

INTELLECTUAL PROPERTY, INNOVATION AND NEW PRODUCT DEVELOPMENT

"...Because its purpose is to create a customer, business has two—and only two functions: Marketing and innovation. Marketing and innovation produce results, all the rest are costs." – Peter Drucker, management consultant and author of "Innovation and Entrepreneurship"

Technological innovation is one of the principal determinants of business success. Enterprises stand to reap greater benefits from innovation if they consider the full range of intellectual property (IP) issues in new product development. Effective use of the tools of the IP system reduces risk and facilitates the process of taking innovative technology to the market place, while at the same time enhancing the competitiveness of technology-based enterprises.

In order to explain the role of the tools of the IP system, this article explores technological innovation as an interactive process made up of a number of distinct stages, beginning with the formulation of a novel idea/concept, followed by research and development (R&D), ending in the launch of a new or improved product in the marketplace. It will highlight the practical IP issues relevant to each stage.

Invention or innovation?

Innovation concerns the commercialization of new ideas, while invention is not necessarily directly associated with commercialization.¹ Invention is the generation of a new

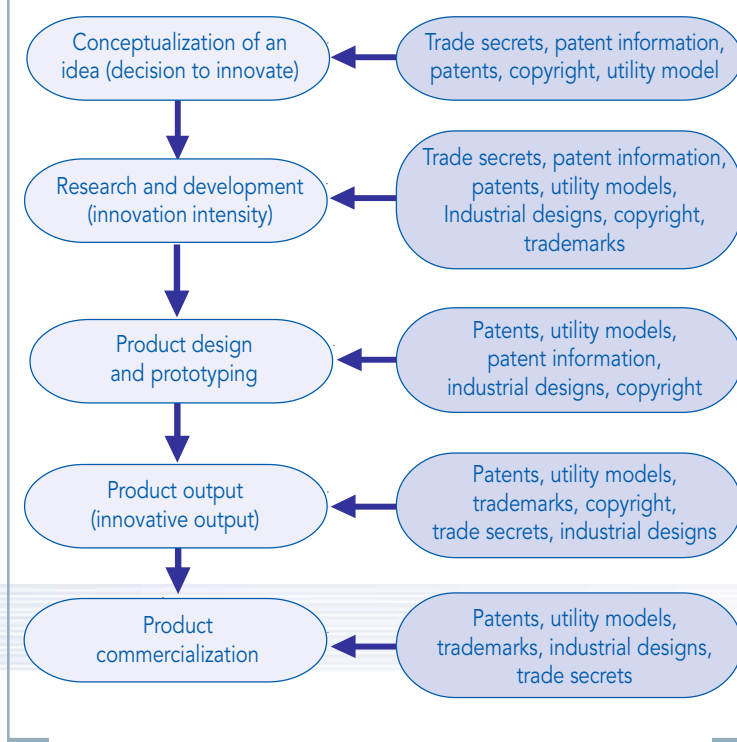
idea aimed at solving a specific technical problem. Innovation can be seen as a process of interaction and feedback during the various stages of product development. Not all inventions are commercialized, so it is clear that not all inventions result in innovation. Many new ideas are born but "most die a lonely death,

never seeing the light of commercial success."²

As is the case with inventions, so trade secrets, utility models/petty patents and patents are relevant for protecting, managing, exploiting and leveraging innovations. Economic studies have revealed that patents are the preferred IP right sought for the protection of technological innovations. This seems to reflect the use of the terms 'innovation' and 'invention' as synonyms. For example, the number of patents owned by an enterprise is often used as one of the main indicators for determining its *innovation intensity*,

IP in the innovation process

Below is a graphic representation of the role of IP in the innovation process, identifying the types of IP tools that can be used at each stage of the process. The choice of the type of IP tool at each stage should be considered as part of the overall business strategy.



¹ Mark Rogers, 1998, "The Definition and Measurement of Innovation"

² Brandt, J. L., "Capturing innovation: Turning Intellectual Assets into Business Assets"

and patents are used as a measure of *output of innovation*. While such an approach is useful, it does not look at the role of the IP system as a whole in facilitating the successful introduction of innovative products in the marketplace.

The idea stage

From the moment an enterprise has a potentially innovative idea, it is imperative that the idea or concept be treated as a secret. That is to say that the information surrounding the creation of the idea must be protected carefully as a trade secret. Not all commercially viable ideas can or will be patented, hence the importance of treating ideas as trade secrets, particularly at the inception stage.

For an idea that may result in a patentable invention, the final choice between either the trade secret route or the patent route for protection should be seen as a strategic business decision to be taken at a later stage of development when all the requirements of patentability are met. The choice depends on the nature of the invention, its business potential, the competition, how easy it is to reproduce and the ability of competitors to reverse engineer it from the final product. Whatever the ultimate decision, the idea must initially be protected as a trade secret in order to preserve the option of patenting at a later stage. Even after patenting, a part of the idea may remain an associated trade secret.



The development of the vacuum cleaner since William Hoover's first model illustrates the strategic use of a combination of IP tools.

Technical drawings, which are often made in the idea stage, should also be treated as trade secrets. They may in addition be protected by copyright. It is important for the drawings to be dated so as to establish the date of creation. Technical drawings could also, at a later stage, form an important part of the relevant patent application.

Information contained in existing *patent documents* also play an important role at this stage in the conception, screening and development of the idea. Patent documents can provide useful insight into whether an idea is new (state-of-the art) and worth developing. Furthermore, proper analysis of patent information may provide insight into the strategy of potential competitors and into technology trends.

R&D stage

The IP tools used during the idea stage continue to be relevant during the R&D stage. Thus, a company must continue to guard its trade secrets, especially if it has yet to decide on whether to file a patent application. Competitors should not

have access to any vital information which could erode the competitive advantage of the final product.

Extensive research and consultation, important to the success of the project, is carried out at this stage. Many companies at this point fail to tap into the valuable technical information contained in published patent documentation. The European Patent Office (EPO) estimates that 70 percent of the information in patent documents is not available elsewhere. With more than 800,000 patents granted annually around the globe they offer a wealth of information, such as information on the state-of-the-art, which can help an enterprise to avoid wasting resources, in terms of money and time, during the R&D process. Patent documents may hold information that can lead to further improvements in the product or shorten the time taken to get the product to market. Small enterprises, particularly in developing and least developed countries, can use patent information in the public domain to

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*Chester Carlson
patented his
xerography
invention in 1942.*



XEROX®

come up with innovative products adapted to local conditions.

Having decided on the type of IP protection it will use to protect its R&D output, the enterprise should immediately start the registration process. In the case of filing a patent, this will facilitate the establishment of a date for determining the priority and claiming exclusive rights over the output (even before a patent is granted – see the Jim Frazier case on page 10). As much R&D results in both functional and aesthetic improvements, enterprises should also consider registering industrial designs to protect the look and packaging of the product.

Outsourcing

In most cases, innovative technology requires resources and technical development that are not available in-house. Ownership of the IP rights on the technology ensures that these are not lost while taking advantage of external technical resources and facilities owned by a third party. To avoid future conflict, IP ownership should be clearly es-

tablished and issues related to resulting IP resolved before embarking on any joint venture or outsourcing.

IP as a lifeline

Taking a product to market is usually a big challenge for inventors, entrepreneurs, and enterprises, hence the concept of the innovation “valley of death,” which runs from the time the invention has been prototyped to the launching of the new product in the market. This is the period where most inventions collapse due to the absence of external support or because they are not commercially viable. During this stage IP, particularly patents, play a crucial role in facilitating access to providers of early stage capital, which may provide a lifeline to enable an invention to reach the marketplace. IP ownership strengthens the negotiating position when looking for investment partners, and makes a business more attractive to potential investors.

For example, Mr. Chester Carlson invented xerography in 1938 and patented it in 1942. It then took him five years to find the necessary funding to take the product to market. In

1947, the Haloid Company acquired the license to his basic xerographic patents. The first xerographic copier, Model A, was introduced in 1949. It would be fair to say that Mr. Carlson would not have been able to market the invention without external investment, and that the patent he held contributed significantly to Haloid’s decision to support the invention.

Most innovative ideas never come to market, but those protected by IP stand a greater chance. IP ownership plays an important role in influencing the decision of external partners as to whether to invest in a firm and provides the holder with more options, such as selling or licensing the patent, or forming strategic business partnerships and alliances for commercialization. Enterprises facing financial constraints but rich with IP assets will probably find it easier to establish joint ventures that allow them access to R&D facilities or to distribution channels and sales networks. An enterprise with a patented product or valuable trade secrets may also find it strategically beneficial to establish a joint venture with an enterprise with a strong trademark.

A well managed IP portfolio, accompanied by a business plan and strategy that demonstrates how the associated IP rights can be exploited to generate future revenue, to develop a strong market position, and to control the market is more than likely to attract venture capital.

Marketing of innovations

In the phase where the product is finally brought to market, trademarks and industrial designs play an important role. These enable consumers to identify the products of a particular company and to distinguish these products from others.

A trademark is a useful tool in launching new product segments or entirely new products. In addition, trademarks can be very effective in penetrating new markets and extending commercial benefits beyond the life of a patent. The case of Aspirin is a good example. Developed in 1897, the drug was patented in 1899 by the Bayer Company. Knowing that patents have a limited duration, the Bayer Company embarked upon promoting a trademark for its new product. When the Aspirin patent expired, the company continued to benefit from the sale of the product through its established trademark Aspirin.

Technological innovation can also be supported by a combination of patent, industrial design and trademark protection. The invention and development of the vacuum cleaner

provides a good example of strategic use of a combination of different types of IP tools. In 1908, Mr. William Hoover produced the first commercial upright vacuum cleaner, but he was not its designer. He purchased the patent from Mr. James Spangler, an inventor who worked nights as a janitor. Over the years, engineers at the Hoover company (established in 1909) designed new and improved devices, and countless other features which were added to the vacuum cleaner. These included disposable paper bags, a vacuum cleaner headlight, a self-propelled feature and a side-mounted attached hose feature, for which Hoover received a patent in 1936. In less than ten years after the company was established, the Hoover trademark was a household name.

Trade secrets, patents, trademarks, industrial designs, and copyright may separately or simultaneously be used as tools of technology protection. Strategic use of a combination of IP tools in the innovation process can contribute to higher profits margins and maintenance of market position, enabling technology-based, innovative companies to have a better return on investment.

Conclusion

Few technological innovations are radically new products, most are improvements, which in some way make a product superior to its predecessor. Development of a new or improved product gives a business an opportunity to enter the marketplace without competition. The IP system plays a significant role in helping a business to gain and retain this advantage. The competitive edge that a business may gain with a radically new innovation is likely to be longer lasting than that obtained from a simple improvement. In the case of an improvement, not only are competitors for the class of product already in place, but the improvement is far more quickly understood and replicated.

IP strategy may differ depending on the type of innovation, but either way the IP system remains a valuable tool. Consulting IP experts will help enterprises to make optimum use of the system.



For more information on various practical aspects of the IP system of interest to business and industry, please visit the website of the SMEs Division at www.wipo.int/sme. The next article in the IP and Business series will discuss biotechnology.

CASE STUDY ON NEXT PAGE >>>



Early advertising created by Bayer to promote its ASPIRIN trademark to extend the product life cycle beyond that of the patent.

CASE STUDY

Australian invention dazzles Hollywood - Jim Frazier

Physicists said it was impossible, but cameraman Jim Frazier went ahead and invented a new lens which revolutionized the international film industry.

Mr. Frazier, who shot wildlife films for David Attenborough, was frustrated with the limitations of the lens available on the market. "Wildlife is very unforgiving – there is no time to set up the camera and position the shot the way you want it. As well, with small subjects, such as insects and spiders, it's very difficult to get both the subject and background in focus. I wanted it all in focus and I needed a versatile lens which would allow me to rapidly get the shots I wanted."

"In the late '70s, I began tinkering myself and started getting the results I'd envisioned. Over the next 10 years I kept rebuilding the lens and, with much trial and effort, formulated a lens with deep focus and a single swivel on the end. The optics to do this are very complex but I began to get positive results."

The new lens has three revolutionary features:

- a 'set and forget' focus which holds everything, from front of lens to infinity, in focus;
- a swivel tip so that, without moving the camera, you can swivel the lens in any direction, completing a sphere if need be; and
- a built-in image rotator. This allows the image to be rotated inside the lens without spinning the camera.

It was a brilliant invention and when Mr. Frazier began using it in his work it did not go unnoticed. Nobody had seen before the sort of depth and clarity of filming that he was achieving, which made his work unique. In 1993 he was invited to speak at Montage 93, an imaging conference in the U.S. Within days of the event, Panavision was knocking on his door.

"It was at this point that I thought I should get a lawyer", he recalls "Panavision sent me a standard three page contract which my lawyer advised me not to sign. He rewrote it and we sent back a document of 30 pages which not only protected my invention but helped me negotiate a very sweet deal."

The contract was structured so that Panavision, regarded as the best lens manufacturer in the world, could never come back and claim they had already known about the optics used in the lens. They met with Mr. Frazier on neutral ground in Hong Kong and the company had to sign a confidentiality agreement before they saw the lens. "The deal was that Panavision would patent the device, at their cost, but that I would own the patent."

When Mr. Frazier first showed the lens to Panavision they could not initially figure how it worked, but they recognized its value. At more than US\$1 million, this may have been one of the biggest patent ever taken out by Panavision, but the returns are already rolling in. Nearly every second commercial made in the U.S. uses Jim Frazier's lens, and many in the feature film area will not go on a set without it.

The benefits to the film industry are huge. Apart from the unique abilities of the lens itself, it has dramatically lowered production costs. What used to be a three day shoot now takes only one day because Mr. Frazier's lens has done away with the need for teams of people to rig up complicated setups every time the director wants a new angle. It is as simple as adjusting the swivel tip.

