the IP system in general. Despite the best efforts of economists, it is often arguable how valuable the IP system is for any general class of innovations. Likewise, despite the best efforts of managers and accountants, it is often unclear exactly how valuable a particular intellectual property right is, despite the fact that deciding to obtain or preserve the right implies a specific value.[26] If organizations are to go to the expense of obtaining and protecting intellectual property, especially intellectual property that requires a complex application procedure such as overseas patent applications, then the considerable costs have to be justified.

It is easy enough to justify long-established legal fees to preserve an established income stream, for example, from licensing a successful piece of intellectual property. However, far more often IP managers will be required to make decisions about incurring costs for intellectual property of unknown value. Such decision making in the early stages of the life of a patent, for example, is inevitably problematic because the decisions require speculation about the invention's future prospects. After all, such predictions about the future can certainly be wrong.

In response, two potential approaches can be taken. The first is simply to adopt a portfolio management view of innovation and to assume that, although much expenditure on R&D and IP protection may be wasted, there will be enough successes to more than pay for the failures. While this approach is adopted often by larger companies that can afford such an approach, such an approach is not easy to sustain when financial pressures mount and organizations are looking for short-term costs to cut. The consequence of such financial pressures are that companies operating near the margins of profitability may find that their IP rights coverage is patchy, reflecting fluctuations in their financial position. In unfortunate cases, financial hardship coincides with the creation of a valuable innovation, which then is left unprotected and less exploitable than it might have been.

The second approach is to adopt a case-by-case analysis of each development, taking into account all the information that is available about the innovation's future prospects. The key feature of such an analysis is the fact that the absence of current revenue early in the life of an invention should not count against it as much as its absence later in the invention's life. Of course, it is easy to value a stable income stream once an invention has become successful. The essence of valuing early-stage innovation is to be aware that such IP rights represent *real options* on the future extra income that might be derived from the IP rights that protect the invention.[27] But calculating patent values, taking such real options into account, is not straightforward. In practice, patent attorneys and IP managers make implicit valuations of this sort whenever they justify preserving an IP right that is currently unproductive, as long as they foresee some chance of it producing an income stream in the future.

In terms of evaluating alternative courses of action, some form of valuation is essential for assessing the potential outcomes against the potential costs. Strategy is thus intimately linked to valuation. However, beyond such assessments, there is the more general issue of the values driving the objectives of the organization. Issues may exist where the values of the organization drive decisions that are not solely based on a financial analysis. That said, even where such plural strategic objectives and nonfinancial values are involved, financial analysis might still be a perfectly valid basis for making many IP-related decisions.

Valuation is a critical, unavoidable element of IP management and strategy. This, however, does not make valuation any easier to carry out reliably when making important strategic decisions.

4.2.2 *Information*

One of the roles of IP rights is to diffuse information. The patent system, for example, promotes the public benefit by forcing inventors to disclose their inventions to the world in return for the grant of patent rights. Of course, publishing such information has its drawbacks. Publishing

provides a source of information of great use to the organization and also of use to competitors.

Besides publications, researchers should conduct patent searches along with literature searches. Though academic publications might be issued before related patent applications, often the patent application is the only, or the first, publication available related to a competing technology. In addition to establishing what already exists in the prior art, patent searching can give a very good view of the technological trajectory of organizations and thus has strategic importance for dealing with competitors or when negotiating licenses or other deals. Patent and other IP-related information thus play, not just a technical, but a strategic role.

Strategy is almost always formulated with reliance on imperfect information. Consequently, any access to information that can inform decisions is a valuable resource.

4.2.3 *Coordination*

Those involved in managing intellectual property need coordination, and such coordination is essential to the strategic process of "allocating resources" identified in Chandler's definition of strategy. The problem often encountered in the strategic management of intellectual property is that the range of people, skills, and qualifications required is such that no one person or group of people can easily carry out, in an integrated way, all the tasks required. The range of skills needed will include those of legal specialists, such as patent attorneys skilled in drafting and prosecuting patent and trademark applications; lawyers specializing in intellectual property who can assist with litigation or licensing contracts; and R&D managers who can provide suitable incentives and motivation to keep personnel involved in obtaining and protecting IP rights. Other personnel such as licensing managers, who may not be legally or technically qualified but have substantial commercial experience, also have a significant part to play in managing intellectual property.

Finally, senior managers are needed to guide and oversee the overall strategic management of the organization's intellectual property. The person ultimately responsible for intellectual property in a company might come from a legal, business, or technical background. However, since it would be unusual for any one of such managers to have all the requisite skills to manage intellectual property, an essential feature of good IP rights management is good communication and coordination among those who, as a group, possess the requisite skills. Communication and coordination are key concepts to keep in mind when assembling staff to provide the skills for the organization. These concepts are especially important when making decisions about where to locate staff or find outsource specialists.

For example, locating patent attorneys near to the R&D scientists the attorneys are meant to interact with will facilitate the process of patenting and technology transfer. Conversely, isolating a specialist IP department from the strategic management of the organization will not help integrate the management of intellectual property into the strategic thinking of the organization as a whole. Compromises may have to be reached to reconcile conflicting demands of the R&D lab, IP legal department, and the organization's headquarters. The aim, however, should be to enable R&D, IP law, general law, and general strategy to work together efficiently.

4.2.4 *Education*

Finally, there must be a minimum level of IP awareness training for all staff, especially the majority who are not IP specialists. Such training is necessary to avoid employees compromising valuable intellectual property because they do not know, for example, that publication before filing a patent application invalidates the application. IP training can also serve to improve communication between researchers and IP specialists. Training sessions can provide a forum for publicizing the organization's policy on incentives offered to employees to support the process of obtaining and preserving IP rights. Preliminary research results in the United Kingdom and of the common experience of those working as in-house patent attorneys show that, while most managers have heard of patents, they have only a limited knowledge of more-detailed information, such as what type of disclosure will prejudice a patent application.

The aim of an organization's IP awareness activity should therefore be to dispel such ignorance without trying to turn all employees into patent attorneys, thus ensuring that employees are reasonably equipped to preserve the organization's IP interests.

5. INSTITUTIONAL DIFFERENCES IN IP STRATEGY

Governments, public sector organizations, spin-out companies, small and medium enterprises (SMEs), and large companies all need to pay attention to IP issues. However, the issues that each will be concerned with will differ from institution to institution, as will the various IP strategies and practices the institutions adopt.

5.1 *Governmental IP strategy*

In addition to having institutions to administer IP laws, most industrialized nations will need an IP policy, for dealing with trade-related IP aspects, as part of their general trade and industry policies. However, any national government intellectual property or patent office has both an administrative role and an *internal* policy-making and promotional role. The first IP systems in the U.K. resulted not from external trade pressure, but from the original goal of encouraging innovation. Today, battles commonly are fought to choose between trade pressures that protect external intellectual property and the perceived local, short-term advantages of minimizing such protection and free riding on such external intellectual property. This conflict can lead to insufficient attention being paid to one of the original roles of IP systems: promoting innovation and diffusion of inventions. In the face of such distractions local innovators will fail to take advantage of the information that IP systems can diffuse (for example, through patent information systems) and will also likely fail to be influenced by, or even aware of, innovation-promoting incentives. Thus, one of the most important things a government can do is to provide an effective, enforceable system for protecting and promoting local innovation that not only provides the infrastructure to administer the system and spread knowledge, but also actively promotes the use and benefits of the IP system to potential users.

Such promotion can be carried nationally by the central government, as illustrated by the promotional activities of the Danish patent office[28] and the traveling seminars of the U.K. patent office.[29] Promotional activities can also be undertaken at the local government level, as has been shown by the Tokyo metropolitan government's IP center, which not only promotes IP awareness but can even help pay for some IP work and applications.[30] Obviously, exactly how awareness is promoted and which aspects of intellectual property are emphasized will vary from country to country. In any case, an IP system that potential users are unaware of is guaranteed to be ineffective, since it will serve only the interests of the few who are aware of the benefits.

5.2 *Public sector IP strategy*

IP strategy might appear to be of interest only to for-profit commercial organizations. Granted, the innovation-promoting role of IP rights may be less relevant for a public sector organization involved in R&D as a matter of government policy, than for a private company seeking a commercial return. However, the controlling and intellectual-resource-management aspects of IP strategy are nonetheless highly relevant to any institution—particularly public institutions that have a duty to manage their resources as best they can to achieve their public objectives. Government services, such as health services, government research departments, university research laboratories, and other public sector institutions involved in creating intellectual property will certainly need to formulate an IP strategy. They will need to ensure that staff are aware of the organization's valuable IP assets and that these assets need managing and preserving as much as any other assets of the organization. An IP strategy can also help to ensure that any liabilities that might be incurred by the use—especially the inadvertent use—of intellectual property owned by other parties are minimized.

Given, for example, the IP management functions within a university or government

research laboratory, an IP strategy is likely to emphasize protecting and exploiting intellectual property through licensing or spinout companies.[31] Noncontractual and nonlitigious aspects of work, such as drafting patent applications, may be outsourced to patent attorneys in private practice. So one key role of a public organization involved in R&D—especially collaborative R&D—will be to manage the IP elements that govern research contracts.

In the case of public or charitably funded research organizations, the absence of an IP strategy is likely to result in the organization effectively giving away its IP assets to others. Ignoring the need to manage IP resources is as serious a failing as neglecting to manage an organization's physical or human resources.

5.3 *Spinout and SME company IP strategy*

Small companies, especially those in the very early start-up phase of their existence, may not have the resources to employ any specialist staff (such as qualified patent attorneys). However, one might argue that companies at that stage of their existence have the largest portion of their overall value embedded in intellectual property. As such, an IP strategy is one of the most essential elements of a company's overall strategy, and because of limited resources and information, the IP strategy will be difficult to formulate. Thus, because small companies lack resources and the complementary assets mentioned above, these companies, including IP spinouts, run the risk of failing to appropriate returns from their innovations.

To counter this potential loss of advantage, smaller companies need to spend what may seem like a disproportionate amount of their resources on protecting and exploiting their intellectual property. If necessary, these organizations should rely on external sources of advice and help to accomplish such protection and exploitation. A risk, which may be unavoidable at times, is that cash constraints may limit the ability of a company to protect and exploit its intellectual property. Thus, the company may be unable to reap as much of the benefit from its innovations as it otherwise might.

By investing in the initial innovations to extract more value from them, a small company can use protected intellectual property to generate the financial and other resources needed to grow the business. A spin-out company may likely find it difficult to extract the maximum value from its innovations, especially if its IP rights are weak. However, as the company gradually increases the resources available to it, its ability to exploit subsequent innovations should improve. An IP strategy is not something that a small company cannot afford to have, but rather something it cannot afford to be without.

5.4 *Large-company IP strategy*

Large companies might be considered to have the simplest task when it comes to IP strategy, since they are likely to have enough resources to deal with IP issues promptly and, very often, in-house. But large companies face IP strategy problems that smaller companies or public institutions are unlikely to encounter.

First, a large company is likely to have been built on the strength of its past technological successes. Most forms of intellectual property (apart from trademarks) have a limited lifetime, so past success is no guarantee of future success. Indeed, the ability of a company to reap large financial rewards from out-licensing previously neglected IP assets may just be a prelude to the company's demise, unless some of those proceeds from past success are invested in the future. Repeating success is never easy, especially in areas where technological uncertainty can undermine technical and commercial ability. In the absence of continued investment, decline is inevitable, since IP rights erode and technology gradually becomes obsolete. No company, however large, can afford to rest on its technological laurels.

Second, communication and integration may present a challenge. One benefit of being a small company is that all the key personnel involved in IP issues probably work in the same building and interact with each other every day. For a large company, especially one with a separate in-house IP department, IP specialists must be continuously encouraged to communicate with those inventing and exploiting innovations within the company. Moreover, the IP department must communicate

well with senior management and convince it of the importance of IP management.

A third challenge is that IP departments within a larger company may be tempted to focus on internal department interests, rather than on the interests of the company as a whole. This might result in too many patent applications being filed or excessive licensing of technology that should instead be kept in-house.

None of these challenges should force larger companies to outsource such IP management functions; they are just good reasons to make sure that IP is properly managed. In terms of communication alone, the benefits of keeping IP management functions in-house can be considerable if IP departments are managed well.

6. IMPROVING IP STRATEGY

IP strategies inevitably differ with size and type of organization. As we have seen, the key elements of an IP strategy involve both external and internal factors. External factors include issues of licensing and litigation; internal factors include issues of valuation, information, coordination, and education. All these aspects of IP strategy should concern all types of institutions to some extent, though emphasis will vary. Public institutions may tend to concentrate more on licensing, information, and education. Spinouts and small companies will be more concerned with external issues of licensing and litigation, and, consequently, valuation. Large companies will be concerned equally with all issues, and the companies may be more aware of IP issues due to their in-house IP departments.

Each kind of institution can take basic actions to improve its own IP strategy. For governments, these might include:

- promoting awareness of intellectual property, from both a creator's (potential innovators) and a user's (potential infringers) perspective
- promoting use of information contained in patent and other IP databases to both source technology and inform further innovation
- providing both central and local sources of advice and assistance with innovation exploitation, especially in overseas markets
- providing basic education in innovation exploitation to IP lawyers (Although they may be the first point of contact for IP advice for many, they are generally only legally and not commercially trained. Having someone to whom companies could refer to for specific advice would help.)
- organizing a network of innovation-support centers to provide communal TTO/IP advice (Infrastructure to exploit innovations exists internationally; the problem in many countries is getting from the inventor to the overseas licensee. Such centers might not be able to do all the work of normal TTOs, but would be able to coordinate IP exploitation and protection.)
- involving external trade organizations, which can help market technology overseas for those companies/organizations without the resources to do so
- taking steps to enable organizations to use, protect, and exploit nontechnological intellectual property—in particular copyright and trademarks, including collective and certification trademarks and designations of origin—even where technological innovation is less common or absent

For public sector institutions and research laboratories, basic actions to improve IP strategy might include:

- promoting an awareness of intellectual property from the innovator's perspective, including its value to the institution
- promoting use of the information contained in patent and other IP databases to inform further innovation
- providing sources of advice and assistance with intellectual property and innovation exploitation, especially in overseas markets
- giving a manager within the organization specific responsibility for IP management

- combining the role of IP manager with that of TTO manager in order to control the exploitation of technology produced by the organization and to provide advice on research contracts with external organizations (This approach will work in an R&D-related organization)
- taking action to facilitate good communication between IP generators and IP managers, as well as between IP managers and those controlling the organization overall

Spinouts and other small and medium enterprises could undertake these actions:

- promoting awareness of the basics of IP law and IP exploitation among staff so that everyone knows what crucial errors to avoid
- encouraging organizations to spend money in order to preserve and exploit commercially valuable intellectual property, where doing so is obviously economically justifiable
- encouraging companies to use IP information sources, such as patent and trademark databases, to supplement literature searches and to inform companies of competitors' activities both at home and abroad
- enabling companies to manage and provide incentives for those inventors who are the source of a company's intellectual property and who may well be the source of future intellectual property
- being prepared to form alliances and licensing deals to supplement the company's resources and to exploit markets earlier than would otherwise be the case, especially in the early stages of a company's life, during which period resources are scarce (Such licensing should not be so late that competitors have sunk investments into developing their own competing technology, nor so early that the value of the company's technology would not be fully appreciated or valued.)
- being prepared for the exploitation of a succession of innovations (The company's ability to fully exploit its inventions should gradually increase over time as proceeds from the exploitation of initial inventions are reinvested.)

With public sector institutions and research laboratory scientists activities to improve IP strategy could include:

- ensuring that laboratory notebooks are properly kept and that any publication is preceded by an assessment of patentability and commercial potential
- ensuring that all research staff are aware of the basics of IP law, especially that publishing technology before an application is filed may preclude patent protection
- ensuring that all research staff are familiar with IP-related staff in the organization or, if necessary, external TTO or patent attorneys who can provide expert advice at short notice
- ensure that all scientists entering collaborative agreements with other institutions have such agreements vetted by IP experts before they are signed

Finally, larger companies will need to bear in mind the following points:

- Even though a large company may have access to all the resources required for successful IP exploitation, these may be rendered useless by inadequate communication among the various people involved. Action should be taken to facilitate good communication between IP generators and IP managers, as well as between IP managers and those controlling the organization overall.
- Intellectual property should be considered both a source of technology to exploit and a means of exploiting technology: a "Not Invented Here" attitude to externally sourced technology can be shortsighted.

7. CONCLUSION

IP strategy encompasses a far greater range of issues than can be dealt with here. Strategic issues connected with intellectual property—in particular, the interaction between the strength of

IP rights and access to complementary assets, as well as the specialist nature of the skills required to manage it—are particular to IP management. However, IP strategy can fit within a number of conventional strategic-management theoretical frameworks, particularly the resource-based view of the company, with its consideration of intangible assets as a resource of the organization, and also game theoretical considerations of value-added distribution. As with any other resource, intellectual assets should be used to best advantage to pursue the organization's objectives.

IP systems are always controversial, because they appear to be cases of means justifying ends: they use something generally considered undesirable (monopoly, even if temporary) to achieve something desirable (technical or commercial progress). Nonetheless, IP-rights systems are now institutionally embedded in many societies to such an extent that abolishing them or even weakening them would be extremely difficult without coordinated international cooperation. Such cooperation is highly unlikely to occur. Thus, whatever views are held of the system, organizations have no option, for now, but to work as best they can within it.

The following is an essential tenet for any organization, including not-for-profit organizations: that if innovators do not use the IP rights at their disposal to try to influence or control the exploitation of their own inventions, then others will do it for them. If this happens, the organization's inventions may be exploited in ways that do not conform or contribute to the organization's objectives. ■

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