

Valuation of Intellectual Property

“शिक्षा मानव को बन्धनों से मुक्त करती है और आज के युग में तो यह लोकतंत्र की भावना का आधार भी है। जन्म तथा अन्य कारणों से उत्पन्न जाति एवं वर्गगत विषमताओं को दूर करते हुए मनुष्य को इन सबसे ऊपर उठाती है।”

— इन्दिरा गांधी

“Education is a liberating force, and in our age it is also a democratising force, cutting across the barriers of caste and class, smoothing out inequalities imposed by birth and other circumstances.”

— Indira Gandhi

Block

2

**VALUATION OF INTELLECTUAL
PROPERTY**

UNIT 5

Theories and Approaches - IP Valuation **5**

UNIT 6

IP Valuation - Methods of Patent Valuation **20**

UNIT 7

Intellectual Property Audit **31**

Expert Committee

Dr. D.P.S Parmar
Technical Member,
Intellectual Property Appellate Board,
Ministry of Commerce & Industry

Prof. S.K. Verma
Director, ISIL
New Delhi

Prof. Salim Akhtar
Professor of Law,
Aligarh Muslim University
Aligarh, Uttar Pradesh

Dr. Ekbal Hussain
Associate Professor
Jamia Milia Islamia University
New Delhi

Mr. T.C. James
Director,
National Intellectual Property Organisation
New Delhi

Prof. K. Elumalai
Director, School of Law
IGNOU

Dr. Suneet Kashyap Srivastava
Assistant Professor, School of Law
IGNOU

Dr. Gurmeet Kaur
Assistant Professor, School of Law
IGNOU

Mr. Anand Gupta
Assistant Professor, School of Law
IGNOU

Ms. Mansi Sharma
Assistant Professor, School of Law
IGNOU

Programme Coordinator: Dr. Suneet Kashyap Srivastava
School of Law, IGNOU, New Delhi

Block Preparation Team

Unit Writer:
Dr. D.P.S Parmar (Unit 5 to 7)
Technical Member
Intellectual Property Appellate Board
Ministry of Commerce & Industry

Format & Language Editor:
Dr. Suneet Kashyap Srivastava
SOL, IGNOU, New Delhi

Content Editor:
Mr. C.M. Gaiind
Former Director, NRDC
Senior Patent Attorney, New Delhi

Print Production

Mr. S.Burman

Mr. Tilak Raj

Mr. Yashpal

Deputy Registrar (Pub.)

Assistant Registrar (Pub.)

Section Officer (Pub.)

January, 2017 (Reprint)

© Indira Gandhi National Open University, 2013

ISBN : 978-81-266-6389-7

All rights reserved. No part of this work may be reproduced in any form, by mimeograph or any other means, without permission in writing from the Indira Gandhi National Open University.

Further information on the Indira Gandhi National Open University courses may be obtained from the University's office at Maidan Garhi, New Delhi-110 068.

Printed and Published on behalf of the Indira Gandhi National Open University, New Delhi by Registrar, MPDD.

Printed at : Berry Art Press New Delhi-64

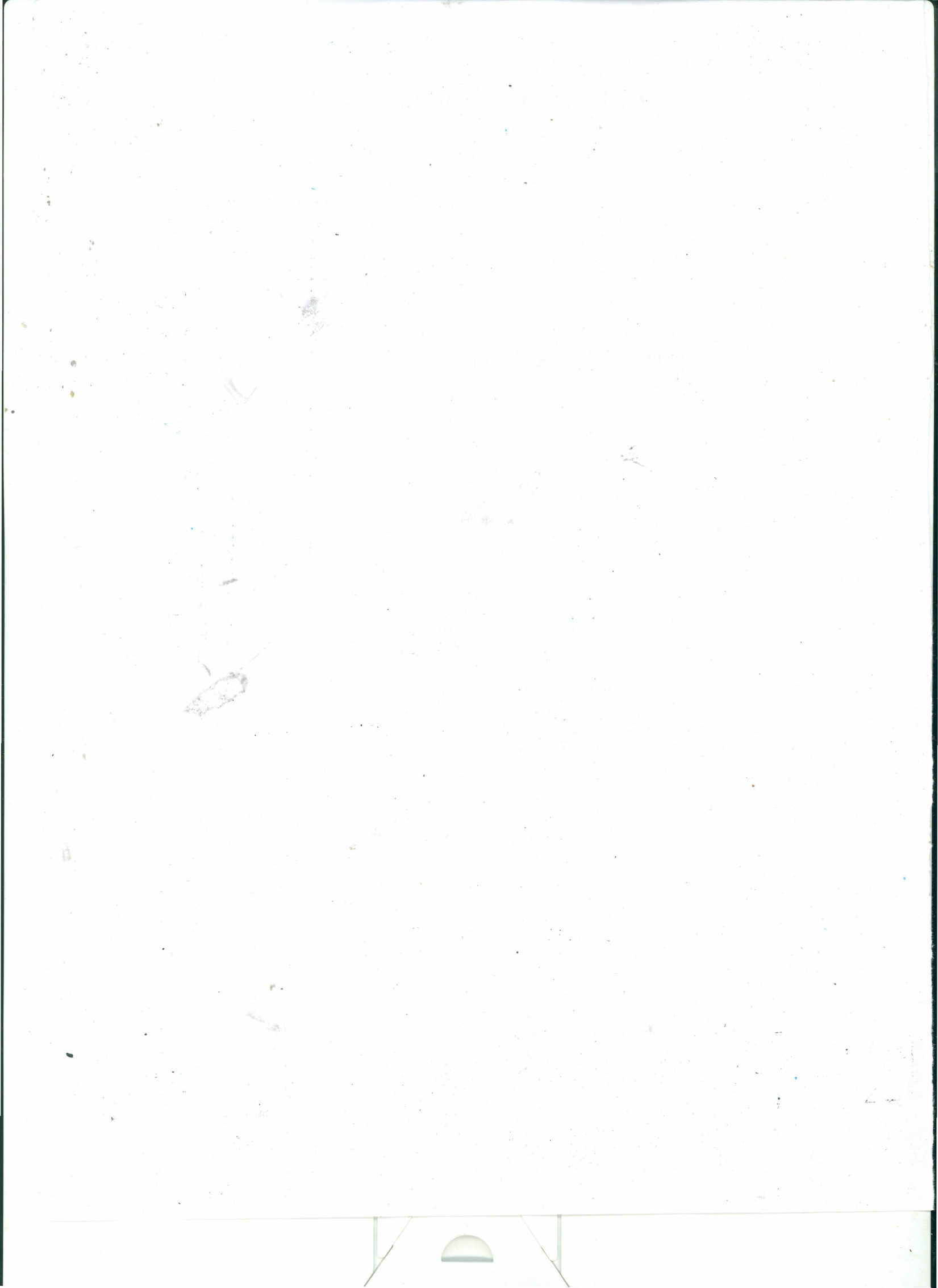
BLOCK 2 VALUATION OF INTELLECTUAL PROPERTY

Block 2 of this Course deals with the valuation of IP. This block has three units.

Unit 5 of this block deals with the theories and approaches of IP valuation. In this Unit, topics like importance of IP valuation, reasons for evaluation, need for valuation, different forms of valuation etc is dealt with.

Unit 6 of this Block deals with the methods of patent valuation. In this Unit the topics which are dealt are why patent should be value, patent suits and damages, need for patent valuation, methods to monetize patent, patent value prediction model etc is dealt with.

Unit 7 This Unit deals with IP audit wherein audit is defined. It also deals with key areas of IP audit, its benefits etc.



UNIT 5 THEORIES AND APPROACHES - IP VALUATION

Structure

- 5.1 Introduction
- 5.2 Objectives
- 5.3 Importance of IP Valuation
- 5.4 Reasons for Evaluating IP
- 5.5 Uses for IP Valuation
- 5.6 When Valuation of IP is Required?
- 5.7 Theoretical Approaches to Valuation
- 5.8 Qualitative Evaluation Approach
- 5.9 Quantitative Evaluation Approach
- 5.10 Econometric Approaches to Patent Valuation
- 5.11 Evaluation of Value Indicators: IP Score
- 5.12 Types of Valuation Methods
- 5.13 Summary
- 5.14 Terminal Questions
- 5.15 Answers and Hints

5.1 INTRODUCTION

Evaluation IP is emerging as science instead of remaining as hit and trial economic valuation methods. Most of methods and theories developed over a period of last two decades to evaluate IP are based on the survey analysis. In 1992 Arthur Andersen in a report on valuing intangible assets divides valuation methods into Cost, Market Value and Economic Value methods. These economic models remained most commonly applied methods to estimate the value of intellectual property and other forms of intangible assets. In 2001 the international valuation standards was adopted which consists of standards procedure and guidance for their application. Russell & Parr divided all possible types of valuation of individual IP into Cost, Market and Income based methods. The correct valuations of patents become more difficult as the assessment are conducted by patentee himself and also by other stakeholders like investors, banks, venture capitalists and financial analysts. In this unit we will study valuation methods based on cost, Market Value and Economic Value. We will study the theories of valuation and difference between cost approach, income approach and market approach. We will study various theoretical approaches to valuation of patents. We will also study the Qualitative, quantitative and econometric methods and their usefulness to business in the evaluation of patents.

5.2 OBJECTIVES

After studying this unit, you will be able to:

- explain the purpose IP valuation and its importance;
- discuss the various approaches to valuation of IP;
- analyse qualitative and quantitative methods of patent valuation; and
- explain the various types of valuation methods.

5.3 IMPORTANCE OF IP VALUATION

Intellectual Property such as patented technology, registered trademarks and designs, copyright and others are increasingly being viewed as major assets by the big organisations as well as by small and medium enterprises. Table 5.1 below indicates the contribution of brand value and their respective trademarks in projecting the market value of multinational companies [based on the Interbrand and JP Morgan table 2002] reported by business week.

Table 5.1

Company	2000 brand value (\$bn)	Brand contribution to market capitalization of parent company (%)
Coca-Cola	69.6	51
Microsoft	64.1	21
IBM	51.2	39
GE	41.3	14
Intel	30.9	22
Nokia	30.0	51
Disney	29.3	68
McDonald's	26.4	71
Marlboro	24.2	20
Meroedes-Benz	21.0	47

This growing role of IP based value of the organisation poses a number of major challenges for the economists, corporate sector, governments and the IP community at large in order to evaluate the value and contribution of IP and maximise its revenue earning potential. Lawyers and judges value patents in the course of patent infringement suits; financial institutions need to calculate the value of patents when they are used as collateral for bank loans; and investors and financial analysts value patents to assess the value of firms as a basis for their investment decisions and recommendations. Table 5.2 gives the value leading global brands in 2007.

Table 5.2

2007 Rank	2006 Rank	Brand	Country of origin	Sector	2007 Brand Value (€)
1	1	Coca-Cola 	US	Beverages	65,324
2	2	Microsoft 	US	Computer Software	64,709
3	3	IBM 	US	Computer Services	57,093
4	4	GE 	US	Diversified	51,549
5	6	Nokia 	Finland	Consumer Electronics	33,095
6	7	Toyota 	Japan	Automotive	32,070
7	5	Intel 	US	Computer Hardware	30,954
8	9	McDonald's 	US	Restaurants	29,398
9	8	Disney 	US	Media	28,245
10	10	Mercedes 	Germany	Automotive	23,568
11	11	Citi 	US	Financial Services	23,443
12	13	Hewlett-Packard 	US	Computer Hardware	22,197
13	15	BMW 	Germany	Automotive	21,612
14	12	Marlboro 	US	Tobacco	21,280
15	14	American Express 	US	Financial Services	20,927
16	16	Gillette 	US	Personal Care	20,415
17	17	Louis Vuitton 	France	Luxury	20,323
18	18	Cisco 	US	Computer Services	19,999
19	19	Honda 	Japan	Automotive	17,990
20	24	Google 	US	Internet Services	17,887

5.4 REASONS FOR EVALUATING IP

The basic purpose behind valuing IP is to maximise its value in order to project the correct worth of the organization. IP valuation also assists the internal management in taking optimum management decisions relating to creation, protection and exploitation of IP. The success or failure of an IP based organisation depends on the ways in which IP is exploited. IP exploitation and creation of IP strategies requires assessment of IP assets and their effective management in research and development, legal, industrial protection and commercialization activities. IP valuation facilitates decisions making which involves high but measurable levels of risk. It is cost effective as it helps to forewarn about the risks involved and also prepare the management to deal with it. The correct estimation of the value of IPRs is increasing becoming daunting yet important task of the companies and their accountants. Different approaches have been proposed and practiced by experts to value patents. Correct assessment of the value of patent on one hand helps in taking informed decision in many transactions such renewal of a patent or negotiating royalty terms in licensing agreements or depositing collateral for a bank loan, on the other hand many and diverse uses of patents rights creates new challenges for their valuation.

Self Assessment Question

(Spend 3 minutes)

1) Why is valuation of patent important?

.....
.....
.....
.....

5.5 USES FOR IP VALUATION

IP valuation is useful in effective management of IP in firms as it facilitate following actions in technology creation, protection and exploitation exercise:-

- a) **Decision making** at IP creation stages such as R&D phase, protection phase, exploitation or Tech transfer phase.
- b) **Adding value to IP assets** by adding results from further R&D and testing of Technology at industrial level
- c) **Communication** of the importance and value of the technology internally to all parties including research staff, directors, the technology transfer managers to fully understand value aspects and to be able to make well founded decisions.
- d) **Indicator / monitoring** of the value of the R&D results to check cost benefit ratio been R&D expenditure and the results achieved.

5.6 WHEN VALUATION OF IP IS REQUIRED?

There are many situations where determination of value of IP is essential prior to entering into any contract agreement by the organisation based on IP. For examples

- a) **Company valuation in buying of selling transactions, establishing joint ventures, executing mergers and acquisitions, bankruptcy and reorganisation**

When we look at the market worth of an organisation we will find that IP is projected as a major component of it's the market value. It is therefore essential that an accurate IP valuation is done before buying or selling a company, establishing joint ventures, and executing mergers and acquisitions. In all such transactions, each party will make its own assessment to determine value of IP assets that will be bought or sold as part of the company. Same is true when company's bankruptcy or reorganisation occurs.

- b) **Licensing**

Before a company negotiate an IP license contract, both parties makes efforts to values IP involved. This requires a submission of due diligence report outlining the details of the IP to be licensed to the management by the IP manager.

- c) **Raising finance (bank loans, venture capital, investment)**

Many IP based companies offer their IP as collateral to finance their expansion plans. Banks in some countries are to ready accept IP assets as collaterals as

sufficient data is made available about IP and its value. Venture capitalist invests in hot tech companies where they are convinced about the value and commercial viability of the IP associated ventures and has reasonable expectation of good returns.

d) Taxation planning and compliance

Correct assessment of the value of IP is important for calculation of eligible tax deductions and tax compliance by the IP based companies. Governments also give tax exemptions on expenditure incurred on acquiring patent rights.

e) External reporting and accounting

Of late many icon companies are using their IP assets in projecting the future prospects and in calculating their exiting market value. These companies believe that existing accounting standards are not helpful in representing IP in company accounts and as a result these are often under-valued and mismanaged. Therefore accurate assessment of IP value is essential in reporting of fair value estimates in annual reports.

f) Litigation support and dispute resolution

In litigation and settlement of IP disputes an accurate IP valuation is helpful in arriving at best informed decisions quantum of royalties/damages.

5.7 THEORETICAL APPROACHES TO VALUATION

Theoretically speaking one cannot separate quantitative financial valuation of patents from qualitative valuation of patents. In order to achieve an acceptable result for any patent valuation, one must scrutinise the patent in question and the intricate interrelation between its legal and economic aspects. After all, what is good in having a wonderful patent with no market? What is good in keeping a patent in force for ten years when the life cycle of the technology is short? Similarly what is good in having thoroughly fenced patent with huge market potential but with no freedom to operate? How much appetent licences would worth where the validity of the patent is challenged and its outcome is difficult to predict? Needless to add many other legal and economic aspects must be taken into consideration in arriving at the near perfect value of a patent. Any patent valuation in real life has to take this into account before setting up any qualitative or quantitative standards for valuation of patents. It may consist in enumerating the most relevant legal aspects and the most relevant economic aspects, as well as some of the most important interrelationships between these two areas.

5.8 QUALITATIVE EVALUATION APPROACH

Qualitative approach of valuation of patent is based on the rating and scoring of different value indicators related to the IP. These indicators can influence the value of the IP both positively and negatively. For example in the case of patents, information contained in the patent document such as the number of references cited relating to prior patents and the number of citations a patent has received indicate its importance scientifically and therefore its relative value. Likewise there is evidence to suggest that there exist a strong correlation between the

number and quality of claims, the patent family size and the outcome of oppositions to the patent application and the value of the patent.

Danish Patent and Trademark Office has developed a qualitative valuation method in 2001 known as IPScore which uses a software tool to value technology, patents and patent portfolios internally, within companies. This IPScore software provides qualitative assessment of a patent by evaluating five categories: legal, technology, market, finance and strategy, each of which has 5-10 associated index questions. Each question relates to a different value indicator. Each question is rated 1-5 according to the patents strengths and weaknesses. Together, the 40 or so value indicators form a whole picture of the patent and its relative risks and opportunities. These are then displayed in various tables and graphical forms to be used by management for making strategic decisions. It also enables the calculation of Quantitative financial forecast of the value based on information on development costs development time, market conditions and product conditions.

Advantages of qualitative approaches

- 1) Useful for identifying strengths and weaknesses of an IP asset.
- 2) Can assist with development and exploitation decisions.
- 3) Can assist with adding value to an IP asset.

Disadvantages of qualitative approaches

- 1) The value drivers used in the valuation are subjective
- 2) If the value drivers are not chosen with care it may lead to wrong valuation.
- 3) The links between the factors and IP value have been established, but the exact importance of each factor is open to interpretation.

5.9 QUANTITATIVE EVALUATION APPROACH

Cost based

The quantitative value approach is based on the cost of obtaining a patented invention either by internal development or external acquisition. It relies on the calculations of the reproduction or replacement costs of the patented invention. In spite of its potential for application in other settings the cost based approach is not widely used for patent valuation because it does not reflect the future economic value of the patent.

Advantages of cost based approaches

- 1) IP assets can become visible in the company's books and patent awareness is increased.
- 2) Useful indicator of IP value in the case of IP whose future benefit is not yet evident.

Disadvantages of cost based approaches

- 1) No direct correlation between cost of development and the future revenue of IP assets.

- 2) Future revenue from IP assets is not considered.
- 3) The cost method can encourage overspending.

Market based

Market approach is based on the use of comparable patent transactions in the market for obtaining the fair value of a patented technology. However small numbers and lack of transparency in the market transactions relating to patented technology makes this approach less reliable and useful than other approaches.

Advantages of Market based approaches

- 1) Relatively straightforward valuation concept.
- 2) Useful to check the validity of other approaches.

Disadvantages of Market based approaches

- 1) Limited formal markets for IP.
- 2) Relevant pricing information not usually public.
- 3) Uniqueness of IP makes direct comparison difficult.

Income based

The income approach is based on the calculation of the present value and the projected future income flow arising from the patent during its economic life. The discounted cash flow method allows an estimated future income flow to be converted to a present value by discounting the estimated future income flow with discount rate. One of the most difficult challenges in this approach is to set the discount rate.

Advantages of income based approaches

- 1) It is relatively simple concept.
- 2) It may be possible to identify/forecast cash flows from the inputs available in company's financial statements and market information.

Disadvantages of income based approach

- 1) This method is uncertain as it is based on subjective assumptions relating to future cash flow and discount rate.
- 2) Both uncertain and distant cash flows and the discount rate are required to be estimated.

Self Assessment Question

(Spend 3 minutes)

- 1) What are the disadvantages of cost based approach?

.....

.....

.....

.....

Table 5.3 shows a summary of advantages, disadvantages and typical uses of the three major approaches.

Table 5.3 : Comparison of the three main quantitative patent valuation approaches

	Cost Approach	Income Approach	Market Approach
Advantages	<ol style="list-style-type: none"> 1. Objective and consistent. 2. Reliability of historic cost data. 3. If a recent acquisition cost of patent exists it is a reliable indicator of value. 	<ol style="list-style-type: none"> 1. Theoretically superior to other approaches as focused on future earnings or cash flow. 2. Consistency can be achieved facilitating comparison across a patent portfolio. 3. Widely accepted and concepts widely understood. 	<ol style="list-style-type: none"> 1. Practical approach which makes use of prices actually paid for comparable assets. 2. Variety of market-based approaches such as comparable companies, comparable transactions or a premium price-earnings-multiple approach allows comparison.
Disadvantages	<ol style="list-style-type: none"> 1. No correlation between expenditure on an asset and its value. 2. Difficult to distinguish between 'normal' operating expenses and patent investment expenditure. 3. Subjective nature of estimate of costs of replacement and some 	<ol style="list-style-type: none"> 1. Requires subjective cash flow allocation. 2. Translation of theory into practice requires assumptions which are limiting. 3. Relevant information is not always readily accessible from internal reporting systems. 	<ol style="list-style-type: none"> 1. Given the uniqueness of patents, third party arm's length transactions involving similar patents are infrequent. 2. Transactions involving the shares of companies owning patents are more frequent but allocating value

	patents may not be replaceable.		between the business and the patent is difficult.
Uses	<ol style="list-style-type: none"> 1. Where a patent has recently been acquired. 2. When the replacement cost can be estimated with a reasonable degree of reliability and confidence 	<ol style="list-style-type: none"> 1. Where information of an appropriate quality can be obtained. 2. The limiting nature of the assumptions needs to be understood 3. Where possible scenario analysis could be performed. 	<ol style="list-style-type: none"> 1. Where information on recent transactions involving similar /same patents exists.

5.10 ECONOMETRIC APPROACHES TO PATENT VALUATION

A variety of econometric approaches based on citation data, renewal data, and patent holder's estimation of value have been studied as tool for valuation of Patents. For example Hall et al (2000) employed citation-weighted US patent stocks to build an indicator of patent quality and showed that often cited patents (forward citation) are highly valued by market. Accordingly firms with such patents (more than 20 citations per patent) showed a 50% increase in value relative to firms with same level of R&D and patent stock but with a median citation intensity. According to a recent study patents that received more citations is suggestive of it better quality and they are more likely to be traded more than those patent that are rarely or never cited in patent document. For example a patent with only 1 citation over a period of 8 years was found to have an estimated probability of being traded of 0.0177; patents with 60 citations had a probability of being traded of 0.038; those with 100 citations, a probability of 0.063.

5.11 EVALUATION OF VALUE INDICATORS: IP SCORE

A variety of variables have been tested as indicators of patent value in various empirical surveys. Reitzig analyzes the appropriateness of the 13 best-known patent indicator/variables. Table 5.4 shows list of identified patent indicators.

Table 5.4

Indicators of patent value
Patent age
Market value of corporation
Backward citations

Forward citations
Family size
Scope
Ownership
Number of claims
Patenting strategy
Number of applicants
Number of trans-boarder research co-operations
Key inventors
Legal disputes (opposition in particular)

Hirschey and Richardson (2001) provide three scientific-based dimensions of patent quality. The details of Scientific-based indicators of patent quality are shown in Table 5.5.

Table 5.5 : Scientific-based indicators of patent quality

Indicators	Definitions
Current Impact Index (CII)	Number of citations generated by a company's most recent 5 years of patents, divided by the expected number of citations for similar high tech companies.
Science Linkage (SL)	Average number of "other references cited" on the front page of the patent, including academic journal articles and papers presented at scientific meetings.
Technology Cycle Time (TCT)	Median age (in years) of earlier patents references cited on the front page of the companies patents.

5.12 TYPES OF VALUATION METHODS

Arthur Andersen in a report on valuing intangible assets divides valuation methods into Cost, Market Value and Economic Value methods (Arthur Andersen & Co. 1992). However for the purpose of this discussion it is perhaps better to classify valuation methods for individual IP by the extra features they account for over and above less sophisticated methods. These can be summarized in increasing order of sophistication as:

- i) Cost based methods
- ii) Market based methods
- iii) Income Methods based on projected cashflows

i) Cost based methods

This method is based on the measuring of the quantitatively of the value of IP through the calculation of the costs incurred by the company to develop a similar asset either in-house or externally. In this approach the costs incurred through the development of the IP at the time it was developed, were measured (Historic Costs). This approach also measures the amount of investment needed to develop similar IP, at the present time, in exactly the same way and achieving the same IP as currently exists. The whole cost of research and development is included in this calculation, including the costs of unsuccessful prototypes etc. (replication cost). This approach measures the amount of money that would be needed to develop the IP as it currently exists, but as the term "replacement" signifies, the costs of failed and unsuccessful research is not included. (Replication Cost). In other words the costs to produce the IP are taken to be its value. Approaches based upon the measurement of cost are generally used in accounting, bookkeeping and in accordance with accounting rules. Cost based methods are useful where bookkeeping purposes and to supplement the income approach.

Advantages of cost based methods

- 1) IP assets becomes visible in the company's books
- 2) It increases IP awareness in the company
- 3) It provides source of knowing the value of the IP whose future benefits are not evident

Disadvantages of cost based methods

There are many pitfalls associated with using the measurement of cost to determine the value of IP. The main disadvantages are:

- 1) There is no direct correlation between cost of development and the future revenue potential of assets.
- 2) It is a fact that IP that costs the most to produce may not necessarily be the most valuable.
- 3) The same applies to IP which is many years old and has been written down in value.
- 4) This IP could still be the most valuable to the company, even though the historical cost approach does not show this.
- 5) The measure of historic costs is unreliable with rapid technological advancement.
- 6) It is not always possible to provide accurate information on the resources spent on development and there will always be a practical challenge to determine which costs to include or exclude.
- 7) Most importantly, cost based methods make no allowance for the future benefits which might accrue from the IP.

ii) Market based methods

In this approach IP value is assessed on the basis of comparison between the prices in recent comparable or similar IP transactions between independent parties.

According to this method observation of the prices of comparable assets traded between parties in an active market gives probable value to the subject IP. These approaches are based on the premise that the market decides the accurate price of IP assets and therefore the value of the IP. These methods include IP auctions, comparable market and comparable royalty rate methods. In IP auctions the value of the IP is determined by the price reached through bidding. In comparable royalty method the value of IP is based on the comparison of royalty rates used when licensing similar IP. Many IP value assessors use industry averages as a basis for setting royalty rates in license agreements. The value of the IP is given through the comparison of the subject IP with the royalty rates in similar license agreements. In Comparable market value method the value of the IP is given by comparison with similar comparable independent IP or similar transactions.

Advantages of market based methods

- 1) Observing the market is a relatively straightforward valuation method.
- 2) It is useful to check the validity of other approaches.

Disadvantages of market based methods

- 1) The uniqueness of IP makes direct comparison difficult.
- 2) There is a risk of comparing the subject IP with other IP which has been traded but which has still not been utilised to the full extent possible.
- 3) In these cases the IP can be undervalued.
- 4) When royalty rates are compared there are also some potential distorting problems.
- 5) Royalty rates set using returns to R&D costs, return on sales figures or industry averages run the risk of valuing costs or other factors rather than value.

iii) Income based methods

This approach relies on the premise of the ability of an IP asset to generate future income. In this method measure the potential future benefits of the subject IP are assessed to arrive at its value. Many income based valuation methods are being useful in assessment of the value of IP. We are giving here three very common methods.

- i) The discounted cash flow (DCF),
- ii) Risk adjusted net present value (rNPV) and
- iii) Relief from royalty methods.

Discounted Cash Flow (DCF)

This is the most fundamental and widespread of the income based valuation approaches. In this method the value of the IP is determined by computing the present value of future cash flows from the IP, over its useful life. The future cash flows so determined are then discounted back at a discount rate to achieve a present value. The other factors which must be accounted for in the discount cash flow calculations are the time value of money and riskiness of the forecasted cash flows. In order to achieve this specific discount rate is chosen depending on the

IP, which accounts for both factors at once. Alternatively, the forecasted cash flows can be adjusted to account for their riskiness and changing riskiness over time. These are then discounted at a risk free rate, which accounts for the time value of money. Both versions are widely used.

Risk adjusted net present value (rNPV)

This approach is an extension of the DCF method. This approach is especially relevant in medicines with technical risk during the development of IP assets. In order to account for technical risk, the cash flows of each stage of development are adjusted by fixed probability rates based on established industry indicators. For instance the probability of successful completing of the first stage of clinical trials may be 20%, second stage 30% and so on. The cash flows then are risk adjusted using these probability rates and discounted like DCF method. Example pharmaceutical and biotechnology industries.

Relief from Royalty

This is a cost saving approach where the cost that the firm may have otherwise have incurred in licensing-in the IP being valued, from a third-party is discounted while assessment of value IP is made. In this method the royalty that the company would have to pay for obtaining license for use of IP measured. According this the value of the IP is defined as the rental charge other companies would pay to use it. In this method first step involves estimation of royalty rate and then a reliable sales forecast is also calculated to estimate the income that flows directly from the IP. The royalty rates are then discounted through an appropriated discount rate like other income based approaches.

Advantages of income based methods

The advantage of these methods is that

- 1) It is relatively simple to assess the value on the basis of the conditions set up.
- 2) These methods are conceptually robust
- 3) It is possible to identify and or forecast particular cash flows as required inputs from the firm's financial statements and market information are easily available.
- 4) This method is useful, where information relating to comparable transactions involving third parties or industry standard royalty rates is available.

Disadvantages of income based methods

- 1) These methods are proved to be difficult to implement in high-uncertainty environments as it involves assessment based on some uncertainty and subjective assumptions.
- 2) A significant disadvantage of these methods is that both uncertain and distant cash flows and the discount rate have to be estimated.
- 3) Absence of an experience based estimation of the market potential and therefore of the cash flow of early stage of IP developments.
- 4) All risks are grouped together and are assumed to be appropriately adjusted for in the discount rate and the probabilities of success, rather than being dealt with separately (such as legal risk, technological risk etc.).

- 5) A significant drawback of the relief from royalty method is that a royalty rate can always be assumed, even if it is not materialised in future.

vi) Option pricing based methods

The theory behind option pricing was primarily developed for use in pricing financial options but can also be applied to a number of other situations other than directly financial assets. The valuation of IP still in development or being commercialised is one of such framework. In these methods options are valued using the Black-Scholes option-pricing model, which is a mathematical model for the valuation of options. Option based methods belongs to the income based methods category as they also use expected future cash flows to the measure value. The options method is particularly useful where high degree of uncertainty exist and all the information is not available at the time of making valuation. This method is being found useful in biotechnology and pharmaceutical patent valuation and during early stage IP developments.

Advantages options based methods

The primary advantage of the real options method is that

- 1) It incorporates the value associated with the uncertainty and accounts for the flexibility inherent in the development of IP.
- 2) It accounts for the value associated with the uncertainty of cash flows and the ability to manage the development of the IP.
- 3) It values the stream of cash flows Like the DCF method
- 4) It also accounts for acquired knowledge.
- 5) It provides a more complete evaluation than the DCF as it captures more than simply cash flows and static costs.

Disadvantages of options based methods

The main disadvantages of the option based methods are

- 1) Options based method evaluation is the complex and difficult.
- 2) This evaluation can be costly.
- 3) The accuracy of options based methods for use with real investments such as IP is doubtful as option based models over-value IP through the inclusion of non-viable development and commercialisation decisions.

5.13 SUMMARY

Patents are being exploited as most valuable IP asset and proper assessment of their value is increasingly necessary in view of expanding range of patent management activities. IP managers evaluate patents worth while taking decisions relating to filing a patent application or renewal of exiting a patent, or for calculating royalties for patent licensing contracts, or estimating the value of a Patent portfolio during mergers or acquisitions or, estimating the corporate value of their company. Difficulties or inconsistencies in valuation methods can impede each of these efforts. Number of viable methods has been developed to value patents but their use has many limitations. Though many new approaches to value patents are

continue to be developed and improved, yet no single method is sufficient to address all the concerns relating to valuation of patents. Increasing patent licensing market seeks acceptable and reliable patent valuation methods which have been developed and employed mainly by the private and academic sectors. IP valuation methods are divided into Cost, Market Value and Economic Value methods. However, in some countries (Denmark and Japan), governments have developed analytical tools such as IPScore, to help firms to value and exploit their patents. This has been done primarily to establish the use of a common set of well defined tools that enables patent holder to more easily and accurately value their patent holdings and provide some assurance of the validity of the valuation.

5.14 TERMINAL QUESTIONS

- 1) Differentiate between Income based, cost based and market based methods for valuation of patents.
- 2) Write Short note on the econometric approach to patent valuation.

5.15 ANSWERS AND HINTS

Self Assessment Questions

- 1) Refer to Section 5.4
- 2) Refer to Section 5.9

Terminal Questions

- 1) Refer to Section 5.9
- 2) Refer to Section 5.10

UNIT 6 IP VALUATION - METHODS OF PATENT VALUATION

Structure

- 6.1 Introduction
- 6.2 Objectives
- 6.3 Why Value Patents?
- 6.4 Patent Suits and Patent Damages
- 6.5 When Patent Valuation is Required?
- 6.6 Who Needs Patent Evaluation?
- 6.7 Popular Methods of Patent Valuation
- 6.8 Econometric Methods of Patent Valuation
- 6.9 Methods to Monetize Patent
- 6.10 Patent Value Predictor Model
- 6.11 Summary
- 6.12 Terminal Questions
- 6.13 Answers and Hints

6.1 INTRODUCTION

The efficient and effective management of innovative ideas is core factor in IP management of growing companies. It requires managing of both patent applications and granted patents. In order to take a sound decision in this matter the IP managers venture to make accurate assessment of the value of the patentable idea. For every IP manager it is therefore essential to know the value of every patent sufficiently accurately if one is to make well-founded decisions about their management. Forecasting financial gains from patented invention require understanding of the risks involved in taking idea to market. Not only the cost of obtaining patent but also cost of its enforcement must be looked into while making the assessment of its real value. Patent value evaluator faces numerous challenges like potential invalidity proceedings, potential infringement and infringement proceedings, obsolescence, or lack of demand for a license or the invention itself. In order to mitigate these risks various methods may be used to determine the value for a single patent, as well as for a portfolio of patents. Prior to the mid-nineties, it was not uncommon for companies to let their patents go to waste simply because there was no immediate use for the product or the company could not determine how to exploit it. It is only within the last decade that companies have begun to actively attempt to exploit their patents. In fact 80% of the value of all publicly-traded companies comes from intangible assets, including patents.

In the knowledge based economy firms seek exploit their patented technology not only for production of new patented products and processes but also for licensing them to other firms and use it as a tools for generating extra funds from

banks and venture capitalists. This brings importance of efficient technology markets and effective IP valuation schemes into forefront for IP managers. While efficient technology markets improves innovation processes by facilitating exchanges of patented inventions (via sale or licensing) among private and public sector actors to commercialise them the accurate and acceptable valuation techniques facilitate not only technology transfer, but open up many channels for exploiting IP. It facilitates such as decision to file a patent and investment in firms which hold patents. In this unit we will consider the case of only those patents whose value constantly needs assessing during the application process, on renewal and for licensing, purchase and sale negotiations. In this unit we will study why early valuation of patent is necessary, what are the various methods of valuation of patents? We will analyse the Current practice in patent valuations including accounting methods, discounted cashflow (DCF) and econometric methods based on renewal and stock market data.

6.2 OBJECTIVES

After studying this unit, you will be able to:

- explain the purpose of patent valuation;
- describe needs for the valuation of patents;
- explain when patent valuation is required;
- elaborate the Patent suits and damages;
- explain popular methods of patent valuation and their limitations; and
- compare between popular methods of patent valuation.

6.3 WHY VALUE PATENTS?

Patents allow the creators of innovative idea to appropriate profitable returns from their innovations. All innovative ideas covered by patents are not profit earners but some patents may turn out to be of extraordinary value. It is well established fact that barring few big companies IP budgets are limited. This makes even more important for the IP managers to find a method of assessing the value of patents which can guide them in arriving at decision to either to renew useful patents or drop the unused patents. We know that patent provides the owner the right to exclude others from making, using, offering for sale, or selling or importing the claimed invention and if this right to exclude is combined with foreseeable commercial success it makes the patent with enormous financial value. Receiving a patent is only the first step in trying to gain value from it. Most commonly, patent owners hope to extract value from the patent through licensing, cross-licensing, or use of patent pools or enforcement through lawsuits against infringers. Patents are also being used as collateral for loans, and more recently royalties from patents have been used as cash flow vehicles for securitization. It is for these uses of patents where patent holders begin to find the reasonable and acceptable price for their patent holdings. When determining the value of a patent is not an easy task for existing technologies then one can expect it to be far more difficult for emerging technologies. When patents are owned by individual inventor or small start-up companies they really have very high royalty expectations where they know that their patents have potential to kill businesses or earn high damages from an infringer.

6.4 PATENT SUITS AND PATENT DAMAGES

If we look at records of last twenty years of the patent suits and the damages awarded we find that value of patents in suit appears to have risen dramatically some of the leading cases listed below shows that there were more than ten damage awards over one hundred million dollars.

Landmark patent suits and of amount of patent damages received

- 1) Polaroid v. Kodak \$873.2 million [Instant camera technology]
- 2) IGEN v. Roche \$505 million [Serono patent]
- 3) Hope v. Genentech \$500.1 million [human insulin patent]
- 4) Haworth v. Steelcase \$211 million [Moveable office panel with built-in electronics]
- 5) Hughes v. Smith \$204.8 million [Drill bit case]
- 6) P&G v. Paragon \$178.4 million [Disposable diaper]
- 7) Exxon v. Mobil \$171 million [Metallocene catalyst patent]
- 8) Fonar v. General electric \$128.7 Million [MRI technology]
- 9) RIM v. NTP \$612.5 million [Wireless email patents]
- 10) 3M v. Johnson & Johnson. \$ 107 million [3M in its medical casting tape patent]
- 11) Microsoft v. Michel Vulpe \$ 200 million [i4i XML patent in Microsoft Word]
- 12) Cordis v. Boston Scientific – \$271 million [Stent patent]
- 13) Eolas Technologies and the University of California v. Microsoft \$527million for [Internet Explorer Web browser that allows embedded links]
- 14) Uniloc USA, Inc. v. Microsoft Corp \$537 million [An antipiracy software technology of Uniloc founder Ric Richardson]
- 15) Rorbert W. Kearns v. Ford \$10.2 Million [Intermittent wiper]

6.5 WHEN PATENT VALUATION IS REQUIRED?

Need for patent valuation arises because of the following reasons

- 1) All patents are not equal and the estimated patent value is highly biased.
- 2) Only few patents have a high value
- 3) Since market for technology is developing patents are increasingly monetized
- 4) Patent disputes are increasing and so is the compensation damages for infringement
- 5) Patents have potential to kill businesses

- 6) Companies are adopting IP based accounting standards which require assessment of fair value of Intellectual Assets (including patents)

6.6 WHO NEEDS PATENT EVALUATION?

- 1) **Inventor** holding a patent and willing to sell it
- 2) **Investor** willing to buy a technology-based start-up with only patents in its balance sheet
- 3) **Auditor** willing to ensure the fair value of the intellectual assets reported by a large firm on its balance sheet
- 4) **Judge** willing to grant compensation damages for a claimant whose patent has been infringed
- 5) **An economist** willing to use patent counts as a measure of technology output
- 6) **A patent fund** willing to securitize a patent portfolio

6.7 POPULAR METHODS OF PATENT VALUATION

Valuation of a patent or patent application whether explicitly or implicitly is like making judgements about the future of bulls and bears in stock market prices based on the judgements of investors about the future performance of a company. Patents are different from other IPRs as they are subjected to a particularly wide range of decisions both at the time they are being applied for and following grant. Patents thus involve both a high degree of complexity in how they are managed and also a high degree of uncertainty as to their eventual value. However for the purpose of this unit we classify valuation methods for individual patents by the extra features they account for over and above less sophisticated methods. These methods are summarised below in the increasing order of sophistication as :

1) The Cost Method

The Cost methods are applicable for recently developed invention, or in-development or non-commercialized invention for which development cost or development effort data are available. This method is based on accounting for historical cost like costs of creating IPRs or historic costs of acquisition with deduction of any allowances for depreciation or obsolescence. This method however makes no allowance for the future benefits which might accrue from the patent. This method is useful where historical cost based accounting systems or where taxation methods dictate their use and useless for making rational decisions. Here value of patent is estimated as replacement cost new (RCN) less Depreciation (RCN minus D). The replacement cost new (RCN) is calculated by adding

- direct costs (person-months × cost per month)
- indirect costs (out-of-pocket costs)
- developer's profit (return on cost investment)
- entrepreneurial incentive (opportunity cost during patent development period)

In order to calculate following cost are added

- functional obsolescence (excess operating costs)
- technological obsolescence (age/life before replacement)
- economic obsolescence (inadequate ROI)

Limitations of Cost method

- 1) The cost method may place a lower limit on the valuation as patent owner commonly tends recoup development costs.
- 2) Owners of patents generally lack appropriate mechanisms to track invention development costs
- 3) This approach does not account for the ability of a patent to generate profit.

2) The Design Around Method

The design around method values a patent at the cost of designing around the claims of the patent. The design around method may place an upper limit on the valuation, since it usually doesn't make sense to pay more for a patent than it would cost to develop an alternative product.

Limitations of the design around method

- 1) The design around method does not account for the ability of a patent to generate profit.
- 2) The valuation of patent tends to be on the higher side

3) The Comparable Transactions Method

1) Comparing market rate of patent

This is a market based methods for valuation of patent assets where comparative study is made on the prices of comparable assets which have been traded between parties at arm's length in an active market. Here the cost of a patent act as useful guide to its value when the cost concerned is the price paid for the same patent in a very recent comparable commercial transaction. However the patent licensing and sale applies comparing market rates to arrive at a base market price. In other technology transactions cases, comparability with other patents whose value is known from market transactions is the main problem as it is risky to make comparisons which may not be justified and be of not more than convenient measures of value. According to Parr and Smith (1994) the comparative transaction used may relate to an IPR whose use may not represent the best use of the IPR to be valued and in such cases values derived from them will be suboptimal.

Limitations of comparable market rate of patent

- 1) Comparing Market rate for valuation of patents has little or no utility because no two patents are similar enough for the sales price of one to define the value of another
- 2) Since most patents are not bought or sold in an 'arms length negotiation' and therefore we it is difficult to get an objective sale price.
- 3) Most of the patent sale and license transaction are usually clubbed with other factors including tech transfer or line of business transfer.

2) Comparing Royalty Rates

In another variation the market based valuation methods may be based on comparable royalty rates. This method is based on the surveys conducted to arrive at an industry averages royalty rates. These averages are usually used as a basis for calculating royalty rates in licensing agreements or in establishing damages in litigation. But such calculations do not take into consideration virtually all factors other than those which people think is the "market rate". In doing so there is a risk of incorrect valuation and use of such average royalty rates may merely perpetuate sub-optimal decisions by a few leading companies throughout an industry.

Limitations of comparing royalty rates

- 1) It is difficult to find comparable patents
- 2) There is no guaranty that the royalty rate calculations of the comparable patent would properly account for its ability to generate profit.
- 3) Royalty rates selected on some other basis than an industry average rate can also have problems.
- 4) Royalty rates set using returns to R&D costs or return on sales figures for the company or industry for example run the risk of valuing costs or other factors rather than value.

4) Income Based Methods - Accounting for Future Value

Income based method is applicable in certain circumstances. Patents rights inherently have limited period for its enjoyment. We can determine the income resulting from ownership of a patent over that period of time and assign a value to the patent treating it as a long term bond. In other words the micro economic data such as gross sales and net income derived from the sale of the patent products including any revenue derived from licensing the patent is collected. This data is used to determine the anticipated economic benefit of owning a patent. This method also requires a techno-legal analysis of the patent document to determine the scope of the claims of the patent to know the size of the market covered by it. It is also necessary to determine the cost advantage of the patented technology over the alternative technologies for that market. This method has an advantage over the cost based methods of valuation as inclusion of some forecast of future income from a patent add some certainty to the value of the patent as opposed to just its estimated market price or its cost.

Limitations of Income based methods

- 1) The techno-legal analysis of a patent is often costly and prohibitive for purposes of business valuation, capital allocation, taxes, and licensing.
- 2) The data necessary for performing analysis of patents is simply not available.
- 3) Since this data includes relationships between patents, product lines, product line specific costs and earnings information, and licensing royalty rates and terms and the companies do not make such data public the micro economic analysis of patents at times is not feasible.
- 4) Using Income based methods to value a patent is labor intensive, costly, and complex.

5) DCF Based Methods - Accounting for Time and Uncertainty

The income based method involve some element of forecasting the future cash flows but it do not take into to account for the elements of time and uncertainty in future cash flows. Discounted Cashflow (DCF) methods of valuation are therefore used to arrive at the value using a risk adjusted discount rate to discount the forecast cashflows. This accounts for both the factors such as the time value of money and riskiness of the forecast cashflows.

The key issue in these methods is how the forecast cashflow is arrived at. It may be possible to identify or forecast particular cashflows which are associated with a particular IPR through licensing or through direct exploitation. Alternatively it may be possible to use ideas similar to those used in brand contribution methods to calculate the contribution to a business of a given patent. This may involve study of the costs of unpatented goods, of the return on capital of unpatented goods, of the return on assets of unpatented goods or of the price commanded by unpatented goods with the actual financial data for the IPR related business. Such methods are in some senses market based methods since they rely on market based averages. A further and very common method based on industry average royalty rates assumes that the income due to a patent per se is the royalty which would have to be paid by a licensee. Needless to say the same cautions apply as when setting royalty rates directly based on such average rates as described above.

The discounted cash flows method take into consideration the amount of profit that a patent can generate. It is for this reason this method is being commonly used for patent valuation. Since his method relies upon company specific profit projections and the use of a risk premium it makes the patent valuation far too subjective. In this method the company specific profit projections determine the amount of profit from the commercialization of a patent could be realize. The risk premium here is part of the discount factor which determines the present value of the profit projections. The risk premium reduces the amount of the valuation in order to account for the uncertainty associated with the company specific projections. The company specific profit projections and the risk premium are difficult to determine, therefore the discounted cash flows method is subject to the undesirable effects of bias and manipulation. Both the profit projections and the risk premium are liable to manipulation, in view of desired valuation favouring either of the party. Even when performed diligently, it's difficult avoid personal biases.

Limitations of discounted cash flows method

- 1) The profit projections and the risk premium are difficult to determine
- 2) This method suffers from undesirable effects of bias and manipulation.
- 3) The company specific profit projections difficult to determine .
- 4) Each party tends to find a valuation in its own favour.

6) Maximum Achievable Profit Method

A new method for determining the value of a patent is referred to as the maximum achievable profit method. This method eliminates the use of company specific profit projections and the risk premium of the discounted cash flows method. This method is transparent because the grading can easily be reviewed to determine

why a particular valuation was provided. The relationship between the score and the valuation depend upon the maximum achievable profit and the amount of investment required to achieve this profit, since these factors affect valuation. This method estimates the present value of the maximum profit that the patent can achieve by using a transfer function to convert the maximum achievable profit, investment amount, and score into a valuation.

The following algebraic expression is used to determine the value of a patent.

$$VAL = (MAP+INV)^e - \frac{(Score - 100)^2}{40} - INV$$

VAL = the valuation;

MAP = the present value of the maximum achievable profit;

INV = the investment amount; and

SCORE = the score

Limitations of maximum achievable Profits methods

- 1) Not applicable to cases with loss
- 2) Requires explicit consideration of all known factors that affect value
- 3) This method is more cumbersome than other methods as it requires more knowledge and efforts as compared to other methods

Comparison of popular patent valuation methods

Method	Cons	Pros
Cost	Does not consider profits.	Sets lower limit on value.
Design Around	Does not consider profits.	Sets upper limit on value.
Comparable Transaction	<ol style="list-style-type: none"> 1) Difficult to find comparable transactions. 2) May not consider profits. 	<ol style="list-style-type: none"> 1) May consider profits. 2) Can be accurate (if profits were properly considered).
Discounted Cash Flows	<ol style="list-style-type: none"> 1) Subject to bias and manipulation. 2) Uses company specific projections. 3) Uses subjective risk premium 	<ol style="list-style-type: none"> 1) Considers profits. 2) Can be accurate if bias and manipulation are avoided.
Maximum Achievable Profits	<ol style="list-style-type: none"> 1) Requires explicit consideration of all known factors that affect value 2) Requires more knowledge & effort than other methods. 	<ol style="list-style-type: none"> 1) Considers profits. 2) Less subject to bias and manipulation. 3) Uses more general market projections for an ideal management team. 4) Does not use a risk premium. 5) Explicit consideration of all known factors enhances accuracy.

6.8 ECONOMETRIC METHODS OF PATENT VALUATION

If we look at the above methods these methods are mostly developed by either academics or economists. Outside the field of academic and economics valuation of patents use of econometric methods are probably little known. These methods generally deals with aggregate values for particular types or bunch of patents rather than the individual patents. We are dealing with these methods briefly for the sake of completeness and for the interesting insights it gives into patent values as a whole.

1) Stock Market Based Methods

This valuation is based on the findings of Pakes Griliches and Kingston that 'the stock market did take account of unpredictable changes in R&D levels and levels of patenting by firms'. Pakes also noted that the results "may reflect an extremely dispersed distribution of the values of patented ideas". Accordingly he observed that 'this may not be of immediate practical help in valuing patents but it is relevant to the idea that patent's values are to a certain extent reflected in stock market valuations.' Therefore Stock Market values is linked to values of the IPRs held by the company. This is so as there is at least a possibility of finding shares which might reflect the volatility of returns considering patents held by the firms.

2) Renewal Data Based Methods

Other econometric method for determining value of patent is based on the patentees interest in patent renewal. The patent renewal data is a one of the way of measuring the patentees assessment of a patents worth. The advantage this an approach lies in the fact that it is aimed at the value of the patent alone. It is thus probably a better valuation of the potential opportunities, for example licensing opportunities, than might be obtained from a stock market valuation, since the patentee usually has better information than the stock market does. This method is having limitations as it is only useful for valuing patents retrospectively and usually only in aggregation. It may give overestimates if the organisation encourage conservative renewal policies. Further as the value is merely viewed relative to payment of annuities and it excludes other incidental expenses it may be an underestimated value.

Student should note that the above categorisation is not comprehensive but only illustrative as it is not possible even in the most sophisticated valuation methods to account for all factors Therefore, it needs to be remembered that any valuation method is merely a starting point or a help towards better decision making.

6.9 METHODS TO MONETIZE PATENT

1) By Exclusive licensing

A common method companies use to monetize patents is to find an existing manufacturer capable and willing to manufacture the invention and to subsequently license the patent to the manufacturer. Being able to license the patent is a key first step in the securitization process. Through licensing, the inventor would allow another to profit from his efforts in exchange for regular license payments. Using

the right to exclude others from making the patent, the owner does not commercialize the invention, but will allow some to make the invention while preventing others from doing so. The patent owner thus gains revenue from the licensee rather than from directly manufacturing the invention. But how much the patentee can earn from this licensing activity again depends upon the need for the technology and purchasing power of the licensee. The patent owner tends to generally recoup the development cost with some lump sum amount.

2) Outright sale – patent auction

Many patent holders decide to sell a patent through patent auction. The patent holders normally engage experts to value their patents and find a suitable buyer in an auction. Many free patent auction sites are available on the internet. One of the popular such site is Patent Auction.com. (Formerly known as FreePatentAuction.com) This is an online marketplace for selling of patents operating since 2004. Inventors can list their patented inventions (or patent pending) without any payments. In 2006 Ocean Tomo LLC introduced the world's first live public auctions of patent. First patent auction in India was organised by Foundation for MSME Cluster in alliance with Skyquest Technology Consulting in 2010 at Ahmadabad. Patent auction is emerging as most popular way for patent sale.

6.10 PATENT VALUE PREDICTOR MODEL

The Patent Value Predictor model for valuing patents model is developed implemented by as a web service, and it provides valuations for all enforceable U.S. patents in real time. This valuation is based on the relationship between measurable properties of patent documents and patent value. Plainly speaking the broader the claim protection, the more valuable the patent will be. The PatentValuePredictor model indicates that the majority of the most valuable patents for many years were in the Pharmaceutical or Biotechnology. Ten currently most valuable US patents based on "PatentValuePredictor" 2004 are listed below.

Patent	Issued	Est Value (\$)	Assignee
6,517,866	2/11/2003	1,797,722,689	Pfizer
6,500,987	12/31/2002	1,570,968,527	Teva
6,465,496	10/15/2002	1,408,931,126	Teva
6,452,054	9/17/2002	1,220,308,695	Teva
6,221,640	4/24/2001	1,194,927,644	Cubist
6,071,970	6/6/2000	1,107,999,343	NPS
6,319,919	11/20/2001	1,081,784,355	Syosset
5,610,034	3/11/1997	1,071,288,767	Alko
6,022,716	2/8/2000	1,069,310,287	Genset

6.11 SUMMARY

Several methods for valuing patents are being used but some methods are more popular than others. Most popular methods include cost method, the design around method, the comparable transactions method, and the discounted cash

flows method. Less popular methods of patent valuation are Stock market based and Renewal data based method. The less popular methods are occasionally used as they are complex and unreliable. Even the most popular methods are not free from shortcoming. None of these popular methods for patent valuation attempt to explicitly consider all of the known factors that affect patent valuation. Another hindrance is the lack of practical methods for valuing them during the early stage of their development in their life when uncertainty about their future prospects looms large. This leads to either under-valuation or over-valuation which may result in sub-optimal decision making during management of patent portfolio. On one hand assessing value of a patent is a daunting task for investors. On the other it is being regularly done by courts to determine infringement damages or by banks and buyer companies in merger and acquisitions. Further, contemporary methods of patent valuation do not provide a mechanism for accounting for the amount by which each of factors individually contribute to a patent's value. Each of the factors that affect the value of a patent contribute in a unique way to its value. Unless the amount of each factor's contribution is properly considered, accuracy is sacrificed. Hence it is practically impossible to mark which method of valuation is best suited. The efforts are in progress to evolve more new methods to find a most suitable one that is to acceptable all concerned.

6.12 TERMINAL QUESTIONS

- 1) Why valuation of patent is necessary?
- 2) What are the most popular methods of patent valuation ?
- 3) Write note of econometric methods of Patents valuation.
- 4) What is Patent Value Predictor Model?

6.13 ANSWERS AND HINTS

Terminal Questions

- 1) Refer to Section 6.3
- 2) Refer to Section 6.7
- 3) Refer to Section 6.8
- 4) Refer to Section 6.10

UNIT 7 INTELLECTUAL PROPERTY AUDIT

Structure

- 7.1 Introduction
- 7.2 Objectives
- 7.3 Definition IP Audit
- 7.4 Intellectual Property Audit Team
- 7.5 When to Conduct an Intellectual Property Audit?
- 7.6 Key Areas of IP Audit
- 7.7 Intellectual Property Audit Breakdown
- 7.8 Intellectual Property Audit Illustration
- 7.9 Benefits of an Intellectual Property Audit
- 7.10 Summary
- 7.11 Terminal Questions
- 7.12 Answers and Hints

7.1 INTRODUCTION

In the knowledgebase economy effective creation and management of knowledge based assets as IP assets requires understanding the nature of IP which will provide maximum returns. People who take risk to invest in R&D to produce new and innovative goods seeks to protect and exploit the IP assets to appropriate profitable returns of their innovations. This involves daunting task of the companies and their IP Managers to correctly assess the usefulness of IPRs. This demands these organizations to have in place the tools to manage the knowledge contained within them. Some examples of IP assets are patents to protect inventions, trademarks and service marks to protect organizational goodwill, copyright to protect publications, and a well-designed licensing program to allow the organization to commercialize and capitalize on its intellectual property. In this unit we will study what is IP audit, when IP audit is required, what are the objectives and purposes of IP audit and why IP audit is essential?

7.2 OBJECTIVES

After reading this unit, you should be able to:

- explain what is meant by IP audit;
- describe the how patent auditing is done;
- analyse why IP audit is necessary; and
- describe when IP audit is necessary.

7.3 DEFINING IP AUDIT

The term intellectual property audit is used to define the process of cataloging of intellectual property assets of an organization. An IP Audit is defined as a systematic review of the IP owned, used or acquired by a business. Its purpose is to uncover under-utilized assets, to identify any threats to a company's bottom line, and to enable business planners to devise informed strategies that will maintain and improve the company's market position. All IP driven organizations view process of intellectual property auditing as a balance sheet for knowing the value and utility of their intangible assets. IP audit help organizations to make self-evaluation of their IP assets to project the book value of the organization in the capital market. This also helps to determine how to best capitalize on those assets, and keep abreast with changing values of its assets in dynamic of economic ecosphere. The IP managers who are constantly and consistently engaged in facilitating mergers, acquisitions, or other transfers require IP auditing to meet the requirement of due-diligence to arrive at a appropriate value of the organization involved in such activity.

7.4 INTELLECTUAL PROPERTY AUDIT TEAM

It not corrects to say that "Intellectual property audit is a mere counting up of assets". It is also not true that the IP Audit team conducting the audit simply adds up the intellectual property found in the organization and reports its value. An intellectual property audit is an inherently legal undertaking and it is diligently performed by a team of experts comprising of an attorney who is an expert in intellectual property law either in-house or outside counsel, or by the in-house personnel of the organization with sufficient knowledge of the organization's intellectual property. Since IP audit is not an accounting function, finance department has no role in making such audits. The IP Audit team makes an assessment of the legal status and value of IP where the marketing and management goals of the organization and the existing protection of the organization's intellectual property are somehow not well suited to each other. The attorney and other team members and at least one representative from each of the management, marketing and technology area is required in the constitution of the IP audit team.

7.5 WHEN TO CONDUCT AN INTELLECTUAL PROPERTY AUDIT?

Conducting of Intellectual property audits is required on several occasions and times in the life span an Organization. Some of these import occasions are :

1) When the new intellectual property management team is constituted

When the organization constitute a new IP management Unit the new IPmanager should get thorough intellectual property audit conducted to become familiar with the status of the portfolio.

2) When a significant corporate change such as Merger, Acquisition, Significant Stock Purchase is envisaged

When an organization take decision to strength its competitive position or market share it opts for significant corporate change through merger, acquisition, significant

stock purchase which significantly impacts its IP ownership and it becomes essential to reassess the value of IP through an internal intellectual property audit.

3) When the transfer or assignment of Interest in Intellectual Property is required

A transfer or assignment of intellectual property from one organization to another requires an intellectual property audit of both organizations' intellectual property to ensure that the transfer or assignment meets the interests of both of the organizations. This is done by to secure that the intellectual property is properly protected and enhances the acquiring organization's existing IP value and intellectual property interests. This also ensures that the intellectual property transfer does not leave any unplanned vulnerabilities for the organization transferring the interests.

4) When a licensing programme is planned

When an organization sets up an intellectual property license or licensing programme then IP audit must be performed on regular basis. It makes no difference whether the organization is the licensor or the licensee. In case the organization licenses its intellectual property to others, it must ensure no existing licenses interfere with the proposed new license. When organization is the licensee for the intellectual property of another, the IP audit helps in determining that meets and bounds of the IP obtained.

5) When there is significant change in law

Any significant change in statutory law may require an organization to re-evaluate its intellectual property. One such change in statutory law occurred when new patent law was passed for allowing product patents for food, chemicals and pharmaceuticals in India. This change in the law significantly impacts the analysis of the potential liability of pharmaceutical companies for infringement of the patents in these fields.

Examples of such change and its impact on IP policy.

- *Novartis* case (which deals with patentability under section 3(d)) [India]
- *Qualitex* case (which deals with the protection of color as a trademark) [US]
- *Betamax* case (which deals with the question of whether a device that can be used for copyright infringement is itself an infringement of copyright) [US]
- *Festo* case (which deals with the Doctrine of Equivalents in patent infringement) [US]

6) When there is a financial transaction involving IP

This is relevant where the financial transactions involving intellectual property includes securing loans, public offerings of shares, securing FDI or inviting venture capital. In such transaction it is important to get the IP audit done to ascertain the real worth of the IP and projecting it as a bargain offer.

7) When change in IP policy is envisaged

Where an organization is aggressive in foreign patent filing program, new marketing approach or direction, expansion of a product line or services, corporate

reorganization, or any other corporate change that would directly impact its intellectual property assets and its position in the marketplace it is necessary that an intellectual property audit is performed.

Self Assessment Question	(Spend 3 minutes)
1) When is an IP audit conducted?	
.....	
.....	
.....	
.....	

7.6 KEY AREAS OF IP AUDIT

Next question which is being generally asked what should be the focus of the Intellectual Property Audit. According to IP experts each intellectual property audit should focus on four key areas viz

- 1) Identifying all the intellectual property assets within the organization.
- 2) Identifying problems that exist with the intellectual property ownership.
- 3) Identifying defects in title or enforceability of the organization's intellectual property.
- 4) Identifying unprotected intellectual property assets.

1) Identification of Intellectual Property Assets

Identification of all of the intellectual property assets of a organization, involves identifying the intellectual property subject matter and it is useful for the organization. Kind of IP mainly depends on the activity of the organization. For instance artistically based organization would have copyright protection in place. Similarly a technology-based or manufacturing organization, would rely heavily on patent and trade secret protection and less on copyright protection. However all the organizations are likely to have logos and trademark protection in place. Organization providing service would get protection of their service marks.

2) Identification of Intellectual Property Problems

After identifying the key area of IP the IP audit team would assess the strength and weakness of IP owned by the organization. This helps them to identify the problem area related to ownership of IP if any. Here IP audit team performing the intellectual property audit attempts to trace the chain of ownership of intellectual property back to its creation and looks for assignment agreements from employees, former employees, contractors, strategic partners, acquired companies, and others who may have rights in the intellectual property if not assigned.

3) Identification of Defect in Intellectual Property Title or Protection

Next stage in the IP audit involves in indentifying the asset that is entitled to more protection than the asset currently enjoys. This is true where IP assets like patents are involved. This is important as the key protection can be lost forever if the

organization postpones the decision to pursue the registration for too long. This problem is more in those inventions, where the inventor has disclosed or used the invention in public more than one year before the organization applied for the patent. IP audit team should also identify valuable trade secrets relating to the organization and seek non disclosure agreements where necessary to protect such trade secrets from misappropriation.

4) Identification of Unprotected Intellectual Property Assets

Lastly, it seen that copyright and trademark protection is mostly based only on common law because the organization fails to register the intellectual property with the appropriate statutory agency. This may cause problems when such IP rights are subjected to enforcement as patent rights especially are unenforceable unless inventions are patented with patent office. The IP audit team should identify any of these problems and suggest remedy. Further lack of registration of intellectual property may lessen its value. Therefore IP audit team must ensure that the proper registration is obtained by the organization to secure that full remedies are available for infringement of IP.

Self Assessment Question

(Spend 3 minutes)

2) What is meant by identification of IP assets?

.....
.....
.....
.....

7.7 INTELLECTUAL PROPERTY AUDIT BREAKDOWN

An intellectual property audit Team should look into major areas of intellectual property such as invention, patents, licenses, brands, trade secrets, designs, manuals, and know-how and will enable a company to identify successful and obsolete technologies. Each one of the area has its own importance and requirements. The IP audit team should monitor them separately.

1) Inventions

Inventions are the stepping stones in the development of every valuable intellectual property of the organization. This brings into focus of the audit team performing the audit to determine all the inventive activity carried out within organization. Once all such activities are recorded the audit team should identify any weaknesses in the organization's "harvesting" of the inventions ripe for launch. Here audit team look for the mechanism for disclosure of inventions and their assessment for patentability. The audit team also monitors the mechanism for checking R&D activity by walking through the laboratories and other workspaces of the potential inventors..

2) Patents

Once an invention is disclosed, the organization must determine whether to obtain a patent on it, and in which country or countries a patent would be most valuable

to the organization. Obtaining patent protection requires that the organization be aware of new innovations that occur in the research and development process. The audit team should look into the mechanism used for proper maintenance of records relating to new developments by R&D team. They should ensure that these records are reviewed and witnessed at regular and frequent intervals for determinations of patentability.

3) Brands and Trademarks

The Audit team performing the intellectual property audit should ensure that an organization do not to lose its rights in a trademark or service mark through abandonment of the mark, or through failure to timely file the application for registration of the mark. This team must look whether the proper assignment is made and recorded for each mark. The auditing team should confirm that the organization filed the required registration and maintenance documents with the trade marks registry. Any non user of a marks should be promptly reported to the organization seeking IP audit. The auditing team should look for any mark which has any danger of becoming generic and address it promptly and vigorously. Lack of proper auditing may result in mark becoming a generic descriptor for the goods and the right to trade mark is lost. "Escalator" and "cellophane" are two examples of such marks that became generic and therefore lost to their owners.

4) Licenses

One of the most popular ways to capitalize intellectual asset is licensing. This requires that interest of the IP assets owners must be well protected by a license agreement. The intellectual property audit team should look into the license agreements to ensure the that license agreement whether express or implied is in writing and clearly state the terms and conditions on exclusivity, royalty payments, knowhow transfer, further improvements, how the agreement can be terminated or modified, who defends the licensed technology in the event of litigation etc. As per Section 68 of the Indian Patent Act 1970 as amended by Patent (Amendment) Act 2002 w.e.f. 1.1.2005, "*an assignment of patent or of a share in a patent, licence or creation of any other interest in a patent shall not be valid unless the same were in writing and the agreement between the parties concerned is reduced to the form of a document embodying all the terms and conditions governing their rights and obligations and duly executed.*" Further Section 69 of the Act requires the registration of such assignments, transmission etc.

5) Trade Secrets and Knowhow

Every valuable patented technology contained in it valuable undisclosed information such as trade secret /know-how that an organization develops around the use of its patented technology. It cannot be found in the specification of the patent as such knowledge becomes available only when the technology is put to use. Patent law requires only that the best mode as of the date of filing be disclosed for grant of patent. The Trade secrets are protected by non disclosure agreements between the organization and its employees, between the organization and its independent contractors, between the organization and its business or technology partners. The intellectual property audit team should evaluate how well these agreements protect the valuable trade secrets.

6) Copyrights, Including Organization Handbooks

For an organizations based on printing, publishing and arts then copyright on these work of art becomes be its most valuable IP asset. Therefore any material

that is fixed and perceivable, directly or indirectly, in a tangible medium is copyrighted under the current copyright law. Though copyright subsists from the moment of creation but full protection is available when such work is registered in the Copyright Office. The intellectual property audit team should check the status of the registration of the written materials to ensure the enforcement of the copyright when any infringement of the written materials occurs.

7.8 INTELLECTUAL PROPERTY AUDIT ILLUSTRATION

The first step in the IP Audit process is to identify IP assets such as registered trademarks (TM 1,2), patents (P1,2....) designs b (D1,2....) or, copyrights owned by the business, including any licenses to third parties and any licenses from third parties, or cross-licenses. Other IP assets include work manuals, charts, publications and product/process know-how and trade secrets. After identification each of the IP's is then scrutinized to determine the ownership, registration status and whether in it is being used. The individual IP components are then given an importance rating based on the factors such as their link to the seed technologies of the organization, the life expectancy of the product and the exclusivity of the technology. Then estimated value of every item is calculated based on the cost required to replace the item. Further assessment is made to find the potential of the IP to increase the revenue of the organization.

An illustrated example of provisional IP Audit is give below:

IP Assets	Product Life (yr)	Extent of Use	Importance	Estimated Value Rs.
<i>Trademarks</i>				
Tm1	10+	***	***	10,000,00
Tm2	1-2	**	*	2,000,00
Tm3 etc	10+	*		1,000,00
<i>Patents</i>				
P1	15	***	***	15,000,00
P2	2	**	**	5,000,00
P3 etc	10	*		1,000,00
<i>Designs</i>				
D1	4	*	***	350,00
D2	10	***	****	400,00
<i>Copyright</i>				
Forms	5	**	*	100,00
Charts, etc	5	*	*	150,00
Manuals	5	**	**	500,00

Publications	1-2	*	**	150,00
<i>Trade Secrets/knowhow</i>				
Trade Secrets	15	***	*****	4,000,00
Knowhow	10	***	*****	2,000,00
<i>Licenses</i>				
Licenses In	1-2	*	**	10,000,00
Licenses Out	5	**	*	10,000,00

The table above merely illustrates how an IP Audit is done and in this example IP Audit is done to identify just what IP assets are owned by a business and how important those are to the firm. In this example, the most valuable assets are clearly the product brands TM1 and a patent listed as P1. With this assessment the Company Management can take decisions to ensure that the patented technology is not being infringed and that the product brands are used effectively.

7.9 BENEFITS OF AN INTELLECTUAL PROPERTY AUDIT

An intellectual property audit is beneficial to intellectual property owners, buyers and investors.

Intellectual Property Owners

Intellectual property owners get benefits from an intellectual property audit in many ways such as

- 1) It provides a most appropriate means to assess the value of the organization when they depend on that property as a component of the organization's value
- 2) It provides a most appropriate means to assess the value of royalty from a license when the property is licensed
- 3) It provides a most appropriate means to assess the value of IP when there is litigation over the property
- 4) It provides a most appropriate means to assess the value of IP when they sell their stock or corporate assets, or when they engage in commerce involving the property.

Intellectual Property Buyers

An intellectual property buyer is acquiring the stock or assets of a company, is benefited by an intellectual property audit in many ways such as

- 1) To determine the scope and level of protection in place and needed to make the investment worthwhile.

- 2) To find any licensing or distribution rights that are already in place in the company and those that the company may be contemplating putting in place.
- 3) To determine what protections are available for the property.
- 4) To determine whether the property is adequately protected against any potential third-party claims to ownership (such as if it was developed by consultants).
- 5) To determine whether the consultant has properly assigned the property to the organization, whether the property is security guaranteeing a debt.
- 6) To find if the required registrations are in place and properly maintained.
- 7) To determine if any part of IP was licensed or purchased from third parties, what rights to the third-party intellectual property the organization has purchased.
- 8) Where an intellectual property buyer is interested in simply acquiring rights to the intellectual property itself, IP audit team should find:
 - a) Existing licenses
 - b) Trade secrets associated with the IP
 - c) Any third party interest in the intellectual property owned by the organization?
 - d) IP which is related to a government-sponsored activity?

Intellectual Property Investors

An intellectual property investor is benefited from an intellectual property audit in many ways such as

- 1) To determine the IP strength and weakness to consider funding a start-up company or financing an existing business where intellectual property is the sole asset of startup and forms a major part of the value of an existing company
- 2) To ensure the due diligence of the investor to know that the property is fully protected.
- 3) To find the information about the IP through an audit to be useful as security on a loan.

7.10 SUMMARY

The intellectual property audit is emerging as an essential and important management tool for every organization in the knowledge based economy. In fact, a good IP audit is the only way to maintain and grow the intangible assets of the organization and to assess the true value of an organization. This is all the more important as the organizations are no longer dependent on the price of its real and personal property. Today, IP managers, IP buyers and IP investors look for a good understanding of the intangible side of the business as well as the tangible side before taking any financial decision on making such investments. The intellectual property audit is the only way for them to know the real value of IP owned by an organization.

7.11 TERMINAL QUESTIONS

- 1) What is an IP audit?
- 2) When IP audit is necessary?
- 3) What are the key areas of IP audit?
- 4) How IP audit is beneficial to the IP owners, IP buyers and IP investors?

7.12 ANSWERS AND HINTS

Self Assessment Questions

- 1) Refer to Section 7.5
- 2) Refer to Section 7.6

Terminal Questions

- 1) Refer to Section 7.3
- 2) Refer to Section 7.5
- 3) Refer to Section 7.6
- 4) Refer to Section 7.9

MPDD-IGNOU/P.O. 1K/March,2017(Reprint)

ISBN-978-81-266-6389-7