

METHODS OF IP PROTECTION: AN OVERVIEW

Two approaches to protect intellectual property

There are two broad approaches to protecting intellectual property:

1. To obtain some official mark of recognition that the invention is the property of the inventor and may not be used for commercial advantage by others.
2. To keep the invention strictly secret – at least until the inventor is in a position to turn the invention into an innovation and longer, in the case of a process invention.

The main formal methods of intellectual property

The main formal methods of intellectual property protection are:

- patents,
- registered designs,
- trademarks,
- copyright.

All four of them make the invention public but ensure that no one else may use or copy the invention.

If a rival does violate it, then the inventor may sue for civil damages.

The effectiveness of these formal methods varies from country to country. They offer pretty strong protection in countries such as the USA and the UK but weaker protection in some other countries.

The main informal methods of intellectual property protection

The most common informal methods of intellectual property protection are:

- process complexity,
- lead-time,
- confidentiality agreements
- strategies for secrecy.

The basic idea is to keep the invention secret for as long as possible, or ensure that products and processes are so complex that even if some fragment of information were to be leaked, it would be of no value to a rival without all the other product details.

Methods of protecting IP

Share of companies saying that method is very important for protecting IP

Lead-time advantage	30%
Confidentiality agreements	28%
Secrecy	28%
Complexity of design	24%
Trademarks	19%
Copyright	18%
Patents	13%
Registration of design	13%

Methods of protecting IP

It is interesting to see that the four **formal methods** come in the last four places in the table and the four **strategic methods** come at the top of the table.

Why is this?

Some companies have suggested that the patent system is expensive and time consuming to use and at the end of the process, the protection it offers is inadequate.

From their point of view, it is better to use a strategic approach to protecting IP.

- There are some variations by industry of course, with chemical and pharmaceuticals standing out as two industries where the patent is exceptionally important.

Variations by company size in methods of protecting IP

Share of companies saying that method is very important for protecting IP	Employees		
	1-250	251-2500	2501+
Lead-time advantage	29%	58%	66%
Confidentiality agreements	27%	58%	78%
Secrecy	27%	57%	65%
Complexity of design	23%	49%	47%
Trademarks	18%	43%	54%
Copyright	17%	35%	57%
Patents	12%	35%	47%
Registration of design	12%	31%	28%

Patent lawyers often argue that patents are much more important in large companies
But all types of IP protection (formal and strategic) are more heavily used by large companies than by the smallest companies.

Whatever size of company we look at, the most important methods of IP protection remain the strategic ones.

INSTITUTIONAL METHODS OF IP PROTECTION:

Patents

The patent gives a firm a **monopoly right** to commercial use of a particular invention for a given period. There are three key elements to the patent:

1. The patent grants a set of exclusive (or monopoly) rights to the inventor.
2. The patent holder has a temporary right to prevent others from making commercial use of the invention. The patent applies for a fixed term and after that, the patent-holder no longer has these monopoly rights.
3. In return, the patent holder must set out in the patent all the details of the invention, and this patent will be made available for public inspection.

INSTITUTIONAL METHODS OF IP PROTECTION:

Patents

In the absence of a patent, some inventions might be copied comparatively freely by many firms other than the originator, and the inventor would not recoup enough to cover the costs of his invention. In such a setting the incentive to invent would start to decline, and that would be a bad thing for the long-term prospects of the economy.

The aim of the patent is to sustain the incentive to innovate.

From an economist's point of view, this is more important than the sheer protection of intellectual property.

When the originator has recouped his costs and a reasonable profit has been made, then, from the economist's perspective, the patent has served its purpose and could lapse.

INSTITUTIONAL METHODS OF IP PROTECTION:

Trademarks

A trademark is a **distinctive sign, mark or logo** which distinguishes the goods and services of one company from those of another.

The trademark may consist of a variety of different things: names, words, logos, symbols and pictures.

The purpose of the trademark is to help the customer to quickly recognise that a particular product or service emanates from a particular company.

To be an acceptable form of trademark for registration, the mark must be distinctive for the goods or services to which it is applied and must not be similar to any earlier marks for the same or similar goods or services.

INSTITUTIONAL METHODS OF IP PROTECTION:

Copyright

Copyright limits ‘the right to copy’ a piece of intellectual property.

It applies to a wide range of creative works: poems, plays, novels, textbooks, journal articles, films, musical compositions and recordings, photographs, software, radio and television broadcasts, and so on.

Copyright law covers only the particular form in which ideas have been expressed – not the underlying ideas.

Eg. the copyright of a Mickey Mouse cartoon prohibits anyone (except Disney) from making or distributing copies of the cartoon or from creating derivative works which mimic this particular mouse. But it does not prohibit people from drawing different cartoons about ‘anthropomorphic mice’ – so long as they are sufficiently different

INSTITUTIONAL METHODS OF IP PROTECTION:

Registered Designs

A registered design refers to the appearance of the whole or a part of a product.

The registered design gives the holder a monopoly right to use such a design in such a context.

The registered design may refer to particular product features, in particular: lines, contours, colours, shape, texture, materials.

The registered design cannot be concerned only with how a product works, or be concerned with designs for components of products that would not be visible in normal use.

As with a patent, the design must be new and have an individual character.

As with other methods of IP protection, registration is for a fixed period (up to 25 years).

In law, a registered design is treated as property like any other business commodity. Specifically, it can be bought, sold, or licensed.

STRATEGIC METHODS OF IP PROTECTION: Confidentiality Agreement

A confidentiality agreement or non-disclosure agreement is a legal contract between at least two parties in which they agree not to share some confidential materials with any third party.

The confidentiality agreement will list the confidential materials which the two parties can share with each other, but which they agree not to share with any others. Confidentiality agreements can be used to protect intellectual property.

STRATEGIC METHODS OF IP PROTECTION: Confidentiality Agreement

Whereas formal methods secure a monopoly right to use the intellectual property in return for laying the IP open to public inspection, the confidentiality agreement keeps the IP secret.

The confidentiality agreement aims to prevent others from using the intellectual property by keeping it secret between the parties to the confidentiality agreement.

The confidentiality agreement can protect IP that could in principle be protected by other means (e.g. patents) but can also protect IP that is hard or impossible to protect by any of the institutional methods.

STRATEGIC METHODS OF IP PROTECTION:

Secrecy

Sometimes companies protect their intellectual property by keeping it secret from all outsiders and almost all insiders.

In contrast to the confidentiality agreement which shares the IP with a limited number of others but binds them to confidentiality, the secrecy strategy is not to share IP at all.

- One of the most famous and closely-guarded examples of a trade secret is the Coca-Cola formula or the nutella recipe.

STRATEGIC METHODS OF IP PROTECTION:

Lead-Time

A different approach to protecting the economic value of IP is to use it quickly before anyone else can.

The first company to make commercial use of an invention can often earn a lead-time advantage. This means that so long as that company is the only player in the market, then it enjoys a temporary monopoly advantage – even if its intellectual property rapidly leaks out after it first enters the market.

The first- mover advantages of lead-time are only temporary.

The more successful the first entrant, the more tempting the invitation to competitors. The length of lead-time enjoyed by an innovator before competitors enter the market depends on several factors.

It will depend on the nature of the innovation, the complexity of the production process and any other barriers to entry. For example, a competitor may take only a few days to copy some online business models, while it may take much longer for a competitor to duplicate complex manufacturing processes.

First Movers and Followers — Who Wins?

In some cases even if first movers have a modest lead-time advantage over competitors, the fast seconds may be well placed to learn from the mistakes of the first mover, and may ultimately be the most successful players in the market.

Product	First Mover	Notable Follower(s)	The Winner
8-mm video camera	Kodak	Sony	Follower
Disposable diaper	Chux	Pampers Kimberly Clark	Followers
Float glass	Pilkington	Corning	First mover
Groupware	Lotus	AT&T	First mover
Instant camera	Polaroid	Kodak	First mover
Microprocessors	Intel	AMD Cyrix	First mover
Microwave	Raytheon	Samsung	Follower
Personal computer	MITS (Altair)	Apple IBM	Followers
Personal computer operating system	Digital Research	Microsoft (MS-DOS)	Follower
Smartphones	IBM (Simon)	Apple Nokia	Followers
Social networking sites	SixDegrees.com	MySpace Facebook	Followers
Spreadsheet software	VisiCalc	Microsoft (Excel) Lotus	Followers
Video game console	Magnavox	Atari Nintendo	Followers
Web browser	NCSA Mosaic	Netscape Microsoft (Internet Explorer)	Followers
Word processing software	MicroPro (WordStar)	Microsoft (MS Word) WordPerfect	Followers
Workstation	Xerox Alto	Sun Microsystems Hewlett-Packard	Followers

STRATEGIC METHODS OF IP PROTECTION: Complexity

It is generally recognised that the lead-time earned by the first entrant into a new market may be greater if the first entrant uses a new and highly complex process, which is hard to copy.

This means that companies may be better able to protect their IP if it is only of value within a complex process that rivals do not currently use.

This systematic cultivation of complexity to secure the economic value from IP will work even better when some of the other key knowledge required to exploit the IP is tacit and not codified.

A fundamental dilemma in IP protection

1. On one hand economics recognises that we need to **maintain incentives** if we are to encourage companies to go to the expense and risk of creating IP.
 - If my investment creates IP that can be immediately used by all my rivals (who have made no contribution to the cost) and gives me no advantage over them, then I may wonder if the investment is worthwhile.
2. On the other hand, it is economically efficient to **diffuse use of IP at marginal cost** – and with IP that is often close to zero.

The best attempt at resolving this dilemma is to limit the protection offered by the formal methods. These limits mean that formal methods of protection restrict others from using the IP during a particular time period and in a particular sub-set of economic activities

A fundamental dilemma in IP protection

From the point of view of Law, IP is property – just like any other property.

From the point of view of Economics, the perspective is a bit different. To provide inventors with the incentive to create new inventions, we allow them to treat these as their own property for a while.

But if the cost of copying this intellectual property to others is very low, then it is economically inefficient to allow this intellectual property to be monopolised.

This presents the economist with a subtle trade-off: we need to maintain incentives but we don't want to hold up the diffusion of new inventions.

To achieve the right balance, agencies that protect IP adjust the length of the monopoly and its scope --> When the patent expires then others may copy the IP at marginal cost.

Different Industry --> Different method

Between the different industries the methods used to protect innovation vary considerably.

E.g. in pharmaceuticals industry, mechanisms like patents are very effective.

E.g. in industries such as electronics, patents and copyright provide relatively little protection because other firms can often invent around the patent without infringing on it.

It is also difficult to enforce patents protecting industrial processes such as manufacturing techniques.

THE EFFECTIVENESS AND USE OF PROTECTION MECHANISMS

In industries characterized by increasing returns, firms sometimes choose to liberally diffuse their technologies to increase their likelihood of rising to the position of dominant design.

The more a technology is adopted, the more valuable it becomes.

This dynamic can lead to winner-take-all markets that create natural monopolies.

A firm that controls the standard can reap monopoly rents and can exert significant architectural control over both its own industry and related industries.

OPEN SOURCE

- This discussion is an obvious consequence of the dilemma described.
- In software, an open source community has arisen. In particular we shall focus on what have become known as Free Open Source Software projects.
- In this movement, companies share some of the intellectual property with others even if that means that they lose some of the potential economic value of their IP by sharing in this way.

Open source means three things:

- 1) Intellectual property rights are not abandoned. The developers of intellectual property retain rights over their property but allow others to use it too.
- 2) The original source code of the software is made open to other software developers. This is in contrast to the norm with much PC industry software in which only the companies developing a particular operating system or applications package have access to the source code.
- 3) Software can be freely redistributed. This means that users of the software are licensed to give away the software and no royalty or other fee needs to be paid to do this.

OPEN SOURCE

What is the point of this? We can answer this question at two levels.

1. Why does open source create better software?

The Open Source website puts the case very well:

- The basic idea behind open source is very simple: When programmers can read, redistribute, and modify the source code for a piece of software, the software evolves ... We in the open source community have learned that this rapid evolutionary process produces better software than the traditional closed model, in which only a very few programmers can see the source and everybody else must blindly use an opaque block of bits.

The idea of open source is to eliminate the access costs of the consumer and the creator by reducing the restrictions of copyright. This will lead to creation of additional works, which build upon previous work and add to greater social benefit.

Additionally, some proponents argue that open source also relieves society of the administration and enforcement costs of copyright.

OPEN SOURCE

2. But why would companies would want to give away some of the potential economic value of their IP in this way?

One argument, is that individual employees gift some of their IP (in the form of software) order to gain professional recognition and thus to enhance their future career. In that respect, it is a little like academic publishing: we do it to raise our reputation and not because we get paid for it.

IPR or Open Innovation?

Another dilemma:

- If a firm liberally diffuses the technology to would-be competitors, it relinquishes the opportunity to capture monopoly rents when and if the technology emerges as a dominant design.
- Once control of a technology is relinquished, it can be very hard to regain; thus, such diffusion may result in the firm losing all hope of controlling the technology.
- Finally, liberal diffusion of the technology can result in the fragmentation of the technology platform: As different producers add improvements to the technology that make it better fit their needs, the “standard” may be split into many non-standardized versions.

Wholly Proprietary Systems vs Wholly Open Systems

Wholly proprietary systems	Wholly open systems
<ul style="list-style-type: none">• Are based on technology that is company-owned and protected through patents, copyrights, secrecy, or other mechanisms.• Such technologies may be legally produced or augmented only by their developers.• Are often not compatible with the products offered by other manufacturers. Because their operation is based on protected technology, other manufacturers are often unable to develop components that may interact with the proprietary system.• Typically provide their developers with the opportunity to appropriate rents from the technology. However, they might also be less likely to be adopted readily by customers as a result of their higher costs and the inability to mix and match components.	<ul style="list-style-type: none">• The technology used in a product or process is not protected by secrecy or patents;• it may be based on available standards or it may be new technology that is openly diffused to other producers.• These technologies may be freely accessed, augmented, and distributed by anyone.• Such technologies are usually quickly commoditized and provide little appropriability of rents to their developers.

Wholly Proprietary Systems vs Wholly Open Systems – some examples

Microsoft Office, Dropbox, AutoCAD and McAfee VirusScan are all **examples of proprietary software**.

Unlike proprietary software, **open-source software** promotes creative work and gives users full access to the source code. These products are typically **free to use and distribute**.

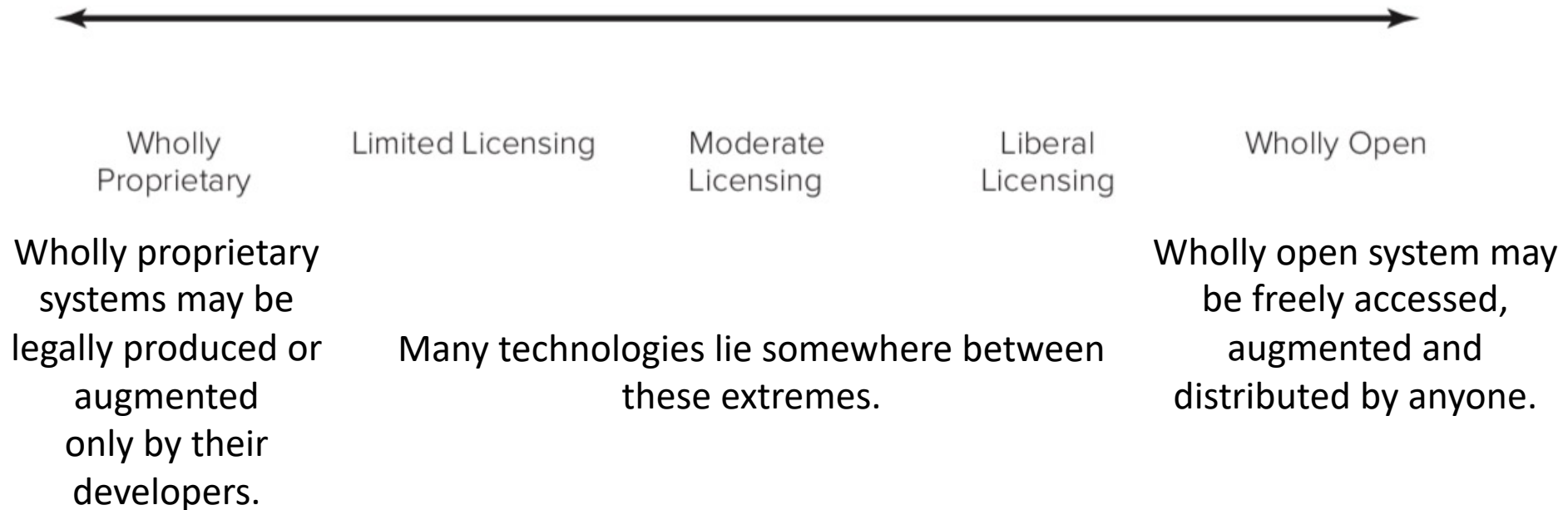
For every proprietary platform on the market, there's a free open-source version.

- **Linux**, for instance, is a viable alternative to Windows. It features an intuitive interface, thousands of apps, office software, photo editing tools and gaming capabilities.
- **OpenOffice** is an alternative to Microsoft Office,
- **Inkscape** can easily replace Adobe Illustrator.

Open-source programs are backed by developers and users worldwide, featuring chat boards and support groups.

Additionally, open-source communities are constantly updating these programs and removing bugs, leading to **enhanced functionality and better security** compared to proprietary software.

Continuum from Wholly Proprietary to Wholly Open



Advantages of Protection

- Proprietary systems offer greater rent appropriability, and their developers often have more money and incentive to invest in technological development, promotion, and distribution.
- The profits from the technology may be directly reinvested in further improvements in the technology.
- The sponsor of a proprietary technology might also adopt a penetration pricing strategy to rapidly build its installed base, it may spend aggressively on advertising to increase awareness of the technology, and it may even subsidize the production of complementary goods to increase the desirability of its technology to customers.
- Protecting the technology also gives the developing firm architectural control over the technology.

Advantages of Diffusion

- Open technologies may accrue more rapid adoptions.
 - If multiple firms are producing, distributing, and promoting the technology, the technology's installed base may accumulate much more rapidly than if one firm alone is responsible for such activities.
- Competition among producers may drive the price of the technology down, making it more attractive to customers.
- Both customers and complementary goods providers may also perceive the technology as better if there are multiple companies backing the technology.
- A liberal diffusion strategy can stimulate the growth of the installed base and availability of complementary goods.

Production Capabilities, Marketing Capabilities, and Capital

- If the firm is unable to produce the technology at sufficient volume or quality levels (or market the technology with sufficient intensity), then protecting the technology so that the firm is its sole provider may significantly hinder its adoption.
- Similarly, if complementary goods influence the value of the technology to users, then the firm must:
 - (a) be able to produce the complements in sufficient range and quantity,
 - (b) sponsor their production by other firms,
 - (c) encourage collective production of the complements through a more open technology strategy.

Industry Opposition against Sole-Source Technology

Sometimes other industry members are able to exert strong pressure against the adoption of a technology that would give:

- one producer
- a few of producers

Undue control and power, causing a technology that is restricted to such production

to be rejected

or more hotly contested than a more open technology.

Resources for Internal Development

- If a firm does not have significant resources (capital, technological expertise) to invest in the technology's functionality, it may have difficulty producing a technology that has an initial performance level, and rate of improvement, that the market finds attractive.
- In such instances, it can be valuable to tap the external development efforts of other firms (or individuals) through utilizing a more open technology strategy.

Control over Fragmentation

For technologies in which standardization and compatibility are important, maintaining the integrity of the core product is absolutely essential, and external development can put it at risk.

- If the developing firm relinquishes all control over the development of the technology, the technology will have no shepherd with the ability and authority to direct its trajectory and ensure that a single standard remains intact.
- This suggests that the developer of any technology that requires standardization and compatibility:
 - should retain some degree of control over the technology,
 - or find/establish another governing body with the authority to do so.

Incentives for Architectural Control

- Architectural control over the evolution of a technology is always valuable; however, it becomes particularly valuable if a firm is a significant producer of complements to the technology.
- A firm with architectural control can typically design the technology to be compatible with its own complements and incompatible with those of competitors.
- If the technology is chosen as the dominant design, this architectural control allows the firm to ensure that it reaps the lion's share of the rewards in complements production.
- Furthermore, by making the technology selectively compatible with some competitors and not others, the firm can exert great influence over the competitive field.