INTELLECTUAL PROPERTY MODELS TO ACCELERATE SUSTAINABILITY TRANSITIONS
(IPACST)

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Intellectual Property (IP) Knowledge Brief

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Intellectual Property (IP) need-to-know for researching sustainability transitions

Intellectual Property (IP), IP rights (IPR) and ownership

"Intellectual property (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce" (WIPO[1]).

Any organisation, whether it is developing new technologies, products, services or new-business models generates informal IP almost automatically, such as copyrights, know how, but also trade secrets even without the need for registration, while some create 'formal' IP, which requires registration (e.g. trademarks, design rights, patents).

To obtain formal IP rights, disclosure of the IP is a legal requirement that is intended to help society by allowing others to use and build upon that IP after the legal protection has expired (incentives to disclose). In general, all IP rights are negative rights legally allowing the owner to exclude others from making, using or selling the IP without prior permission from the owner for a limited period of time. The strength of IP protection varies across the different IP types, but also across countries and jurisdictions.

Not the least due to that definition, IP and its associated property rights are often misunderstood as protective mechanism to keep IP to oneself. However, IP rights essentially assign ownership rights and do not prescribe any particular i.e. protective behaviour. As we know from economic theory, ownership rights allocation is a fundamental prerequisite for efficient markets and transactions among agents. In a similar manner, companies claiming IP ownership only enable them to make decisions of what to do with their IP (govern usage). This can range all the way from not sharing their IP (i.e. excluding others) to free licensing for all (e.g. through patent pledges or open-source licensing).

For instance, being able to demonstrate IP ownership without sharing it can be particularly helpful in an early stage of a business in order to attract funding. In a later business stage, it

Box 1: QR code example

Denso Wave, a Japanese company in 1994 invented and claimed ownership of the QR code technology (Quick Response code) through patenting. Then, the company decided to let anyone use QR codes for free, which may have very well boosted QR code diffusion as this technology was still competing with the Barcode technology. The company announced that it retains patent ownership but not exercise its patent rights on others. As a result diffusion accelerated worldwide with QR code applications now spanning across several industries. The key patents on QR code expired in 2015 but the term 'QR Code' is trade mark registered. The company eventually is generating revenues from out-licensing the technology for commercially reading QR codes, and by selling their own QR code readers.

Source: https://www.qrcode.com/en/history/

[1] World Intellectual Property Organization (WIPO) https://www.wipo.int/about-ip/en/

might however be of advantage to share IP through out-licensing thereby encouraging adoption and further development by others and generating additional income from royalty payments. Hence, IP rights and claiming IP ownership does not per se slow down or hinder any diffusion of new technologies (see Box 1 for an example), which potentially could negatively impact sustainability transitions. Claiming IP ownership however puts owners in the position to make decisions and control the usage of their IP. While companies that claim IP ownership can decide to keep IP for themselves (closed IP model, see Fig.1) using trade secrets, they can also engage in collaborations without the threat of imitation by collaborators, i.e. share IP openly by clarifying existing (background) IP and collaboratively develop new (foreground) IP in collaboration contracts. In addition, organisations can be at the giving end (e.g. sharing out the internally owned IP through out-licensing) or the receiving end (e.g. externally accessing IP owned by others through in-licensing).

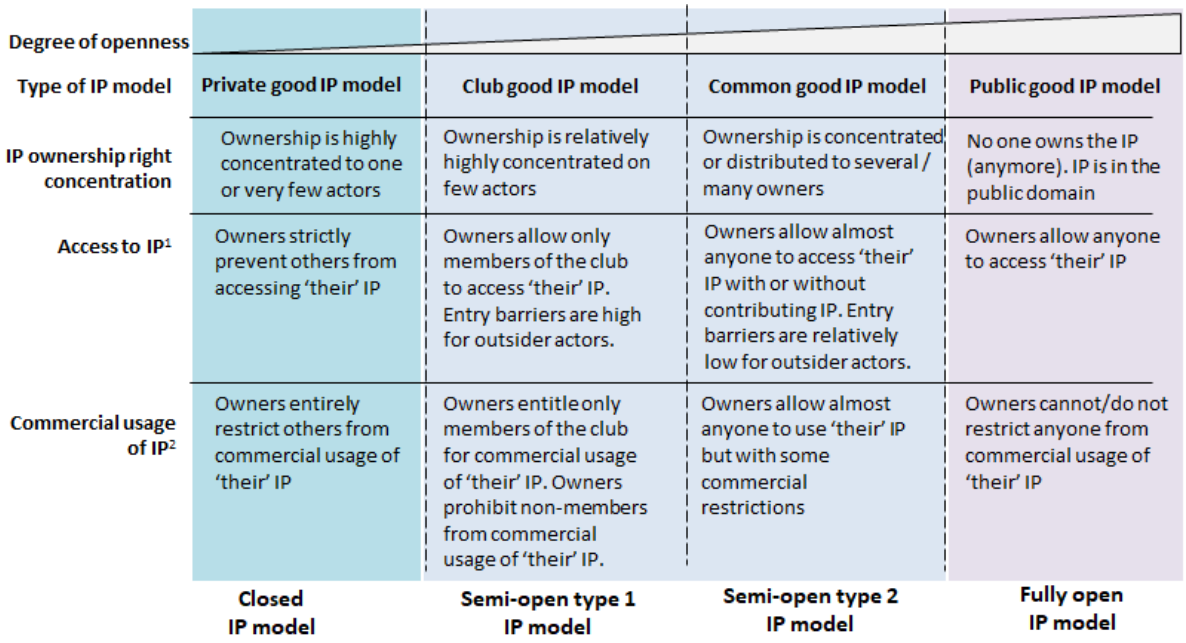

Figure 1: Spectrum of IP models by degree of openness
Source: Vimalnath, Tietze, Eppinger (2020)

Importantly is to note that if IP is not properly looked after, others cannot be prevented from using that IP, which can have potential negative impact on sustainability transitions. For instance, a green start-up not claiming IP ownership might not be able to attract funding for its novel and more sustainable technology. Funders might be afraid the technology could be adopted also by competitors. This could result in a catch 22 preventing a sustainable technology to get off the ground at all. If the company would claim ownership for its IP it then has the opportunity to exercise a selective approach on who can and who cannot use the technology. It can prevent competitors from adopting their technology, but share it with other green start-ups working in the same space, e.g. on complementary technologies.

IP generation, portfolio building and exploitation

A company follows a series of steps in building and maintaining its IP portfolio (see Fig 2). Employees within the company generate ideas as a part of their R&D process, as spill-overs from their regular activities or as a serendipity. Ideas can also be generated through acquisitions and collaborations.

Those ideas worthy some economic value to the firm and eligible for formal IP protection can be considered for obtaining IP protection. Box 2 provides an overview of different types of IP rights. The company should ideally build its IP portfolio strategically and in alignment with its business goals.

The company can choose to strategically exploit their protected IP as well as unprotected IP through licensing mechanisms. Licensing can be exclusive (to a single licensee) or non-exclusive (to many licensees) in exchange of licensee's IP (cross-licensing), one-off payment, periodic royalty payments or even for free (free licensing).

To share or not to share IP

Whether organisations want to share their IP widely (open model), with a selected group of others (semi-open model) or not at all (closed model), knowing their IP (see Fig. 2) and claiming IP ownership (e.g. through a patent) is the fundamental basis that puts them in a position to make decisions and control the usage of their IP. In other words, claiming ownership of IP is nothing bad or good as such. It is only the basis to make decisions, which could very well be to let all others use their IP for free. There might then be situations, where one would want to exclude others from using own IP, such as not licensing to the defense industry or companies that one regards as unethical (by some kind of measure). Unfortunately, there are also situations where others are excluded from using particular IP, which has negative social impact (e.g. valuable knowhow being kept secret and not being shared; patented IP not being licensed in the pharmaceutical sector).

Box 2: Types of IP

Please note that IP and associated rights are typically governed by national legal systems that are not always harmonized internationally. Details provided can vary for certain countries.

Patent - process, machine, manufacture, or composition of matter, computer implemented inventions or any improvement thereof (Duration of protection: 20 years for utility patent, 14 years for design patent (in US))

Copyright – Software code, literary, dramatic, musical, artistic (Duration if protection: authors' life + 70 years)

Trademark - Word, name, symbol, or any combination, used, or intended to be used, in commerce to identify and distinguish the goods or services, like logo, banner, sound, smell (Duration of protection: infinite, but typically with 10 year renewals)

Trade secret – Information and know-how of economic value that is kept secret, like formulas, patterns, compilations, programs, AI algorithms, customer data, devices, methods, production/ assembly techniques or processes (Duration of protection: As long as the secrecy is maintained)

Geographical indication – 'a sign used on goods that have a specific geographical origin and possess qualities or a reputation due to that place of origin'.

Sources: WIPO, EPO, USPTO

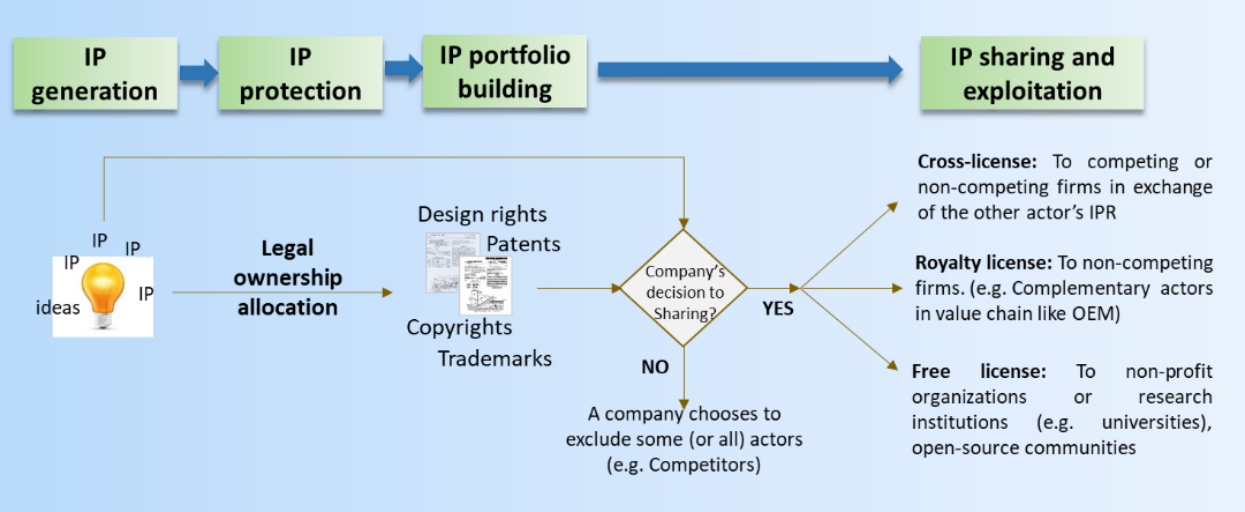

Figure 2: IP generation, portfolio building and usage

If IP owners want to share their IP they own and let others use it, legal IP rights do not prevent them from doing so. Rather in contrast, IPR allocation enables them to do exactly that and collaborate in joint development processes.

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