Brief: IP Strategies for Space Startups

December 14th, 2022

Findings

Rotoiti spoke with intellectual property experts to understand which factors space firms should consider when devising IP strategies. Overarching takeaways are that IP strategies should be tailored to business objectives, and that space poses unique uncertainties for IP strategies.

There are two common types of IP – patents and trade secrets – which each have advantages and disadvantages. Patents give filers rights to exclude other parties from making, using, or selling technologies without permission for a set time period. They are furthermore easily quantifiable and thus help attract financing. A major drawback of patents is they entail making details about technologies public, which enables other parties to recreate technologies (illegally before rights expire, and legally afterwards). Patents also cost time and money to file. Trade secrets, on the other hand, are confidentially held information. Their major benefit is they do not entail making details public, which is particularly useful if a technology will still be valuable after a patent would expire. A drawback of trade secrets, though, is it can be difficult to control information flows, and there is moreover little protection if competitors recreate technologies.

- There's an art to patent-writing in terms of deciding how much information to reveal. One can selectively withhold information from filings to prevent the recreation of technologies. This approach partially depends on understanding the capabilities of the individuals in patent offices and relying on one's own superior technical knowledge.

- A shortcoming of patents is that, even if they disclose a significant amount of information, that information alone may not be enough to replicate a technology. A patent is like a recipe; to be useful there must also be a skilled cook. This is why acquirers will often not only buy firms and their patents, but also employ firms' staff.

- Trade secrets are protected in most countries, though the extent of protection varies. Different conditions must be met in order to secure protection. Such conditions are often why firms require NDAs – to enable protection of trade secrets. But trade secrets do not necessarily preclude competitors from recreating technologies; they only penalize theft. If there is no clear line of causality showing a competitor's technology resulted from theft, then competitors will not face penalties for creating the technology.

Patents and trade secrets are assets with value, and awareness of this value enables advancement of business goals. If asymmetry exists in terms of awareness of IP's value, the better-informed party has an advantage. Assume a space startup is seeking financing for non-recurring engineering (NRE) costs, for instance. A savvy financier may understand better than the space startup how NRE leads to the creation of valuable IP, and offer financing that is cheap up-front, but include stipulations that the space startup must transfer or license resulting IP to the financier. If the startup is relatively unsavvy, it may perceive the cheap financing as a good deal, being unaware that it is undermining its ability to make significant profits with later IP.

- There are many scenarios in which information asymmetries about IP's value can help advance business goals, particularly in terms of accounting. If the goal is to achieve a certain outcome on a balance sheet that helps with taxes or shareholder relations, for instance, when is it best to purchase IP? The answer to this question partially depends on awareness of IP's value and how much longer that IP will likely continue to be useful. Better awareness helps refine preferences in terms of when IP should be purchased.

There are costs to using IP illegally, but such costs do not mean counterparties will not infringe patents or steal trade secrets. Net benefits of infringement or theft are more important than costs. If infringing patents, for instance, yields a net benefit, then infringing may well be worth the cost. Particularly if a counterparty deems IP holders as unable to defend themselves, it may assess that costs will not be particularly onerous. If a large firm is aware of a small firm with valuable patents that is close to bankruptcy, for instance, then the large firm may simply infringe those patents and offer to pay the smaller firm so it avoids bankruptcy.

Patent filings should focus on relevant markets. Filing patents requires time and money, so space firms should focus on filing patents in markets that are relevant to their business. This may mean focusing on markets where: they have operations; competitors have a presence; there are significant numbers of customers importing the relevant technologies; or there is capacity to produce similar technologies. In the space industry, some markets play outstanding roles in terms of importance, so space firms should consider those markets when filing patents.

- Space industry supply chains are often divided along geopolitical fault lines. Chinese firms, for instance, face significantly more difficulty supplying the US space industry than do American firms. This means apparent "competitors" on other sides of fault lines may actually be selling into entirely separate supply chains, so filing patents in jurisdictions on other sides of geopolitical fault lines may be less useful than it might first appear.

IP strategy should also entail efforts to avoid allegations of infringement. Just as a space firm should consider taking measures to protect its intellectual property, its competitors should also consider taking similar measures. For a space firm, this means that besides deciding on its own particular combination of patents and trade secrets to protect IP, it should be aware of competitors' IP strategies. Being aware of what other patents exist and where they exist can impact strategy (e.g. deciding which technologies to pursue in which markets). Awareness helps avoid infringement allegations and litigation, which can be costly and reputationally damaging.

The concept of jurisdiction is problematized off Earth, which arguably undermines patents' usefulness. To what extent do patent laws extend into space? Parties to the International Space Station have an agreement in place that defines different modules as falling under the jurisdictions of different governments, but what will jurisdictional situations be like on future space stations? What about outside space stations? What about within satellites? Or within satellites from one country, which are in turn located aboard launch vehicles from yet another country? How do patent laws interact with international treaties which limit governments' ability to make sovereignty claims in space? Answers to all of these questions are debatable.

- Jurisdiction is clearer (though still confusing) in other areas of the space industry. With space insurance, for instance, space objects are usually linked to governments that are responsible for damages the objects may cause. With spectrum use, on the other hand, governments file and authorize use for different systems that are orbiting Earth. In the realm of IP, similar conventions or rules may coalesce that assign objects to certain governments and apply those governments' IP law and jurisdiction to those objects.

- Patents can cover either products or processes. Processes are particularly problematic in terms of jurisdiction in space. Whereas products tend to be made on Earth in clearly defined jurisdictional contexts, processes often happen entirely in space, starting and ending off Earth. Even if one can argue that a process is subject to a jurisdiction, it is still difficult to monitor what happens in space and to know if infringements are occurring.

Even if patents are arguably invalid in certain space contexts, filing them can still be to a firm's advantage because patents force competitors to spend resources. Though one might question if a patent is valid, and thus whether it would enable infringement claims, it may still be worth filing patents. The reason is that if a firm has a slew of patents, this gives competitors pause; competitors will want to be certain that they are not infringing valid patents. To have such certainty, they will need to spend time and money to assess patents' validity. And if consultants are working with IP consultants who seek to stoke customers' uncertainty, then this means that competitors are unlikely to quickly and certainly know whether patents are valid.

The remoteness of space also has benefits for trade secrets compared to Earth. Whereas patents may be less useful in space than they are on Earth, the converse point is arguably true for trade secrets. It is arguably more difficult for leakage of trade secrets to occur off Earth than on Earth. If a firm can control the flow of information on Earth, then information about what happens in space is difficult to access. Processes occurring aboard satellites, for instance, are difficult for competitors to observe. This is especially true if comms systems are designed to be secure – if uplink/downlink entails optical comms or quantum key distribution, for instance.

Many countries have exemptions for patent law pertaining to vehicles temporarily passing through their territories; this may apply to satellites being transported to launch sites. Such exemptions originate in governments' desire to not impede international trade. To understand why, consider the following scenario: without such exemptions, if ships were to temporarily enter a country using engines that are patented in that country, the ships might be accused of patent infringement. Uncertainty about whether they are infringing patents might cause ships to avoid the country. On a macro level, such uncertainty about infringements in other countries would have a cooling effect on international trade. This is why vehicles temporarily passing through countries are generally exempt from patent law. Satellites are sometimes considered similarly, but there is less international consensus on their status than for terrestrial vehicles.