

Innovation without IP

Firms use multiple mechanisms other than IP to protect their inventions to ensure they gain and keep competitive advantage over their competitors. Such mechanisms include the use of tacit knowledge, lead-time advantage, design complexity, learning-effect advantage, complementary capabilities and secrecy. The limited available evidence suggests the use of these mechanisms is widespread among firms and differs across industries and countries.

What is meant by innovation without IP?

Non IP protection means are flexible, non-statutory tools or methods which can be used by firms in order to make it more challenging for rivals to imitate inventions and resulting innovations (Hurmelinna-Laukkanen and Puumalainen, 2007; Ruuskanen and Seppänen, 2013).

Such alternative mechanisms include the use of tacit knowledge, lead-time advantage, design complexity, learning effect advantage, complementary capabilities, and secrecy. Human resource management tools are often used to ensure the innovation is kept secret from competitors (e.g. non compete agreements). The mechanisms are described as follows.

- **Lead-time.** As a protection mechanism lead-time exploits the principle of first-mover advantage. This means an innovative firm gains rewards by being first on the market before its rivals can catch up with imitations of the innovation. By constantly innovating relatively faster than its competitors, a firm can keep ahead of the imitators, uphold its “leading position” over the technology and benefit from the innovation (Lopez and Roberts, 2002; Carow, Heron and Saxton, 2004).
- **Learning effect advantage.** It refers to “gaining advantage over potential imitators and newcomers by being ahead of them on the learning curve so as to be able to reduce production cost below those of competitors. Being able to reduce costs allows the incumbent a powerful tool over its imitators.” (Xu, Huang and S. Gao 2012).
- **Tacit knowledge.** Tacit knowledge is the uncodified, internalized knowledge and know-how that individuals possess, based fundamentally on their experience. Innovations that largely rely on tacit knowledge allow their owners to keep their advantage over competitors, as the latter cannot easily copy the innovation.
- **Secrecy.** Secrecy is another approach firms employ to block competitors from appropriating valuable knowledge and innovations, without (in some cases, partially) relying on the conventional statutory IP instruments. Firms explicitly aim to keep what is needed to replicate the innovation secret from competitors. This is closely related to tacit knowledge, which is often the approach that allows for such secrecy to effectively operate. Trade secrets are a type of IP right (see [Trade Secrets](#) [1]) that may provide additional protection, as they can cover all valuable knowledge the firm has exclusive possession of and which the competitors do not have. Most importantly, the possessor must take reasonable steps in practice to preserve its trade secrecy from being copied.
- **Complex design of products.** Using complex designs is another protection mechanism which can potentially block competitors from direct imitation or reverse engineering. This is because imitators would have to work the whole innovation process and to spend substantial time and resources in their attempt to imitate the innovation keeping them from engaging in such activities.

To avoid losing such valuable knowledge, an organization can resort to various **human resource management tools**—such as rotation of personnel in different functions, organization of

cross-functional teams and building an environment that supports social interaction—to keep the tacit knowledge or innovation from going out of the company (Hurmelinna-Laukkanen, Kylaheiko and Jauhiainen 2007).

How does innovation without IP foster innovation?

Alternative mechanisms to support innovations to IP arguably can provide further incentives for firms to engage in innovations. This is to the extent that they can raise returns on investments in inventions and their innovations. According to Pisano (2006), “appropriability is a multi-dimensional concept and it is not only about protecting innovations via patents but also about various other means that are available for use, influenced endogenously by the behavior and strategies of the firm.” The strategic appropriability methods (non-IP) described earlier also include complementary capabilities and management know-how that may have an effect on innovativeness. Hurmelinna-Laukkanen and Puumalainen (2007) assert that labor mobility is also a form of technology imitation; therefore, labor legislation, contracts and human resource management practices are also relevant appropriability mechanisms. According to López (2009), there are a number of practical and technical means of protection, such as passwords, digital signatures, copy prevention mechanisms, among others, even though some of those mechanisms could be included under the heading of secrecy.

However, some of the ways firms resort to protect their innovations can present a hindrance for innovation activities. Notably, secrecy and complex product design (when exaggerated strategically) reduce the diffusion of knowledge about inventions and force competitors to first re-invent those inventions before they could use them to create new innovations on their basis. These factors thus stress the potential value of using registered types of IP that facilitate revealing information regarding inventions (see [Access to knowledge and inventions](#) [2]). It is worth noting that this issue does not arise for strategies based on lead-time: these can be used effectively, even if knowledge regarding the innovation is revealed.

The question of how to make innovation efficient as well as profitable without using legal intellectual property protection has intrigued many legal and management scholars alike. Comprising of similar samples of firms, the Carnegie-Mellon study by Cohen, Nelson and Walsh (2000), on the one hand, concluded secrecy was the most effective mechanism, along with lead time, while the Yale study by Levin et al. (1987), on the other hand, judged secrecy as the least effective of all mechanisms. Gans and Stern (2003) conclude that without IP protection, start-ups—which are most often small firms—make weak competitors. However, the evidence (shown in the next section) is limited because many firms use IP and non-IP protection methods jointly and, more importantly, as most countries have an IP system, it is difficult to set out a counterfactual case. This is because non-use of IP is not necessarily related to higher returns of alternative mechanisms but could also be related to well-known costs of IP use (notably for small entities). Effectively, the well-known study by Cohen, Nelson and Walsh (2000) found that the cost component demotivated small firms rather than larger firms from not seeking IP-based protection mechanisms.

What evidence on innovation without IP?

There is wide variety of evidence to show firms use such non-IP mechanisms to protect their innovations. Lead-time advantage seems to be favoured by firms (small scale) that deal with product innovations and innovations in production methods (Gallié and Legros, 2012). Differences across industries seem equally important (Cohen, Nelson and Walsh 2000). Evidence across a variety of countries points to their importance as well as to that of other mechanisms: Laursen and Salter (2005) found the first mover mechanisms to be the most relevant appropriability method in U.K. industries. Similar results were found for process innovations in a study by Harabi (1995) of R&D-intensive firms in the Swiss manufacturing industry. Lead time ranked second in product innovations. In a study of German industrial firms, Sattler (2003) determined that the ranking of effectiveness was as follows: long-term employment relationships, lead time, design complexity, secrecy, patents and design registrations. For manufacturing firms in Spain, the most preferred mechanism was related to lead time, followed by time and cost for imitation (related to the complexity of innovation),

secrecy and patents (Gonzalez-Alvarez and Nieto-Antolin, 2007). For Finnish manufacturing firms the ranking of the effectiveness of appropriability mechanisms was as follows: lead time, technical/practical means (secrecy, passwords, and limited access), tacitness, contracts, IPRs (patents, trademarks, copyright, utility models, designs, trade secrets), labor legislation and human resource management (Hurmelinna-Laukkanen and Puumalainen (2007). Reliance on these mechanisms tends to be even more pronounced for emerging and developing countries. A study of Indian IT firms found that better lead times and access to good marketing and distribution facilities were the most critical strategies for profiting from product and process innovations, followed by brand building (Basant, 2004).

Often these methods are used in combination with IP. For example, product innovations based on tacit knowledge generated within the company can be protected by a combination of IP (trademark) protection and strong reliance on some alternative non-IP methods (Howells, James and Malik, 2003). For process innovations, which are less likely to be of tangible and codified nature compared to product innovation, secrecy and lead time advantage are considered powerful tools to protect innovation when compared to statutory means, especially patents (Gallié and Legros, 2012). In addition, secrecy can be used as an alternative to patents (Teece, 1986; Levin. et al. 1987; Cohen, Nelson and Walsh, 2000). Coca Cola's recipe for its popular drink is a case where secrecy is used in combination with a trademark.

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