



Session 2

B - Opportunities identification

Patents & other IP assets role as Strategic Resources

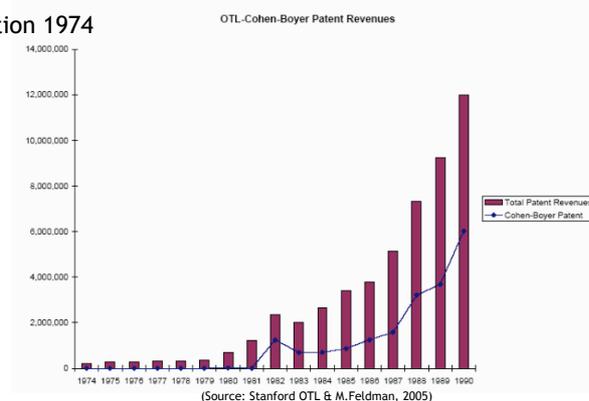
Dr. Robert Pitkethly

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- Cohen - Boyer : Key Patent on Recombinant DNA
"Process for Producing Biologically Functional Chimeras" US 4,327,224
- Paper Nov 1973 - US Application 1974
- US Patent Granted 1980
- US Patent Expired 1997
- \$35bn Product Sales
- **Licensing Revenues \$255m** from approx 467 licensees for Stanford University



Patents are not only valuable but a means of defining & packaging ideas

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Opportunities Identification

- Strategic Management & IP Assets
- Internal Review of Patents & other IP Assets
- External Review of IP Environment (Economic & Technical)
- Conclusions

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Key Strategic Management Concepts - 1

- 1950s/60s Alfred Chandler defined “Strategy”
“the determination of the basic long-term goals and objectives of an enterprise and the adoption of courses of action and the allocation of resources necessary for carrying out these goals”.

Alfred D. Chandler (1962), Strategy & Structure

Implications for Patent & IP Asset Management - 1

A firm's resources need to be thought of as to *including*
Patents and other IP Assets

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Key Strategic Management Concepts - 2

- 1950s/60s Igor Ansoff's Product/Market Grid analysed Diversification

MARKETS		μ_0	μ_1	μ_2 ...	μ_m
PRODUCT LINE					
π_0	MARKET Penetration		MARKET DEVELOPMENT		
π_1	PRODUCT DEVELOPMENT		DIVERSIFICATION		
π_2					
...					
π_n					

A Product-Market Strategy $\sigma_{ij} : (\pi_i, \mu_j)$
 Overall Company Product-Market Strategy $\sigma_x = \{\sigma_{ij}\}$

Ansoff, H.I. (1958) "A model for Diversification" Management Science 4(4)p392

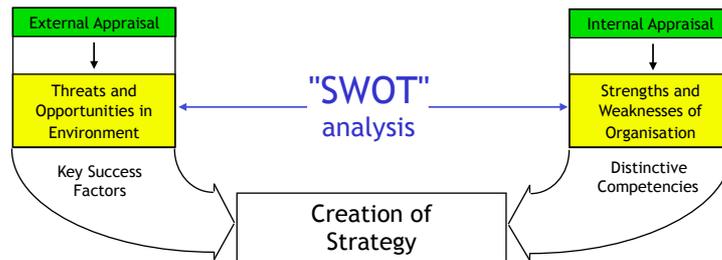
Firms can diversify by developing new products &/or new markets
 Firms can grow in a number of different dimensions

Implications for Patent & IP Asset Management - 2

- 1950s/60s Ansoff's Product/Market Grid
 - To exploit it's resources fully a firm must think about *all* dimensions in which the firm can be expanded and thus in which Patents or IP assets can be used.
 - Products/Technologies/Markets/Countries/etc.
 - The greater the distance from core products & markets the greater the risk of diversification
 - Patents or IP assets may be used to reduce these risks though this may have an acceptable cost

Key Strategic Management Concepts - 3

- 1960s SWOT : “Strengths Weaknesses Opportunities Threats”

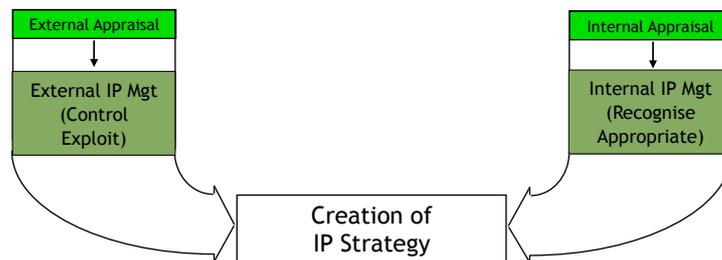


Based on the "LCAG Model" from : Learned E.P., Christensen, C.R., Andrews, K.R., Guth, W.D. (1965) Business Policy Text & Cases

Strategy requires both external and internal analysis

Implications for Patent & IP Asset Management - 3

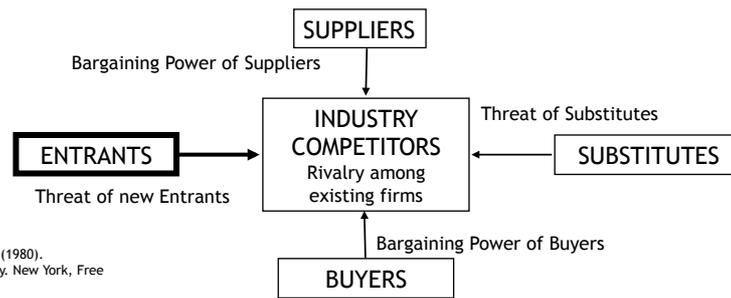
- 1960s SWOT : “Strengths Weaknesses Opportunities Threats”



IP Strategy also requires both external and internal analysis

Key Strategic Management Concepts - 4

- 1970/80s External Environment - Industry Structure Analysis

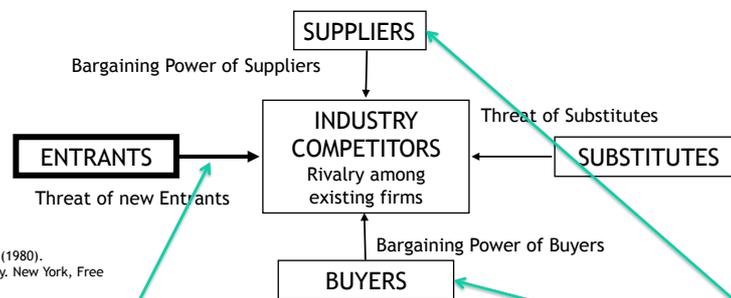


From : Porter, M. E. (1980).
Competitive Strategy. New York, Free Press.

Perfect Competition & Eroded Profits
=> Search for Imperfections / Barriers to entry

Implications for Patent & IP Asset Management - 4

- 1970/80s External Environment - Industry Structure Analysis



From : Porter, M. E. (1980).
Competitive Strategy. New York, Free Press.

Patents & IP Assets are one form of barrier to new entrants

Patents & IP Assets may affect the bargaining power of suppliers & buyers



Implications for Patent & IP Asset Management - 5

- **External Environment**

PESTLE

- Political
- Economic
- Social
- Technological
- **Legal**
- Environmental



IPRs are part of the legal environment - even if you ignore them others won't



Key Strategic Management Concepts - 6

- 1980s Firm Resources - The Resource Based View

- **Strategy :**

- Assessing resources and opportunities
- Establishing achievable objectives
- Organising resources to achieve those objectives

- **Resources :**

- Company Staff
- Financial resources
- Tangible assets
- Intangible assets

Resources should be Valuable, Rare, Inimitable and Non-substitutable

(Barney, 1991)



Implications for Patent & IP Asset Management - 6

- 1980s Firm Resources - The Resource Based View

- **Resources :**

- Company Staff (Human resources)
- Financial resources (€ / £)
- Tangible assets (Buildings and equipment)
- Intangible assets (inc. Patents and other Intellectual Property Assets)

"Lets use IPRs as the fourth resource of business as well as People, Things and Money."

「知的財産権を人、モノ、金に次ぐ第四の経営資源として活用しよう」

(Japanese IP dept slogan c1993)



Because technology is our franchise, aggressively protecting our technology and patents is critical to our ability to deliver long-term value to our stockholders"

J.J.Renier Chairman & CEO of Honeywell, 1992



Key Strategic Management Concepts & Implications

- Strategy needs to look
 - Inwards - at resources
 - Outwards - at the environment
- In practice and in the presence of other firms one needs to look everywhere:

Inwards - at firm's own operating environment
Outwards - at firm's external environment

Inwards - at firm's own resources
Outwards - at other firm's resources

Patents & IP Assets are an essential (not an optional part) of strategic management



Strategic Management of Patents & other IP Assets

Using firm resources to :

- Recognise
- Appropriate
- Control
- Exploit

All relevant Patents & IP assets

Oxford Intellectual Property Research Centre
www.oiprc.ox.ac.uk

St. Peter's College University of Oxford
www.spc.ox.ac.uk

Recognition : What / Who needs Managing ?

Explicit

Embodiment of Intellectual Asset

Tacit

Low High

Legal Appropriability of Intellectual Asset

Management of explicit, appropriable “Knowledge” or “IP” involves IPRs
But.... How important are Patents & IP Assets in appropriation?

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Oxford Intellectual Property Research Centre
www.oiprc.ox.ac.uk

St. Peter's College University of Oxford
www.spc.ox.ac.uk

CAT Scanners

- 1967 G.Hounsfield invents the CT X-ray Scanner
EMI files first patent application
- 1972 first patent granted
- 1972/4 customers waiting 12 months for delivery
- 1975 250 systems sold 85% in USA
Sales = £20m pa 800 people hired
- 1975 GE enters market
- 1977 Sales in Japan via Toshiba under licence
- 1977 EMI share of US market drops to 50%
- 1978 purchasing restrictions in US slow sales
EMI has applied for over 500 patents
- 1979 Sales decline further, companies fail
- 1979 EMI merged with Thorn Electric
G.Hounsfield receives Nobel prize

EMI Medical Electronics
sold to GE

EMI needed more than just patents...

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Key Strategic Management Concepts - 7

Appropriability & Complementary Assets

	INNOVATOR	IMITATOR -FOLLOWER
WIN	<ul style="list-style-type: none"> • Pilkington (Float Glass) • GD Searle (Nutrasweet) • Dupont (Teflon) 	<ul style="list-style-type: none"> • IBM pc • Matsushita VHS VCR • Seiko Quartz Watch
LOSE	<ul style="list-style-type: none"> • RC Cola (diet cola) • EMI CAT Scanner • DeHavilland (Comet) • Xerox office computer 	<ul style="list-style-type: none"> • Kodak instant photography • DEC personal computer

Success linked to :

- appropriability
- **complementary assets**
- dominant design

Innovators don't always win

What could EMI have done?

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(Teece, 1986)

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Pilkington's Float Glass Process

- c1953 A.Pilkington begins development
- 1957 first patent granted
- 1959 development takes c7 years + £7m : Reduces costs by c70%
- 1962 first licence granted in US
- 1969 Sir A.Pilkington becomes an F.R.S.
- 1972 over 100 patent applications filed many in over 50 countries
- 1976 21 licensees in at least 16 countries
- Licenses granted to existing manufacturers for existing lines and existing markets
- Own float lines established in Canada 1967, Mexico 1968, Australia 1974, Sweden 1976, South Africa 1977, Brazil 1979
- Existing market structure maintained and used to capture profits for Pilkingtons by using the patents to control licensees

Licensing was used to gain control of complementary assets...

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Appropriation

- = Capturing the benefits due to a resource
- Requires both Legal Appropriability & Complementary Assets (Teece)
- May be affected by dominant design / standardisation issues
- May be increased by not trying to capture all the benefits (e.g. CT Scanner)

Are Patents and other IP assets the only means of appropriation?

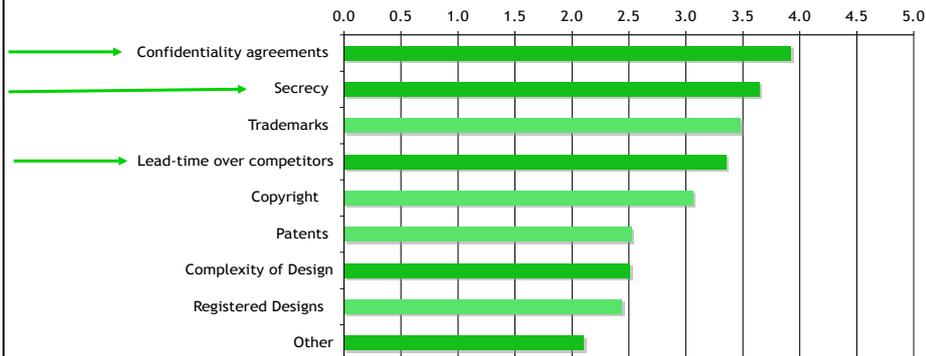
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Survey of UK Industry 2006

Q. 11 Please indicate the importance to your business of each of the following methods to protect innovations:
(1. Unimportant 2. Not very Important 3. Important 4. Very Important 5. Essential) :



Non IPR means of appropriation are complementary to Patents and other IP Assets

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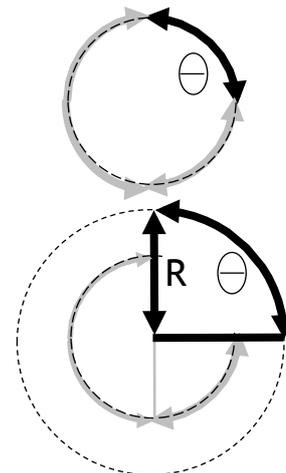
Strategic Appropriability

Appropriability

- Legal Appropriability & Complementary Assets
- Deciding the % of returns players appropriate
- How much of the cake - RADIANS

Strategic Appropriability

- Ability of a given player to maximise returns
- Deciding the returns a player appropriates
- How much of the cake - RADIANS
- How large a cake - RADIUS



How can one use control over IPRs to not just capture but increase the returns ?

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Control of Intellectual Assets

- "A patent does not give you the right to do make something or to do anything except to appear in court as the plaintiff in an action for infringement"
Earl of Halsbury House of Lords 20/2/85

But Patents & other IPRs can :

- Protect - an invention from use by others by litigation
- Appropriate - the returns / profits from an invention by using IPRs and any necessary complementary assets
- CONTROL - how an invention is exploited

IPRs are not just a means of protecting but of *controlling* IP

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Two Cases of IPR exploitation - II

- Penicillin
 - Neither penicillin nor production methods were patented by the discoverers Fleming and Florey for legal and other reasons
 - Production methods were patented by scientists in the USA
 - Andrew J. Moyer - Method for Production of Penicillin
 - US Patent Nos. 2,442,141; 2,443,989; UK Applications 45/13674-6 Etc.
 - Fleming received \$100k from US Penicillin Manufacturers in 1945 to fund medical research
- Cephalosporin-C
 - In 1957, Abraham and Newton isolated cephalosporin-C, the first cephalosporin antibiotic. This was patented.
 - The E P Abraham Research Fund and the Guy Newton Trust, funded by over £150m in royalties still support medical, biological and chemical research in Oxford.

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IPRs - Lost Opportunities

- **Monoclonal Antibodies**
Discovered in Cambridge by Kohler & Milstein in 1975 using Medical Research Council (MRC) Funding but not patented by the MRC / NRDC. Patents were subsequently obtained by US Wistar Institute
- Almost certainly involved £millions of lost research funding
- Even without basic patents, improvement patents are important
- The patents that do exist decide who reaps the most benefits
- No organisation can afford to ignore IPRs

If you don't control your inventions & IP Assets someone else will

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Net Present Value

	B	C	D	E	F	G	H	I	J	K	L	M	N
			TODAY	Year									
			0	1	2	3	4	5	6	7	8	9	10
		CASHFLOW											
		Paid	10										
		Received		2	2	2	2	2	2	2	2	2	2
	=B5+B6	NET CASHFLOW	-10	2	2	2	2	2	2	2	2	2	2
	0.05	Discount Rate	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	=B7*(1+B8)^A3	Present Value	-10.00	1.90	1.81	1.73	1.65	1.57	1.49	1.42	1.35	1.29	1.23
	=SUM(D9:N9)	NET PRESENT VALUE	5.44										
	=NPV(B8,E7:N7)+D7	EXCEL NPV	5.44										

- Valuations often involve just one projected cashflow
- There may be multiple ways of exploiting an IP Asset
 - there may of course be many components of the one projected cashflow
- A firm should be aware of not just its own but other firms' Patents and IP Assets
- The aim should be to maximise the return from the firm's assets
 - including any Patents or other IP Assets

But how does one exploit an IP Asset?

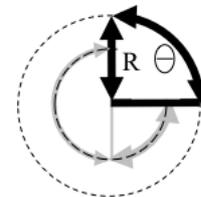
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Use / Exploitation of a Firm's Technology / IP Assets

- **In-House** Exploitation of technology
 - development and marketing of own products
- **Licensing Out** of technology developed in-house
 - for revenue
 - for lack of resources to fully exploit it in-house
 - to entrap licensees
 - to allow use by others under patentees control
 - for cross-licensing purposes
- **Outright Sale** of technology
 - exit from technical field



Consider as many options as possible but remember their consequences...

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Use / Exploitation of *Other Firm's* Technology / IP Assets

- **Licensing In** of technology developed elsewhere
 - to fill a resource gap with the licensed in technology
 - to exploit an opportunity where the IP Asset owner lacks resources
 - for payment or part of a *cross-license*
- **Outright Purchase** of technology
 - entry to or advance within a technical field
- **Use of freely available technology in the public domain**
 - Access to free technology not subject to IPRs
 - Re-use /Improvement of old/abandoned technology for new uses

Consider as many options as possible but remember their consequences...



Open Innovation? / Complementary IP Assets? / Cross licensing? / IP Portfolios?

These are not new ideas.....

“It seems obvious that the best defence (of market and technology position) is to... maintain such a strong engineering, patent, and commercial situation... as to always have something to trade against the accomplishment of other parties....

Ability to stop the owner of a fundamental and controlling patent from realising the full fruits of his patent by the ownership of necessary secondary patents may easily put one in position to trade where money alone may be of little value”.

AT&T's J.E.Otterson memo of 1927 (cited in Noble, 1977)



Licensing

WHO?

Who to license from or to is critical : consider the opportunities and threats involved (nb: licensing, network externalities & cross-licensing)

WHAT? - Type & Scope

What to licence and the type and scope or extent of licence need to be decided
Whether associated know-how/show-how / material transfer agreements are needed (& what IP terms they may contain)

WHY?

To access the necessary resources enabling otherwise impossible value extraction

Licensing IN : to fill a resource gap
Licensing OUT : to fill an exploitation gap

WHY NOT?

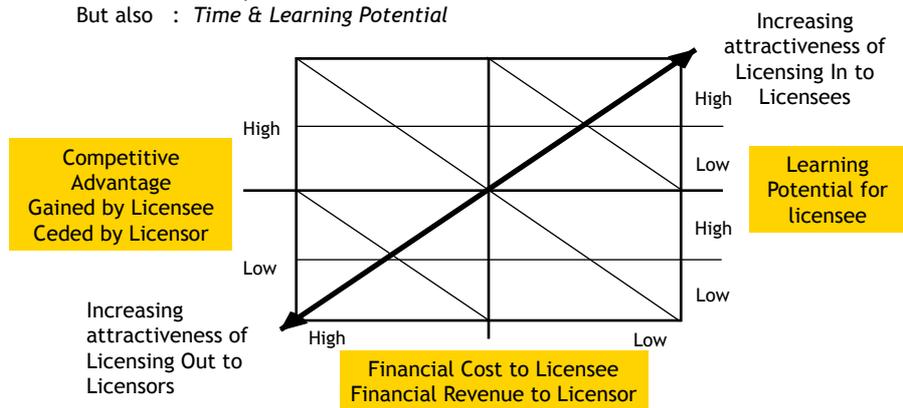
Licensing IN : Developing too concentrated a dependency or followership
Licensing OUT : Giving too much strategic advantage for too little financial gain

Remember that Licensing involves Learning



Licensing Attractiveness

Consider Not Just : Competitive & Financial Costs/Benefits
But also : Time & Learning Potential



Licensees want to : Pay little, Catch-up a lot, Learn a lot
Licensors want : the opposite

But Cross-Licensing need not be a zero-sum game



Types of Licence

- **Exclusive Licenses**
 - An Exclusive Licence excludes even the owner of the IP from exploiting it and permits only the licensee to exploit the IP concerned.
- **Non-exclusive Licenses**
 - A Non-exclusive Licence permits the owner of the IP to exploit the IP as well and in doing so *may* licence to many others as well
- **Sole Licenses**
 - A Sole Licence resembles an exclusive licence in permitting the owner of the IP to exploit the IP as well but in doing so the owner agrees *not* to licence to others
- **Pooling Agreements**
 - Including cross-licensing arrangements. These may have competition law implications
- **Package Licences**

A package licence involves a licensor who owns a large range of related patents and other IP offering licenses to use any or all of the technology covered by the IPRs concerned for a flat fee which is not broken down into individual payments for each IPR.
- **Early Day Licences**

Licence agreements which may have real options built into them in the form of milestone payments on achieving certain development objectives. e.g. Pharmaceuticals

(Also compulsory licences and implied licences)

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Licence Scope

= the extent to which the licensee can avoid being sued for infringement of the licensor's IP.

- **The territory covered by the licence**
 - Does the licence cover the whole of the territory covered by the IP or only part?
 - Is the territory licensed exclusively or not? Different rights may exist in different countries.
- **The commercial field of use covered by the licence**
 - Does the licence cover the whole of the possible fields of use covered by the IP or only part?
- **The commercial activities covered by the licence**
 - In the UK patent infringement can involve, inter alia, making, selling, using or importing the patented product and any or all of these can be licensed.
- **The technology covered by the licence.**
 - Where a licence to a patent exists, is it in respect of all possible uses of the patented technology or only some? Are all technical fields treated in the same way?
- **The timescale covered by the licence**
 - Is the licence limited by time - for example to a fixed duration. Obviously there may be limits imposed by the lifetime of the IPRs involved but are shorter license terms envisaged? Is the licence for the whole, the remainder or a specified part of the IP life.

Use by a licensee outside the licence terms will result in infringement

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Why to License In

Potential specific reasons for In-licensing include :

- To access critical resources or complementary assets needed for the firm's business
- Obtaining access to IP blocking the path of the firm's products
- Sourcing technology better developed by others
- Wanting to use tried and tested technology
- To save development time
- Aiming to catch up with licensors by learning from licensed technology and know-how
- Wishing to include others' IP protected product features that the market demands
- To gain a competitive advantage through an exclusive licence
- Acquiring technology scavenged from larger competitors who are too big to exploit it
- Bringing some component sourcing in-house to assist bargaining position with suppliers
- Settling IP infringement litigation
- As part of a cross licensing deal

The underlying strategic justification for licensing in is to fill a resource gap in a company

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Why to License Out

- To raise licensing revenue and make a direct contribution to company profits
- To entrap licensees into followership and pre-empt attempts to design around IP
 - This only works if the licensor can keep one step ahead of the pursuing licensees
- To extract value from technology which does not fit into core businesses
 - This may involve non-core or merely obsolete technology
- Where the company does not have the resources to exploit the technology on its own.
 - This is important where the market is far larger than the company can exploit unaided. For example even Western Electric did not have the resources to exploit the full potential of the basic transistor patents.
 - This is also a key justification for University TLOs (Technology Licensing Offices).
- As part of an entry strategy into overseas markets
 - This only works if the licensor can keep control of the technology and confidential know how. Direct investment in manufacturing or a distributorship may be preferable.

The underlying strategic justification for licensing in is to fill an exploitation gap in a company

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More reasons to License Out

- **Where local regulations require local manufacture**
 - Local content regulations are one potential reason but there must also be good reasons for not making a direct investment in overseas manufacturing plant.
- **In order to maintain a link with the technology that early sale would break**
 - The value of IP early in its life is difficult to assess. Licensing enables an option on future benefits to be retained in case the IP turns out to be of exceptional value
- **To try to maximise adoption of the technology with standards/network effects**
 - In extreme cases it may be worthwhile virtually giving away products to establish a standard.
- **To enable access to other resources through cross licensing**
- **As part of establishing a strategic alliance**
- **To deflect an attack on a patent and convert the attacker into a defender**
 - This may be at the cost of a share in the profits from the technology but may be the optimum solution.



Why not to Licence In

Good reasons for NOT licensing in include :

- * **Becoming reliant on other's technology and remaining at best second best.**
- * **Losing the ability to develop one's own technology and IP resources.**
At first this may not seem important but in the longer term the knowledge required to outsource R&D efficiently may be lost.
- * **Increased costs of licensing in**
Historically, licensing royalties payable by licensees have rarely reflected the true cost or value of the licensed technology and enabled licensees to catch up licensors at bargain prices. The recent past has seen a new concern to exploit IP assets fully and this may have made licensing in a slightly less attractive option.
- * **Insufficient resources to successfully commercialise the licensed technology.**

BAD reasons for not licensing in include :

- * **The "NIH" syndrome or Not Invented Here syndrome**
Internal pride, prejudice, or misplaced confidence in the firm's own abilities may lead to any external technology being rejected however good an opportunity it represents.



Why not to Licence Out

- It enables followers to learn and catch up faster than they could on their own
- The managerial costs of licence administration may make selling the IP easier
- The strategic disadvantage of teaching competitors can exceed any financial benefits
Though there are few disadvantages to licensing out technology the most critical issue in deciding whether to licence out technology is the balance between the financial benefit and the strategic cost. If this is unfavourable it may outweigh any other consideration.
- The balance between the financial benefit and strategic cost of licensing out may vary according to the field, territory and type of licence.
It may be advantageous to grant licences in some fields and with respect to some territories but not others. With the increasing globalisation of business and problem of competition law such divide and rule strategies are more likely to be divisions by field of use than by territory. Licensors may licence out to areas they do not compete in whilst only licensing out old technology in fields they do compete in.
- The disadvantages of teaching competitors is minimised if the licensor is always several steps ahead of any competing licensees.

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Internal Review of Patents & other IP Assets

What should an internal IP review cover to Identify Opportunities?

- “IP Legal Due Diligence” ?
 - Aims to check the history, existence, validity, ownership, scope, freedom to use, regulatory reporting of and possibly even value of a firm's IP Portfolio (and IP Management processes) - essentially the IP portfolio's quality & quantity in the context of a pending transaction directly or indirectly involving the IP Portfolio.
 - This is necessary but not sufficient to identify the full range of opportunities (which may exceed the current scope of or not be identified in the current IP portfolio).

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Internal Review of Patents & other IP Assets

An opportunity identifying internal IP review might (inter alia):

- be combined with an external review
- include a due diligence type survey of existing in-house IP
- involve not just IP lawyers but Business Development Executives
- attempt to identify existing unexploited IP and/or additional markets, products, technologies, brand extensions, and other directions along which the firm's Patent and IP Assets could be exploited or- whether directly or indirectly
- assess the costs, risks and benefits of the opportunities identified
- check the opportunities identified against the due diligence survey
- identify how the IP Portfolio might be enlarged to help exploit new opportunities
- identify complementary assets or IPRs necessary to exploit identified opportunities

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External Review of IP Environment

What should an external IP review cover to Identify Opportunities?

- “IP Legal Due Diligence” ?
 - Often includes checks on freedom to operate which may include infringement clearance searches for other firms' IPRs which may limit a firm's actions.
 - again necessary but again insufficient to identify the full range of opportunities

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External Review of Patents & other IP Assets

An opportunity identifying External IP review might (inter alia):

- be combined with an internal review
- include a due diligence type survey of existing EXTERNAL IP owned by others
 - e.g. through patent searching / mapping exercises
- involve not just IP lawyers but Business Development Executives
- attempt to identify existing unexploited IPRs of OTHER firms and/or additional markets, products, technologies, brand extensions, and other directions along which OTHER firm's Patent and IP Assets could be exploited - whether directly or indirectly through purchase or licensing in
- assess the costs, risks and benefits of the opportunities identified
- check the opportunities identified against the due diligence survey
- identify how the own IP Portfolio might be enlarged to exploit new opportunities
 - e.g. by providing IPRs to trade in cross-licensing deals to give access to needed IP or other resources
- identify complementary assets or IPRs necessary to exploit identified opportunities

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Conclusions

Opportunities Identification involves:

- more than just developing the existing business
- exploration of both possible and seemingly impossible options in a search for value - licensing or sale may make everything possible at a price.
- willingness to explore all routes to exploitation which allow for/enable the assembly of the necessary complementary assets and resources
- ability to assess both the strategic, learning and financial consequences of sale or purchase and licensing in or out of Patents and IP Assets
- **seeking strong Patents other IP Assets and managing them as firm resources so as to realise their maximum value for the firm**

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