

## Extending legal protection strategies to the service innovations area: Review and analysis <sup>☆</sup>

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### Abstract

In highly industrialized countries, innovation and technologies account for about half of economic growth. Patent management plays a crucial role in managing innovation by providing legal protection, especially when supporting factual protection strategies that enable profits from temporary monopolies. However, the requirements for handling innovations have become tougher due to an increase in complexity, shortened innovation cycles as well as the higher risks and costs of generating innovation.

Today, value creation is shifting towards service innovations. However, legal protection strategies still are a novelty in this emerging business field. The paper gives an extensive review and an analysis of the current status quo and its recent history, and outlines how common practices in managing patents can get extended to the service environment.

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### 1. Increasing competitiveness

At the beginning of the 21st century, the business world is dynamic and complex and competition is globalized. Success rates in innovation in such a context are low. Only 0.6% of innovative ideas are eventually successful. In the pharmaceutical industry, the success rate falls to 1 in 10,000. The requirements for handling innovations have increased in numerous ways: globalization of competition, explosion of technological knowledge, technological fusion, decentralization of knowledge, escalation of research and development costs, reduction of innovation cycles, and acceleration of innovation diffusion.

*Globalization of competition:* The intensity of competition has increased due to the opening of national borders

and the expansion of multinational firms. The takeover of IBM's PC operations by the Chinese firm Lenovo in 2004 would have been inconceivable only a few years ago. Hence, in many industries it is no longer sufficient to merely sell and protect products locally. The power of economies of scale of production, along with a dramatic reduction in transportation and information costs has forced many players to go global.

*Explosion of technological knowledge:* The amount of knowledge doubles every seven years. The number of scientific journals has grown substantially over the last few centuries. The figure was estimated at only about 100 in the 19th century, increasing to around 1000 in 1850, jumping to 10,000 in 1900, and coming close to 100,000 in 2000. At the same time, approximately 80% of technical knowledge in the form of patent applications is published. Over 90% of the information in patent documents is not protected, due to expiration, rejection, retraction or non-extension [1]. Not only is the greater part of technological knowledge openly accessible, but it can also be freely and openly used.

*Technological fusion:* Increasingly, there has been fusion of various technological knowledge areas. According to a

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1998 report by the OECD, interdisciplinary research activities have great potential in the next 20 years. Electronics has merged with optics (optronics), with mechanics on a micro-technical level (mechatronics), and also with biology (biotronics). The important breakthroughs in the development and identification of the human genome are thanks to the close linkage between computer science and genetic engineering.

*Decentralization of knowledge:* The increased globalization of research and development (R&D) in transnational enterprises has led to the decentralization of competence centres. In a number of investigations, a clear trend could be ascertained towards integrated network structures and the establishment of a definition of R&D competence centres. The complexity of innovation processes has clearly increased because of decentralization. The application of modern information and communication technologies becomes indispensable and opens up new forms of innovation; for example internet-based innovation networks [2].

*Escalation of R&D costs:* Given the increased technology dynamics and more stringent requirements, R&D costs have risen dramatically. Yet, the 1990s were marked by a reduction in central funding for research. During the 1980s, the corporate research centre in a company such as ABB was responsible for 20% of the financing, with the remaining amount being in the form of company reallocations. Today, 80% of research funds must come from the various divisions or third parties. A larger portion of the R&D budget is allocated to patent rights. In technology-intensive industries, more than 5% of the R&D budget is reserved for the generation and preservation of commercial protection rights, plus the costs for the infringement and defending of own positions.

*Reduction of innovation cycles:* Despite rising R&D costs, companies are under increasing pressure to produce more products within a shorter time frame. The main reason for this is the fact that regardless of rising costs in R&D, innovation and technology leadership has become a substantial competitive factor [3]. For example, the innovation life cycle for a mechanical typewriter remains at around 25 years, while a typewriter that is based on micro-processor technology only has one of five years. If one were to look at newer substitute products such as laptops and palm pilots, the cycle time has been reduced to a few months. The risk of late market entry has increased notably.

*Acceleration of innovation diffusion:* As a result of the globalization of knowledge, shortening of the innovation cycle and the aggravation of the price situation, the diffusion of innovation has accelerated. In the *electronics industry*, it is only a matter of months after a product innovation before there is an imitation product on the market, in the *toy industry* this time frame shrinks to weeks. The protection of innovation has become even more important for companies in technology-intensive industries. Legal and actual patent right strategies complement one another, in order to amortize the investment in product development.

In the *automobile industry* 4–5% of turnover is invested in R&D, while in the *pharmaceutical industry* that number jumps to 18–20%.

The main challenges in the management of innovation in companies can be summarized by complexity, dynamics, and costs. Future-oriented organizations endeavour to achieve those projections on how to better handle innovation that were made in the years after restructuring. In order to handle high competition costs, companies are looking to achieve differentiation with customers. New products in the electronics, telecommunications, and software industries are usually associated with simultaneously increased input and reduced costs. Innovation is not only limited to the development of new products, but also includes the development of new services and business practices. Hence, an essential component of innovation management is to establish differentiation advantages with the customer, and find ways in which to make these advantages sustainable and renewable.

## 2. Protecting temporary monopoly profits to support entrepreneurial success

To justify high investment costs in R&D, companies have to gain competitive advantages. Only through realizing these temporary monopoly profits can such companies then continue to invest in research and development on a long-term basis. Therefore, these companies search for suitable protection strategies for their own innovations. Situationally adjusted protection strategies for internal innovations are essential. Traditional, factual protection strategies for the reduction of imitation risks are ever increasingly being supported by legal protection strategies to ensure freedom of action and block competitors (Fig. 1). Intellectual property rights have therefore become a suitable instrument for influencing sustainability and returns-on-investments.

The demand to use and apply intellectual property rights increased dramatically at the end of the last decade. Worldwide, the overall demand for patent rights rose between 2000 and 2004 from more than 10.1 million to an all-time high of almost 23.5 million [4]. The trend shows an annual average increase of about 24%. This is a lot more than the global estimated economic growth as per the International Monetary Fund (IMF 2005: 4.4%).

Today many technology-intensive companies not only want to protect their products from being copied, but are now also looking to maintain and defend their *freedom of action* status by enforcing the rules of their intellectual property rights. This means that they intend to block competitors through specifically shaped intellectual property rights, e.g. by dependent patents.

Companies have created licensing departments, some of which are even structured and budgeted as profit centres. Furthermore, various external licensing and litigation companies have been established to support these business models. The approaches to and methods of enforcing

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