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VALUATION OF INTELLECTUAL PROPERTY ASSETS; VALUATION TECHNIQUES:
PARAMETERS, METHODOLOGIES AND LIMITATIONS

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1. INTRODUCTION

I will begin this presentation where many end on the subject of valuing IP assets: by saying that a true valuation of an IP asset is what the market will pay for it. This is to say, ultimately, the market judges what an IP asset is worth.

If an IP asset has been sold for $1 million, then at the time of the sale the value can be said to be $1 million, providing the transaction is fair and at arms length and the seller and buyer were informed and not forced to do the deal.

Quite obviously, before such a transaction takes place a valuation is needed that will justify the fairness of the transaction between a seller and buyer of the asset. This is important because the stake-holders on both sides of a transaction must be satisfied that the deal is fair and reasonable. However, valuation of an IP asset may be carried out for reasons other than the actual selling or buying an IP asset at a price ultimately set by the market.

2. REASONS FOR VALUING IP ASSETS

Like the valuation of any other asset, there are several reasons why valuing IP assets is important for a business. Common reasons are:

1. Corporate valuation for shareholders

2. Corporate mergers and acquisitions

3. Management buy-out or buy-in

4. Privatization of public entity

5. Fund raising

6. IPO

7. Financial reporting

8. Assignment or acquisition of an IP asset itself

9. Licensing in or out an IP asset

10. Investment in the IP asset (e.g., for further development)

Reasons 1-7 relate to the value of a business as a whole whereas 8, 9 and 10 relate to transactions involving the IP asset itself.

3. ACCOUNTING FOR INTANGIBLE ASSETS

For a business, its balance sheet shows the Assets, Liabilities and Capital (i.e., owners equity) at a particular balance date.

The presentation of balance sheets and valuation of assets are governed by accounting standards and the audience should refer to the standards applying to their own country. For further information on this subject, there are international accounting standards issued by the International Accounting Standards Committee (IASC) and the US Generally Accepted Accounting Principles (US GAAP) which are widely accepted in international capital markets.

In a balance sheet, the assets LESS the liabilities determine the 'book value' of the business for the holders of shares in the business (stock-holders).

Clearly, asset valuations (or re-valuations) will be reflected in the book value of the business. However, the book value is rarely the value placed upon a business by its owners. The difference between the book value of a business and a higher valuation is the value of the Intangible Assets.

It is reasonably straightforward to work out the value of Tangible Assets like Current Assets (cash and accounts receivable), Long Term Investments and Fixed Assets (property, plant, equipment).

It is much more difficult to make a valuation of intangible assets because the value of intangible assets is dependent upon the presence or expectation of earnings. This requires making predictions about the future. The future is always easier to predict with hind-sight!

Intangible assets can be classified further as Identifiable Intangible Assets and Unidentifiable Intangible Assets.

Identifiable Intangible Assets are typically IP assets like: Patents, Copyright, Design, Trade Secrets and know-how, Trademarks & Brand-names.

IP assets exist by virtue of protection afforded by law (which is a complex subject).

These assets may be contrasted with Unidentifiable Intangible Assets, such as Goodwill, Reputation, Management Team, Distributor networks and Trained workforce, that are created through the business itself.

Briefly, from an accounting standpoint, Unidentifiable Intangible Assets constitute the remaining value of a business after account has been made for all the other assets, including IP assets. Unidentifiable Intangible Assets should only be recognized on acquisition and, moreover, should be amortized (written down) over their useful life. Unidentifiable Intangible Assets that are internally created, should not be recognized on the business' balance sheet.

4. PROPERTIES OF IP ASSETS

Focusing now on IP assets (Identifiable Intangible Assets): to have value, these assets must be:

- ◆ identifiable from other assets of a business;
- ◆ able to produce on-going benefits for the business;
- ◆ protected and not free in the public domain;
- ◆ transferable from a seller to a buyer

For valuation purposes, some IP assets may be grouped and treated as a single asset.

For example, a license[1] to copyright in work books which describe a chemical process would be worthless without also having rights to a patent protecting the same process. Rights to a patentable improvement would be useless without rights to the original patent, e.g., for making a piece of machinery. A license to manufacture a product protected by a patent could have little value unless secret 'know-how' for manufacturing is provided.

5. DIFFICULTIES IN VALUING IP ASSETS

Grouping IP assets, however, creates difficulties in ascribing the appropriate economic benefit to an individual IP asset. Consider for example, a patented DNA processing kit that carries a registered Trademark 'FTA' (this example arises from our own business). The value of the patent is initially high but the initial value is amortized over the life of the patent. On the other hand, the value of the FTA Trademark is initially low, but as the FTA products become more widely known and used, the value of the Trademark increases with time. In reality, the situation is not quite as simple because the patent could be re-valued periodically as sales for FTA products grow.

Difficulties in valuing IP assets can be further understood by considering the analogy between Patent Rights and title to Real Estate and the similar ways the owner of a Patent and the owner of a Real Estate can deal with these kinds of assets.

For example, patent claims define the boundaries of protection conferred by a patent and a deed of title to real estate defines the boundaries of a property and what it contains. Licensing out a patent is like renting out real estate; assigning a patent is like selling real estate.

We know that in an active real estate market, for example for domestic dwellings, there are properties being bought and sold regularly. This activity provides a reasonable guide to the market value of such properties. However, in a stagnant domestic market or, say, with an unusual property for which there are few comparisons, the value of a real estate becomes much more difficult to assess. In these circumstances, putting the property up for auction so that a

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[1] US English spelling has been used in this paper because it is generally more phonetic

sale goes to the highest bidder, is a means for finding the market value (and finding a buyer). It is a mechanism that justifies the sale price for both the buyer and the seller.

More often than not, an IP is unique so that valuation comparisons with other IP are difficult to justify. However, putting the IP up for auction may not achieve a reasonable result for the seller because the number of potential buyers might be small, indeed, there may only be one. A limited market will not enable a fair value for the IP to be found.

6.   DEFINING PARAMETERS FOR IP ASSET VALUATION

From the previous simple example, it is obvious that pre-sale valuations of IP are necessary but difficult to make and, clearly, the value of an IP asset will be seen differently by the seller and the buyer. Therefore, in order to carry out IP valuation it is important to define the following:

- ♦ What is the IP to be valued? (Patents, Copyright, Design, Trade Secrets and know-how, Trademarks, Brand-names)

- ♦ For whom is the valuation being done?

- ♦ What is the purpose of the valuation?

- ♦ The date of the valuation (consider a dated company balance sheet).

- ♦ What valuation method is appropriate for the circumstances?

Valuation methods for IP must be robust, verifiable, transparent, and give best estimates on a reliable basis. There are four main approaches:

- ♦ Market value of company LESS the Net Tangible Assets

- ♦ Cost based (Historical Cost and Replacement Cost)

- ♦ Comparable Market Valuations

- ♦ Economic Benefits Method

I will briefly discuss each in turn.

7.   MARKET VALUE OF COMPANY *LESS* NET TANGIBLE ASSETS (N.T.A.) AND UNIDENTIFIABLE INTANGIBLE ASSETS (U.I.A.) VALUATION

This approach can be used to value IP assets of public companies. From the company balance sheet, the book value can be obtained from Total Assets [A] LESS Total Liabilities [L]. If any book value has been ascribed to any Intangible assets [I] this is subtracted. Thus, Net Tangible Assets [N] = A – L - I.

The market capitalization [C] of a listed company is the price per share multiplied by the number of shares issued. This information is obtained from the stock market. An estimate of

Unidentifiable Intangible Assets [U] (e.g., Goodwill) can be estimated at 10% of the total capitalization (based upon experience) i.e., U=10% x C.

Thus, the market valuation of the company is given from C = N + U + IP assets. Therefore,

$$IP \text{ assets} = C - (N + U)$$
$$= 0.9C - N$$

In effect, this is the residual value of the company after deducting the value of the net tangible assets and a reasonable estimate for unidentifiable intangible assets.

Obvious weaknesses with this valuation approach are, that IP assets are not valued individually and valuations will fluctuate with the valuation of the company's shares. However, the marketplace by valuing the company above its book value, is making a judgement on the value of the IP assets and their potential to produce on-going benefits for shareholders in the future.

7.1 Ford Motor Company Brand Example

The Ford Motor Company has over 5,300 US patents and FORD is a well known brand. The following figures are approximately correct from market data and from Ford's balance sheet:

		$ millions
Capitalization [C]	=	48,400
Total assets [A]	=	276,230
Total Liabilities [L]	=	248,700
Intangible assets (bal. sheet)	=	nil

IP assets	= 0.9 X 48,400 − (276,230 − 248,700)
market value	= 43,560 − 27,530
	= $16,030 million

On this calculation, Fords IP assets make up approximately 33% of the market capitalization.

The market is placing an average value of $ 3 million on each patent NOT including any valuation for the Brand name. We shall see from Interbrand data below, that the market could be undervaluing the IP assets of the Ford Motor Company (or Interbrand have over-estimated the value).

8.   COST BASED (HISTORICAL COST AND REPLACEMENT COST) VALUATION

8.1   The Historical Cost Method

The historical cost [H] is the actual cost incurred in creating and developing an intellectual property. This is relatively easy to calculate from funds invested [F], factored-up for the 'time cost' of money [T] (based on a risk-free interest rate). This method is easy to use for IP assets in the R&D phase.

8.1.1 R&D Example 1

For example if researchers spent $100,000 per annum on a project for 2 years, they could argue that the IP is worth at least that amount. The total funds invested is $200,000. If the time cost of money is 7% per annum and no premium is factored in for the technical risk, then the historical cost valuation is :

$$H = F + T$$

$$\begin{aligned} H &= \$200,000 + [(100,000 \times 0.07) + (200,000 \times 0.07)\,] \\ &= 200,000 + 7000 + 14,000 \\ &= \$221,000. \end{aligned}$$

However, there are problems with this approach. There is no direct correlation between expenditure on a particular IP asset and its subsequent revenue potential in the long term. Early stage R&D and patenting can be costly, but the product or process may never reach the market for technical or commercial reasons. Trying to establish a new Trademark can be costly but the mark may fail if customers do not like it. On the other hand, the market may grow significantly and a modest investment in an IP asset, might lead to a large success.

The historical cost method provides a guide for the minimum return needed to justify an investment in an IP asset but it should not be the sole basis for valuing an IP asset.

8.2   Replacement Cost Method

The replacement cost valuation [R] is based upon an assessment of the cost to replace the IP asset or to develop an alternative one. To carry out the valuation, an estimate is made of the time and resources needed to bring an asset to the same stage of maturity as the IP asset being valued. The method can also factor in risk and estimates of future costs and benefits although this complicates the calculation but no more so than for discounted cash-flow valuations discussed later.

A seller of an IP asset can use the replacement cost valuation in negotiations with a buyer to argue that it would cost an equivalent amount to create an alternative IP. Moreover, if a buyer chose to develop an IP asset alternative, there is no certainty the alternative would work as successfully or enjoy the same level of IP protection as the IP asset in question.

To take the previous example: the seller might factor in to the valuation a reasonable risk premium [M] to counter-balance the technical risk in developing the IP asset. The formula becomes:

$$R = (F + T) \times M$$

8.2.1 R&D Example 2

If the chance of failure in Example 1 was judged to be 40%, i.e., there was a 60/40 chance of success/failure then $M = 100/(100 - 40) = 1.67$; the estimated value in the above example could be increased to:

$$R = (221,000) \times 1.67 = \$369,070$$

Another way of looking at this is to say, unless the investors in the R&D think a minimum of $369,070 can be made from the IP asset, then an investment in the project should not be made in the first place.

9. COMPARABLE MARKET VALUATIONS

As noted earlier in comparing the characteristics of Patent Rights with Real Estate, a market valuation of assets is the most straightforward and acceptable approach as it results from the judgement of a buyer and seller on what is a fair value. For comparable market valuations to be valid there must be an active market that is trading comparable assets. This occurs in trading common assets like motor vehicles and houses.

If these market conditions do not exist, finding reasonable comparisons becomes more subjective and hence, valuations become less reliable.

Data have been gathered for license royalty rates in about 250 transactions for several industries (Zareer Pavri, Vice President, PricewaterhouseCoopers, Canada). The data can be used for comparative valuations of IP assets and setting royalty rates.

A royalty stream is a measure of the value that an IP asset adds to a product (or process) over a product that is not protected by the IP rights. Thus, the present value [PV] for the royalty income = the value of the IP asset.

Although arbitrary, the '25% rule' seems to work just as well for determining a fair royalty for the use of an IP asset. Basically, the rule is that a royalty rate (usually based on sales) should result in a licensor receiving 25% of the profit from the branded or patented product. The licensee receiving 75% is to compensate for the risk and effort in final product development, manufacturing and marketing.

In the case of trading IP assets themselves, the market is not normally sufficiently active, nor is there sufficient public information about details such as price and IP characteristics, to allow reliable comparisons.

9.1 Data Bases on IP Values

However, data bases on IP valuations are growing and the 'Interbrand' survey data on brand values of leading global corporations is informative both on the value placed on brands and methodology used (see: *The World's Most Valuable Brands 2000* www.interbrand.com/league_chart.html).

9.1.1 Brand Value Example 1

Consider the following Interbrand data and the valuations of brands for the following Food/Beverages companies. The figures in brackets are the brand values as a percentage of the market capitalization. :

Coca Cola	$ 72.5 billion	(51%)
Heinz	$ 11.7 billion	(76%)
Kelloggs	$ 7.3 billion	(61%)
Wrigley's	$ 4.3 billion	(59%)

Given the similarities in brand value as a percentage of market capitalization, what would you estimate for Pepsi-Cola which has a market capitalization of about $64 billion ? According to Interbrand, the Pepsi-Cola brand value is $6.6 billion, only about 10% of the market capitalization!

9.1.2 Brand Value Example 2

Consider the following Interbrand data and the valuations for brands of the following motor vehicle companies :

Toyota	$ 18.8 billion	(11%);
Mercedes	$ 21.1 billion	(40%);
Honda	$ 15.2 billion	(46%)
Volkswagen	$ 7.8 billion	(66%)

In the motor vehicles category, there is a wide range of values as a percentage of market capitalization.

If these four brands were traded at these valuations, what you would you pay for the Ford name and, at what percentage of market capitalization?

According to Interbrand, the brand value is $36.4 billion, 75% of the market capitalization. So a bid for the Ford name between 11% to 66% of market capitalization would not succeed if the Interbrand valuation is used.

9.2   Comments on Brand Valuations

It is not immediately obvious why the value of the Pepsi-Cola brand is relatively low at 10% capital value, and Ford's brand valuation is relatively high at 75%.

According to the market (and the market-based calculations in Section 7.1), Ford's IP assets in total are worth $16 billion or 33% of market capitalization.

Quite clearly, valuations based on market comparisons that are suitable for frequently traded comparable assets like houses and motor vehicles, are not applicable in a simple way for IP assets that are infrequently traded.

In valuing brands, Interbrand examines three areas: the future economic earnings expected from the branded business; the role of the brand in generating those earnings; and the risk profile of the brand's expected earnings. This is an economic benefits approach that looks beyond the present market valuation and, performance of the company and its IP assets.

10.   ECONOMIC BENEFITS VALUATION

The Economic Benefits Method is based upon the principle that an IP asset must produce a net economic benefit during its life in order to have any value. In other words, the benefit of the asset over its lifetime must exceed the cost. Moreover, the net economic benefit must be sufficiently large to provide a rate of return commensurate with the investment risk. These are basic requirements for an investor or owner of an asset.

In the R&D phase of innovation, a project and associated IP are a liability not an asset, since there is a consumption of capital and generally no income and, a beneficial outcome is uncertain. Moreover, during the life of an IP asset the benefits from it may arise in an uneven way.

10.1   Life Cycle Costing: NPV : DCF

In order to work out the present value of a new IP asset (or value at a future date) it is necessary to calculate (a) the cost of design, research, development, production, marketing, and distribution, (b) the life of the product or process, (c) the life of the associated IP and (d) the timing and quantum of the income stream. Risk and inflation factors can be applied also. This is sometimes known as 'life cycle costing' [LCC] and it brings the IP asset to a net present value [NPV].

For an IP asset underpinning a product or process that is already generating an income stream, a basic discounted cash flow [DCF] method of valuation should suffice. This also leads to the NPV of the IP asset.

10.1.1 Patent Valuation Example

As a simple example, consider our need to value an IP asset being licensed to a company [LEE & Co] that had been taken over by another. This is based upon a case involving Flinders Technologies but names and numbers have been changed for commercial confidentiality reasons. We first carried out an economic benefits calculation of the value based upon an agreed guaranteed income stream.

Valuation of IP Asset to Flinders Technologies at 31st December 2000

FACTS
- Term of agreement is for the life of the longest running patent

- US Patent issued June 1995: remaining life of longest running patent = 14.5 years

- Minimum guaranteed annual gross royalty US $100,000 pa

- Payment net of tax made annually; due 31 December

CALCULATION

Annual minimum royalty		US $ 100,000	This is the pre-tax amount due per annum
Value Added Tax	16%	16,000	
Grossed-up capital		116,000	
Less withholding tax	10%	11,600	
Net revenue		88,400	This is the US $ amount actually received p.a.
Conversion to A$	0.55	160,727	This is the A$ amount received after conversion

Valuation Scenarios

Life	Discount rate	NPV AU$	Year 2001	2002	2003	etc	2014	2014.5
14.5 yr	14%	987,214	160,727	138,225	118,874	etc	22,624	19,457
10 yr	10%	987,600						
7 yr	7%	866,206						

Note: Discount rate is a composition of inflation + risk + exchange rate variation
NPV can be calculated from spreadsheet financial formula
NPV=(Rate,Value1,Value 2, ...Value N)

The valuation scenarios reflect possible variations in the planned life of the products. A shorter life (e.g., from 14.5 to 10 years) is associated with a lower risk, therefore the discount rate is reduced.

Thus, the NPV of the patents is between AU$ 866,200 and 987,500, or between US$ 476,300 and 543,125.

This is a very conservative valuation and one suitable for internal accounting purposes. Note that the valuation range is quite narrow.

The following calculation was used for negotiation purposes based on confident sales projections of LEE & Co for the next seven years. The valuation is based upon a DCF of the future profit margin.

Years	2001	2002	2003	2004	2005	2006	2007
Sales US $ Millions	4.5	6	10	15	20	25	25
5% royalty	0.225	0.300	0.500	0.750	1.000	1.250	1.250
75% Net Profit LEE & Co (from 25% rule) Discount rate 7% pa	0.68	0.90	1.50	2.25	3.00	3.75	3.75
NPV (US $) = 11.33 Million							
Convert AU$(0.55) 20.60 Million							

Arguably, the value of the IP asset to LEE & Co is the NPV of the future net profit and this is US$ 11.3 million (AU$ 20.6 million). This is 20 times (= 11.33/0.543) the conservative valuation above. Obviously, knowing the potential value for a buyer or licensee is very useful in negotiations.

11. CONCLUSION

In summary, the following approaches are commonly used for the valuation of IP assets: Market value of company LESS the Net Tangible Assets and Unidentifiable Intangible Assets; Cost based (Historical Cost and Replacement Cost); Comparable Market Valuations and Economic Benefits Methods.

It is important to identify: the IP to be valued (Patents, Copyright, Design, Trade Secrets and know-how, Trademarks, Brand-names); for whom the valuation is being done; the purpose of the valuation; the date of the valuation and to choose a valuation method that is appropriate for the circumstances. This should be tested using alternative valuation methods.

Normally, many assumptions need to be made and valuing IP assets has the character of being more of an art than a science. As I said at the beginning, the best valuation of an IP asset is what the market will pay for it.

People inexperienced in valuing of IP assets, are strongly advised to obtain professional assistance.

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Disclaimer:

This paper on the valuation of IP assets is intended only to aid discussions at the WIPO Asia-Pacific Forum in Korea, November 2000. The author, Dr. J. V. Turner, will not be liable for any acts or omissions based on the paper and he advises readers to obtain professional help for IP valuations.