

4. INTELLECTUAL PROPERTY STRATEGY

In this chapter the need for and structuring of an intellectual property portfolio is broached; its possible strategic deployment is outlined; and licensing strategy; and reasons to license or not are discussed.

4.1 Intellectual property portfolio

Preferably underpinning a technology strategy (Figure 3, p19) but in isolation if need be, companies should be aware of and have a policy to govern their intellectual property (IP) or appropriated assets as defined in 3.4, p35 above to at least prevent them falling prey to competitors and to position them for growth. Once IP is given its deserved recognition the possibilities of trading with it will become apparent. Such a policy could be quite informal, depending on size and sophistication of companies but it should encompass the following aspects which will orient a company and position it *vis-à-vis* its actual and potential competitors:

- (i) IP is an asset and must be protected to the advantage of the company. The company will therefore take care of, grow and protect its own IP and will enforce its rights when necessary.
- (ii) The company will be aware of and take care not to infringe the rights of others.
- (iii) Communication within the company and with its suppliers and customers and transfer of information are unavoidable. Awareness, sensitivity and care by each employee handling information form the basis of protection of the company's IP.
- (iv) IP will be acquired and sold or licensed as part of company strategy.

Notably, IP is recognised as an *asset* that albeit immaterial, confers the advantages of assets and the concept of tradeability is pertinently attached to it, the *rights of others* are recognised and the company is *alerted*. No distinction is made between statutory and non-statutory IP.

The process of developing an IP portfolio begins with identifying a company's valuable intangible assets and developing an IP portfolio strategy that dovetails with business goals. Identification and awareness of these assets will focus attention on their value and will in the first place raise questions about protecting them.

How does a company protect itself against the dangerous possibility that a single employee

can walk out of the company's premises with very valuable assets such as blueprints in his pocket or even in his head? Physical protection is not possible. Patenting is an option. When General Electric and Hitachi began using magnetic resonance imaging medical equipment technology invented by Raymond V. Damadian, this founder of Fonar Inc. fought back against his powerhouse competitors with a patent infringement lawsuit. Hitachi settled, but GE decided to take its chances in court. The gamble cost GE dearly and Fonar, at the time a \$15 million company, put the damages received toward funding research and development and expanding the company. Patents are not the only kind of intellectual property that can be used to protect IP. When the recent launch of Viagra, the impotence drug from Pfizer, was followed by the introduction of two similarly named products, the company quickly defended its investment in the Viagra name by filing suit for trademark infringement. (Practising USA lawyers Conlin and Schutz, 1998.) Or enforce copyright:

Cartoonist in the bucks

A Paris court yesterday ordered the publisher Dargaud to pay 5,5 million francs (about R6,2 million) in damages to Asterix cartoonist Albert Uderzo, ending a dispute over royalties. (Pretoria News 10 September 1998, p8.)

It can be argued that Chief Executive Officers are not sufficiently or even not at all aware that IP assets such as patents, copyright and trade marks are corporate resources that confer competitive advantage and revenues. Not protecting and managing them can risk or harm revenue and shareholder value. Often responsibility for managing them is given to someone else and then forgotten. It is necessary that the Chief Executive Officer should understand the issues and be able to focus and motivate the management of the IP.

The protection obtainable should not be seen in a defensive role, in the narrow sense of the word. It extends in two directions. It offers defence of technology, market share and a company's position; and importantly, a protected springboard or base enabling action aimed at generating new business as was partially shown at 3.1 above. Managing both options is necessary to prevent IP management sinking to reactive defensive monitoring and prosecution, rather than adding creative initiatives to boost return on investment. Doubtlessly, many companies - often of the kind that can be called middle-tech - which may have none or a few patents or trade marks but still enough IP of the various kinds to assemble a portfolio,

miss out on opportunities to use intellectual property to enhance revenues and earnings in various ways including through trading.

For small companies, individual inventors and large companies alike, protection of IP assets can be critically important because the patent or trade secret may represent a primary asset. Expropriation of the invention or idea could destroy the company or ruin an inventor's life's work. The *Brown v. Shimano* case involved the Japanese bicycle components manufacturer Shimano using gear-shifting technology without a licence from the technology's inventor after he attempted to license it to Shimano. The inventor's financial position and even his health were affected, until he vindicated his invention through lengthy litigation.

In the field of non-statutorily protected IP General Motors provided a notable example of enforcing a non-competition agreement when it successfully prosecuted Jose Ignacio Lopez de Arriortua after he left GM with seven of his executives to join Volkswagen - taking many of GM's purchasing secrets with him.

The IP assets portfolio should be constructed strategically and deliberately to lay a firm base for the deployment in many ways including out-licensing and selling of IP. It should involve iterative consideration of at least the following aspects, interactively with those mentioned in 4.2, p45 and 4.3, p50 below:

Does the company know its important technology? And needs?

Why is it, or is it not, protecting its assets through patenting, copyrighting, trademarking and secrecy? Defend? Protect? Trade?

Do the necessary arrangements with suppliers exist to ensure ownership or usage rights?

Are there confidentiality and ownership agreements with employees? With suppliers and customers?

Are there adequate security measures in place so that if an employee leaves with a company secret the company will be able to win a lawsuit? Restraint of trade arrangements?

Does the company conduct right-to-use searches before launching into new projects or business? Is it aware of major actual or potential threats to its IP? Is it informed regarding the competition's IP?

What limitations does it suffer or has it imposed as part of licensing?

Is it on guard when approached by would-be inventors?

Who is responsible for the portfolio?

IP-smart companies, such as Honeywell, Unocal and Fonar annually evaluate their patent portfolios for patents that should be licensed, sold, or otherwise used to produce revenue. Their plans have revenue targets for patent managers to achieve and involve discussions of potential litigation their companies might face during the coming year and how their firms plan to handle them using existing patent portfolios. Their CEOs receive an annual presentation from in-house counsel that discusses how their companies protect trademarks from theft or from becoming generic terms. (Conlin and Schutz ,1998.)

The value of trademarks should not be underrated. The world's five most valuable brands, according to Financial World magazine's sixth yearly rankings in 1997 were Coca Cola, Marlboro, IBM, McDonald's and Disney at values respectively in US\$ billion, rounded, of 48, 48, 24, 20 and 17. (Sunday Times survey, October 25, 1998: 24.)

..... it is essential for companies to value their brands. The value of intellectual property is as important for effective management decision making as the value of the firm's assets. (Owen Dean, patent attorney, Spoor & Fischer, *ibid.*)

Awareness will prevent trademarks being used in such a manner as to become the common name for goods, that is, become generic and fall into the public domain. Aspirin, linoleum and escalator are examples. Brand owners will also be more alert to misuse through counterfeiting or parallel importing where non-related products are offered under their trademarks.

Digital Equipment Corporation (DEC) provided an example of organising an IP portfolio. In 1995 it decided to categorise DEC's patent portfolio and related technology for licensing potential. (Drinkwater, 1997: 1-3.) DEC had over 2000 patents and applications at the time. The goals were three-fold:

- (i) Identify intellectual property that could be profitably exploited through licensing.
- (ii) Create a repository of information to facilitate responses to licence inquiries.
- (iii) Use DEC's personnel and financial resources efficiently.

The DEC IP database included the following substantive contents:

(i) Technology description.

A simple explanation of the problem solved by the technology.

A simple explanation of how the technology works.

A list of companies and industries that the technology would benefit.

Other technologies owned by the company that are related.

A list of competing technologies.

(ii) Intellectual property.

List of all forms of protection for the technology: patents, copyright, trade secret, trademark..

List of available documents for the technology.

(iii) Proprietary status.

Will the company license the technology?

Is the company using the technology?

Has the technology been licensed to a standards body?

(iv) Licensing status.

Are there currently licensees?

Are there any known companies that might be interested in licensing the technology?

The database included three sets of information:

(i) The above data.

(ii) Specific fields from DEC's law department's database (patent prosecution status).

(iii) Information derived from a compact disc produced by the US Patent Office (classification, title, etc.)

The relational capability of the database allowed various searches and sorts.

Survey objectives. (Results are presented in 8.11.)

It was decided to establish the presence and nature of intellectual property (IP) data bases in literal and abstract format by surveying quality of IP data bases and IP planning, research and development with objective to license, and quality of technology strategy and core competence audits. It was also notionally proposed that there will be positive correlation between these indicants and licensing activity.

The concept of IP is widely acknowledged as a valid construct. Several indicants are available to measure a company's IP activity. An example would be number of patents. Its reliability as measurement of IP awareness may be problematic if company size is not factored out. Qualitative characteristics mentioned above were therefore proposed as indicants of the existence and intensity of IP awareness. These indicants represent aspects that offer acceptable content validity because they are very simple and can be reasonably expected to be understood by a diversity of respondents or not at all by ignorant respondents. Reliability may be doubtful because of possible central tendency responses.

4.2 Deployment of intellectual property portfolio

IP practice has evolved from what may be seen as simple appropriation of and protection of and by IP to shrewd deployment. An industrial company's IP and rights to IP are valuable and useful assets that can be deployed (i) for straightforward enforcement as illustrated by the Honeywell, Brown vs Shimano, GE, Viagra and other cases mentioned above, (ii) in several strategic and tactical ways to a company's advantage and (iii) in simple licensing of the concomitant monopolistic rights.

The first two deployment classes may or may not involve licensing and selling. In so far as licensing and selling may play an important role, they are discussed in 4.3 below from a licensing and selling point of view. Strategic and tactical deployment are introduced in this section 4.2.

Arguably, most patents are not technology driven and not the result of great new technology. Instead, most patents and certainly trade marks and designs are product driven. That is, when a new product or service is planned, the providers want to inhibit or control competition by legitimate means. Therefore, the providers adopt a strategy to fight the competition that they know will develop. If possible, the strategy includes IP strategies, which in turn include patent strategies, if the providers are so fortunate. The IP including patents are then developed to protect the product or service in the market according to the planned strategy. At the same time any company should bear in mind that its own IP can come under attack.

These attack and defence strategies have even been named and are described in the literature.

(Glazier, 1995) They include inventing around, the picket fence strategy, the toll gate strategy, the submarine strategy, the counter-attack strategy, the stealth counter-attack strategy, the cut your exposure strategy, and the bargaining chip strategy.

Inventing around can be viewed as inventing around everything that went before. Thus, inventing around the competition's patent is just a more focused and immediate application of a broader inventing project. The invent around strategy can follow a company becoming aware of the existence of potentially problematic patents and also is a bona fide response to threats of patent infringement claims by competitors and is one of several strategies including accepting a licence that might be pursued in response to a letter or other notification from patent holders to cease and desist from alleged infringement. Invention around or invention-on-demand with the objective to develop and possibly patent another product that does not infringe the competitor's patent, yet still penetrates the same basic market and customer base, has been well-developed. There are even rules for what has also been called "virtual invention": (i) Eliminate a part. (ii) Do not add parts. (iii) Use a lean design team. (iv) Focus the product. (v) Exploit components with new low prices. (vi) Make old equipment smart. (vii) Exploit new communication devices and services. (viii) Computerise a manual process. (ix) Use new materials. (x) Focus on the software. (xi) Mind the aesthetics. Interestingly, inventing around may underlie leapfrogging in the market.

Another patent strategy is the picket fence strategy. When a competitor has a key fundamental patent, a company may obtain a series of patents that represent small incremental innovations around the core technology. The incremental innovations represent the preferred products in which the core technology may be used commercially. They then become a barrier to the effective use of the technology by the owner of the original technology. The owner of the picket fence then is in a position to force a cross-licence of patents to acquire the core technology for its own use. The picket fence invention strategy is relatively straight forward. It can be facilitated by close contact between the patent team and the marketing and manufacturing divisions regarding the consumer's perceived needs to commercialise the core technology.

The toll gate strategy is another possible invention strategy in response to a competitor's patent. In this approach, the entire body of prior art, not just the competitor's, is reviewed and

generally conceptualised to identify the direction in which it is developing. A company then projects the trend to anticipate future developments. Finally, it leapfrogs the current developments to file the first patent application with very broad claims for the next generation of improvements, even if only a vague concept of the best products to implement these improvements exists. Upon its issue this patent can then act as a toll gate to the industry when its actual products develop to that level of advancement.

The toll gate strategy was sometimes combined with the submarine strategy in the USA where, historically, pending patent applications were secret until issue. The traditional submarine strategy involved filing a broad patent application and then keeping it pending, and secret, with a string of claim amendments zeroing in on specific product developments. Once the market and the patent application had developed with specific products, the patent would be allowed to issue, or to surface like a submarine for all to see. A long application process could also result by chance and not by specific intent. The traditional submarine strategy has been changed and largely ruled out by recent amendments to the US patent statute, following the General Agreement on Tariffs and Trade with TRIPs agreements. In amended form it can still be practised under the Patent Co-operation Treaty which leaves uncertainty regarding countries in which protection is or will be sought.

In South Africa filing of a provisional patent application establishes a priority date or date after which others cannot obtain protection of the same subject matter. The contents of the provisional application remain secret until the complete application is laid open for inspection and this can be delayed at the election of the applicant. The submarine can thus remain submerged for a long time before surprising the unwary third party user of the subject technology. Scanning the titles of provisional patent applications in the Patent Journal may help to defend against this situation.

The counter-attack strategy involves attacking a competitor's problem patent. The attack may be based on the fact that patents may have been improperly issued and can be subject to efforts to cancel or restrict them. The first step of this strategy is to find a potentially fatal weakness in a competitor's patent by studying the prior art to determine what practices preceded the patent. Another research step is to study the patent application file to determine if any administrative irregularity occurred.

The stealth counter-attack can be followed in the USA. A cheaper, and perhaps faster, method than action in the federal court, where it is available, is to file a request for re-examination in the US Patent Office requesting that the competitor's patent be limited or cancelled. To do this, a request for re-examination should be filed with the Patent Office citing published references that create a new issue of patentability. The request for re-examination may be filed by a patent attorney. Therefore, any business relationship of the requesting party with the patent holder need not be undermined by the re-examination. A further advantage is that, in contrast to the case with the direct attack, the onus of proof is on the patent applicant and not the requesting party. A risk is that the re-examination may result in a stronger rather than weaker patent.

The cut your exposure strategy involves a company obtaining, for its own product, an outside patent attorney's written opinion of non-infringement of the competitor's patent. Such a written opinion may reduce the liability exposure of an infringer in those instances where patent infringement liability is subsequently found.

The bargaining chip strategy may also be pursued against a troublesome patent of a competitor. This involves developing bargaining chips in the form of a company's own patent portfolio that may be cross-licensed or traded with the competitor for a licence under its patent. One way to initiate this programme is to execute an intellectual property audit. This reviews the existing and planned products and technologies of a company to ascertain what might be patented to create future problems for the competitor.

The smokescreen strategy can be seen as a variation of the picket fence strategy. It involves a patentee filing several patent applications with the objective of making interpretation of what is really protected virtually impossible for would-be users and forcing them to follow the licensing route instead. Monopolies have found this useful to promote self-perpetuation. A variety of patents which they do not intend to use or license keep entry cost and difficulty up. (Gilbert and Newbery, 1982.)

The Nomura Research Institute found that Japanese firms could be divided into four categories in terms of their approach to intellectual property. See Table 3. Murakami and

Nakata conducted a survey of intellectual property managers at 1800 major Japanese firms in all industries, except for financial institutions, in 1992. The survey had a response rate of 26,5% and while Nomura states that the statistical accuracy may be suspect, the results nevertheless are informative.

In the first category firms are described as defending against intellectual property-related attacks from their competitors, thus securing freedom in their technical and product development activities. They have centralised processes for submitting large numbers of patent applications for applied technologies that relate to, or would be used to commercialise a particular invention. This process limits the ability of the original inventor to exert his patent rights. In other words, they practise the picket fence strategy.

Category	Current (%)	Future (%)
Defensive	60,7	28,7
Monopoly seeking	27,3	35,5
Deterring others	8,4	19,4
Royalty seeking	1,6	14,9
Other or combinations of above	1,9	1,5

Table 3. Japanese firms' present and future patent strategies.
(Murakami and Nakata, 1994: 129)

The second category aims to obtain a monopoly position based on truly novel and creative patents - the original intention behind the patent system and perhaps leading to the toll-gate strategy.

The third category tries to deter others from entering a field by filing patent applications in a specific field as a way to signal that they are very active therein and it would not be worthwhile for others to enter the field. This is a variation of the smoke-screen strategy because it may become difficult for would-be entrants to identify really meaningful patents.

The fourth category of firms selectively publicises patents and seeks to earn royalties. They generally have several so-called sleeping patents that are not applicable in their own operations.

It is quite clear from this sample that Japanese industry was planning to deploy its intellectual

property, in the form of patents, much more aggressively.

Sometimes strategies or circumstances may become very entangled:

Over the past year, such companies as Exxon Chemical, Dow Chemical Co., Hoechst AG, Mobil Chemical, BP Chemicals Ltd., and Mitsui Petrochemicals have retrofitted gas-phase, slurry, and high-pressure reactors to produce such staples as linear low density polyethylene (LLDPE) and polypropylene (PP) via metallocene catalysis. What is drawing polymer producers, and turning rivals into partners is the lure The patent situation is another reason why companies are forming joint ventures to exploit metallocene catalysts for licensing. According to Roland Hingmann, a research scientist at BASF, there have been so many unpublished metallocene patents that commercialization is a risk. (Chowdhury, Fouhy and Shanley, 1996.)

Survey objectives. (Results are presented in 8.12.)`

It was decided to establish whether South African manufacturing companies' broad use of IP is to monopolise, deter, earn royalties or to defend if sued.

4.3 Licensing strategy

4.3.1 Licensing is a mainstay of managing technology transfer

An industrial company needs a technology strategy for survival and growth; technology transfer will be an integral part of the strategy; and licensing is one of the transfer methods. Patentees, having been granted an enforceable monopoly right by the state to an invention in return for disclosing the subject invention or technology, license their patents, *i.e.* allow others controlled access to their monopoly. Likewise trade marks, designs and copyright - bestowing enforceable monopoly rights - and secret know-how are licensed. The sale of a book actually constitutes licensed access to its copyright protected contents. Carefully composed and controlled bundles of technology are more and more frequently licensed in what is called franchising. It could be argued that business consultants, when installing systems, are selling franchises. Rights to each other's technology increasingly form explicit parts of strategic alliances.

Licensing can, has been, will be and ought to be an action of choice for a variety of reasons

which range from the truly strategic to the tactical and certainly do not involve only quick increases of income or a quick agreement to pay royalties. Knowing what shortages or surpluses of technology exist, remedial or exploitative action by a company should include consideration of the option of licensing which is but one way to use, obtain or to divest technology. Instead of being merely reactive, the possibility to license in or out should *ab initio* form a deliberately integral part of the overall competitive decision framework of industrial companies.

The advantages of licensing would arguably be a function of (i) the characteristics of the technology involved, considering that licenses will rarely be used if the transfer involves a core technology of the licensor rather than a peripheral one; they will be more frequent for old technologies than for newer ones, except if the pace of technological change is sufficiently fast so that the leader can stay ahead even if he cannot stop competitors from copying it; (ii) the size of the firm considering that small firms will tend to use licensing more than larger ones, because they lack the necessary resources for foreign direct investment; (iii) the maturity of the product, considering that licences will be more willingly granted for relatively old products, except if technological feedback or reciprocity looks good even for newer products; (iv) the firm's degree of experience in international operations and risk considerations; comparative pace of response for licensing and foreign direct investment; transaction costs relative to licensing; (v) constraints related to host countries and to countries of origin, such as barriers to entry of foreign direct investors; an opportunity cost of capital which is higher in the host country than in the country of the potential licensor which would be detrimental to licensing since the licensee would thus enjoy a lower value on the flow of rents expected from the technology than would the owner of the technology himself. (Bonin, 1987: 76.) Bonin continues, and quotes Telesio, 1979: OECD 1984:

Given these advantages, one would expect licensing, and more generally new forms of international investment, to become increasingly important. Besides licensing, the latter would include franchising, management contracts, turnkey operations, co-production agreements, international contracting-out and joint equity ventures in which equity participation would be 50% or less.

Ford (1988) uses the three-fold functional typology of technology acquisition, exploitation and management, also presented in Figure 1, p16 to look at continuing, regular technology strategy development under different positions in which a company may find itself.

He distinguishes four basic methods of acquiring technology and shows their applicability under different circumstances (Figure 9). Thus, licensing-in should definitely be considered where the company has a weaker standing in the technology, there is a high urgency to obtain it, it is relatively mature and it is relatively distinctive (has intrinsic value); and the investment required is low. Note that the technology could be of the high level system type or of the component or even material type.

Acquisition method	Company's relative standing	Urgency of acquisition	Commitment/ investment involved in acquisition	Technology life-cycle position	Categories of technology
Internal R&D	High	Lowest	Highest	Earliest	Most distinctive or critical
Joint venture		Lower		Early	Distinctive or basic
Contracted-out R&D		Low		Early	Distinctive or basic
License-in		High	Lowest	Later	Distinctive or basic
Non-acquisition. Buy final product.	Low	High	No commitment/ investment	All stages	External

Figure 9. Factors affecting technology acquisition decisions.

(Ford, 1988 : 91)

Ford also considers four different methods of exploitation of technology (Figure 10). A company should consider granting licences when it has a high standing in the technology, the urgency of exploitation is high, little support technology is necessary, the technology is mature, it is peripheral and has wide application; and little investment is required.

Although Bonin states that relatively old and non-core technology would be licensed more readily he does allow for exceptions. Such technology can be found in Ford's matrix where the licensor has high standing and the urgency of exploitation is high. Analysing the automotive components sector in South Africa in global context Barnes and Kaplinsky (2000) found that effective global sourcing by vehicle assemblers requires component manufacturers with significant design and technological capability. These, with suitable own or arranged production capacity are sought after as and become first tier suppliers to the assemblers. To

meet assemblers' stringent quality and delivery requirements these first tier suppliers will arrange manufacture in close proximity to major assembler plants. The authors opine that the restructuring problems facing global components suppliers will turn them to joint venturing and licensing, away from establishing owned subsidiaries. Clearly the latest technology will be involved.

	Company's relative standing	Urgency of exploitation	Need for support technologies	Commitment/investment involved	Technology life-cycle position	Categories of technology	Potential application
Employ in own production or products	Lowest	Lowest	Lowest	Highest	Earliest	Most distinctive or critical	Narrowest
Contracted-out manufacture or marketing	Lower	High	High		Early		Narrow
Joint venture	High	Low	High		Early		Wide
License-out	High	Highest	Low	Lowest	Later	Least distinctive or critical; peripheral	Widest

Figure 10. Factors affecting technology exploitation decisions.
(Ford, 1988 : 92)

Ford's typology represents a very valuable heuristic tool but it is clear that the various circumstance factors he lists are not necessarily exhaustive and are subject to tight definition or understanding by would-be users. In real life they probably will not fall into neatly graded groups as his typology may suggest. For example, it is possible that a company will have a high relative standing in a technology as well as high urgency to acquire. This apparent conflict could be due to inexact definition and could be ameliorated by focussing on subsets of the technology presumably suffering it. A high standing in electrical motors does not necessarily imply a high standing in stators.

Entering new business requires strategy also. Roberts and Berry (1985) developed another useful matrix to assist in strategy selection (Figure 11).

Market factors	New unfamiliar	Joint ventures	Venture capital or venture nurturing or educational acquisitions	Venture capital or venture nurturing or educational acquisitions
	New familiar	Internal market developments or acquisitions (or joint venture)	Internal ventures or acquisitions or licensing	Venture capital or venture nurturing or educational acquisitions
	Base	Internal base developments (or acquisition)	Internal product developments or acquisition or licensing	New style joint ventures
		Base	New familiar	New unfamiliar
Technologies or services embodied in the product				

Figure 11. Optimum entry strategies.
(Roberts and Berry, 1985: 551)

The conditions for simple licensing are clearly discernible from this. In addition, licensing can logically also form a part of any of the other strategies.

4.3.2 Basic function of licensing

Cross-licensing resulted when computer manufacturer Acer responded to a Lucent Technologies lawsuit with a countersuit, alleging that Lucent violated several Acer patents. Acer sought a cross-licensing agreement with Lucent to resolve the costly litigation. The widely reported Digital Equipment (DEC) lawsuit against Intel also involved allegations of infringement by both companies. It ended in an unusual settlement in which Intel and DEC

entered into a 10 year patent cross-license agreement and Intel purchased DEC's semiconductor operations. Strategic actions included or resulted in licensing.

Also, licensing and selling *per se* will or should be considered pro-actively in most instances to establish their viability as part of a company's broader competitive strategy (4.2, p45). In this context the use of licensing is contingent on the topic of the formation of domestic or international, small or large, alliances as transpires from 4.2. The formation of these in essence revolves around the dovetailing or assembly of assets that are deemed complementary as part of company structure or company competitive accoutrements. An IP licence on its own may be a simple form of alliance, or it may be a small part of a much greater whole.

Licensing itself is multi-dimensional and can be approached from several different directions depending on the purpose of discussion - *e.g.* why, how and what. Some taxonomies in addition to those offered by Kim (Figures 6 and 7 - p29) and Ford (Figures 9 and 10 – p52) are presented in Figure 12 and Table 4.

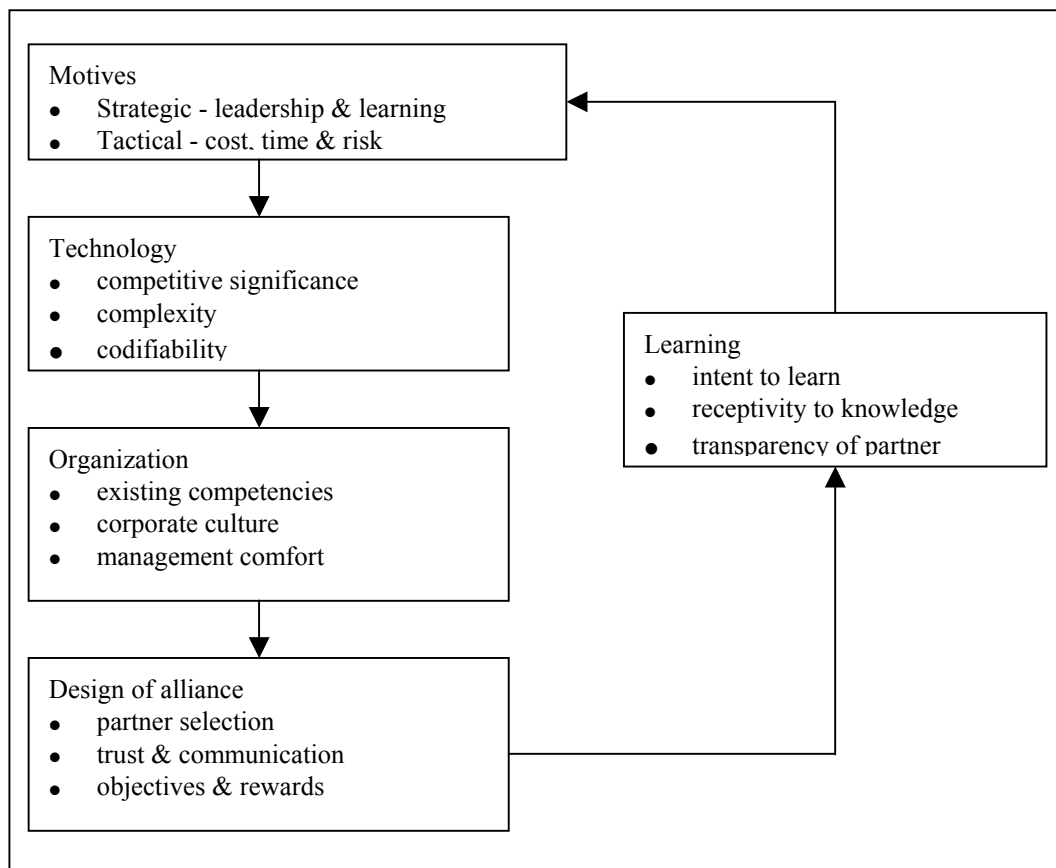


Figure 12. A model for collaboration.

(Tidd *et al*, 1997: 199)

Tidd *et al* (1997: 198) examine the role of collaboration in the development of new technologies, products and processes and recognising that in any specific case a firm is likely to have multiple motives for an alliance suggest that it may be useful to group the rationale for collaboration into technological, market and organisational motives and do so in the taxonomy appearing in Figure 12. It can be seen that transfer of technology and the managing thereof and thus licensing can assume an important role.

A second taxonomy appearing in Table 4, distinguishing two basic types of licensing, *viz.* vertical in which a company licenses another to use the technology and market the resulting products and horizontal which involves cross-licensing among competitors, is suggested by Barton, Dellenbach and Kuruk (1988).

Vertical licensing		Horizontal licensing
Reasons for: licensor	Reasons for: licensee	Reasons
Size	Size	Industry structure issues, eg. Cost/risk
Cash flow	Cash flow	
Market entry considerations	Risk diversification	Complexity
Technological factors	Patent restrictions	Time
International factors	Technological education	Joint venturing
Legal factors		Standardisation questions
		Legal issues
		Political issues

Table 4. A vertical/horizontal licensing taxonomy.
(Barton, Dellenbach and Kuruk, 1988)

The generalised and simpler taxonomy presented in Table 5 was deemed more suitable and practical as a starting point for the purposes of this research. Although reasons for and against licensing, which term includes selling as defined in 3.5 above, appear in what may be termed disentangled form it should be borne in mind that a combination of reasons will usually drive any particular transaction. The two taxonomies presented also point to this.

	Reasons for	Reasons against
License out	4.3.4 below.	4.3.6 below.
License in	4.3.5 below.	4.3.7 below.

Table 5. A practical taxonomy for analysing in- and out-licensing.

Furthermore any one reason as listed should always be considered against the simultaneous motivation of the second party to any transaction. It can be expected that an eventual agreement will take the form of some compromise between offeror and offeree. It is equally important whether the licence is independent or forms part of greater collaboration or is vertical or horizontal.

Patents, trademarks, designs, copyright and non-statutory IP are all involved as the subject matter of licensing.

Degnan and Horton conducted a world-wide patent licensing survey in 1997 and analysed companies' involvement in technology transfer and their superordinate reasons. They mailed 2100 patent licensing questionnaires to members of the Licensing Executives Society and received 428 useful responses. Three out of four of the respondents worked in for-profit businesses and the remainder in academia, research or government. Over 70% were from the USA and Canada, 15% from Europe, 3% from Japan and 3% from Australia. Of the for-profit respondents 40% worked for companies with less than \$50 million in gross income, 5% for companies grossing between \$51 million and \$100 million, and 18% for companies grossing between \$101 million and \$1 billion. Some 17% of the respondents had 5 or fewer technology licensing agreements, 46% between 6 and 50, and 37% had more than 50. Agreements were not necessarily at arms length. They reported their results as shown in Tables 6 and 7.

The authors note that 71% of the respondents licensed both in and out.

Technology transfer type	Respondents involved (%)
Licensing-out	88
Licensing-in	68
Co-development	61
Strategic alliances	58
Joint ventures	54
Cross licensing	40

Table 6. Involvement in technology transfer areas
(Degnan and Horton, 1997: 91)

Patent licensing reason	Respondents involved (%)
Royalty income	61
Developing a business advantage	54
Product profit maximization	44
Increased technical proficiency	32
Defensive	20
Deterring or delaying others	13

Table 7. Reasons for technology licensing
(Ibid: 92)

4.3.3 Some reasons for licensing out

The superordinate reasons appearing above may be dissected to varying degrees.

(i) License out to make use of technology developed for use by the company but which is also useful in a different field; or is not relevant to or the market is too small, or even too big, for the company's operations. The use of the technology could be restricted to that field. This would represent making use of technology that might otherwise not have been used. The risk of direct investment can be eliminated as well.

The objective would be to earn royalties and the technology could also be entrusted to a firm or firms that purchase, market and license patents and other IP that otherwise would decay in a company's possession, to realise revenues that would have been lost, at minimal expense.

Telular Corporation was founded in 1986 to exploit an obscure patent involving connecting wired telephones to cellular systems. Telular had to defend its patents over several years and financed its legal cost by selling rights to pieces of its basic patent. (Samuels, 1994: 62.)

Many years ago, Sohio, a major energy company in the United States, developed a chemical compound called acrolein. ... no one knew any commercial use. Rather than spend its own money Sohio embarked on a program to license its use to others.... And rather than ask royalties ... required them to grant back to Sohio the rights in any technology developed by them. (Rein, 1995: 87.)

Acrolein currently is an important raw material for the feed additive DL-methiomine.

Or license the use of the trademark "ZOZO", well-known in South Africa in connection with site and Wendy huts, to be used in connection with gymnasium equipment; or license manufacturers to make "Micky Mouse" coffee mugs.

(ii) License use of the technology in a different place, for example, offshore. An offshore company which may be an independent company, a joint venture or even a subsidiary or parent company may then be licensed. This might represent making use of technology without the need for capital investment while expanding markets geographically. The technology itself could also be used to obtain an equity stake.

The purpose could be to obtain a toe-hold in a new market.

Tacey (1988: 41) expressed the opinion that traditional process industry licence deals, in which a company that does not know how to go about making something, buys this know-how from a company that does, may be going out of fashion. Instead, licensee and licensor, or the licensor's agent in the form of a contractor, are entering into more collaborative deals or forming joint ventures. He referred to both BP and ICI saying that licensing represented a very small part of their total business. But the contractors such as Foster Wheeler, Costain Petrocarbon and John Brown were relying very heavily on selling licensed technology. The MD of John Brown was quoted as saying that that could be the way forward for technology owners. Their technology could be their contribution to a joint venture. This method is certainly widely used as is evident from the quotation at the end of 4.2 (p45) above and is also practised by the South African process industry.

(iii) License out to prevent others including competitors from entering or flooding a market by locking a licensee into the licensed product also through licensed trade mark use or by building sufficient volume to render a market unattractive for third parties. When a concomitant patent expires the licensor's competition in the licensee country would be his selected licensee.

Two classic cases demonstrating the effectiveness of the strategic mixing of licensing with tangible product manufacture are those of Pilkington and Dolby. Following a risky and

expensive development programme Pilkington introduced its revolutionary float flat glass process in the 1960s. The licence income was used to good effect to boost manufacturing and for research and development to ensure the future soundness of the company. A small family company grew into an international force.

Dolby worked towards creating a world-wide standard to establish demand for both licences and hardware. Manufacturers were manoeuvred into a position where they had little option but to maintain full compatibility of products by using Dolby techniques. (Lawrenson, 1992: 340.)

A US manufacturer had an excellent line of products but no distribution in Europe. It had no patents to license its specific designs and manufacturing specifications constituted "know-how" which is usually protectable under the laws regarding trade secrecy. A licensing company in the US was able to identify several European stove manufacturers with excess capacity, who ultimately in-licensed the US company's designs throughout Europe. The licensees got the benefit that they did not have to develop new designs. The licensor got the benefit of revenues from a new market and prevented the licensees from becoming own design manufacturers. (Rein, 1995: 87.)

(iv) License out to attain control over a technology or market by saturating it in an effort to establish the dominant design, also through standards setting and licensed trade mark use or by licensing on condition that improvements be granted back by the licensee.

See the Pilkington and Dolby examples under (iii) above. Trade mark licensing could be used to good effect to establish the licensor's mark and hence its standards and lock in the licensee.

(v) License out to avoid anti-trust or monopoly prosecution; win trust of customers.

If Microsoft had initially licensed its Windows source code, it could possibly have avoided being attacked by the government (probably at the instigation of its competitors) and being forced to lay it open.

The artificial sweetener Aspartame was licensed solely to offer potential customers afraid of

relying on a monopoly supplier more than one supplier.

(vi) License out to showcase co-operation - the forerunner to greater business. Mutual learning could also be the goal.

(vii) License out to satisfy local "patent working" requirements. This could apply where entry has to be gained into a country with a restrictive IP regime or to avoid trade limitations such as high tariff barriers.

It could apply where the technology has to be adapted to fit the market.

(viii) License out to settle litigation.

See the DEC : Intel 10 year cross-licence example at 4.3.2, p54.

(ix) License out for administrative purposes, such as to sort out a multi-national company's research and development cost or to receive tax friendly income where the licensor could be based in a jurisdiction with attractive reciprocal tax agreements.

4.3.4 Some reasons for licensing in

(i) License in to eliminate cost, time and risk of development. Jump to future technology.

Unable to afford or unwilling to risk the huge development costs of Siemens and Motorola referred to in Chapter 1 and Pilkington (4.3.3, (iii) - p59) a licensee would be able to supply or part-supply lucrative markets without any risky up-front expenditures.

South Africa's Atlas Aircraft Corporation licensed Italian airframe technology to supply a rather restricted market centering on South Africa and its neighbours as well as for strategic reasons.

(ii) License in to access a market quickly and with minimal or no risk. Diversify.

South Africa's Atlantis Diesel Engines started manufacturing German automotive engines under licence. It was provided with complete manufacturing know-how and allowed to use the respected trade mark in exchange for essentially a running royalty.

The licensee could also be the recipient of rights obtained, perhaps under favourable conditions, following local patent working requirements compelling a patentee to license.

Trade mark licensing offers the possibility of supplying already well-known goods or services to a market. During 1996/7 MacDonaldis fast foods of the USA was involved in court battles to have the registration of its name by a South African nullified and to have it re-registered in its own name. It forms the core of its franchising package.

The advantages offered by famous trade marks are so great that even the threat of legal action does not deter many concerns from being illegally active on the so-called grey market.

(iii) License in to acknowledge a dominant patent position

The Brown vs Shimano gear-shift case (4.1 – p42) demonstrated the risk to even a fair sized company using patented technology without the permission of the patentee.

Several unpublished metallocene patents resulted in cross-licensing among several large chemical companies (4.2 – p49/50).

(iv) License in to settle litigation (DEC: 4.3.2 – p54).

(v) License in to augment a company's technology stock and to learn.

This strategy as followed by Korean companies is discussed at Figure 15 – p.108.

(vi) License in to show-case co-operation.

4.3.5 Some reasons for not licensing out.

Perhaps the culture is not helpful:

.... Traditionally, companies have given a low priority to out-licensing. There are a number of reasons for this. The business imperative ... is to introduce new products. Outlicensing is seen to divert resources. It gets the lowest priority in legal departments when other deals are being done. It can be seen as failure by R&D departments trying to develop products for the company. And company executives may be concerned they might give away rights the company will need later. (Schafer, 1993: 119.)

(i) Out-licensing may reveal own know-how.

Chemical process technology and even Stradivarius manufacturing techniques can be kept confidential (3.4, p35). A South African research institute proposed the radically cheaper and easier use of chlorine gas in stead of hypochlorite in wool treatment. A patent issued but the technology was practised behind closed factory doors and the patent proved unenforceable. Any one factory could have kept the technology to itself for at least a number of years if the technology were not disclosed through the patent system.

(ii) Out-licensing may lead to loss of close control

(iii) Out-licensing may dilute a company's own market.

A licence may return about 25% of the net income that may accrue to a licensor exploiting its own technology. Assessed opportunity plus transfer cost may be prohibitive.

(iv) Out-licensing may debilitate own R&D.

Market and product feedback from licensees will tend to be less intense, leaving the R&D function isolated. The R&D department may also be demotivated - see quotation above.

(v) Out-licensing may be seen as an administrative burden.

Some companies may decide that the search for licensees and negotiation with licensees,

technology transfer activities required and on-going monitoring are non-productive.

4.3.6 Some reasons for not licensing in.

A cursory look at the reasons for granting licences may tend to suggest that licensees could often be difficult to find. Nevertheless licensees have their reasons for taking licenses, some of which are set out in 4.3.4, p61. Some situations requiring a wary licensee can be mentioned.

(i) Build licensor's trademark.

When a licensor demands that licensed goods or services be marketed under its trademark there is a real risk that the licensee may find itself unable to terminate the license agreement without losing the relevant market which can then relatively easily be supplied by the licensor or another licensee.

(ii) Danger of subjugation.

A single licence may lead to a passive licensee attitude and thus loss of licensee capability because the licensor guarantees a working technology. In contrast, when a recipient acquires technologies from various sources and assumes responsibility for integration, it is at risk and the consequent crisis forces learning.

A wise licensee will rather see a single or restricted (field of use or market) licence as too little and may then set in motion suitable plans to overcome the possible hurdle.

(iii) Excessive grant-back.

A licensor may require a licensee to grant even ownership of new technologies developed by the licensee and more or less relevant to the first-licensed technology, to the licensor. This can debilitate a licensee.

Survey objectives. (Results are presented in 8.1 and 8.14.)

It was decided to establish South African manufacturing companies' reasons for licensing and not licensing inwards and outwards (detail in question 11 in the questionnaire – Annexure A), the broad nature of the technology transfer relationship where a licence is involved, size of the other party, extent of technology adaptation required, whether research and development cost is regarded as sunk, whether transfer cost is pertinently charged and whether their Boards are sufficiently knowledgeable in relevant technology.