# CHAPTER 5: INTELLECTUAL PROPERTY RIGHTS AND TECHNOLOGY TRANSFER

## INTRODUCTION TO INTELLECTUAL PROPERTY

The relevance of intellectual property is crucial to development and economic growth. Intellectual property has its basis in the concept of property. Property can be tangible like in the nature of land or chattels or intangible like shares or intellectual property. Property, as best understood in the context of law and legal interpretation is a bundle of rights. The fact that the understanding of property is deemed sufficient to incentivize creativity and extend protection to works borne out of the intellect, is due to the nature of remedies that property rights offer as against property, which is *in rem* as opposed to *in personam.* The rights *in rem*, relating to a property are rights that are generally enforceable against any third party who wishes to interfere with the property in an unauthorized manner. A property right applies against the world whereas a contractual right, which is a right *in personam*, relates to only a specific person against whom it can be enforced[322]. Thus property rights provide a broad ambit of protection for property against the world in general.

Intellectual property is most commonly understood as creations of the mind such as "inventions, literary, musical, dramatic and artistic works, designs, symbols and images used in commerce[323]." Works considered intellectual property are protected by Intellectual Property Rights in law. These properties are protected by intellectual property law in the form of-

- Copyright: This protects original literary, dramatic, musical and artistic works, cinematograph films and sound recording for the entire lifetime of author plus sixty years after the year in which the author dies.
- Trademarks: Offers protection to symbols or figures consisting of names, signature, numerals or a combination of the graphical representation of these

[322] POONAM PRADHAN SAXENA, PROPERTY LAW 3(2017).
[323] *See, What is Intellectual Property?,* World Intellectual Property Organisation, https://www.wipo.int/about-ip/en/

that serves to distinguish goods of one from another for a term of ten years extendable till perpetuity on successive renewal before lapse[324].

- Patents: Patents protects novel inventions after scrutinising that the invention consists of an inventive step (a feature of value that takes it above the existing knowledge) and has industrial applicability for a period of twenty years after which the invention becomes a part of the public domain[325].
- Industrial Design: Designs under the Indian law are protected by the Designs Act of 2000 which extend protection to the visual and aesthetic aspects of an article. These features should not aid in the functionality of the element. Design protection extends on the article for ten years which can be extended for another period of 5 years.
- Geographical Indications: Geographical indication or GI as it is popularly known is a sign in the form of an intellectual property protection which is used on products highlighting a specific geographical origin that helps the consumer of the goods to associate the goods as not just coming from a specific location but also carrying with it certain properties, reputation and characteristics owing to the location. Like trademarks, GIs are also protected for renewable ten year periods.
- Plant Varieties: The TRIPS Agreement[326] advises member nation to protect plant varieties either by means of a *sui generis* system or patents or a combination of both kinds of protection. While there still is much doubt as to how a combination system of protection would work, India provides for a *sui generis* system of protection for plant varieties[327] and the United States provides for plant patent. The protection is extended to a breeder of a variety to recognize the efforts that go into having the requisite knowledge to nurture the variety.
- Trade Secrets: Trade Secrets and undisclosed information forms part of intellectual property and have been recognized so under Article 39 of TRIPS[328]. Trade secrets offer intellectual property protection to undisclosed or confidential information which is usually of great economic value and an

[324] *Cadbury India Limited v. Neeraj Food Products,* 2007 (35) PTC 95 (Del), "The purpose of trademark legislation is to protect the trader and consumer against dishonest adoption of one's trademark by another with the intention of capitalizing on the attached reputation and goodwill."
[325] F. Hoffmann La Roche Ltd. v. Cipla Ltd., 2008 (37) PTC 71 (Del)
[326] Trade Related Aspects of Intellectual Property Rights, 1995
[327] Protection of Plant Varieties and Farmers' Rights Act, 2001
[328] Article 39: Protection of Undisclosed Information, TRIPS Agreement

important part of business to an extent that efforts are done to keep this information secret so as to secure the business position in the market. The unauthorized use or disclosure of such information which is contrary to commercial practices may be regarded as a severe violation. While the remedy may bring some temporary relief in the form of compensation, it can never bring back the secrecy attached to the information.

- Semiconductor Integrated Circuits and Layout Designs: The Act[329] of 2000 aims to protect the designs of semiconductor integrated circuits and chips.[330] Chips layout are made of semi-conductors and are assembled in the form of layers which demand protection. A *sui generis* system of protection was developed after it was found that none of copyright, patent or design regimes were suitable for providing the required protection.

Intellectual Property around 1960's in its initial understanding was believed to be divided into two categories, Industrial Property[331] and Copyright[332] protected by the Paris Convention and the Berne Convention respectively. Both the treaties are administered by the World Intellectual Property Organisation (WIPO). The distinction lay as copyright was more concerned with authorial creativity and was thought to be reflective of the author's own personality and hence a little distinct from industrial property which lay more focus on the commercial exploitation of the works to fetch monetary benefits. Industrial property included trademarks, designs, geographical indications and patents. The rationale behind protection accorded to intellectual property can be:

- A reward for intellectual creation: An incentive in the form of a reward that can be monetary or non-monetary, for the creator who invests his labour, time, skill, money into a creation should benefit from his endeavor.
- Growth and Encouragement: When hard work and labour are given due recognition by means of intellectual property protection, it acts as a motivation and encouragement for further ideas to grow.

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[329] Semiconductor Integrated Circuits Layout Designs Act, 2000

[330] Section 2(r): "Semiconductor integrated circuit means a product having transistors and other circuitry elements which are inseparably formed on a semiconductor material or an insulating material or inside the semiconductor material and designed to perform an electronic circuitry function.

[331] Paris Convention for the Protection of Industrial Property (1883)

[332] Berne Convention for the Protection of Literary and Artistic Works (1886)

- Stimulus to others: The protected works which reap benefits for the author not only encourage the authors but also people in general to contribute to the society by means of their ideas.

It is to our common understanding that the authors of a book, the composer of music or the inventor of a machine usually 'own' their work. Whenever a customer purchases any of the said items (any kind of intellectual property), a part of this sum paid goes to the creator of the item as a recompense for the time, effort and money that has gone into creating the work. This way the creators of the intellectual property benefit from their work. The right to benefit from one's work has in principle been derived from Article 27 of the UDHR[333] that provides "for the right to benefit from the protection of moral and material interests resulting from authorship of scientific, literary or artistic productions."

Two of the most important rights that come along with property are:

- The right to exclude; and
- The right to alienate

The right to exclude contains the right of the intellectual property owner to exclude others from making, using, selling, reproducing, offering for sale, distribution and the like. The right to alienate includes the specific rights of sale, distribution and transfer. These are core rights to property rights. In addition to these two rights, a key component is that of remedy/remedial action which may be in the form of damages[334], accounts for profits or even injunctions[335]. The Supreme Court of India in *Eastern Book Company v. D.B. Modak*[336], reiterated the right of the copyright owner to stop others from using the work without the creator's consent. So was held in the cases *Sulamangalam R. Jayalakshmi v. Meta Musicals Chennai*[337] and *Aamir Raza Husain v. Cinevistaas*

[333] Universal Declaration of Human Rights is a foundational text in the history of human rights and civil rights that set out "basic rights and fundamental freedoms with a universal character of being inherent and inalienable adopted as a common standard of achievement for all people across all nations by the United Nations General Assembly on 10th December 1948."
[334] *See* Patents Act 1977, s 61(1)(c); Trade Marks Act 1994, s 14(2); Copyright, Designs and Patents Act 1988, s 9(2); Registered Design Act 1949, s 9(1).
[335] [1975] FSR 273 England and Wales; *General Tire & Rubber Company v. Firestone Tyre & Rubber Company Ltd., Reports of Patent, Design and Trade Mark Cases, 92(9), 203-274 (July 1975).*
[336] (2008) 1 SCC 1.
[337] 2000 PTC 681, 694.

*Ltd.*[338], that "the idea in providing the copyright a statutory protection is to encourage art and originality and not to stifle it[339]."

The entitlement which the intellectual property (IP) owner holds is eventually determined by market forces. It is the market which determines the demand and thus the amount of compensation should ideally go back to the owner on purchase of the good.

## RELATIONSHIP OF INTELLECTUAL PROPERTY WITH TRADE AND TECHNOLOGY

**Intellectual Property and Trade:** Intellectual Property has become a part of our daily lives so much so that there is some kind of IP attached with each and every article we are surrounded with. The most major transformations in the world economy have been made during the last three decades. The advancements, majorly brought in by technology, in the field of telecommunications, computing, biotechnology, pharmaceutical sector have changed the global scenario for trade in different economies. This has somewhat led to an increase in inclination towards intellectual property rights.

Globalisation and technology advancements have strengthened economic and trade relations among different nations across the globe. Today, the goods and services that are traded, are all mostly protected by one IP right or another as the laws governing and regulating IP rights provide a mechanism by which this property is established in intellectual assets.

IP concerns the intellectual activity in literary, scientific, industrial or artistic fields[340]. Contributions made by the creators in these fields in the form of property are protected by IP rights and go ahead in becoming the goods and services that are traded across the world. For example in healthcare, drugs and other essential medicines owned by companies are marketed and sold to specific geographical regions. In this context, IP rights play an important role in governing the movement of these drugs, ensuring access to medicines to the masses and also providing incentives to the owner of the drug.

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[338] 2003 (27) PTC 425 (Bom) (DB).
[339] *Id* at 450.
[340] V. K. AHUJA, LAW RELATING TO INTELLECTUAL PROPERTY RIGHTS, 3(2017).

Patenting of the drugs also acts as a motivation for the development of new drugs by giving a boost to research and innovation in the respective field.

An important aspect of intellectual property is its commercialization. By means of commercialization, an author/owner of an IP not only ensures distribution of the work in public, but also has the expectation of fiscal profits accruing to him. These benefits give the owner a competitive edge on the business front. Initially the motive behind creation of the work was meeting social ends as the monetary potential of intellectual property creation was much unknown. However, with the gradual passage of time, authors and creators only came to know what a novel idea is worth. Distribution of the work or public access to the creation is also the reason behind providing for infringement, as it is only when an original work is communicated to the public, does a chance of infringement arises. Thus, tapping the fiscal benefits of protected IP became possible on commercialization of the creation in the market (where there are consumers ready to pay for the same) and on infringement of the creation by a third party resulting in the payment of damages to the IP owner.

International exploitation of intellectual property has led to international trade. This in turn has facilitated FDI (foreign direct investment), trade and technology licensing and transfer across borders. With innovation, creativity of the mind, ideas and technology, the concept of international trade has gone much beyond mere shipping of goods from one country to another. The regulations and policies on trade are more focused on how to facilitate the flow of value added goods and transfer of knowledge amongst nations. That IPRs have assumed significance worldwide is also attributable to the fact that competition in goods and services that are traded internationally attracts an increasingly high degree of innovation with each inventor craving for monopoly.

Extending protection to creations of the mind and enforcement of the protection has been a much awaited dream aiding in shaping the international trading structure of the developed nations, particularly U.S. With this dream in mind, the developed nations aimed to work on the growing issues in the IPR domain concerning the growing role of emerging markets in the development of new technologies[341]. The creation of WTO in 1995, paved way for the reorganization of the international trading structure. Focus was

[341] *See,* Report on Intellectual Property Rights and International Trade, CRS Report (December 20, 2007), https://www.everycrsreport.com/reports/RL34292.html

laid on managed trade instead of free trade which did not involve removal of all tariffs of trade but was a combination of free trade and trade with reduced tariff and non-tariff barriers[342].

The contributions of North American Free Trade Agreement (NAFTA) and the Trade Related Aspects of Intellectual Property Rights (TRIPS) in 1994 and 1995 respectively in the area of IPR have been immense. The agreements have given due recognition to IP and advanced IPR rules internationally. The TRIPS Agreement has been instrumental in the promotion of exchange of knowledge and creativity, providing for dispute settlement regarding IP issues, and laying down the path to help all WTO member countries to achieve their domestic goals. The Agreement serves as a legal recognition of the interconnection between intellectual property and international trade[343].

Since the degree of protection extended to IP differed to quite an extent in different countries around the world, the differences became an issue and a reason for discord in international economic relations as IP evolved each passing day. Thus, a set of new rules and regulations governing IP, having universal application, were deemed to be more appropriate to bring harmony and to settle disputes more amicably. This culminated at the Uruguay Round[344] which brought forth WTO's TRIPS Agreement. The naïve attempt to bridge the existing gap among nations as regards trade in intellectual property rights did good in laying down minimum standards for the enforcement of IP rights and bringing all member countries under the ambit of common international rules.

Not only this, but the Agreement also gives the liberty to member nations to modify and adapt to their perspective towards IP protection to achieve policy goals, provided the minimum standard protection criteria is not disturbed. Striking a balance between the long felt need of incentivizing creativity with a monopoly in the market and achievement of access to the creativity for meeting social demands and larger public interest now seemed possible. The Agreement while bowing down to the demands of the developed nations that rooted for the protection of intellectual property as they saw

[342] *Supra* Note 17, 5.
[343] *Supra* Note 35, 9.
[344] Uruguay Round: Trade Negotiations Committee Meeting at Ministerial Level, GATT/AIR/2708 31 OCTOBER 1988, https://www.wto.org/gatt_docs/English/HTM/2708.RFT.HTM

in them immense potential for trade, also cast a responsibility on these nations to help and support the developing/ transition economies or the LDCs to become technologically advanced and develop economically so as to enable them to make themselves TRIPS compliant and thus participate and benefit equally from international trade.

The Agreement focuses on five broad areas for which it provides[345]:

- ✓ It gives an idea of the application of the general provisions in the Agreement containing basic principles of multilateral trading system to international IP.
- ✓ It lays down the minimum standards of protection to be provided to IP which the member nations should provide. (The member nations may choose to provide for a more stringent protection, but the standards as down in the Agreement is what the members should at least provide.)
- ✓ It gives the freedom to the member states to decide the procedures for the enforcement of IP rights that are to be adopted and applicable in their respective territories only (as IP rights are territorial rights).
- ✓ It suggests how disputes regarding IP are to be settled between the members of the WTO by providing for a dispute settlement mechanism.
- ✓ It also makes special transitional arrangements for the transition economies, developing and the LDCs by providing for relaxations in terms of the number of years in which these economies should make themselves TRIPS compliant and implement the IP protection regime as laid down in the Agreement.[346]

TRIPS was indeed successful in recognizing IP internationally. Today, with the growth of technology and the power of the internet, the role of IP has increased tremendously in the field of e-commerce as well[347]. Operation of business online where, basic activities like buying, selling, renting, exchanging goods and services take place primarily over the internet fall under the wide ambit of e-commerce. IPR has a huge role to play in the protection of brands and domain names online. Domain names serve as internet addresses which directs a user to a particular website. It has become the

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[345] *See, Intellectual Property: Protection and enforcement,* World Trade Organisation, https://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm7_e.htm

[346] *Id.*

[347] Syeda Fauzia, *Role of IP in E-Commerce,* Enhelion Blogs, https://enhelion.com/blogs/2022/02/07/role-of-ip-in-e-commerce/

identity of an online business. Due to an increase in e-commerce and people resorting to extend their businesses through online mode there has been a demand for protection of domain names[348].

Thus, trade and intellectual property have been inseparable since the advent of IPR extending its scope to almost each and every usable good and service; bringing about quite a humongous change in the landscape of international trade as well.

**Trade and Technology:** The significance of technology in international trade has been long discussed and recognized[349]. Advancements in technology and trade are indistinguishably linked. It is true that international trade has enhanced the diffusion of technology and innovation while technology on the other hand has continued to reshape the dynamics of trade till this day. Technology helps determine what goods and services should be traded in the domestic/international markets and also decides the most effective way in which they should be traded. A current example of how technology has eased trade and transactions is electronic commerce[350].

Technology, trade and industrial policies are determinants of economic growth of a nation and which directly have an influence on the development of its industries and economic sectors. Pushing these areas to develop further helps transition or developing economies to catch-up to the standards as set by other comparatively developed nations. These areas need focus and work which can be achieved by technology transfer along with the promotion of IPRs. Technology plays a pivotal role in fueling the growth of productivity and fostering global market competition, while also shaping global value chains. It is through technological advancements that new businesses emerge and influence the dynamics of international competition and trade. Technological activism brings new opportunities and challenges for the countries. With just a touch of smartphone, information can be sent to the receiver living thousands of miles away. The internet has itself launched a host of new possibilities stretching its limits every day to make possible what was even unheard of.

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[348] *See also,* Domain name as IP Rights, Browne Jacobson (January 31, 2020), https://www.brownejacobson.com/insights/domain-names-as-ip-rights
[349]Trade and Development Report, UNCTAD 1989.
[350] *Supra* Note 20, 7.

Progress in technology is regarded as the most crucial source of economic growth as it directly affects trade. With the advent of new technologies, much of the work which was initially done by human labour is replaced with machines which can do the same work more efficiently. Thus, technologies have reduced the cost of labour. However, these technologies which have the potential of replacing human resource may be affordable or highly priced advanced technologies/machines in which case they may be out of reach of some of the middle income nations. If labour is cheap, and the country may not have enough resources to spend they may save costs and capital on buying machinery and required equipment that may be technologically more advanced. What costs are incurred or saved on labour, equipment or technology will depend on the monetary situation of the country that wishes to benefit from technology transfer.

Technologies may also determine production. Advanced technologies used in production would definitely lead to a better quality of produce which in turn leads to a better quantity of exports generating revenue[351]. Production technologies decide the structure of trade to a great extent. They also have a direct influence on global value chains. For example, if there is a common business amongst many countries, the differences in technology may justify the differences between the costs and quality of the finished products, giving a hint of the pattern of trade and specialization in that country[352]. Textiles and apparels are manufactured by many economies but the designs, patterns, material used, weave and the price of the product would not remain the same. This illustrates the impact of technology on trade.

The relationship between technology and trade only continues to grow. The future that holds immense scope for artificial intelligence (AI) may contribute further in the development and restructuring of trade patterns in domestic and international trade. While technology helps nations to prosper owing to trade, trade also affects technology in one way or the other. The building competition in the commercial markets due to trade has each and every company fighting for its existence in a particular domain[353]. Trade may affect technology in different ways. A situation may arise where, in order to

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[351] *See generally,* Note by the Secretariat, *Leveraging technology and trade for economic development,* Economic and Social Commission for Asia and the Pacific, ESCAP/CICTSTI/2018/7 (June 2018), https://www.unescap.org/sites/default/d8files/event-documents/CICTST~2_1.PDF

[352] *Id.*

[353] Alan L. Frohman, *Technology as a Competitive Weapon,* Decision Making and Problem Solving, HARVARD BUSINESS REVIEW (1982); *See also,* GEORGE STEINER, TOP MANAGEMENT PLANNING (1978) on cutting edge technology used as a market strategy.

compete in the international market, manufacturers may feel the need to adopt an emerging or a highly advanced technology so as to have an edge over the others in the same field, lest it shall loose recognition and customers. The producer in an attempt to carve a niche for themselves may adopt a marketing strategy backed by technology like serving a particular preferred quality, catering to all customers by robust and efficient customer services, relaxing costs by cutting down on extras and the like. It is not too late to realise that a potential solution to majority of the problems existing in the world today is through technological upgradation.

A somehow different impact of trade on technology is when in an open-trade economy domestic products are phased out from the markets because of import of foreign products which crowd the market predominantly. The importation of technologically advanced products may also adversely impact the local industries produce (if they do not catch-up by learning, copying or reverse engineering from the competitive products) and the consequential deindustrialization may restrict the avenues of nations to comprehend and develop new and advanced technologies. It is in this sphere that technology transfer and diffusion become important as nations which may not have the resources to develop its own technology may absorb advanced technologies by choosing a well suited mechanism for transfer or may learn/copy/reverse engineer from the foreign good which also serves to diffuse technological knowledge.

The developments in technology are also altering the definition of trade. The zone of 'what is tradable' is ever expanding. Data, which is the new oil, is the biggest driver of growth and a harbinger of change. It is technology that holds responsibility for generating tons of data every passing minute and also makes possible the exchange of data and data flows that account for new sprawling businesses and ideas leading to new economies[354]. It is data which is inadvertently generated by human actions and which makes the digital services over the internet efficient and more suitable to the needs of the consumers. This expression of the term 'data' involves significant interpretation bearing varied connotations. As much as utilization of data for providing enhanced customer services to customers in the course of trade can be used as a defense, it is

[354] Press Release, The Economist, Data is giving rise to a new economy: How is it shaping up (May 6, 2017) https://www.economist.com/briefing/2017/05/06/data-is-giving-rise-to-a-new-economy

equally important to highlight the privacy concerns[355] attached with it and lay down proper guidelines against manipulation. Not only do the personal rights flow from the protection of data but also proprietary rights that usually go unaccounted. Thus, the anticipation and an obvious requirement for appropriate legislations and policy guidelines in this regard sound justified.

**Intellectual Property and Technology:** The fact that today the industry that has the latest technology, the mobile company that makes the 'smartest' smartphone, the automobile company installing the most advanced machinery in their cars is the one to set sail further into the ocean of opportunities. Technology has not failed to inspire the world with the wonders that it can do with just the application of scientific knowledge to industrial processes to get the desired outcome. Various kinds of technology influencing our lives in one way or the other like biotechnology, stem cell technology, technology in the field of medicine, forensic science technology, space technology, nanotechnology, information technology and other similar kinds of technologies have in some way or the other developed a relationship with intellectual property rights protecting almost each and every usable goods and services and influencing trade.

An example to illustrate this relationship can be the use of information technology[356]. Information technology has provided a seamless and an effective means of communication, using which millions of people interact with each other today. The means of communication are facilitated by the use of computers and computer software which make subject matter of IPR protection. Research in the field of information technology has given a boost to new inventions and innovations which subsequently claim the protection of patents, copyright and other suited IPR to reap the benefits of monopoly in the market[357]. The inventions in the field of information technology, pertaining to computer hardware, machinery, equipment and functional components have initially been protected via patents.

Protection of software has been a debatable issue which has evolved over a period of time. A program is a set of instructions which instructs a computer to perform a specific

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[355] Sara Quach et. al, *Digital technologies: tensions in privacy and data,* 50 JOURNAL OF THE ACADEMY OF MARKETING SCIENCE 1299-1323 (2022).
[356] Maria Lilla Montagnani, *The Interface between Intellectual Property and Information Technology Law, in,* HANDBOOK OF INTELLECTUAL PROPERTY RESEARCH 149-210 (Irene Calboli & Maria Lilla Montagnani eds., 2021).
[357] SREENIVASULU NS, INTELLECTUAL PROPERTY LAW-DYNAMIC INTERFACES, 1(2017).

task as desired. Software is a set of programs so coded[358]. Since the programs written down formed more a part of literary work, subject matter of copyright than patent, there was little or no inclination for a patent protection for software. However, the judiciary considering that it is near to impossible to separate software and computer related invention (CRI), has realized that since majority of the inventions today are based on computer programs, it would be unfair to not extend patent protection to all of such inventions[359] on the pretext of exclusion under 3(k) of the Act[360]. It also supported that back in 1981, in U.S. in the case of *Diamond v. Diehr*[361], a computer controlled process using an algorithm to instruct a computer to perform the intended task was held patentable; when for the very first time, a court held an algorithm to be patentable. Other reasons justifying software patents were that under the Act[362] only computer programs 'per se' were excluded from patentability and that the new CRI guidelines[363] should be re-analysed in order to grant patent protection to technical advancements and technical contributions made through software.

Without a doubt, a stronger technological base furthers more innovations which become the subject matter of protection under the IPR regime. A corollary is that with growing advancements in technology, copying and infringement of original work has become much easier. Thus, a conclusion may be drawn that in the digital era, where technology can have both a positive and a negative influence on the society, it is all the more important that in as regards to an author's original creation, a strict IP protection should be implemented by the government.

## INTELLECTUAL PROPERTY RIGHTS AND TECHNOLOGY TRANSFER

As has been discussed in the previous chapters, technology transfer is the process of transfer /movement of technology along with related data, information and other technical know-how from one entity to the other. Usually the process takes place from developed nations to developing nations in order to give an impetus to the lesser

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[358] *Id.*
[359] *See also,* Ferid Allani v. Union of India, OA/17/2020/PT/DEL.
[360] Section 3(k), Patents Act 1970: "*(3) The following are not inventions within the meaning of this Act,—(k) a mathematical or business method or a computer programme per se or algorithms;*", falling in the category of inventions not patentable under Chapter II.
[361] Diamond v. Diehr, 450 US 175, 209 USPQ 97, 1981.
[362] *Supra* Note 33.
[363] *See,* Guidelines for Examination of Computer Related Inventions (CRIs), Office of the Controller General of Patents, Designs and Trade Marks, 2017.

developed economies to reach new and higher levels of technological excellence, for technological advancement is central to any developmental process or economic growth.

While this technology is traded between countries, companies or different entities, intellectual property rights happen to play an important role in the transfer of the same[364]. IPRs regulate and affect both trade and the transfer of technology between developed and developing countries. The protection and promotion of all kinds of intellectual property by means of intellectual property law is important to the growth of trade; however, an overly stringent and restrictive protectionist regime can become a hurdle to the transfer and flow of technology by being a non-tariff trade barrier[365]. This is realized by nations in providing for laws to protect intellectual property, particularly United States which considers any "inadequate and ineffective" protection extended to its intellectual property by another country as a trade offence[366]. Restrictive intellectual property protection laws themselves pose such a barrier that it may discourage FDI into a country and subsequently technology flow. The developed countries which rooted for the implementation of the TRIPS Agreement[367] have criticized strict IPR regimes and have negotiated for changes to be made in order to make the laws more flexible. After all, facilitation of trade does not only benefit the recipient country but also the donor country which derives opportunity to expand its trade and trade relations with other nations in addition to monetary benefits. Transfer of technology is done to achieve commercialization of the technology, to have an impact on society and to serve public benefit.

## INTELLECTUAL PROPERTY RIGHTS IN TECHNOLOGY

Transfer of technology is the means by which technology (physical as a product or otherwise) is transferred from one nation, organization or person to another. This technology is often transferred with relevant technical know-how and related intellectual property right. The transfer of IPR is a part of the technology transfer

[364] Geoffrey Kransdorf, *Intellectual Property, Trade, and Technology Transfer Law: The United States and Mexico*, 7 B. C. THIRD WORLD L. J. 277 (1987).
[365] *Id.* A non-tariff barrier to trade is the adoption of any restrictive trade practice in a form other than imposition of a tariff. It can be sanctions, quotas, rules and regulations instructing manufacture and handling of the product in a certain way and similar other measures. *See also,* Larson, *Introduction to Non-Tariff Barriers to International Trade,* 7 U. Bridgeport L. Rev. 155 (1986).
[366] Trade Act of 1974, 19 U.S.C. § 301 (1984).
[367] *Supra* Note 3, 2.

process which relates to transfer of either IP related to technology or IP related to knowhow, or both. In the domain of technology related inventions, technologies are quite commonly protected by patents or it is the product which imbibes the technology that is patented. This is the reason why intellectual property rights hold deep significance in the transfer and diffusion of technology. Apart from patents, copyright, trade secrets and trademarks might be other different forms of IP protection that have a role to play in technology transfer.

While it is true that not all technologies are necessarily patented, they may be protected by any other form of IP protection. Even if not so, the way IP exists today, it is highly likely that the technology/product which is the subject matter of transfer will have some form of inherent protection as copyright and trade secret do not require registration. They exist as is. Copyright subsists in a work by virtue of the original work being fixated[368] and trade secret does the moment it has commercial value and the owner intends to keep it secret[369]. If efforts to keep it undisclosed are not made, the information cannot claim trade secret protection. If it is a product embodying the technology, which is the subject matter of transfer, trademark protection can also exist once the sale starts and the owner can have passing off[370] remedies available in case of unauthorized use of the mark[371].

Not protecting a technology by means of a patent and keeping it as a trade secret may be exercised as a matter of choice by the owner. A patent protection requires disclosure of the invention and its working in the application itself. If the protection concerns a technology or know-how that may be central to the business of the owner, he may not desire a patent protection and may wish to keep it as a trade secret.

**Patents**

The intellectual property rights in technology are majorly **patents**, which were traditionally deemed to be the heart and soul of protection extended to technological

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[368] *Infra,* Note 46.
[369] Protection of Undisclosed Information, Article 39 of Trade Related Aspects of Intellectual Property Rights 1995.
[370] "Section 135: Relief in suits for infringement or for passing off; Trademarks act 1999, *M/s L.D. Malhotra Industries v. M/s Ropi Industries,* PTC (Suppl) (2) 564 (Del)."
[371] *See,* Vijay Pal Dalmia et. al, Vaish Associates Advocates, Protection of Unregistered Trademarks in India (April 22, 2022), https://www.mondaq.com/india/trademark/1185802/protection-of-unregistered-trademarks-in-india

innovations. At the same time, patents may not be considered to be the best form of IP to protect all kinds of technological inventions. An example of this can be computer software. Much controversial, software initially were protected by copyright as the set of instructions formed part of literary work protectable under copyright and were not considered inventions under the Patents Act.[372] The European Patent Convention also provided against patent protected for "programs for computer". This also led to a lot of issues arising from the protection granted to software and thus, gradually computer related invention run by software are have been recognized as falling within the ambit of patent protection[373].

Under the Act of 1970[374], a patent is granted to any invention upon fulfilment of the criteria of patentability as laid down under the domestic law. Three major criteria as laid down are:

- Novelty;
- Non-Obviousness;
- Industrial Application

The criteria of novelty which is more or less a general standard for intellectual property protection means that the invention, which is a physical manifestation of a creative idea, should be new entailing at least an element which has not been thought of before. In addition to this, the invention should be non-obvious to the person skilled in the art and shall involve a feature that makes the invention technically advanced as compared to existing knowledge or have economic significance[375]. Lastly, the invention must have some utility in society and for the same, it should prove industrial applicability. The patent till today is considered one of the most appropriate methods to secure technology.

In line with Article 7 of the TRIPS Agreement[376], the Patents Act contains amongst its "general principles applicable to working of patented inventions[377]" that while exercise

[372] The Patents Act, 1970.
[373] *See,* Aayush Sharma, *Software Patent Protection in India,* Mondaq (April 24, 2022), https://www.mondaq.com/india/patent/1185942/software-patent-protection-in-india
[374] The Patents Act, 1970.
[375] Section 2(ja), Patents Act 1970.
[376] *Supra* Note 12, 5.
[377] Section 83 (c), Patents Act 1970.

of the rights as enunciated under the act, due regard shall be had to the following consideration-

*"that the protection and enforcement of patent rights contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.."*

Justice Sarkaria in the celebrated case of *Bishwanath Prasad Radhey Shyam v. Hindustan Metal Industries*[378], held that "The object of Patent Law is to encourage scientific research, new technology and industrial progress."

**Copyright**

Copyright has also sometimes been resorted to, to protect technical information or know-how. Copyright subsists in creative expressions like original literary works like poems, musical works, dramatic works like scripts, artistic works like photos, drawings, works of architecture and other kinds of similar creativity. Copyright protects the form of expression and not the inherent idea itself. However, copyright can also form an important IP right in technology, essentially software, data and other sensitive information. While a patent shall be granted registration upon fulfilment of the three step criteria, a copyright subsists in an original creative work on fixation of the work on a tangible medium[379]. It will without a doubt, be up to the owner of copyright whether to enforce it or not[380]. Thus, technical know-how or other technological information existing as subject matter of copyright protection will have some inherent protection upon fixation.

Copyright might not be the most appropriate means of protection as developments in the digital age have led to immense misuse of copyrighted material, especially as regards digital rights[381] (copying, illegal downloading etc.). Authors, at the same time,

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[378] (1979) 2 SCC 511, p. 517.
[379] *See,* Blog Post, Namrata Pahwa, Impermanent Art, Copyright and Fixation Requirements, NUJS Intellectual Property & Technology Laws Society (August 29, 2021), https://nujsiplaw.wordpress.com/2021/08/29/impermanent-art-copyright-and-fixation-requirements/
[380] Registration of copyright can serve for better evidentiary purposes in the claim for right over the work as it is a legal proof of ownership.
[381] Juhi Saraswat et. al, *Copyright Protection in the Digital Environment: Indian Perspective and International Obligations,* 22 JOURNAL OF INTELELCTUAL PROPERTY RIGHTS 303-310 (2017).

with tools like watermarking, encryption of data, and so many international treaties in place have options to analyse a well-suited copyright protection for their original work.

**Trade Secret**

As stated earlier, **trade secret** is another form of IP that may be used to protect technical know-how related to a technology[382]. A trade secret has three essential elements which must be fulfilled if the proprietor wishes to claim protection of the same-

- The information must be a secret (in the sense that it be not "generally known or easily accessible" to people working in a similar field and dealing with the similar kind of information)[383];
- It has a commercial value attached to it on being kept a secret; and
- Reasonable efforts have been made by the legal owner to keep the information a secret.

Trade secrets are generally used to protect know-hows of a business. Since the information may be vital to the working of the business, some people may be duly appointed to ensure confidentiality of the information. This may even relate to technical know-how in case of a patented technology. It may sometimes be the case that in the event of licensing of patent rights as regards a technology, the licensee may still not be able to make use of the technology without having access to the relevant technical know-how. This may be a roadblock for the licensee to use, exploit and commercialise the technology in an efficient manner which in turn defeats the purpose of the transfer. In order to ensure that such a situation does not arise, it may be desirous to conclude a "patent and know-how license" so as to transfer both the technology and the know-how together and enable the licensee to fully utilize the invention.

A need to license the know-how would arise only in a case that the information/know-how has been kept a secret; otherwise it would anyway be easily accessible and incorporating a similar clause in the agreement to transfer this information would not make much sense. Not only knowledge/information but an invention too may be protected by a trade secret instead of a patent, although it may not generally be done

[382] *See generally, Approaches to the Protection of trade secrets, in* ENQUIRIES INTO INTELLECTUAL PROPERTY'S ECONOMIC IMPACT, OECD 127-172 (2015), https://www.oecd.org/sti/ieconomy/Chapter3-KBC2-IP.pdf
[383] *Supra* Note 42.

so; reason being that in case of unauthorized/illegal disclosure of the information, the same would lose protection forever. Once the secret is made public knowingly or unknowingly, its leak cannot be reversed. Also from a public interest point of view, a trade secret never becomes a part of public domain so long as it is protected, while a patent contributes to sharing of the invention and technical information in the application itself (which may be used for reverse engineering purposes) and also when the invention becomes a part of public domain after the expiry of the term of patent that is twenty years[384].

**Trademark**

Trademark protection too, cannot be ignored in technology transfer in instances where the transfer relates to a product which is patented. Registration for trademarks too, is not compulsory. It holds prima facie evidentiary value for ownership of the mark. However, no suit for civil or criminal action may be instituted for infringement of unregistered trademarks, but this does not hamper the remedy of passing off action[385]. The Trademarks Act[386] considers registration of marks that have been used in commerce or intended to be used[387]. Thus on 'use in commerce[388]', trademark protection shall subsist in the product which is transferred and any unauthorized use can allow the proprietor to initiate an action for passing off.

In order to claim protection, a mark as a valid trademark must be

- graphically representable; and
- possess the capability of distinguishing goods and services of one from another by virtue of the use of mark

In today's business world, trademarks have become an indispensable means to trade and promote one's goods. It aids in expanding market share from the viewpoint of

[384] Section 53, Patents Act, 1970
[385] "Section 27, Trade Marks Act, 1999"
[386] "Trade Marks Act, 1999"
[387] "Section 18, Trade Marks Act 1999"
[388] Use in commerce is when the goods may be sold, transported, marketed, advertised in any type of commerce so that the use leads the consumers to differentiate between the mark from other marks in the market. *See,* Peter C. Christensen et. al, *The "Use in Commerce" requirement for Trademark Registration after Larry Harmon Pictures,* THE JOURNAL OF LAW AND TECHNOLOGY 327-342 (1992).

proprietor and helps customers identify their choice of goods and services amidst a plethora of confusingly similar options.

IPRs significantly affect technology transfer in a good way by protecting the innovations, giving exclusive rights to the owner of the creators which in turn encourages them to deliver more. These exclusive rights bring incentives to the creators upon commercialization. In the context of technology transfer, these incentives motivate inventors or technology owners to share their knowledge and technologies with others by means of licensing, collaboration and partnerships. The diffusion of technical knowledge may occur well before the actual transfer as patents require disclosure of the invention in the application for registration[389]. Once the application is published, the disclosure forms part of the public knowledge base, allowing others to learn from these inventions. The disclosed knowledge can also be used to develop further inventions. Technology diffusion also fosters market competition, which drives technology transfer. IPRs act like such economic instruments that support global innovation as the dissemination of technical information on related technological inventions leads to subsequent adoptions, improvements and adaptations and research on it by others.[390] Thus, an effective IP protection leads to the creation of more 'state-of-the-art' technology, ready to be disbursed.

In case that a technology is protected by intellectual property rights such as patents, a licensing agreement seems to be an appropriate means to transfer technology[391]. In a situation where a certain technology or related aspect is not patented, but still proprietary in nature, the transfer may happen through a series of Non-Disclosure Agreements (NDA) as transfer of trade secret or transfer of information which is still confidential. The limitations as to its access and use may be negotiated and decided by the parties and included in its terms and conditions. If the technology is not proprietary in nature (for example, if patent has expired), then even though the product may fall in the public domain for reverse engineering purposes and for researchers to build on the technology, the related technical information behind the patented technology may still have trade secret or copyright protection which shall be relied onto for making transfers.

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[389] Disclosure as part of provisional and complete specification to be filed with the application to contain adequate details, Section 9 & 10, Patents Act 1970.
[390] *Infra* Note 64.
[391] *Supra* Note 255, 108.

Just like everything else in business relations and management, transactions of any kind are concluded through agreements itself. With the nature and kind of Agreement, the source of rights accruing to the beneficiary, also changes. Different rights will ensue from a licensing agreement to the licensee as compared to when an NDA occurs. By ensuring market exclusivity for a fixed period of time of a proprietary technology and consequently protecting it from competition from its generic copies undoubtedly generates incentives that affect the nature and rate of innovation in the area, trade flows, domestic investments and technology transfer[392].

Appropriate measures for IP protection in innovations become important as generating revenue for these creations in the technological field is required to support investments to develop such technologies further. Barriers on entry to the commercial market are lowered for creators with their works backed by IPR protection as such creators/authors are better able to commercially exploit and defend the ownership of their creations in the international markets[393].

Different intellectual property rights have different economic characteristics; having a difference in their term of protection and consequently a different impact on technology transfer as well. The supporting wisdom pertaining to the international governance of IPR suggests that in the welfare of everybody, a harmonization of international regulation and protectionist regime shall act as a catalyst strengthening the trade and IP relationship[394]. Examples of these may be the TRIPS Agreement, Paris Convention, Berne Convention, Patent Cooperation Treaty, WIPO Copyright Treaty and similar other international treaties and agreements.

## INTELLECTUAL PROPERTY ISSUES IN TECHNOLOGY TRANSFER

The contemporary concept of technology transfer is incomplete without the understanding of IPRs, especially rights granted by patents, trade secrets and copyright in particular, which have become integral aspects of international transfer of

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[392] Jock Langford, *Intellectual Property Rights: Technology Transfer and Resource Implications,* 79(5) AMERICAN JOURNAL OF AGRICULTURAL ECONOMICS 1576-1583 (1997).
[393] *Id.*
[394] *See, Chapter 5: Intellectual Property Rights and Technology and Knowledge Transfer,* Transfer of Technology and Knowledge Sharing for Development: Science, technology and innovation issues for developing countries, Report of United Nations Conference on Trade and Development, 2014.

technology[395]. Majority of the international discussions on Technology Transfer have expressed concerns on the following[396]:

- Capacity building and removing hurdles to development through technical assistance
- Focus on developed countries' obligations regarding financial and investment aspects of technology transfer towards developing countries
- IPRs involved in technology transfer and standards of IPR protection

Considering the market exclusivity that comes along with the monopoly enjoyed by IP holders on the protection of their intellectual property, there have been instances where access to the relevant IP because of the strict protection has been denied to the public. Where the denial of the access to the IP has to the extent caused damage or violated basic human rights of the people, the judiciary has time and again stepped in to establish a balance between the public welfare and individual rights; after all a person who invests his time, labour, skill, capital and effort into a creation which fulfills the exclusive criteria laid down for different intellectual properties under different domestic legislations, deserves to enjoy monopolistic rights. However, a check on the excessive protection to ensure that intellectual property rights do not cater to private rights more than they should, would not be totally uncalled for.

While there are ways to transfer technology with the help of various kinds of agreements, one component of the transfer process might revolve around the transfer of the related IP and the technical know-how for which a separate agreement may be concluded or a separate clause added in the agreement referring to the said transfer. As has been rightly said, *"The patent system has been claimed to be one of the ways of facilitating the transfer of technology from the industrialized North to the less developed countries of the South. It is by no means the only way in which this can be done. For one thing, not all technology is patented. Also, quite often before a patented process can be successfully worked, there is need for the transfer of unpatented know-how along with the technology covered by the patent. Besides, it is not the patent itself which enables the transfer of technology, rather by making the title and exclusive rights*

[395] Irina V. Shugurova et. al, *The International Legal Policy in the Field of Technology Transfer and the Intellectual Property Rights: Some Controversial Issues,* 6(5) MEDITERRANEAN JOURNAL OF SOCIAL SCIENCES 177-185 (2015).
[396] *Id.*

*of the patentee secure, it emboldens him to transfer his technology to others for commercial exploitation. Nevertheless, the patent is an important factor in the technology transfer process*[397]*."*

It may sometimes be desired that in place of a patent, a 'patent and know-how license' is executed considering that it may be worthless transferring just the technology without the know-how in particular cases where the transferee would not be able to make use of the technology if he did not have access to the know-how. However, there are certain risks involved in the licensing of secret know-how pertaining to its unwanted and potential disclosure to third parties. Thus, it becomes imperative to address issues on confidentiality of this information[398].

Human Rights support that if knowledge and information are seen as non-rivalrous and non-excludable goods[399], they ought to be made available to the society to serve public welfare. Intellectual Property on the other hand has provided for incentives for similar creations which prevents free-riding. The knowledge that forms the base of a technological creation invented by the inventor cannot however be traded for free of cost. Not only will that lead to a situation where the proprietor is unrewarded for his due share but also might affect business and trade. In technology transfer cases, the transfer of such vital information which may be essential for completion of the transfer would naturally be done at a significantly high cost, considering that the information may also be a trade secret. This knowledge owing to the sensitivity attached is thus protected and not considered non-rivalrous and non-excludable.

"Know-how is an entirety of technical information which is secret, substantial and identified[400]." Following may be the key characteristics of know-how:

1. It should be secret and valuable information. The value attached to the information makes it give a competitive edge to the proprietor over his competitors in the market.

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[397] SANJAYA LALL, *The Patent System and the Transfer of Technology to Less-Developed Countries, in,* DEVELOPING COUNTRIES IN THE INTERNATIONAL ECONOMY, 153-170 (1981).
[398] *Supra* Note 67, 20.
[399] Non-rivalrous goods are goods that do not diminish in quality or quantity upon use, regardless of any number of people using the good. Non-excludable goods are goods that are available to people without any cost. They are deemed to be public goods and cannot exclude a certain member of society from use of the same. Apart from knowledge, digital content can serve as another example.
[400] "Article 7 of the Commission Regulation 556/89 on know-how licensing agreements."

2. The information must be essential to the technology. It must be an intrinsic part of either the production process or the product itself.
3. The know-how must be particularly identified and established properly to show that it is worthy of being kept secret.

Since there is no particular provision in law for protecting know-how, it is generally protected as trade secrets. Since it is considered a business asset, for its transfer the donor may even require the recipient to sign a Non-Disclosure Agreement.

Some of the prominent IP issues in technology transfer are discussed as under-

- **Loss of confidentiality**: On the issue of **loss of confidentiality,** the manner in which the confidentiality is lost may be provided for in the agreement and accordingly the norms and rules would apply. The general norm is that if there is a breach of the 'maintaining confidentiality requirement' due to an act/omission of the licensee, then the licensor stands at a position to terminate the contract and sue the licensee for breach. This may be followed impliedly even in a case of no express provision in the contract. On the loss of confidentiality parties may agree to pay the royalties even beyond the life of the trade secret. This is followed under US law[401]. The licensee has a duty 'not to disclose' and its violation may not just be a breach of contract but may also attract common law tort remedies[402].

In India as there is no legislation that governs the protection of undisclosed information or trade secrets, the rights in respect of the trade secrets may be enforced through the Law of Contract[403] or through common law by means of principles of equity or common law action for breach of confidence. This has been reiterated by the Delhi High Court in 1987 as-

*"These rules may, according to the circumstances in any given case, either rest on the principles of equity, that is to say the application by the Court of the need for*

[401] Aronson v. Quick Point Pencil Company, 440 US 257 (1979).
[402] Tracer Research Corporation v. National Environmental Services Company, 422 F.3d 1292 (9th Cir.).
[403] Indian Contract Act, 1872.

*conscientiousness in the course of conduct, or by the common law action for breach of confidence, which is in effect a breach of contract*[404]*."*

In addition to this, India is also a signatory to TRIPS, which in its Article 39, allows member nations to provide for the protection of such information to prevent/minimise the unauthorised disclosure and use of secret and sensitive information.

Where a country has a legislation governing transfer of technology the source of right of remedy for breach of the conditions of transfer would emanate from the legislation itself. In India, in the absence of a *sui generis* system for technology transfer, one may have protection of common law tort remedies through Agreements signed for such transfer or remedies for breach of contract.

- **Hybrid Agreements**: Certain issues also arise on the **conclusion of a common agreement for patents and know-how**. As previously discussed, a patent and know-how license agreement may be negotiated in place of only a patent license when the know-how seems as important as any part of the technology transferred. It is common to execute such agreements, although it comes along with additional concerns. As regards patent, a license agreement which demands the licensee to pay royalties even after the patent term of protection has expired, is deemed to be gross misuse and void as per public policy[405].

A license agreement cannot extend beyond the term of the patent. A patent holder (owner/proprietor) may only be able to transfer to the licensee any of the rights that the patent monopoly has bestowed on him by virtue of protection of the invention under the given law. Consequently, on the expiration of the term of patent, the licensor automatically loses all his monopoly rights and the invention falls into the public domain. Thus, after the patent loses protection, the licensor cannot transfer any of the rights to the licensee which he himself does not possess. Hence any charge of royalty by the licensor beyond expiration of rights shall be illegal and unenforceable.

This is particularly not the case with trade secrets/know-how. Parties to the license agreement may mutually decide and agree to the payment of royalty even after the

[404] John Richard Brady v. Chemical Process Equipment Pvt. Ltd., AIR 1987 Del. 372.
[405] Kimble v. Marvel Entertainment, 576 US 29 (2015), American Securit Company v. Shatterproof Glass Corporation, 268 F.2d 769 (3rd Cir. 1959).

know-how loses its confidentiality[406]. This causes problems in the determination and computation of royalties in hybrid agreements (patents and know-how). To minimize the chances of such problems cropping up, not only does the agreement demands to be well drafted with clarity on the royalties for patent and know-how but also allocation of these royalties such that just the appropriate reduction in royalty occurs when the patent expires. Provisions in the Indian Patents Act that provide for the termination of a compulsory license as regards patent[407], and under the Australian Patents Act where provision for termination at the request of either party on giving three months' notice[408] is given, may be taken help of while incorporating clauses into the agreement making separation of the patent from the know-how easier.

- **Multiple patents**: Issues may also arise with **package licenses.** This issue particularly arises where in certain technology domains multiple patents exist on different aspects of a particular technology. This is also known as patent thickets and creates a situation where more than one patents are licensed forcefully. In the form of a package license drawn, the patent holder would grant a license of one or more desired patents on a condition that the licensee would also take a license for the other patents that he did not want. This was *per se* held to be patent misuse under the US law[409]. Even after the amendment of the code in 1988, the position today that stands in US is that while mandatory package licensing of patents is still considered misuse, an inquiry shall be conducted on a "rule of reason" ground.

In India, coercive package licensing where desired patents are grouped together with undesired patents and are licensed forcefully and unnecessarily are looked down upon and considered to be practices against the reasonable requirements of the public[410]. These are also known as patent thickets and are responsible for creating complexities and uncertainties for the transfer of technology. Navigating through multiple patent rights and negotiating licenses from various patent holders can be challenging and time consuming, thereby potentially discouraging technology transfer.

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[406] *Supra* Note 73, 22; Spin-Deck Inc. v. Fab-Con Inc., 677 F.2d 1237 (8th Cir. 1982).
[407] Section 94, Patents Act 1970
[408] Section 145, Patents Act 1990
[409] 35 USC § 271(d) (4) and (5).
[410] "Section 84 (1) (a) read with Section 84 (7) (c) of the Patents Act 1970."

- **Grant-back clause**: Another point of concern is **the grant-back clause in a patent license**. Grant back clauses like the patent package license, may be evaluated on a "reasonable" approach. A grant-back as a clause in the patent license agreement is an arrangement under which the licensee makes improvements in the licensed technology and agrees to extend the right to use these improvements made by him (or commercialise the improved product) to the licensor of the patented technology without applying for separate licenses. The licensor may be given an exclusive right to use and sublicense the improved technology and the non-exclusive right to continue using such improvements may remain with the licensee. If grant backs are non-exclusive, they may favour competition for they allow the licensee and the licensor to work together for the promotion and innovation of the improved technology while also sharing risks together.

They also may sometimes be seen as anti-competitive in the case of exclusive licenses and may have an adverse impact on competition by significantly lessening the licensee's incentives to engage in further research and development[411]. This is not just the stand under US law[412], but the Indian law also considers exclusive grant back as against reasonable requirements of the public[413].

- **Cost and Access**: Apart from the abovementioned, **cost (thereby affecting access)** has been the major hurdle posed by intellectual property rights in the transfer and diffusion of technology. While the developing countries on their path to chasing economic development hold a great demand for advanced technologies, one of the trade barriers that the nations face are posed by intellectual property regulations which makes attainment of such technologies cost prohibitive.

IP holders, especially patent owners see the grant of monopoly more as an incentive based right enjoyed by them during the course of IP protection than serving social needs. From the perspective of the inventor, the profits earned from the commercial exploitation of the invention should surpass the costs incurred in the development of

[411] Antitrust Guidelines for the Licensing of Intellectual Property.
[412] Transparent Wrap Mach Corp v. Stokes & Smith Co. 329 US 637 (1947)
[413] *Supra* Note 403, 163.

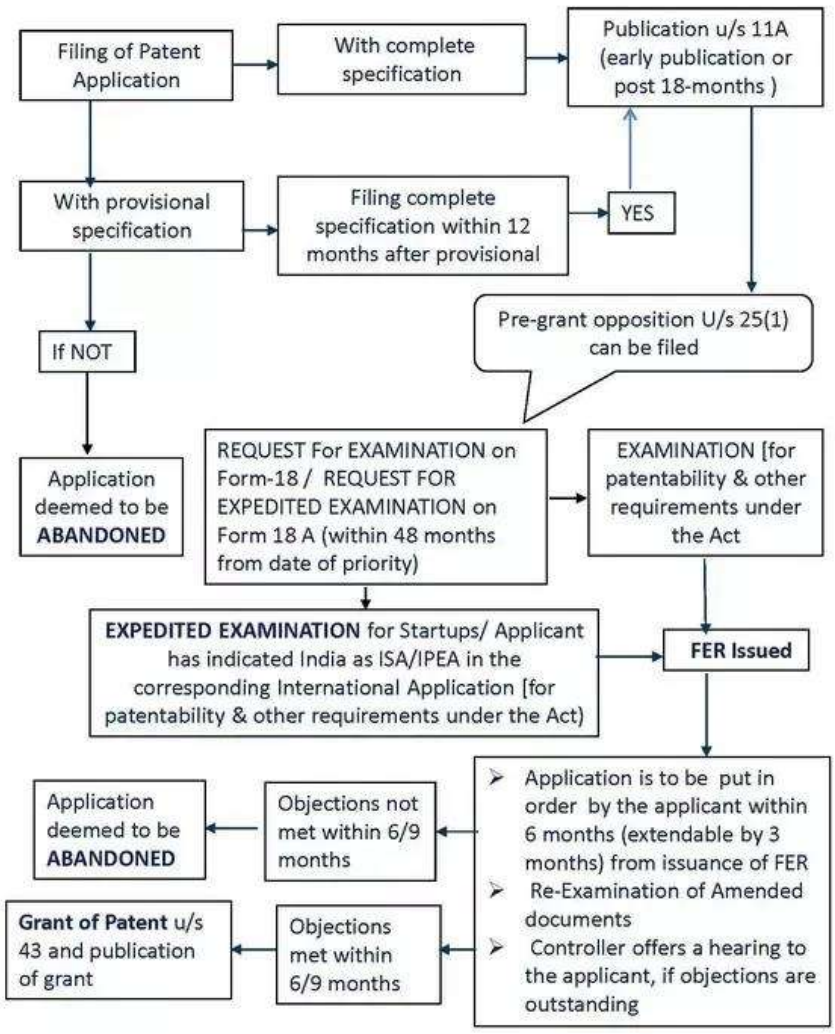
the same. This is borne in mind when the royalties are charged as decided and provided for in the license agreement. IP protection often comes with associated costs, such as filing fees, maintenance fees, and legal expenses. These costs can pose financial barriers, especially for smaller enterprises or developing countries, limiting their ability to access and transfer technologies protected by IPRs. Licensing fees or patent royalties make cost a significant hurdle in the smooth flow of technology.

- **Complex and Lengthy Intellectual Property Protection Process**: If the technology is protected by a patent, then obtaining and enforcing patents can be a lengthy and complex process. Patent applications require detailed documentation, examination procedures, and often involve substantial time and financial resources. The complexity and duration of the process can delay the transfer of technologies, hindering their timely dissemination[414].

It generally takes quite a lot of time to finally have patent protection as the process of grant of patent is quite lengthy and time consuming. The process as in India can be summarised in the following flowchart-

[414] Antoine Llor, *Delay from patent filing to technology transfer: A statistical study at a major public research organization,* 27(8) TECHNOVATION 446-460 (2007).

**1. Patent Flow Chart**




In case of technologies which ought to be protected by intellectual property rights, the transfer would not be effected until the protection is sought, thereby causing delay. This may only be true in case of patents where a registration is compulsory for protection. Other IP rights which may play a role in the transfer of technology like copyrights, trade secret or even trademark do not require registration for protection.

- **Intellectual Property Disputes**: During the course of technology transfer, IPR related disputes leading to litigation between the parties may arise, particularly concerning ownership, right to use and infringement claims. These legal battles may result in determination of rights which in turn delays transfer and diffusion

of technology and knowledge. Such disputes also lead to increased costs incurred by the parties, bitters relations, hamper collaborations and deter technology users and licensees.

From this is understood that the disputes arising out of agreements for technology transfer can have a significant economic impact on the transfer process. It may so happen that parties have divergent opinions on IP issues, but some clarity is desired on the point of ownership of IP and the allocation of rights[415]. Negotiations and decisions should be had at an early stage to minimize chances of friction between parties. Another lucrative option is the WIPO's alternative dispute resolution (ADR) mechanism which companies and other organisations are increasingly turning heads to[416].

- **Cultural and Legal Differences**: Technology Transfer usually involves transactions pertaining to technology across borders (from developed nations to developing nations) which can be complicated by variations in intellectual property laws and practices across different jurisdictions. When transactions occur between nations, differences in the legal framework, enforcement mechanisms and interpretations of intellectual property leading to challenges in agreement negotiations are bound to occur.

This situation can peculiarly lead to difficulty in implementing technology transfer agreements. Numerous instances have occurred in the field of technology where the abuse of patent rights has resulted in the problem of "access" for developing countries; either there is a issue of availability or affordability[417].

- **Balance between public access and exclusive private rights**: Intellectual property rights grant exclusive rights to inventors or creators, allowing them to control and commercialize their innovations. However, striking the right balance between protecting exclusive rights and facilitating access to technologies for further development or implementation can be challenging.

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[415] Alicia Blaya et. al, *Technology Transactions: Managing Risks Arising from Disputes,* WIPO MAGAZINE (September, 2011) https://www.wipo.int/wipo_magazine/en/2011/05/article_0010.html

[416] WIPO Arbitration and Mediation Center (WIPO Center) provides for a range of services like arbitration, mediation, expert determination, enabling private entities to settle their domestic/cross-border commercial disputes; https://www.wipo.int/amc/en/

[417] SANGEETA SHASHIKANT, INTELLECTUAL PROPERTY AND TECHNOLOGY TRANSFER ISSUES IN THE CONTEXT OF CLIMATE CHANGE (2010).

> Strict enforcement of IPRs may limit the dissemination of technologies and hinder technology transfer, especially in areas where urgent societal needs exist.

In the end, intellectual property rights always seem to be at loggerheads with public interest as a strict IPR protection will cater to more monopolistic rights than it actually should. Apart from the creation granting exclusive rights to the creator, the intellectual property serves some usefulness in the society. This at no costs should take a backseat. An intellectual property which is out of reach of the people it is supposed to serve will not bring any profits to the owner on commercialization.

Efforts should be made to address these challenges and strike a balance between "protecting intellectual property and promoting technology transfer. Initiatives such as open innovation, collaborative research, compulsory licensing, and technology transfer facilitation mechanisms aim to overcome some of the difficulties associated with IPRs in technology transfer and foster greater access to knowledge and technologies.

**Developing and the Least-Developed Nations**: Developing countries have always seen technology transfer as part of the bargain package deal that they were lured into while signing for the TRIPS Agreement to agree to provide for the protection of intellectual property rights and facilitate trade in IPR. In return, the developed nations would support the developing nations to ensure that they are able to fulfil the objectives[418] laid down in the Agreement. As part of one of the major objectives, the Agreement strives to achieve the "transfer and dissemination" of technology globally and for the developed countries to afford incentives for the enterprises and institutions in their territories supporting technology transfer to the least developed nations[419]."

This is mandated[420] to the developed countries in the Agreement with an aim to help the least developed nations in building a strong and viable technological base[421] for themselves by promoting research and development. The least developed countries are in a dire need of resources. Resources of help might not always be monetary but can be

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[418] "Article 7 and 8 of the TRIPS Agreement, 1995"
[419] "Article 66.2 of the TRIPS Agreement, 1995"
[420] Use of the word "shall" and not "may" in Article 66.2: "Developed country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members in order to enable them to create a sound and viable technological base."
[421] Leticia Caminero et. al, Research and Analysis: Working Paper, *Least-developed countries, transfer of technology and the TRIPS Agreement,* World Trade Organisation (November 2017) https://www.wto.org/english/res_e/reser_e/ersd201801_e.htm

technological aids to pursue economic growth. To see that the mandate has been followed or not, there have been phases to monitor the implementation of the Article[422] in the TRIPS Council where till 1998 its implementation was not present in the agenda and it is only after the annual review in 2003 that for the implementation of the monitoring mechanism, the Secretariat organised workshops to be attended by both developed and developing nations to review Article 66.2 annual reports. The LDC group in 2011 also proposed a revised reporting format to be submitted. Some reports were submitted by the developed nations from 2003-2016 which show that quite a few LDCs have actually been benefitted.

The developed community's acceptance towards the LDCs capabilities to develop technologically is widely known. Developed countries agree that LDCs have the required leadership and responsibility towards their own development. They need to trace out their paths for growth, understand their requirements and leap-frog to newer technologies to build a robust technology ecosystem. What is needed is a little extra push that these nations can get from developed nations which can help them prosper. The LDCs with help can determine the areas of emphasis and the roadmap to a technological progress that best suits their demands. This promotes a proactive participation of the LDCs in the journey of development. The active role played by the LDCs in a technology transfer process is as necessary as the developed nation donor's participation as once after the technology has been transferred, local absorptive capabilities decide how well the technology is been made use of. Along with absorptive capabilities, an understanding needs to be developed on the point of adaptation of the technology to suit the local conditions.

## TECHNOLOGY TRANSFER IN THE CONTEXT OF COVID-19 PANDEMIC

The year 2020 and 2021 turned out to be the biggest nightmare for the world when it was hit by a small virus known as SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) or simply the novel coronavirus but what resulted in one of the major destruction of human life in history. Stuck neck deep with the global health crisis as it was later referred to, the world, till today, with its research is making all possible efforts to emerge strong from it. Even though umpteen patience and determination has gone into finding a cure for it, the struggle continues. It took some time for the world to

[422] *Id.*

realise that the way out is through cooperation and support on the part of all nations; to put public interest in the forefront and to let the comparatively trivial gains that one would make from the trade in IP inventions take a backseat. Intellectual property laws here too played an important role as few major efforts needed to pull the world out of the clutches of the virus were:

- Access to information (medical and technological) for research
- Incorporating flexibilities in patent protection regimes
- Ensure affordability and availability of drugs/vaccine
- Collaborative research
- Compulsory licensing
- Patent pool and multilateral cross licensing
- Transfer of Technology

The abovementioned were marked as necessities of time in order to curtail the spread of the virus. While there still does not exist a total cure of the virus or a vaccine that could make a person immune against all strains of the mutating virus, seeing the catastrophic effect on human life in the first and the second wave of the pandemic[423], research and innovation is focused on doing every bit it can to use resources and technology in science and medicine to save the valuable human life.

Amidst all efforts from the states and governments regarding imposition of lockdown[424], issuing health advisory and guidelines regulating public behaviour, using masks and sanitizers, some concern was expressed on the intellectual property issues circling the pandemic. Almost all kinds of intellectual property somewhere played a role in the fight against pandemic, most importantly patents. Along with countries like Germany, Israel, Italy and U.S, international organisations like United Nations and the World Health Organisation (WHO) engaged in discussions about how best to mobilise resources to cater to the public health demands. All of this was to come up with an invention (vaccine) that could be seen as the only possible solution.

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[423] "A pandemic is a global outbreak of a disease, affecting quite a large number of countries worldwide. Covid-19 was declared to be a pandemic by the WHO in March 2020."

[424] Jeffrey Gettleman and Kai Schultz, '*Modi Orders 3-Week Total Lockdown for All 1.3 Billion Indians'*, THE N.Y. TIMES, March 24, 2020, Available at: https://www.nytimes.com/2020/03/24/world/asia/india-coronavirus-lockdown.html

Realising the crisis and the fact that co-operation alone can help the world recover from the pandemic, nations all over the world expressed willingness over relaxing the intellectual property protection over goods and technology. Torn between meeting the basic rights of the people as regards health emerging from the kind of health emergency and the disturbed supply chain which could not provide for all the people, not much could have been achieved if the nations did not come together for formulating policies on ensuring the flow of knowledge and technology needed to give impetus to Article 7[425] and 8[426] of the TRIPS Agreement and other privileged provisions under the Patents law like compulsory licensing[427]. Under the Doha Declaration on Public Health[428] it is acknowledged that *"The TRIPS Agreement should be interpreted and implemented in a manner supportive of WTO Members' right to protect public health and, in particular, to promote access to medicines for all."*

Surprisingly though, while developed nations stood at the forefront and in a position to help other developing nations gather and fuel their resources for investment in research and development, U.S. during the pandemic emerged as one of the worst hit nations by covid-19 and was desperately looking out for support from other nations which could in their limited capacities extend help. Developing countries like India which for many things depended heavily on imports now put ends together and provided for more testing, safety kits and started manufacturing vaccines and exporting them to the needy

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[425] "The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations."

[426] "1. Members may, in formulating or amending their laws and regulations, adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development, provided that such measures are consistent with the provisions of this Agreement.

2. Appropriate measures, provided that they are consistent with the provisions of this Agreement, may be needed to prevent the abuse of intellectual property rights by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology."

[427] "The Patents Act, 1970, § 84:

84. Compulsory Licenses: (1) At any time after the expiration of three years from the date of the grant of a patent, any person interested may make an application to the Controller for grant of compulsory license on patent on any of the following grounds, namely:—

(a) that the reasonable requirements of the public with respect to the patented invention have not been satisfied, or

(b) that the patented invention is not available to the public at a reasonably affordable price, or

(c) that the patented invention is not worked in the territory of India."

[428] *Supra* Note 14, 5.

nations. Nations engaged in activities like these to not just be independent in times of crises but also to be able to help others.

When few of the known drugs which treated some of the common symptoms between covid-19 and other diseases, came to light as potential treatment for covid-19, companies like Gilead, which is an American research based biopharmaceutical company, developed the experimental antiviral drug *remdesivir,* for which the WHO called for series of clinical trials[429] to test the drug for its effectiveness against the disease. All efforts were put under check as no substantial evidence existed validating the effectiveness for any line of treatment. However, that did not deter the nations from trying. Soon nations began pushing for compulsory licenses. It was not only the access to life saving drugs that needed to be promoted but access to information shared among nations for research purposes as the ultimate aim of the world was to find a cure to the virus.

Be it information, medicines or technology, to be open and accessible in times of a grave public health emergency, intellectual property laws needed to be made more relaxed and flexible. New technologies/vaccine that could come up as a result of the ongoing research was thought to be circulated in the market so that it could reach the masses even before applying for any IP protection for it. True that *"Monopoly is the reward of the inventor",* but even IP laws provide leeway in exceptional circumstances like these because if the only objective of IP protection is seen to be incentivising creativity through grant of monopoly, it would defeat the very rationale of the intellectual property which fulfils some public demand[430]. Not one but many instances have occurred where the judiciary has seconded pro-access attitude rather than profit making perspective of the IP holders, putting public interest at an all-time high[431]. **Compulsory licenses** work on a similar idea of maintaining the right balance between the rights of patent holder and the public at large. An application for a compulsory license may be made by an interested person after three years of grant of patent, on the

[429] WHO named the project "SOLIDARITY" which had the task of carrying out clinical trials for some of the potential drugs like *remdesivir, lopinavir, ritonavir, favipiravir, lopinavir/ritonavir plus interferon-beta; and chloroquine and hydroxychloroquine* (also these drugs in combination)

[430] Anuja Misra, *The Corona Menace and Impact on IP Rights: Analyzing the Need for Better Decisions,* 5 UPES LAW REVIEW 187-206 (2020).

[431] Bayer Corporation v. Natco Pharma Ltd., Order No. 45/2013 (Intellectual Property Appellate Board, Chennai); The Chancellor, Masters & Scholars of the University of Oxford v. Rameshwari Photocopy Services, CS (OS) No. 2439 of 2012 (Del) (October 6, 2016).

fulfilment of any of the conditions mentioned in Section 84[432]. This came as a relief when patent holders charge high royalty fees as part of licenses[433]. In the initial struggle against the virus during the pandemic, Gilead the original manufacturer of *Remdesivir,* signed royalty free licenses to five different pharmaceutical companies for large scale manufacturing. **Access to information** was demanded by the Netherlands and United Kingdom from Roche, the global pioneer in pharmaceuticals based in Switzerland about the chemical composition for a reagent, used as a buffer to break open cells, which proved helpful to run a test for COVID-19. The company was initially hesitant in sharing the reagent with the other countries which would enable them to mass produce it to run tests. Open access to sources or pools of technology was encouraged in order to jointly fight against the disease. Talking of joint efforts, collaborative research was also given a push. **Collaborative research** basically encompasses research that is born as an output of collective efforts by researchers working in different areas/departments.

In an attempt to utilise the knowledge that was proposed to be shared, **patent pool** as powerful instruments were thought of as a strong tool to further innovation and research into the area. Patent pools are basically instruments that allow patent sharing among nations[434], a concept similar to multilateral cross-licensing but with a slight difference. It is usually an agreement between two or more right holders to pool their patent licenses for common use for all the members to the consortium. It helps relax patent rights by facilitating members to collectively make use of the patents in regard to a technology. This can happen either when there is a demand for a particular technology which cannot be harboured without the help of another set of rights or when the elements which can lead up to a technology are separately and individually patented and owned by different entities. In that way, they make the basis for sharing of knowledge and technology. A party to the patent pool, even if unable to contribute with a patent technology is not barred from reaping the benefits arising therewith in the form of non-exclusive license, unlike in case of multilateral cross licensing where rights are bartered for another set of rights.

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[432] *Supra* Note 99, 31.
[433] *See also, Lee Pharma v. AstraZeneca,* Appellate Board [C.L.A 1 of 2015].
[434] *See generally, United States v. Singer Mfg. Co.,* 374 U.S. 174 (1963).

The TRIPS Agreement in its Article 30[435] and 31 also support the idea of open access in cases of patent. In dire need of technology and knowledge sharing in a crisis like the recent pandemic, technology transfer developed new teeth. Technology transfer in such a case formed the base of all kinds of efforts that were made to pull the nations out of the public health crisis courtesy coronavirus. Access to information, open access to resources, patent pool, compulsory license, collaborative research and incorporating any flexibility in the intellectual property protection involve elements of technology transfer. Thus, transfer of technology gathered much more importance in the pandemic to fight the menace than what was usually accorded to it.

Example of technology crisis could be seen during the pandemic when Italy, which at one point of time was reporting the maximum number of deaths, ran out of the supply of its ventilator's spare parts. In a crucial time like this, if something went wrong with the functioning of the machine which was serving a major utility then, it would be very difficult to have the issue fixed. The original manufacturers of the valves as spare parts were not able to provide for the requirement. They refused to lend the blueprint of the manufactured units and prepared to sue for infringement of patents[436]. Local firms, seeing the growing need day by day, but weighing the desperation to save people's lives above the threatened legal action, took up the initiative of copying the prototype of the using 3-D printing machines, selling copies at $1 in place of the marketed price of $11,000. Many countries like Germany, Israel and Chile[437] way ahead of the times anticipated the way out and had already issued orders facilitating compulsory licenses for life saving drugs.

The World Intellectual Property Organisation (WIPO) established a flexible platform for innovation support and transfer of technology in the context of Covid-19

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[435] "Article 30 of TRIPS: Exceptions to Rights Conferred, Members may provide limited exceptions to the exclusive rights conferred by a patent, provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking account of the legitimate interests of third parties."

[436] Joe C Mathew, *'Coronavirus: Will intellectual property be a hurdle in India's fight against COVID-19?',* BUSINESS TODAY, April 5, 2020, Available at: https://www.businesstoday.in/latest/trends/coronavirus-will-intellectual-property-be-a-hurdle-in-indias-fight-against-covid-19/story/400200.html

[437] *See,* "RESOLUTION *FOR THE GRANTING OF NON-VOLUNTARY LICENSES REFERRED TO IN ARTICLE 51º Nº 2 OF INDUSTRIAL PROPERTY LAW Nº 19.030 TO FACILITATE ACCESS AND AVAILABILITY OF MEDICINES AND TECHNOLOGIES FOR THE PREVENTION, TREATMENT AND CURE OF CORONAVIRUS COVID-19*", https://www.keionline.org/chilean-covid-resolution

pandemic[438]. This platform provides for evidence-based analysis, institutional frameworks, different policies, capacity building and other related information and knowledge resources which may be relevant to the present time's needs[439]. Some of the elements of this platform include knowledge and resources related to the following-

- Technology Licensing: WIPO developed a Successful technology Licensing (STL) manual in response to the various requests made by scientists, technology managers and technology businesspersons for a user-friendly knowledge source which could help them in the licensing of their work.
- Intellectual Property Valuation: Valuation of IP assets involves risk analysis and measurement of profits from an intangible asset. This helps businesses in their planning, acquisitions, mergers, licensing and joint ventures. Methodologies for valuation are necessary as funding entities will always consider return on investments in research and innovative technologies.
- Database of IP Policies from University/Research Organisations: This database contained National IP Policy Models and other specific policies from universities and R&D centres on technology transfer. Policies can be looked at on choosing details of type of institution, focus areas, country/territory, accompanying documents and language. This sets another example for open access to information.
- Capacity building programs for Technology and Innovation Support Centres (TISCs) and Technology Transfer Structures: The World Intellectual Property Organization's (WIPO) Technology and Innovation Support Center (TISC) programs aim to offer innovators in developing countries access to locally available, top-notch technology information and associated services. These programs assist innovators in harnessing their creative capabilities and effectively developing, safeguarding, and handling their intellectual property (IP) rights.

  On the other hand, Technology Transfer Organizations (TTOs) are academic or commercial entities that play a crucial role in facilitating the management of

[438] *See, Intellectual Property and Technology Transfer,* WIPO, https://www.wipo.int/technology-transfer/en/

[439] Promoting Access to Medical Technologies and Innovation: Intersections between public health, intellectual property and trade, WIPO extract on integrated health, trade and IP approach to respond to the COVID-19 pandemic (August 30, 2021).

intellectual property rights and technology transfer. Acting as intermediaries between research and practical implementation, TTOs provide valuable support for collaboration and act as mediators, fostering connections among various stakeholders in the innovation landscape, such as academia and industry.

The spirit of the global policy of IPR protection goes hand in glove with the encouragement to international transfer of technology. A strict IPR regime may cause hindrances to the smooth flow of technology but liberally interpreted in the global cooperation context, IPRs have become mediums for access to technology.

Just as developing countries move up the income ladder, the active input of IPRs as a means of technology transfer increases. Countries need to be more proactive in international trade so as to facilitate further opportunities for technology transfer. Trade in technology related goods that are protected by patents is directly proportional to the improvements that a nation makes in their IPR regime. This is common amongst the middle income and high income developing countries. Such countries opt for providing a strong patent protection to inventions so that the imports of the goods can increase and generate revenue lest the unprotected inventions may pose a competitive imitation threat by other nations.

This indirectly suggests that patents (intellectual property) may be used to measure technology transfer flows into a nation with a certain amount of absorptive capability for technology. For quite a few LDCs technology transfers may become difficult owing to low absorptive capacities consequently low intellectual property protection. Thus, strengthening domestic intellectual property protection along with compliance with international standards may result in successful technology transfer flows.