



**Asia-Pacific
Economic Cooperation**

Advancing Free Trade
for Asia-Pacific **Prosperity**

Intellectual Property (IP) Valuation Manual: A Preliminary Guide

APEC Intellectual Property Experts Group

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TABLE OF CONTENTS

I.	INTRODUCTION	4
II.	IMPORTANCE OF IP AND ITS VALUATION	5
	USES OF IP VALUATION	6
III.	IDENTIFYING IP AND INTANGIBLE ASSETS IN BUSINESS	8
	OTHER INTANGIBLE ASSETS	9
	PORTER'S FIVE FORCES	9
	CONCEPTUAL FRAMEWORK	10
	REGULATORY FRAMEWORK	11
	CHARACTERISTICS OF INTANGIBLE ASSETS	11
	DRIVERS OF INTANGIBLE ASSET VALUE	12
	MAPPING IPs AND OTHER INTANGIBLE ASSETS IN BUSINESS	12
IV.	METHODOLOGIES IN IP VALUATION	14
	FACTORS TO CONSIDER	15
	VALUATION PROCESS	16
	VALUATION APPROACHES	17
	COST APPROACH	17
	MARKET APPROACH	18
	INCOME APPROACH	19
	STEPS ON TECHNOLOGY VALUATION (ASSET ALLOCATION METHOD)	20
	VALUATION STEPS ON TECHNOLOGY VALUATION USING MULTI-PERIOD EXCESS EARNING METHOD (MEEM)	20
	TECHNOLOGY VALUATION USING MULTIPLE INDICATORS	23
V.	LIMITATIONS IN IP VALUATION	25
VI.	IP VALUATION REPORTS CONTENT SAMPLES	26
VII.	SUMMARY OF KEY CONSIDERATIONS	27
VIII.	REFERENCES	28

I. INTRODUCTION

Intellectual Property (IP) can be sold, mortgaged, or disposed of like any ordinary property. However, unlike tangible properties, the determination of the value of IP has been a challenge. There are many kinds of IP and for every kind and stage of its utilization, the value or even the appreciation of its value changes.

On the one hand, IP is promoted, protected and enforced. In doing so, it has been emphasized that there is great value in the said intangible asset, and in fact, in the course of time, it has been noted that when it comes to determining the value of the whole business itself, greater value has been attributed to intangible assets.

Notably, it is observed that Micro, Small, and Medium Enterprises (MSMEs) have yet to be enlightened even more as to the value of IP. A practical instrument, therefore, will have to be developed to encourage MSMEs to be more inclined to avail of the benefits of the IP system and the valuation mechanism which in the present time is relevant and can be taken advantage of if they want to generate more value from their businesses.

With this manual on IP valuation, it is envisioned that APEC Economies can present to the general public, particularly the MSMEs, how IP can be valued and why it is important to come up with an IP valuation mechanism. By seeing and understanding the value of an IP and how valuation works, it is hoped that MSMEs will be encouraged to avail themselves of the IP system, and protect and enforce their IPs. This approach is considered a concrete way of showing to them that IP is not just a concept or a legal right. MSMEs must realize that IPs and other intangible assets are integral parts of their businesses with corresponding value and importance in business operations and transactions.

Corollary with the said valuation mechanism, it is also observed that with the various methodologies and schemes by which IPs and other intangible assets can be valued, there are limitations, issues and challenges which IP owners and even stakeholders should take note of.

Lastly, while this Manual elaborates important principles as a guide in valuing IP assets, it is not designed to be a comprehensive guide in valuing various kinds of IP. A more thorough discussion and in-depth study will have to be conducted to develop a more detailed and comprehensive guide. It should be emphasized that this Manual was a result of two three-day workshops on Promoting Innovation Through a Mechanism for IP

Valuation, Financing and Leveraging IP Assets which were held in Metro-Manila, Philippines in 2017. Hence, this Manual is intended merely as a reference for APEC Economies primarily to enable them to present to stakeholders why IP has value, how it is being valued, and why it is important to come up with an IP valuation mechanism.

II. IMPORTANCE OF IP AND ITS VALUATION

“The knowledge in today’s economy becomes a locomotive that defines the development of the contemporary companies. The successful companies are, undoubtedly, those constantly introducing the innovations based on new technologies as well as on knowledge, experience and attainments of their employees. It is arguable that the value of companies is now mostly generated by Intangible Assets, and not by “traditional” assets having the tangible form.”

- *The Electronic Journal of Knowledge Management*

Caliban Darklock had said that “[T]he only thing you really own is what you create; and the only thing you can create without needing someone else to give you raw materials first, is intellectual property” (Goodreads, 2017).

Intellectual property is an intangible asset per se. It can therefore be the subject of the rules on ownership and should be treated like any ordinary tangible property. Being an asset, IP is also considered as a right which consists of a bundle of rights defined and protected under the law. In addition, an important characteristic of IP is that it provides a company with competitive advantage in terms of allowing it, for the purpose of generating income stream or cash flow, to be used by others through the different modalities of utilization.

More than being an intangible asset, IP is also a tool for competitiveness and a critical component of a country’s economic development. The use of IP as tool for spurring economic growth has been shown in studies done by the World Intellectual Property Organization (WIPO). One of such studies conducted in 2002 (as cited by Yap Su Ming, 2005) found that many economies are developing and capitalizing on IP as an economic asset. A study done by the Ministry of Economy, Trade and Industry (METI) of Japan cites empirical studies showing investment in research and development as goading innovation, subsequently leading to growth of companies. According to the study of WIPO and the United Nations University Joint Research Project in Six Asian Countries, there is also "a positive correlation between strengthening of the IP system and subsequent economic growth."

Today, intangible assets, in particular intellectual properties are increasingly recognized as key business assets, such that their management, including funding business

activities, is now said to be “a pillar of corporate strategy” (Nigel, et. al, 2006: 01). According to Alan Greenspan, former Chair of US Federal Reserve, *“In recent decades, the fraction of the total output of the US economy that is essentially conceptual rather than physical has been rising. The trend has, of necessity, shifted the emphasis in asset valuation from physical property to intellectual property and to the legal rights inherent in intellectual property.”*

In a 2015 study conducted by an international firm providing services centered on IP assets, Ocean Tomo, LLC, data showed that in a span of 20 years, more and more value has been attributable to intangible assets than to tangible assets – from a market value share of 17% in 1975, it grew to 87% in 2015. This increasing trend in the value of intangibles only supports that indeed, intangible assets fuel value, growth and development of an enterprise.



Fig.1. Ocean Tomo, LLC's 2015 study on Intangible Asset Market Value

With the increasing contribution of intangible assets, such as IP, in business growth, it has now become imperative to measure and determine its value. This is important because in every business transaction, it would be inevitable to factor in the contribution of the intangible assets. Interestingly, however, this value or contribution varies depending on the kind of business transaction, and it is in this sense that one must be able to determine the various uses of IP valuation.

Moreover, valuing and financing IP creates a multiplier effect not just for the business sector but also for the government. If a standard in valuation and financing IP is established, investments beneficial both for the economy and the industry will come in and numerous expansions will happen. This will mean added jobs, bigger researches, and more opportunities. So the potentials IP brings to an industry and to the economy can be massively felt not just nationally but also globally.

Uses of IP Valuation

Emerging new business models, prompted by changes in the global economy, now recognize IP as a central element in establishing value and potential growth of business. Thus, it is not surprising if governments or accounting practices will require companies to properly determine the value of their intangible assets.

The table below details the various purposes and uses of IP valuation:

When and Why is IP Valuation Relevant	
Strategic Planning	Basis for decision making, capital allocation, profit sharing
Strategic Alliances	
Financial Reporting	Required under International Financing Reporting Standards (IFRS) or most General Accepted Accounting Principles (GAAPs)
Sale Transaction Support	Basis for the exploitation of IP, like in negotiations involving sale, licensing, or exchange of IP
Licensing	
Equity Restructuring	For fund raising and securing financing, collateral, liquidation, mergers, spinoffs or bankruptcy
Collateral-based Financing	
Infringement Damages	For assessing damage claims in a dispute, infringement or breach of rights, and for quantification of damages
Transfer Pricing	Relevant in cross border transactions as tax authorities are involved in this kind of transactions
<i>Source: JamesyLaya (2017)</i>	

Gleaned from the foregoing, it can be said that depending on the purpose and driving motivation of the user of IP, the valuation in itself will also vary. According to Mr. Laya, in IP valuation, there is a need to contextualize valuation, evaluate risk and return, consider robustness and consistency in strategy, and consistency in approach and methodology.

For MSMEs, it is important for them to know how to determine the value of their IPs from conceptualization of their businesses, sale of business, acquisition, merger, financing, securitization, franchising, to licensing or even liquidation.

III. IDENTIFYING IP AND INTANGIBLE ASSETS IN BUSINESS

One important consideration that any MSME should take into account is that at the outset, they must be able to identify their intangible assets. Intangible assets include IPs, thus, they must familiarize themselves with the various kinds of IP. In the legal and technical context, it may be well to take note of the intellectual property rights (IPRs) defined under the existing laws of each economy. The rights granted, therefore, are territorial. For purposes of reference, hereunder are the basic descriptions of the concepts and definitions of the various kinds of IPR.

Patents	Utility Model	Industrial Design	Trademark
<p>An exclusive right granted to the inventor of a product or process that is new, involves an inventive step and is capable of industrial application.</p> <p>This term of protection is generally limited to 20 years from filing date.</p>	<p>Short-term patent is a right granted to the improvement made to an invention.</p> <p>This has a shorter protection term compared to patents, often 6 to 15 years depending on the country, and less stringent.</p>	<p>The appearance and design of a product. It is any composition of lines or colors or any three-dimensional form that provides appearance or pattern to an object. The term of protection under this differs from one country to another.</p> <p>Term of protection under this is at least 10 years.</p>	<p>Trademark is the exclusive right over any sign, or any combination of signs, capable of distinguishing goods or services. These signs can be personal names, letters, numerals, figurative elements, combinations of colors, or combination of such signs.</p> <p>Term of protection under this is 10 years and is renewable.</p>
Copyright	Trade Secret	Geographical Indications	Layout Designs of Integrated Circuits
<p>The protection given to the expression of literary and artistic works. Translations, adaptations, arrangements of music and other alterations of a literary or artistic work are also protected as original works without prejudice to the copyright in the original work.</p>	<p>Trade secret is any confidential information that gives competitive advantage to a business. It should not be generally known to others and should have commercial value. Also, the owner of the information should have taken reasonable steps to keep the information confidential like a "need to know" basis or entering into non-disclosure agreements.</p>	<p>Geographical Indications or GIs identify a good as originating in the territory, where a given quality, reputation or other characteristic of the good is essentially attributable to its geographical origin.</p>	<p>Layout designs refer to the three-dimensional disposition, however expressed, of the elements, at least one of which is an active element, and of some or all of the interconnections of an integrated circuit, or such a three-dimensional disposition prepared for an integrated circuit intended for manufacture.</p>

Other intangible assets

In addition to the aforementioned IPRs, there are other forms of intangible assets which may not be legally defined by any existing laws but are considered valuable and in accounting context can be given a value. In which case, it is important that one must be able to recognize these intangible assets and if necessary consider these assets for appropriate valuation. Some examples of these intangible assets are contracts, exclusive agreements, and goodwill.

In valuation, IPs are most of the time bundled with or supported by other types of intangible assets (Anson & Suchy, 2005). Differing in forms and types, intangibles are identified with the help of existing frameworks:

- 1) Business and economic theory, i.e. Porter's Five Forces
- 2) Conceptual framework, and
- 3) Regulatory framework.

Porter's Five Forces

Developed by Professor Michael Porter of Harvard Business School, Porter's Five Forces helps in understanding the competitiveness of a business environment, as well as in identifying the potentials of a business strategy.

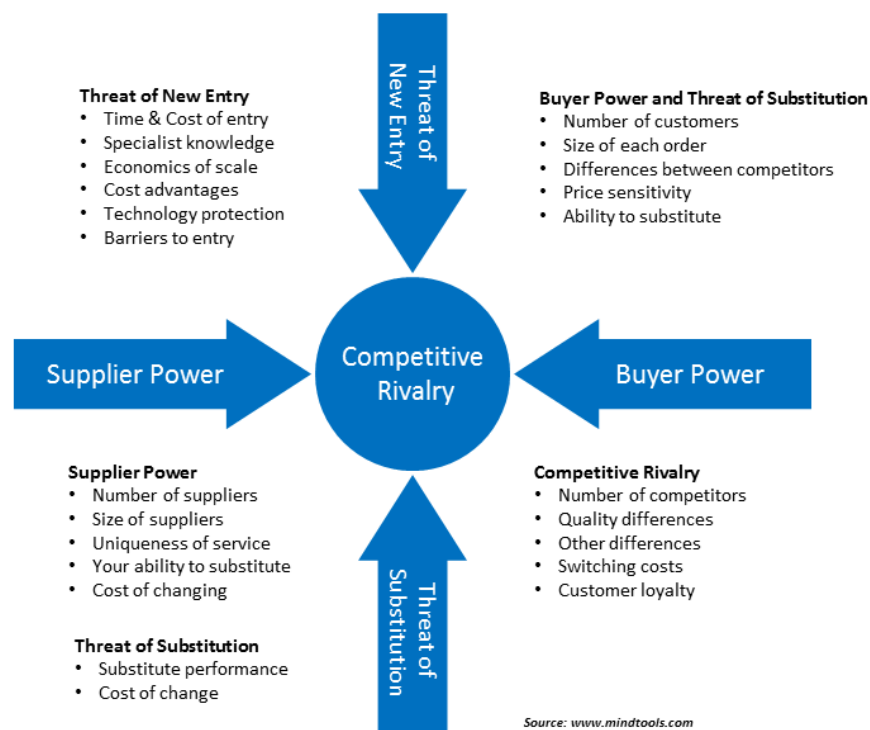


Fig.2.Porter's Five Forces

Conceptual Framework

Intellectual capital (IC) is the term that is now being used more and more often as the collective name for the new performance drivers in enterprises. It covers the different types of capital that may be further classified into Intellectual Property and Intellectual Assets.

Common Attributes	<ul style="list-style-type: none"> • No physical substance • Dependent on excess earnings • Last to appear, first to disappear
Intellectual Property (IP)	<ul style="list-style-type: none"> • IP is a special classification of intangible assets and is unique because the owner of IP is protected by law from unauthorized exploitation of it by others • Generate additional value from the ability of its owner to exercise exclusive rights of ownership (i.e. use, sell, etc.)
Intellectual Assets (IA)	<ul style="list-style-type: none"> • IA represents the codified tangible or physical descriptions of specific knowledge to which a company can assert ownership rights • Not all IA are protected by law
Intellectual Capital (IC)	<ul style="list-style-type: none"> • IC represents the cumulative knowledge of a business which allows for knowledge transfer and leverage. It creates competitive advantage and allows you to avoid repeating old mistakes

Source: *Valuation of Intellectual Property and Intangible Assets, Third Edition* by Gordon V. Smith and Russell Parr

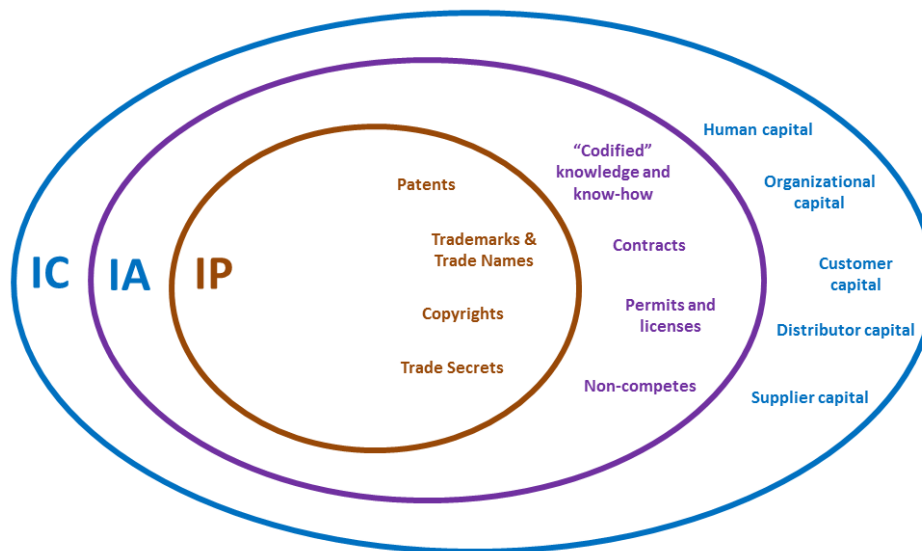


Fig.3. Conceptual Framework on Identifying Intangible Assets

Source: Valuation of Intellectual Property and Intangible Assets, Third Edition by Gordon V. Smith and Russell Parr

Regulatory Framework

International Financial Reporting Standards 3 (IFRS 3) seeks to enhance the relevance, reliability and comparability of information provided about business combinations and their effects. It sets out the principles on the recognition and measurement of acquired assets and liabilities, the determination of goodwill and the necessary disclosures (Global IFRS, 2008). The IFRS 3 categorizes intangible assets into the following categories.

Intangibles Class	Assets
Customer-related	Order or production backlog; customer lists; contracts and relationships
Technology-based	Patented and unpatented technologies; software and databases; secret formulas/processes
Contract-based	Licensing, royalty and leasing agreements, broadcasting rights
Marketing-related	Trademarks and names; internet domain names; non-competition agreements; designs
Artistic-related	Plays, books, and pictures

Source: International Financial Reporting Standards

Anson, et.al, explained that although these assets go together, it does not mean that these cannot be valued separately. Intangible assets are bundled to provide or establish a clearer market value.

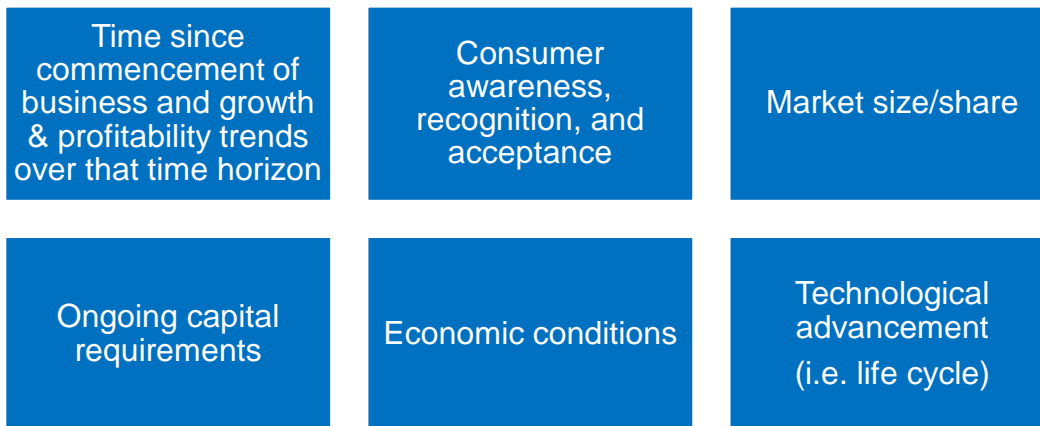
Characteristics of Intangible Assets

Intangible assets can provide significant economic advantages for the following reasons:

- Can be a main value driver;
- Provide premium pricing;
- Create a cost advantage;
- Overcome/ Create barriers to entry;
- Establish technological superiority (First to market);
- Enhance market share; and
- Represent “currency” in transactions (Barter).

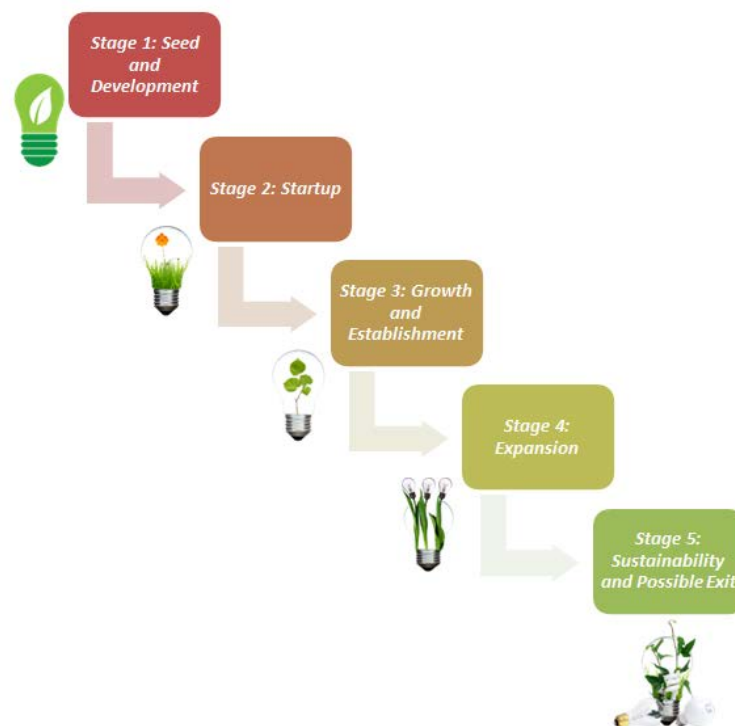
Drivers of Intangible Asset Value

Intangible Assets are valued based on the different types of drivers they may have. For instance, there is a correlation between the time a company has been in business, the company's growth and profitability, and the creation of intangible asset value. Below are some examples of value drivers for intangible assets.



Source: SGV, 2017

Mapping IPs and other Intangible Assets in Business





Stage 1: Seed and Development (Conceptualization Stage)

Businesses have a particular lifecycle. Inventors and other ideators may not be aware of it, but from the moment that an idea pops up from their heads, they are now becoming an entrepreneur. An idea to come up with a simple food kiosk or an application program (Apps) to address a particular need could be the beginning of greater things to come. At this point, these inventors and creators should already be conscious that they are actually coming up with IPs or intangible assets.

For example, the concept paper or technical drawings could be protected by copyright. The design of the kiosk could be the subject of an industrial design protection. The Apps may also be protected by copyright. The special recipe or formula could be the subject of a patent, a utility model or a trade secret. Simply stated, an MSME even before the start of its business operation must already be able to identify what IPs or intangible assets it owns. Thereafter, it has to ensure that these IPs are duly protected in accordance with existing laws, rules and regulations.



Stage 2: Startup

At this stage, inventors or ideators are now ready to officially announce that they are now open for business. And when they launch their business, they will also tell everyone how their business and products will be identified. They will have logos and brands and these are trademarks. The start-up stage usually lasts around five years, depending on the type of business, and during this period, their businesses could be coming up with more IPs. The inventors or ideators, who have now become new entrepreneurs, may now have operations manuals to standardize and systematize their operations. These manuals can be protected by copyright.



Stage 3: Growth and Development

At this stage, their business may have managed to outlive all the negative predictions usually associated with start-ups. They now have their own customer base, supplier information, contracts and other confidential information. On this note, they may have to consider the need to protect this valuable information and if necessary, keep them with utmost secrecy. At this stage, employees or business partners may be made to

sign Non-Disclosure Agreements (NDAs) to protect trade secrets and there may be a need to tag files as “Confidential”.

In addition, additional products or processes maybe developed and during this stage, the business established must be able again to identify the various kinds of IPs and intangible assets added to its portfolio.



Stage 4: Expansion

At this stage, the entrepreneurs may continue to innovate and develop new products, as they have already developed the expertise in running their businesses. They may also have established their own research and development capability. They may contemplate acquiring other businesses or IPs to fortify the presence of their businesses. Thus, there is a need to properly manage their IPs and strategically value them.



Stage 5: Sustainability or Possible Exit

Once business becomes profitable and there is sustained profitability, one may consider further expanding the same or diversifying the business. Another option is to come up with an exit strategy wherein the owner will cash in on what they have built by selling the same to interested investors or entering into a merger. In either case, it is highly important that at this stage they must be able to come up with an appropriate valuation on all the IPs and intangible assets they have generated to ensure the optimal return of investments.

IV. METHODOLOGIES IN IP VALUATION

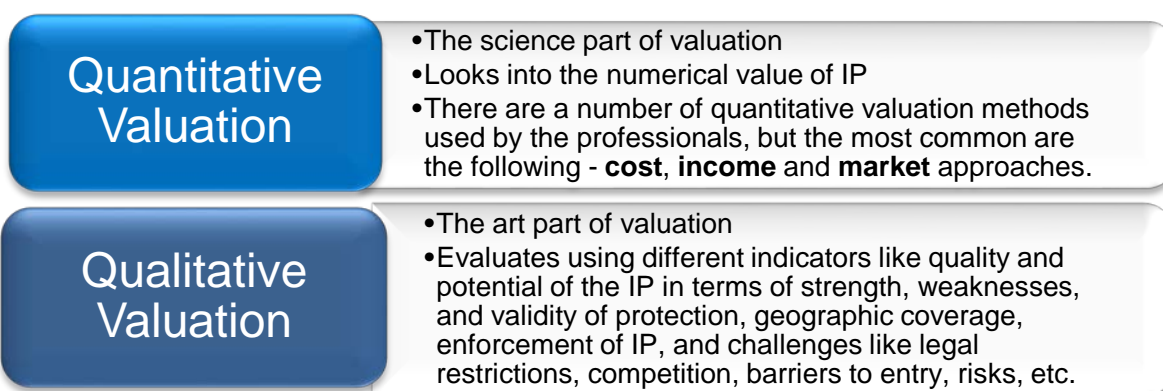
The purpose of IP valuation is to obtain an objective value using reliable information such as industry data and market predictions on future sales. This is done to come up with a value acceptable to IP owners, as well as to other parties who are interested in using the IP.

Valuation in itself is both an art and a science - art because its appreciation, application and usage are subjective, and science because valuation must be, in any case, methodical. The valuation process includes defining the valuation parameters, collecting

and analyzing data, applying the appropriate valuation approaches, and estimating the range of values.

There are different standards of values from varying points such as fair market value from the stand point of the financial investor; acquisition value for the strategic buyer; fair value for the auditor; market value for the competitor; liquidation value for the banker; and the current value for the owner.

Generally, there are two main categories of valuation: **Quantitative** and **Qualitative**.



Source: Quisumbing Torres, 2017

Factors to Consider

There are several factors that may be considered in doing valuation of IP and these are:

- 1) the information available about the business/commercialization opportunity;
- 2) well-understood market conditions; and
- 3) the marketability of resultant products/services based on the IP.

Current Australian Private Equity and Venture Capital Association Limited (AVCAL) valuation 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:

- 1) determine licensing royalty rates;
- 2) secure financial investment and determine level of equity; and
- 3) 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 be used for:

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

In addition, valuers have to always use at least one cross-check. For instance, the value derived using income method can be cross-checked against the implied multiple, adjusted multiple, and market multiples. For determining earnings and cash flow potential, valuers have to consider market size, diversity, growth, and legal protection attached to the IP.

Valuation Process

Valuing intangibles may prove to be a complicated, drawn-out task. It is so because, as has already been pointed out, while valuation is a science that follows a clear-cut procedure, it is not an absolute science. Valuation entails a good deal of subjectivity as valuers still need to put in their professional assumptions in order to come up with a value.

Although valuation may be complicated, the table below suggests the task needed to be undertaken for a systematic valuation process.

Valuation Task	Process
1. Define the valuation parameters.	Defining the IP assets and its components
2. Collect and analyze the data.	Understanding the objectives or purposes of the valuation
3. Apply the appropriate valuation approaches.	Intangible value deemed temporary; “as of” date important
4. Estimate the range values.	Defining the standard of value
<i>Source: PWC, 2017:9</i>	

Valuation Approaches

There are a number of acceptable ways to value assets but the three general approaches in IP valuation are **cost**, **income**, and **market** approaches. Each approach includes several kinds of methods. As there are many methods for IP valuation, one can choose any methods which are applicable to the relevant IP. In choosing the methods, one has to note that getting consensus of parties who have interest in the valuation result is the important issue.

Cost Approach

This is the type of IP valuation based on the costs that were expended in the development of the IP.

<p>Principle</p>	<p>Has two variants – reproduction and replacement costs;</p> <ul style="list-style-type: none"> • Reproduction - estimates the cost that will be spent to reconstruct the exact replica of the IP asset • Replacement - what is usually spent to replace an asset - not necessarily the same replica, but something that has the same utility or the same use with the one that is being valued <p>Accumulates what was spent historically; estimates how much will be spent to replace that particular asset.</p> <p>Can be used to value:</p> <ul style="list-style-type: none"> • Acquired third-party software • Internally developed and internally used, non-marketable software • Assembled workforce
<p>Issues and Challenges</p>	<ul style="list-style-type: none"> • Does not think if there is a market demand or market acceptance, as well as its future economic benefits (earnings and value), therefore does not give the intrinsic value of the asset • Determining the basis of gross replacement/reproduction costs • Determining the basis of estimated useful lives (EUL) or the lifespan of a depreciable fixed asset • Calculating the economic depreciation and the resulting remaining economic lives

Source: International Valuation Standards

Example:

For a drug to get to market, a pharmaceutical company may have spent R&D cost of USD1.3B, patent registration and legal cost of USD100k, clinical trials of USD1.4B, and labor and other costs of USD200M. All in all, the company may have spent a total of USD2.91B.

Market Approach

This method estimates IP value on similar market transactions (e.g. similar license/acquisition agreements) most frequently for comparable patents.

<p>Principle</p>	<ul style="list-style-type: none"> • Estimates the assets' value by looking at similar assets that may have been sold or licensed, and uses the transactional value as benchmark • Quoted prices in an active market • Needs to look at each of the circumstances of the asset portfolio and understand the future economic benefit before deriving to the actual value • Can be used to value: <ul style="list-style-type: none"> ○ Frequency/spectrum ○ Internet domain names ○ Listing rights
<p>Issues and Challenges</p>	<ul style="list-style-type: none"> • Difficulty in finding comparable assets to base the market approach on due to the IP assets' uniqueness and innovativeness. • Making appropriate adjustments to market-based data • Having non-robust basis due to non-financial basis
<p><i>Source: PWC and SGV, 2017</i></p>	

Example:

Company A sold a portfolio of its patents composing of 6000 patents for USD4.5B. Getting the average, the value per patent is around USD750k.

Using the same metric of USD750k per patent, a subsequent transaction for Company B, which has 17,000 patents, will give a value of USD12.75B for its whole portfolio of patents. Company C paid Company B USD12.5B for the latter's assets, including hard assets like handsets and equipment. In the end, analysts estimated that the value of Company B's patents is around USD4.0B. Per patent value would be USD250k or just one third of how much Company A's patents were valued.

Another transaction is Company D, which has 9000 patents. Applying Company A's valuation of USD750k, it will give a value of USD6.75B for the patent portfolio. Analysts however estimated it to be only worth USD2-3B. This gives USD200k per patent value, closer to what Company C paid for Company B's patents.

Income Approach

This is the most common method used in IP valuation.

<p>Principle</p>	<ul style="list-style-type: none"> • Uses the principle of anticipation and values the future economic benefit of the intangible asset • Two of the most common methods under this approach are: <ul style="list-style-type: none"> ○ Relief from royalty (RFR) - The idea behind this is that money is being saved because there is no longer payment for royalty because you own the asset or brand. <i>(Best for valuating trademarks or trade names, but can also be used to value technology)</i> <li style="padding-left: 40px;">$= \text{Sales} \times \text{Royalty Rate}$ ○ Multi-period excess earning method (MEEM) – This forecasts the cash flows that are attributable solely to the intangible assets. If there are cash flows that can be attributable to the supporting assets like property, working capital and equipment, then they can be deducted to the value of intangibles or to the cash flows that are considered in this approach. <i>(Best for valuating customer relationship or technology)</i> • The methods above can also be used to value: <ul style="list-style-type: none"> ○ Operating licenses ○ Non-Competition agreements • Other methods for technology valuation are: <ul style="list-style-type: none"> ○ Asset Allocation = $(\text{Business Value} - \text{Other Assets}) \times \% \text{ of Technology}$ ○ Rule of Thumb = $\text{Business Value} \times 25\%$ ○ Profit Split = $\text{Operating Profit} \times (1/3)$
<p>Issues and Challenges</p>	<p>Identifying the economic income specifically attributable to the IP or asset that is being valued</p>
<p><i>Source: International Valuation Standards</i></p>	

Steps on Technology Valuation (Asset Allocation Method)

- STEP 1:** Estimate future sales of business where technology is exploited.
- STEP 2:** Estimate Operating Profit after Tax
- STEP 3:** Predict Adjusting Factors (Depreciation etc.)
- STEP 4:** Calculate cash flow of future years
- STEP 5:** Calculate Discount Rate of cash flow
- STEP 6:** Calculate Discount Cash Flow(DCF)
- STEP 7:** Calculate Business Value by Summing up DCF
- STEP 8:** Calculate Intangible Asset Value (Business Value - FA - TA)
- STEP 9:** Estimate % of Technology Value among Intangible Assets
- STEP 10:** Reach to Total Technology Value (Intangible x %)
- STEP 11:** Estimate the % of Specific Technology Value
- STEP 12:** Reach to Specific Technology Value (Total Technology x %)³

(Ishii, 2017)

Steps on Technology Valuation (Multi-period Excess Earning Method (MEEM))

STEP 1: Derive expected revenues for subject IP.

$$\text{This year's actual revenue} \times \text{Obsolescence Rate in Technology} = \text{Next Year's expected revenues from existing Technology}$$

STEP 2: Deduct all expenses.

$$\begin{aligned} & \text{Expected revenue from existing Technology} - \text{Cost of sales} - \text{General and administrative expenses} = \text{Earnings before interest and taxes from Technology} \times (1 - \text{income tax rate}) \\ & = \text{Net Operating Profit After Tax from Technology} \end{aligned}$$

STEP 3: Apply contributory asset charges (CAC).

$$\begin{aligned} & \text{Net income after tax rate from existing Technology} + \text{Amortization and depreciation expenses relating to the Technology} - \text{Capital charge related to are turn on (and of) associated fixed assets, working capital, assembled work force and other intangible assets, if applicable} = \text{Excess earnings from existing Technology} \\ & \text{(These expenses are only added if these were deducted in estimating the Net Income after tax rate from the existing technology.)} \end{aligned}$$

STEP 4: Calculate present value of future cash flows.

$$\begin{array}{l} \text{Excess earnings} \\ \text{from Technology} \end{array} \times \text{Discount Factor} = \begin{array}{l} \text{Present value from excess earnings from} \\ \text{existing Technology} \end{array}$$

STEP 5: Sum the present value of excess earnings for each year

STEP 6: Estimate the Tax Amortization Benefit (TAB), if applicable.

(Laya, 2017)

Example 1: Income-Based Method

Company A is offered 100 patents for license, prior to Owner offering for sale to third parties -

- *Due diligence on the patents suggests that there is risk of infringement as to 5 patents*
- *If Company doesn't acquire/license patents, what are the chances it will be sued? (e.g., 80% chance of suit on a risky patent)*
- *Probability of loss? (e.g., 30%)*
- *Targeted activity and est. exposure in case of loss (e.g., \$10M)*
- *Average Litigation costs? (e.g., \$1M, win or lose)*

Risk Patents		Hit Rate	=	Expected Suits		Loss Rate		Exposure in Loss		Avg. Lit Expenses	=	Total
5	x	80%	=	4	x	[(30%	x	\$10M)	+	\$1M]	=	\$16M

Example 2: Valuation of a Trademark (RFR Method) with license to distribute product granted to 2022 -

		<u>Variables</u>
Royalty:	2%	• Royalty rates
Discount rate:	10%	• Discount rate
Tax:	30%	• Useful economic life

Business forecasts for exploitation by hypothetical licensee

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025
Sales	500	500	500	500	500	500	500	500	500
Royalty Rate	2%								
Royalty Earned	10	10	10	10	10	10	10	10	10
Tax Payable	30%	3	3	3	3	3	3	3	3
After-tax cash flow	7	7	7	7	7	7	7	7	7
Discount rate	10%								
Discount factor	0.95	0.87	0.79	0.72	0.65	0.59	0.54	0.49	0.44
Discounted Cash Flow	6.7	6.1	5.5	5.0	4.6	4.1	3.8	3.4	3.1
NPV	42.3								

Example 3: Valuation via MEEM Approach

<u>(in thousand USD)</u>	2017	2018	2019	2020
Revenues	1,000.00	800.00	500.00	300.00
Costs	750.00	800.00	375.00	225.00
Profit before tax	250.00	200.00	125.00	75.00
Taxes @ 40%	100.00	80.00	50.00	30.00
Net Income	150.00	120.00	75.00	45.00
<u>Contributory Asset charges</u>				
Land and building	10.00	8.00	5.00	3.00
Machinery and equipment	25.00	20.00	12.50	7.50
Working capital	15.00	12.00	7.50	4.50
Workforce	9.50	7.60	4.75	2.85
Trademarks	20.00	16.00	10.00	6.00
Total Asset Charges	79.50	63.60	39.75	23.85
Cash Flow after tax	70.50	56.40	35.25	23.85
Present value factor	0.9174	0.8417	0.7722	0.7084
Present value of cash flows	64.68	47.47	27.22	14.98

Technology Valuation Using Multiple Indicators

Valuing an IP asset using several indicators (i.e. market data and trends when using market approach) is critical in coming up with a most approximate and realistic value of a technology. In patent valuation, for example, using multiple indicators will consider a wide-range of available data to calculate value. PatSnap (2017) dishes out specific indicators to consider when determining the market value of a patent.

Some of these indicators are the following:

R&D strength of the invention	Based on the number of inventors in a patent, multiple inventors on a patent often indicates greater potential value.
Trending Technology	This indicates if a technology is “hot” by comparing the IP activity within an International Patent Classification (IPC) code.
Sustainability of technology trend	This indicates the innovation cycle of a technology or industry by comparing various reference periods.
Total size of activity	This takes into account the total amount of inventions made within a certain period in the same technology field, which determines the total activity per period.
Family size	This refers to equivalent patents that relate to the same invention. This will show how many markets are covered within this protection, and take into account the number and size of markets.
Importance for other technologies or applications	This takes the patent age into account. This is important since it means the more a patent is cited, the more relevant the technology is likely to be.
Patent/technology maturity	This takes into account the life span of the patent. The value of a technology decreases in its final stage of lifetime. The point of maximum value starts after the opposition phase. Within the final six months to expiration, a technology may no longer be tradable.

Depending on the asset class under which an IP is being assessed, the valuer has to analyze the string of the other assets a company may have and anchor the valuation process to the interrelatedness of these assets with each other. Of all the company's assets, the valuer must:

- Understand the extent and impact of the interrelationships within the asset classes;
- Identify which of a company's assets is the major driver; and
- Select valuation methodologies based on the characteristics of the IP, the interrelation, and hierarchy.

A valuer has to conduct industry analysis to analyze existence of competitive forces and pinpoint what drives profitability. The use of Porter's Five Forces (SGV, 2017:6) will be helpful in this task. The valuer zeroes in on factors such as "competitive rivalry", "threat of new entry", "buyer power", "threat of substitution", and "supplier power".

Moreover, knowing how the interrelationship works within the enterprise would help the valuers in identifying the most appropriate valuation methodology to value such intangible asset. The table below enumerates the different aspects that the valuers must look into.

Aspects	Questions to help the valuers:
Industry Analysis	<ul style="list-style-type: none"> • Is industry defined too broadly? • What is the source of above-average performance? • Are factors given appropriate weights and attention?
Value Drivers	<ul style="list-style-type: none"> • Is the intangible asset the main value driver? • Can the asset command premium pricing? • Is there a cost advantage? • Can the asset overcome or create barriers to entry? • Is there a technological superiority?
Value Creation Timeline	<ul style="list-style-type: none"> • Where is the asset in its life cycle? • What is the trend in growth and profitability? • Market share • Is growth supported by capital requirements • Do economic conditions corroborate?
Regulatory	<ul style="list-style-type: none"> • Are the group of intangibles assets separable? • Contractual? • Arising from legal rights?
Source: SGV, 2017	

V. LIMITATIONS IN IP VALUATION

After discussing and establishing the importance and use of IP valuation and financing, it is also necessary to look into their limitations to give a more holistic view on the subject matter.

Timing

- Valuating IP is not static and it can change depending on the risks surrounding it. Valuation today may not be valid tomorrow due to different scenarios like market crashing or the product losing its credibility in the market. Result of the valuation can also be affected by the status of the business when the valuation was done. As the business grows, the value of technology only grows.

Uniqueness of IP

- Due to the uniqueness of IPs, when it comes to valuation, it is relatively harder to get market data relating to those assets as compared to other more common assets like real estate. More work needs to be done and assumptions are more daunting to come up with. Also, because IPs are considered unique and innovative, especially patents, a consistent way of valuing new technologies sometimes becomes an issue. And even if there are accepted valuation methods used in placing values for the assets, the full value will still not be likely captured.

Getting financed

- IPs need to be bundled with a business in order for the IP owner to get a loan or an IP to get collateralized. Financing institutions like banks look into the business as a whole to determine its cash flow. They look into the credit rating of the IP owner, as well as take the valuation of say, a technology, to obtain the income stream relating to the business. Big and established companies will have no problem with this. But for MSMEs, this becomes an issue most especially if the business is still in the infancy stage and if the owners are with very little, or none, or worse, bad credit rating.

Perspective

- There are valuation methods where the derived value is not from the perspective of the owner but from the perspective of the buyer, which is often seen from the large companies. They may pay five times more from what the seller is expecting because they know they can make ten times from it. Again, IP relates to the potential business that is why it is hard to split it out from the economic benefit.
- Depending on who is using the IP, the value may vary such as fair market value from the stand point of a financial investor; acquisition value for a strategic buyer; fair value for an auditor; market value for a competitor; liquidation value for the banker; and the current value for the owner.

Accounting

- Self-generated IPs are not allowed by accounting rules to be reflected in the financial books.
- Only acquired IPs get to be reported as assets. Valuing IPs for internal purposes may present subjectivity and manipulation of numbers in favor of the owner.

Tax Implications

- IP transactions like assignment, sale, and transfer are taxable income, as well as payments from royalties.

Use of IP

- Value of IP, or say technology, depends on the size of the business. If the technology is being exploited by a small company, the percentage of its exploitation is also small, therefore resulting in a smaller technology value.

VI. IP VALUATION REPORTS CONTENT SAMPLES

Below is a sample of the possible contents of a valuation report.

I. Summary of Valuation Results

1. Valuation overview
2. Technology-based business overview
3. Valuation method, procedures, and major hypothesis
4. Valuation result summary

II. Technology Analysis

1. Technology overview
2. Technology trend
3. Usefulness and competitiveness of the technology
4. Comprehensive analysis of the technology

III. Rights Analysis

1. Patent contents
2. Information on relevant patented technologies
3. Rights analysis and evaluation opinions
4. Comprehensive opinions on rights

IV. Marketability Analysis

1. Product based on technology and market overview
2. Distinct features of the industry
3. Market status and size
4. Comprehensive opinions on marketability

V. Business Feasibility Analysis and Value Calculation

1. Business overview
2. Business to be evaluated
3. Business feasibility analysis and value calculation

(Source: (WIPO, 2017)

VII. SUMMARY OF KEY CONSIDERATIONS

Having established the paramount importance of valuation to business growth and profitability, the process and indispensability of IP valuation as a key business tool may be synthesized in the following vital points:

1. It is important that one must be able to identify the different kinds of intangible assets and IPRs in every stage of the business cycle.
2. Identified IPs must be properly protected and inventoried.
3. Determine the use and relevance of IP valuation based on the purpose, e.g. strategic planning, reporting, transaction report, licensing, equity raising, collateralization, transfer pricing, merger and acquisitions, and tax issues.
4. Contextualize valuation, evaluate risk and return, consider robustness and consistency in strategy, as well as consistency in approach and methodology.
5. There are different standards of values from varying points such as fair market value from the stand point of a financial investor; acquisition value for a strategic buyer; fair value for an auditor; market value for a competitor; liquidation value for the banker; and the current value for the owner.
6. Subjectivity is very much part of the valuation. Thus, reporting of analysis must be done to support the major assumptions used in the valuation.
7. Valuation professionals must have the right experience and qualifications.
8. The purpose of valuation is not to find absolute and perfect value. What is important is consensus. To get consensus is to get objective information such as industry average data, and market prediction on future scale of sales of the relevant goods.
9. In IP valuation, take into account possible tax consequences, and effects on profit or net income.

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