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Australian Institute
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Realistic valuations of intellectual property

Methods and techniques for valuing IP

August 2004

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Acknowledgements

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1. SCOPE

New and emerging industries are based on the exploitation of technology. As a result the exploitation of intellectual property forms the basis of many early stage companies with potential for high growth. These early stage companies rely heavily on the longer term potential of their intangible assets to generate future income streams rather than specifically generating immediate earnings from sales. Therefore an essential element of company formation and growth is the valuation of their business opportunities related to the intellectual property they hold and the development cost of realising those opportunities.

Inappropriate valuations and a lack of understanding of the valuation process often result in perceived inequities relating to the value of core assets in terms of investment, company ownership and any distribution of potential future returns as well as less effective strategic business planning processes.

This guide is designed to assist early stage companies and their founders minimize the difficulties associated with the valuation of intellectual property and the impact this has on the company's ability to plan and raise the necessary funds for growth and its ability to negotiate appropriate equity splits.

The guide provides:

- an approach to initial valuing of early stage investments;
- a distinction between valuation for intellectual property asset recognition purposes and the valuation of business opportunities;
- an introduction to the most commonly practiced valuation approaches to determine equity in early stage investment;
- several factors to consider when determining the most appropriate valuation approach to use; and
- guidance to the use of formal valuation approaches in the negotiating process.

In the context of early stage company development, reference to valuation of intellectual property is generally based on the potential commercial returns that can be gained from the exploitation of that IP versus the cost of exploitation – ie valuation methodologies are really valuing the business opportunity rather than the actual technology “worth”. Therefore, for the purposes of this guide, valuation of intellectual property will be taken as valuation of the business opportunity.

A key element of the valuation process is negotiation. Formal valuation processes represent only one part of assessing the intellectual property/business opportunity. Valuation assessments provide a basis (or benchmark) to commence negotiation for prospective investment into a new start-up or early stage company and the equity exchange that is appropriate for that investment.

Valuation methodologies are based on educated estimates regarding market potential, and it is not possible to develop a one-size fits all valuation model that will cover all industries. This guide provides assistance by outlining an identification process to determine the most appropriate valuation methodology for each case, and outlines the steps required to ensure this valuation can be used and justified during the negotiation process.

This guide does not provide a definitive answer for a standardised valuation approach for any individual organisation, but rather offers insight into the issues facing an early stage company or commercialisation manager to enable them to develop the strongest position possible to form the basis of discussions with potential investors/buyers. In short, the guide provides a checklist for those entering into negotiations to ensure that they have all the information required to defend the basis of their valuation.

2. VALUATION AND COMPANY GROWTH

2.1 Purpose of a valuation

“Valuations” are undertaken for a variety of reasons and primarily can be used as a tool to aid in any decision making process. It might be to determine the most appropriate strategy for development, allocation of resources, level of investment needed to achieve optimal growth value etc. Valuations should always be considered in context and this is vital. The purpose for the valuation will have a bearing on the outcome sought (and *vice versa*), and will therefore determine the appropriate methodology to be used. For example, valuation at a very early stage in company formation will be a simple process compared to a company in a more advanced development phase when a more sophisticated valuation approach will be taken.

Key reasons for IP valuations include:

- 1 to assist the decision-making process for strategic business development in the enterprise;
- 2 for securing financial investment;
- 3 to determine a “walk away position” in any business negotiation;
- 4 as a basis for establishing potential damages for IP infringement;
- 5 as a basis for determination of licensing royalties (ie benchmarking), although the royalty that can be anticipated from a market application will also provide a valuation estimate;
- 6 for legal and accounting standards requirements; and
- 7 for taxation, particularly capital gains tax and stamp duty liabilities¹.

Stakeholder consultation has identified that the priority issues for early stage companies relate to the valuation of their IP and the need to obtain financing for future business growth and consequently the imperative to determine appropriate benchmarks as a basis for negotiation in any of:

- licensing activities (based either on exclusive or non-exclusive approaches),
- partnership or joint venture opportunities
- sale of technology; or
- securing appropriate financing for further technology/company development².

These key strategies form the basis for growth opportunities for these companies and need to be balanced with the “cost” of that financing in terms of business ownership³.

However, from the investor perspective, the key issue and weakness in any investment proposal is a lack of understanding of the fundamentals driving the valuation, rather than the specific valuation methodology utilised. This investor context reinforces the need to ensure

¹ McGuinness 2003

² Consultation

³ AVCAL 2003, McGuinness 2003, Matolcsy & Wyatt (2002)

an understanding of the business development process and assumptions that feed into any valuation methodology rather than any end figure.

2.2 Valuation of Intellectual Property versus Valuation for Business Opportunity Development Purposes

As previously stated, there are a number of reasons for valuing intellectual property. Those not concerned with business growth [6. accounting standards and 7. taxation] are less complex as in these cases it is possible to treat the intellectual property as a legally defined and standardised asset recognised in the corporate balance sheet.

However, when valuing IP in terms of business growth, the issues to be considered relate more to market opportunity rather than the use of that intellectual property as an asset within the organisation. This broader context includes considerations such as:

- valuation relating to use in specific (restricted) geographic areas;
- valuation for use in all potential applications;
- value recognition of the associated “know-how” (human capital) required to enable the IP;
- the impact cost of accessing those identified markets;
- specific skills of the management team responsible for driving the opportunity in any specific company.

The focus of this guide is on the valuation of the total business opportunity presented by a technology or intellectual property for an early stage company. However, it also provides a guide to assist in determining the appropriate valuation strategy to be used in any general purpose.

2.3 Valuation Issues and Challenges for Early-Stage Companies

There are a number of common valuation issues impacting on the survival of early stage companies and the consequent generation of an appropriate return on investment.

- 1 The level of subjectivity associated with the valuation and the dependence on underlying assumptions are not necessarily made explicit,
- 2 The lack of information available to enable establishment of a benchmark to assist in reducing subjectivity of valuation is generally minimal;
- 3 The shortage of valuation skills, both internal to organisation and in terms of independent industry experts, increases the subjectivity of valuations;
- 4 Early stage companies often suffer in “defending” their valuation during a negotiation process, due to perceptions of relative “power”, a potential lack of understanding in how to use the valuation as a basis for discussion;
- 5 The tendency to equate the historical **costs** relating to the creation of intellectual property with **value**, which is reinforced by the accounting standards treatment of

intangible assets. Later round investments further contribute to confusion and conflict over appropriate valuations;

- 6 A lack of understanding relating to the cost of accessing the market and the impact this has on both valuation and future earnings – a key factor which impacts on future equity positions in the company ownership structure.

Subjectivity of valuation

The valuation of IP is based on assumptions about the potential of business opportunities to gain future revenue streams or create markets. This means there is no certainty on which to base any valuation. The assumptions made could be viewed by those with a different perspective as an opinion, rather than calculated analysis of future probability. This potential for divergence of opinion has resulted in a reliance on service providers to assist in the process of valuation and negotiation in order to decrease the perception of subjectivity of valuation. The service providers in this instance are seen as being independent and technical experts. However the use of these external experts, whether by the early stage company or the potential investor, increases the costs of accessing finance and consequently elevates the return on investment required to cover development costs should the opportunity be pursued.

Scarcity of industry benchmarks

Due to the nature of cutting edge IP, in terms of new products/technologies and potentially new markets, there can be either a shortage of comparable information or a high cost associated with purchase of such information for use in reducing the perception of subjectivity. There are a number of international databases which collate information on deals by industry sector or technology platform which provide some guidelines that can be used to reduce the impression of subjectivity in valuation of business opportunities. The requirement to purchase access to such information can be problematic in situations such as start-up companies, where financial resources are strictly limited.

Shortage of valuation skills

As mentioned in above, the shortage of industry benchmarks and the need to reduce subjectivity associated with valuation relies on the utilisation of specialist external valuers to provide independence and technical validation of the proposed technology. Stakeholder consultation has indicated a number of issues with this reliance:

- 1 the shortage of professional valuers who can undertake this process which has consequently increased the cost of those services; and
- 2 the lack of a standardised valuation methodology undertaken by those valuation experts. This consequently makes it difficult to judge the worth of those respective services.

Consequently, confidence in the quality of the valuation is dependent on the ability of the early stage firm or the financier to access those expert services and to understand the market for which the valuation is undertaken.

Importance of the negotiation process

Consultation with investors and professional valuers has indicated that difficulties most commonly arise when companies attempt to maximize the IP valuation but fail to use the business case developed to obtain that valuation to support their negotiating position. If there is no transfer of knowledge to early stage company management, or there is no ownership of the business case (ie it has been prepared externally), a valuation figure is available but not the ability to justify that figure. It should always be remembered that a valuation is the starting point for any negotiation for investment rather than the end point.

Investors also indicate difficulties in perceptions during the negotiation process where a “guess-timate” valuation figure nominated is not in accordance with any demonstrated research and education about the process used to determine valuation figures. A common example quoted is the “There are 1.3 billion Chinese in China, they all use chopsticks, we estimate that we will achieve 1% market share and therefore our estimated market value is \$X.” Investors require demonstrated research and an educated understanding of any valuation process before considering or negotiating over figures.

Relationship between cost and price

Early stage companies have also demonstrated a poor understanding of the relationship between cost and price. The historical cost of developing the IP is not necessarily relevant to the price that people will be prepared to pay, either to purchase an end product or service derived from that IP or to invest in the company as a whole.

Market Access

While the valuation is a key element of the process, the cost of market access must be considered when determining the appropriate equity required to secure the required value. Thus, early stage companies must not only value their IP but must also determine the comparative worth of the IP provided *visa ve* the cost of development, production, distribution and marketing required to access the assumed revenue that the business opportunity represents.

Failure to do so, results in differences regarding the “value” of the investment between investors and IP owners. Companies owning IP tend to overlook or undervalue any investor’s ability to add further value by assisting the company and facilitating access to markets beyond the quantum of dollars contributed as part of the investment. A company with a product and identified path or access to a market and an associated defined revenue stream differs significantly from a company with a product and no identified path to market. It is this difference in perception that needs to be considered during the valuation phase in order to ensure any successful negotiation process.

The risks associated with the uncertainty of developing an early stage technology into a product increases the premium that financiers, prospective partners and licensees will place on expected returns. This can result in overstating the cost of accessing the market by these

parties. The result will be a negative impact on the actual IP contribution to the returns to be generated from its development. This is then manifested in equity percentages and perceived to be unreasonable by investee companies.

In contrast there is a tendency for the owners/creators of the IP to see the valuation and the potential revenue its products/services may generate, as one and the same. This leads to a resentment of equity given up (or sold) in exchange for the funds or other assistance required to access the market.

These individual challenges can be compounded by errors in the actual (value) calculation process by both parties based on a failure to define/consider the fundamentals underlying valuation such as:

- choice of inappropriate approaches and methodologies for projection calculation;
- use of unrealistic assumptions (eg: market size, market share, time to market, price for end product/service, uptake of product/service);
- inappropriate application of discount rates applied to future cash flow;
- failure to undertake comprehensive sensitivity testing; and
- incorrect use of the valuation.

These issues indicate that the challenge for early stage companies is more complex than the lack of a standard valuation methodology. Three valuation methodologies are accepted as standard and currently used in the Australian market. These are discussed in Section 3.

3. COMMON VALUATION METHODOLOGIES

3.1 Overview

Current accounting standards and AVCAL recommend that all valuation methodologies follow “a fair value approach” to valuation for investment and reporting purposes. This assumes that the valuation will reflect reasonable estimates and assumptions for all significant factors which are relevant to the transaction, particularly those which impact on expected cashflows and degree of risk associated with those cashflows.⁴

Significant factors to be considered include:

- the information available about the business/commercialization opportunity
- well understood market conditions
- the marketability of resultant products/services based on the IP.

Current valuation methodologies can be divided into two major approaches:

- cost based; and
- market-based.

The former is generally used when the valuation is being treated as an asset in a transfer of ownership (merger and acquisition, direct sale) or to meet accounting, taxation and other regulatory requirements relating to reporting of IP assets.⁵

3.2 Cost based Valuation

This approach is based upon economic principles of substitution and price - the value of the IP or associated technology is assumed to be equivalent to the historical cost of production and protection.

Information required for the cost approach includes:

- material costs: isolated costing of tangible assets used to develop IP and associated technology;
- labour costs: wages, fees to contractors, workers compensation, insurance, superannuation contributions and other employer related taxable costs;
- apportioned overhead costs;
- redevelopment information; and
- a profit and incentive component.

⁴ AVCAL Valuation Guide, Wyatt 2003, Zambon 2003

⁵ McGuinness 2003

Issues with use of this approach for early-stage companies

- There is no correlation between (sunk) **cost** and the real market **value** of the IP opportunity. Therefore this valuation will not inform the valuer of the **price** the market may be prepared to pay to acquire the IP or products/services derived from that IP;
- Economic and market factors relating to the technology (IP application), such as the current demand for like assets or competitor activity which will impact on potential returns are not taken into account;
- The loss of the IP to the organisation in terms of economic value or foregone future revenue or other opportunity costs for secondary developments is not considered;
- The risks associated with securing the economic and other returns are not directly factored in; and
- Technological obsolescence is not factored in and must be separately calculated to ensure valuation is made on present-day terms.

However, this approach may be useful:

- where the IP is new and exchangeable for other intangible assets such as software where a different code may be written to create the same function;
- where workforce know-how is a significant component of value - eg to further enable the IP or where the IP asset requires ongoing modification and improvement such as with operational manuals, organizational policies, records etc;
- to assist in the preparation of balance sheets;
- to value highly specialised property such as software engineering drawings, or a distribution network;
- where royalty rates are set as a fair rate of return based on the creation cost of the IP;
- when estimating the amount of damages suffered by the owner of IP in any infringement action;
- to acquire insurance for all the IP against cost of recreating the IP, research or technology;
- to estimate the internal return on investment (ROI) of IP and any associated technology or other intangible asset.

3.3 Market-based Valuation

Market-based valuations are based on potential economic returns that could be earned from products/services developed from the IP. This market-based valuation can then be used to determine an appropriate sale price, royalty rate or level of investment for the business. The market-based methodologies can be further broken into

- 1 Comparable transactions/industry benchmarked approaches
- 2 Future income based approaches.

Comparable transaction/industry benchmark approaches

This comparative approach is based on benchmarking similar technologies or deals done with IP at similar stages. If relevant market information on prices, royalty rates or quantum of investment is available, this approach can represent the most reliable and accurate form of valuation.

Valuation by the comparative approach depends on access to information (both public and private where possible). Issues that need to be considered include:

- the nature of the industry to which the technology applies (eg. product lifecycles, competitiveness, maturity etc);
- whether an old or emerging or new technology is the subject of the valuation (eg the likelihood that a new product superseding existing products/services will effect future earnings capacity;
- potential barriers to entry to any market (eg. legislative requirements such as therapeutic goods or environmental approvals may present barriers to entry on individual products/services);
- potential for income growth - are the products/services likely to receive the same level of growth as comparable existing products given no first-mover advantage (eg first to market entrants generally receive a price premium which will not be available to followers and/or substitutes);
- product/service lifespan - will patents or similar robust legal foundations protect the products/services derived from your IP as comparable products.

Applying the comparative approach requires allocation of significant time and effort to source the market information required. Valuation by this approach depends on available evidence of a comparable transaction (such as licensing terms, sales of assets and a business that involve the transfer of like-IP). This need for comparability causes the following challenges for early stage companies based on new technologies:

- Difficulties in identifying IP that is truly similar;
- Difficulty obtaining sufficient details regarding terms and conditions of any relevant transactions – may result in need for significant outlay of funds for detailed reports required to support this valuation; and
- Market may undervalue IP at an early stage due to information asymmetry, with the result that valuation of company IP is similarly downgraded.

Common negotiating tactic

The “other side” (ie the purchaser) will always want lower numbers and will use many approaches to test negotiators – Anecdote: “No-one in this industry will pay this amount.”

Future income based approaches

This approach involves forecasting future income streams to be expected from the IP and related technologies and converting that into an equivalent present value. Income generated by other related intangible assets is not relevant. It is important to note that “income” in the current context refers to cash flow rather than accounting profit.

There are three essential elements to the income approach:

- identification of the potential income that may be generated from the products/services derived from the IP;
- assessment of the duration of that income stream; and
- assessment of the risk associated with forecasted income.

Determining the potential income stream will be influenced by:

- whether the income stream could be expected to be constant or not;
- whether the measure of income relates to the revenues being earned or savings to be achieved (either from decreases in expenses or investments required);
- whether the projected income will be generated by use of the IP (such as use of trademark), ownership of the IP, licensing of the IP (to or by the enterprise), or the decision not to use the IP (which may protect the competitive position of the enterprise).

Information required for the income approach includes:

- projections made concerning future selling prices, market share, and volume of product will be sold, cost of goods sold, future capital expenditures, rate of product uptake in the market, and marketing and selling expenses;
- the length of time required to obtain regulatory approval (for medical, pharmaceutical applications) where relevant;
- competitive lead time – ie the length of time required for competitors to re-engineer the IP and/or associated technology (will be dependent on level of IP protection in place);
- risk of technical failure associated with introducing the associated technology into the market;
- historical information regarding retail prices, sales, costs, profits of the products/services derived from any related competitor;
- manufacturing information - what equipment and labour is needed to capture a market (or segment) and associated costs;
- extent of development expenditure required to bring the IP and its associated products/services to a useful commercial stage;
- market competition issues, selling prices, market opportunities, market cycles;
- legal and regulatory requirements to enable the technology to be exploited.

The major issue with this income based approach is that it is based on scenario creation and assumptions of market uptake or penetration. This makes it highly subjective. Many service

providers and investment firms rely on expert valuers to reduce the perceived level of subjectivity. However it is difficult to reduce the subjectivity associated with

- identifying IP with similar application to obtain sufficient information regarding terms and conditions of any relevant transaction, and
- Forecasting future income streams

Income based approaches typically utilize discounting rates (and/or rates of return) of approximately 30%. This rate is based on the generally accepted failure rates of early stage investments to have success in reaching any market. Consequently, this approach tends to weigh equity splits in favour of the initial investor rather than on a balance of comparative contributions.

3.4 Selecting the appropriate Valuation Methodology

Current AVCAL valuation⁶ guidelines recommend that market-based approaches be used as a primary methodology for determining the level of investment in early stage companies, with net assets (or cost approaches) utilized as a cross-check of these values.

Market-based valuations are recommended when conducting a valuation to:

- determine licensing royalty rates;
- secure financial investment and determine level of equity;
- assist decision-making for strategic business development in the enterprise.

It is recommended that where possible, both methods be used, as any available industry benchmark provides a level of objectivity that is easier to defend in negotiations than projected revenues. The exception to this rule is where the market is undervaluing the type of IP and if the company feels this is the case, then evidence must be provided to support this allegation.

It is recommended that the cost approach is used for:

- legal and accounting standards requirements (including determining damages from a potential IP infringements); and
- taxation, particularly capital gains tax and stamp duty liabilities.

The majority of valuations for investment/licensing purposes are based on a combination of the two market approaches, using an industry standard valuation combined with information available on comparable deals. This can then be supported by the business plan examining the potential income and cost of securing sources of this income.

⁶ AVCAL Valuation Guidelines

4. VALUATION AS A BASIS FOR NEGOTIATION

A number of commercialisation pathway options are available to all new IP based business opportunities and one of the critical decisions is to define the best path to market appropriate to an organisation to meet its strategic goals and available resources. Options can include licensing, equity investment through creation of a start-up company, strategic partnerships, trade sale etc. Assessment of the value available from each option should be considered as part of the strategic decision making process. This process can be undertaken by any group of decision makers whether early stage company, research institution or agency.

Two commonly used development models (in the Australian public research sector) are licensing (either as the licensee or licensor) and equity investment.

4.1 Licensing Activities - Royalty rate calculation

The appropriate royalty rate payable as consideration for licensing of IP is critical for all parties from two perspectives:-

- 1 as the licensor of intellectual property to other users, and
- 2 as the licensee who is utilising background IP or developing that IP into a product.

Licensing may occur with or without exclusivity and can involve the IP owner foregoing the right to exploit the IP in return for fees from the licensee if the owner does not wish to be exposed to any development risks. It can generally be stated that exclusivity with respect to any market specific criteria offers potential for higher royalty rates. Terms to consider include:

- Time period for license agreement
- Field of use
- Scope of license agreement
- Ability of license or lack thereof to form a barrier to market entry
- Inclusion of sub-licensing and “reach through” rights
- Impact of market structure and number of potential licensees.

Scope operates on two levels including the field of application/industry sector for the intellectual property and the territory for which the license is valid. For example, it is possible that IP may be licensed to a number of licensees exclusively in their field of application bounded by geographical areas.

Sub-licensing involves further on-licensing by the licensee to another third party. Consequent implications should be considered carefully. For example, the ability/approval to do so, for what purpose, financial consideration from potential royalty payments from sub-license income etc. Failure to consider these implications could result in exposure of the

original licensor to otherwise unforeseen risks and reduce the level of future earnings to which they may reasonably have a right to expect.

With benchmark royalty rates determined, a business case analysis can be undertaken to estimate a fair value royalty rate. Use of comparable industry rates is much more common for royalties than for equity investments as this data is more readily available than information on the size of equity investments. Information on comparable deals can be sourced from expert providers or several publicly available web sites.

Licensing is often entered into quite early in the commercialization cycle and as such the licensee is generally bearing much of the development risk. For this reason, royalties are often structured around milestone payments set against performance of specified activities.

25% Rule of Thumb

This principle states the royalty should be 25% of an expected profit margin determined as a result of a significant number of global licenses negotiated over many years. ie the licensor should receive 25% of the pre-tax profits and the licensee should receive 75% of the pre-tax profits. Useful to generate a starting point and also in licensing and damages cases, but always to be used with caution.

4.2 Equity Investments

Early stage companies often seek seed investment to support their activities in accessing a market. Where the inventor/founder is part of the company, many early stage companies anecdotally report that equity capital is too expensive in terms of foregone ownership.

In reality, venture capitalists, who commonly provide such funding, are constrained by the need to generate a high rate of return to compensate them for the financial risk involved in each early stage deal. From the investor perspective, IP is valueless without a defined market and a business plan outlining potential future revenues.

This is in contrast to the traditional inventor perspective which tends to be based on technical novelty and ignores business development costs. The inventor needs to feel recognised and rewarded for his achievements and this compounds the tendency to focus on the technology and historical cost.

Venture Capital Funds are expected to generate a high internal rate of return (IRR) for their investors, due to the high failure rate of early stage companies. The 'hurdle rate' of around 60% is set because two-thirds of the projects in an investment portfolio are expected to fail (based on historical figures).

Venture capitalists will generally seek at least a 30% rate of return (IRR) on any equity investment to develop a marketable product – due to the high risk of failure with each individual project – although this rate can vary between investors. Table 1 below provides a guide to examining how the potential future value for the company affects the equity sought by an investor in order to achieve this return. In short, it can be said that equity capital for development of a company with an estimated small market value is much more ‘expensive’ than that for a large one. These figures are based on risk assessment with a standard assumption that 30% return on a successful portfolio is required.

Table 1: Percentage ownership required to achieve a 30% rate of return⁷

\$M Invested	Estimated future market value of a company in 6 years time \$M			
	20	40	60	80
\$2.0	48%	24%	16%	10%
\$4.0	96%	48%	32%	19%
\$6.0	N/A	72%	48%	29%
\$8.0	N/A	96%	64%	48%

4.3 Securing investment—Context, Assumptions and Audience Analysis⁸

When conducting a valuation for an IP based business opportunity the valuation must be considered in the broader context of investor expectations.

Management and other skills are seen as vital in determining the investment provided for company growth, and result in the differences between a valuation done for the purpose of royalty rate calculation and for investment in a growth company.

The stage of development of the IP or technology in relation to the proposed target market will also impact significantly on the quantum of any potential investment or negotiated royalty rate. The level of risk associated with the cost to develop an opportunity into a growing business with revenue streams can be significant. (see Section 4.5 - Risk)

The following variables should be considered during any start-up company valuation process:

- the development costs and who pays those costs

⁷ Horngren, Datar, Foster 2003

⁸ Horngren, Datar, Foster 2003, AIC- MUP Strategic Business Planning for Technology Commercialisation

- the size of the potential market
- the number of competitors for product/service arising out of intellectual property
- how essential/willing is the inventor to hand over control
- how skilled is the management team
- corporate governance and structure

While investors will always seek validation of the technical claims and functionality, the pure technical aspects are not generally of interest in and of themselves, other than to demonstrate some superiority in a competitive position.⁹

Preparation for a negotiation

In preparing for a negotiation it important to research the background of the other party:

- What other investments have they made?
- Does this demonstrate expertise in the fields that are relevant to the IP in question?
- What are the technical qualifications of their assessors/negotiators? Will an independent technical evaluation be required?
- How much and when do they plan to invest or what schedule of royalty rates would be paid?
- What field of science/business is their specialty/expertise?
- What management experience and market contacts can they offer?
- At what stage of development do they generally invest and how do they generally “exit” from their investments?
- What restrictions do they put on payment?
- Can you speak to any of their existing investee companies (ie do a reference check)

4.4 Financial Forecasting and Market Value

The valuation of IP in the business opportunity context is dependent on the ability to generate revenues in the accessible market. This requires the presentation of a financial forecast that answers all the questions listed above and is cross referenced to the business plan.

The business plan will make a number of assumptions which must be explained and justified, and the company must be in a position to defend these assumptions in a negotiation. The problem with outsourcing preparation of a business plan is the potential information “disconnect” where the company/owner of the intellectual property is often not familiar with the base assumptions that have been made. As these assumptions generally cover the areas associated with key areas of risk, it is critical that these assumptions are well understood prior to any negotiation.

⁹ Horngren, Datar, Foster 2003, AIC- MUP Strategic Business Planning for Technology Commercialisation

These assumptions must cover:

- an analysis of the market
- the market share and
- the cost of producing the market offering.

It is also useful to conduct a sensitivity analysis (See Side Bar 1) to test the strength of the business case based on these assumptions. This creates a defensible rationale for the asking price during a negotiation.

Side Bar 1: Sensitivity Analysis

Sensitivity analysis

A sensitivity analysis enables testing of the basic assumptions and their strength. Particular emphasis should be placed on testing the sensitivity of identified risks. The results of this analysis and the financial analysis will provide an indication of valuation range that can then be used as a basis of negotiation. This sensitivity analysis can then be applied to the business plan and its scenario of assumptions, to estimate the likely range of revenues that will be derived from the product(s) of IP development.

Questions that should be considered in terms of defining sensitivity of business plan assumptions include:

- What if the development process takes longer than anticipated – effect on costs, competitors
- How strong is the intellectual property protection
- What if market size was 20% less/more
- What if market share was 20% less more.

Step 1 to financial forecasting

The first step in preparing a business case for valuation is the financial forecasting for a business opportunity.

There are two areas to consider:

- 1 Revenue that will be derived from the product
- 2 Costs of product development and distribution required to access the market which will provide the revenue

The combination of these will provide the information required to develop the components of a cash flow statement to support the business plan. Detail on the issues and assumptions that relate to the development of the financial forecast is provided in Appendix A.

Step 2 to financial forecasting

The financial analysis then needs to be discounted to take into account the fact that the real return on investment will be affected by inflation and interest rates. It also must take into account that some sources of cash flow or revenue are more risky than others.

Net Present Value (NPV) calculations are based on the concept that a dollar today is worth more than a dollar tomorrow and that some cash flows are higher risk than others. NPV calculations calculate the value of anticipated future cash flows with a discount factor for the timing and risk, and subtract the cost of investing in the company.

Selecting the appropriate discount rate is the most difficult component of this calculation.

Two general principles can be adopted:

- 3 In general, the higher the risk, the higher the discount rate, and
- 4 The average rate required by venture capitalists for investment (as an IRR) is generally around 30%, which is comparatively high and potentially hard to achieve.

Limitations

Net Present Value and Internal Rate of Return (IRR) Analyses are used by most investors to determine the valuation of a business opportunity. These approaches are quite technical and can be intimidating for the inexperienced.

It is important for early stage companies to note that these approaches are mechanical and the appearance of scientific rigour is deceptive. Subjectivity and judgement associated with the applied discount rate play a significant part. The apparent precision of results is based on the calculation where correct inputs produce correct answers. Consequently investors focus heavily on the assumptions driving inputs to the calculation (ie if the inputs are good the results are valid and conversely, if the inputs are unrealistic then the results will similarly not be realistic.)

Some common implementation errors to check for in IRR and NPV calculations include:

- Not adjusting the discount rate for the risk of the proposal
- Not changing whether cash payments/receipts are made at the beginning, during or end of the period
- Not adjusting the rate to match the period
- Not allowing for inflation or allowing for it twice
- Adjusting cash flows to reflect the probability of receipt while not adjusting the discount rate
- Mixing pre- and post-tax cash flows with pre- and post-tax discount rate
- Calculating the cash flow by simply adding back non-cash items to the profit or loss.
- Not allowing for the effects of dilution on returns
- Ignoring the financial capacity of investors to make large up-front payment and to be able to wait for large far-off receipts.

Anecdotal approach sometimes used

Consider the number of sales staff etc required to get your end product to customers and take a Profit and Loss approach to securing access to your customers.

4.5 Risk

Risk is a key factor that needs to be managed in all valuations and negotiation processes. The investing party needs confidence that the risk can be managed and that the investment or license will result in revenue returns.

Components of risk that need to be considered in your proposal include:

-
- Scientific risk
- Technical risk
- Commercial risk
- Management risk
- Market risk
- Competitive risk – barriers to entry
- Financial risk
- Currency interest rate risk
- Exit risk

The questions that need to be answered to address these risks are:

- Who are the people involved in the business – skills experience and commitment
- Will the product or services work – this involves technical evaluation
- Why is the product superior?
- Do you control any associated intellectual property?
- Is there a large global market for the product/service? What are the features of the market?
- What is the potential return?
- What is the time horizon until return can be realised?
- What is going to prevent any of the milestones being achieved?

5. CONCLUSION

This guide provides an introduction to approaches to valuation, associated issues for consideration and some methodologies to use when conducting a valuation for an IP business opportunity. As each opportunity has individual characteristics a guide of this nature can only provide an indication of those areas that must be considered in order to derive the most appropriate determination of value. There is no “one size fits all” solution.

At present many early stage companies lack the skills to conduct their own valuation and thus rely on contracting external expertise. This further increases the costs and potentially constrains business growth. This is not an optimal solution as there is little transfer of knowledge to the company and companies need to consider how they can build their internal capabilities to undertake basic valuations.

Before engaging external consultants or entering into negotiations with investors early stage companies or IP vendors should ensure they have a sufficient understanding of the processes outlined here to determine the value of the advice they are receiving and to ensure they are in a position to defend the valuation they feel is most appropriate. It is the shortage of these skills rather than the valuation methodology implemented that are vital in maximizing IP value.

We hope this guide helps managers develop their own capability and confidence to undertake basic valuations.

APPENDIX: Techniques & Methodologies

Financial forecasting requires the determination of revenue derived from potential products and an appropriate estimation of the costs associated with the creation of the revenue.

In determining potential revenue the following assumptions should be considered:

- Estimates for sales of the product are a crucial component and all else flows from these estimates.
- the correct size of the accessible market
- existing and potential competitors and products
- estimation of a price that the market will bear – and why
- the unique selling position
- the growth rate of the market – and why
- the buyer trends in the market –and why
- How much market penetration can be realistically expected – and why

The next stage is to estimate the costs required to derive this revenue – ie to access the market including (but not exclusively):

- Research and development
- Marketing
- Manufacturing
- Wages – R&D, management, administration, marketing
- Rent
- Insurance
- Legal and accounting
- License and royalty fees
- Interest on borrowings
- Travel and accommodation
- Consultants
- Administration
- Plant and equipment, buildings

Utilising standard production benchmarks it is likely that the costs will break down into proportions as follows (example only):

Cost of manufacturing	15-25 %
Cost of marketing	20%
Administration	5-10%
Tax	30-35%

Early-stage companies need to factor in the cost of product development, and in the case of services this may take the place of manufacturing. This information allows the development of a profit and loss statement, balance sheet and cash flow statement to support the business plan.

The basis of the accounting used in the financial forecasting is important. There are two bases:

- accrual accounting, requiring all transactions are accounted for in the period they happen.
- cash accounting, in contract, records the transaction when the cash is paid or received.

1. **Profit and loss statement** – statement of financial performance – is prepared for a given time period. All forecasts begin with profit and loss calculated on an accruals basis. All other forecasts follow from this. It is recommended to undertake on a monthly basis for at least the first year then on a quarterly basis for at least five years.

The statement of financial performance must detail the following:

1. all revenues
2. cost of goods sold
3. gross profit
4. all expenses
5. profit before tax
6. profit after tax
7. tax expense

2. The **balance sheet** known as the statement of financial position is prepared to demonstrate the position of the organisation at a given period in time. It details:

1. all assets
2. all liabilities
3. all equity

3. The **cash flow** which includes.

1. All cash receipts during a period
2. All cash payments during a period
3. The opening cash balance at the beginning of the period
4. The closing cash balance at the end of the period

Common errors in developing the financial forecast:

- Making assumptions and using numbers that don't tally to the business plan
- Not understanding different bases of accounting
- Opening balances not matching with previous period closing balance

- Lack of critical thinking in allowing for future sales or expenses growth or inflation
- Assuming that fixed costs will remain fixed
- Inability to reconcile cash flows with profits
- Insufficient consideration given to start-up cost and amount of time required to break even
- Not allowing for tax
- Not allowing for contingencies

Net Present Value (NPV) Methodology

NPV is the net present value of future cash flows, discounted for the timing and risk, less the cost of investing in the company. The Net Present Value is a function of the timing and volume of the cash flows and the discount rate applied.

- 1 Prepare a cash flow forecast for the company
- 2 Identify when each cash inflow/outflow will occur
- 3 Set these out in a time line years 1 to five
- 4 Select a discount (interest) rate
- 5 Calculate NPV

The formula for NPV is:

$$NPV = C + \frac{R_1}{(1+r)} + \frac{R_2}{(1+r)^2} + \frac{R_3}{(1+r)^3} + \frac{R_4}{(1+r)^4} + \frac{R_5}{(1+r)^5}$$

Where C = initial capital cost (investment), R = annual net cash flows, r = required rate of return.

The **discount rate** is the most difficult component of the calculation and it requires judgement in selection and application. Generally, the higher the risk, the higher the discount rate.

The **internal rate of return** is the rate of return that the project must generate to be worthwhile. The target result is defined when the NPV equals zero. When the IRR is used to make accept-reject decisions the decision criteria are as follows:

- If the IRR is equal to or greater than the cost of capital then accept the project
- If the IRR is less than the value of the cost of capital then reject the project.

If NPV > 0 try a higher discount rate, if < 0 try a lower discount rate until the NPV=0. This provides a range for negotiation, particularly given that a rational investor will select project with greatest IRR.

Common errors:

- Not adjusting the discount rate for the risk of the proposal

- Not changing whether cash payments/receipts are made at the beginning, during or end of the period
- Not adjusting the rate to match the period
- Not allowing for inflation or allowing for it twice
- Adjusting cash flows to reflect the probability of receipt while not adjusting the discount rate
- Mixing pre and post tax cash flows with pre/post tax discount rate
- Calculating the cash flow by simply adding back non-cash items to the profit or loss.
- Not allowing for the effects of dilution on returns

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