Entrepreneurship
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Ideation and Prototyping Part 6

We have in the previous lectures considered different aspects of ideation and prototyping, including conducting ideation workshops and understanding the typical process adopted in prototype development. In this module lecture, we will consider the importance of patenting for startups.

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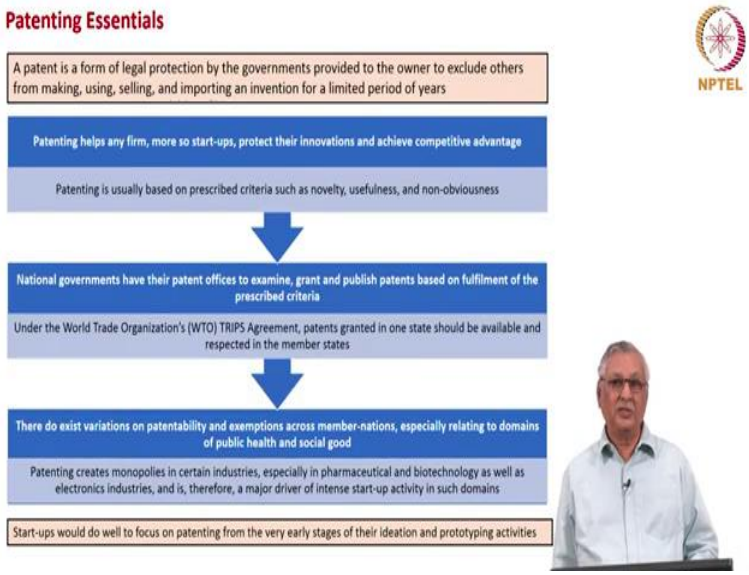

A patent is a form of legal protection which is offered by the governments to inventors to ensure that others do not transgress the inventions that have been discovered or created by the inventors. They prohibit the non-inventors from making, using, selling and importing an invention of an inventor for a limited number of years which means that by virtue of patent protection, an inventor is able to utilize for business purpose or protect the patent for any other intellectual purpose for the prescribed duration of time.

Patenting helps any firm more so startups protect their innovations and achieve competitive advantage. Patenting is usually based on certain criteria. One is non-obviousness, the second is novelty, third is usefulness. So, an invention which is absolutely novel, but has no utility of any kind is unlikely to be granted a patent. Similarly, a patent which is not obvious to the normal person, but has got no novelty, but which has got no utility is also unlikely to be granted a patent.

Therefore, patenting has to have all the three things together, which is novelty, non-obviousness and usefulness. So, every national government has got a patent office. And the job of the patent office is to grant patents based on fulfillment of certain prescribed criteria.

Under the World Trade Organization TRIPS Agreement, the patents granted in one state should be available and respected by other member states. There do exist certain variations in how patents are granted. There are also certain variations in how the patents are protected and how certain exemptions are granted to the patent regime.

These exemptions are usually based on public health and social good. So, we have got provisions for compulsory licensing in the case of certain medicines of acute or intense public health requirements. That apart patenting generally creates monopolies because nobody else can use the patentable invention and in the pharmaceutical biotechnology, electronics and digital in industries, patenting helps companies achieve high level of scale, high level of business and therefore, create at times usurious profits. Therefore, startups would do well to focus on patenting from the very early stages of their ideation and prototyping activities.

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What are the steps in patenting? It is fairly simple and rigorous process. One, the inventor must be very clear that the invention which is being applied for, is patentable because patenting has got certain time and cost aspects attached to that, and it cannot be a frivolous exercise.

So, prior to embarking upon the patenting journey, the startup has to be very clear that the product or the service or the process, which is sort to be protected through patenting is deserving of such patent protection.

Secondly, what is the type of patent that is required for the invention? The second step is to filing with the patent office. There are different routes for filing the patent application, which will come to very shortly. Third, formal examination by the patent office, whether the patent is maintainable at the first look that would be decided by the office and if the patient is maintainable, it would be accepted in the patent examination system. Once the patent is accepted and up to the initial scrutiny, the patent is usually published. And the publication of the patent is to ensure that there are no opposing claims.

And in the event that there are people who believe that the same invention has been done by them earlier or that there is a prior part already in published domain, those kinds of objections and viewpoints can arise at that point of time. That is the time when the inventor as well as the patent office have to work together to address those concerns and establish whether the patent is really patentable or not. Finally, the process takes its due course and the patent is granted if the invention matches with the prescribed criteria of novelty, non-obviousness as well as usefulness.

But after the patent is granted, depending upon the national rules and regulations, the patent needs to be maintained by payment of appropriate fees to the patent office. Therefore, this is the cycle of patenting and patent maintenance.

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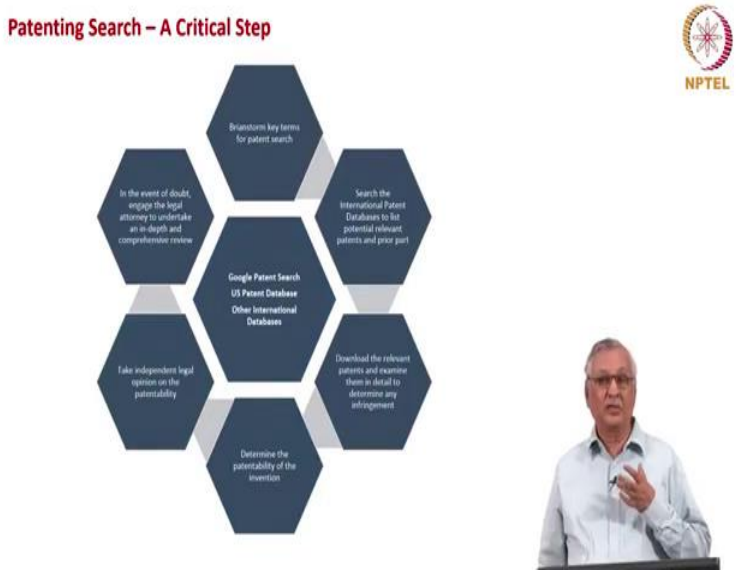

The bedrock of any patenting system is the search for the prior art and whether the invention that is sought to be patented is really the invention that nobody has ever thought about or converted into a workable proposition. So, to be able to do that, in today's digital world, there are several avenues and options available. Search is extremely easy these days but also very complex also. Therefore, we need to have certain broad terms, key terms which would define the domain of the invention that is being considered for patenting.

So, the startup has to brainstorm, the key terms which are relevant for the patent search. Once the broad terms are established, the international patent database can be searched to identify the patents and classify the patents depending upon the filters that one may set up. Once the classification of the patents is done, it remains for the startup the R and D head of the other people who are associated with the patenting process to download those patents and examine them minutely with the reference to the patentable invention that the startup is proposing.

So, determining the patentability of invention is expected to be on the part of the startup, a very objective and unbiased activity. Because if the startup is in love with its own invention and does not really look at or consider potentially threatening prior art, then the company would be on a path which could be finally injurious to its financial health. Therefore, it is very important that the startup is very unbiased, very objective and very candid it to itself on whether the proposed apparatus or the proposed service is patentable or not.

And after the analysis is done, the startup is well advised to take up an independent legal opinion whether the conclusion that has been arrived at is correct or not. There are certain cases in which the patentability has got very deep ramifications. Particularly in abstract sciences, abstract activities and newer emerging domains such as for biotechnology, genetics and pharmaceuticals.

It becomes important to have a competent legal authority, competent patent attorney to undertake an in depth and intensive analysis of the invention that is proposed as well as the prior art to ensure that the invention is properly protected. Because just understanding whether the proposed product or service is patentable or not, is one thing.

But writing out the patent application, writing out the thesis why the invention should be patented is also a extremely important task and that requires thorough knowledge of the field. Either the company has got intellectually oriented intellectual property protectors within the organization. All the startups should rely on external intellectual property attorneys to do this

job. So, the patenting search and understanding whether the product is patentable is the next important step.

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To be able to do that I said there are number of databases which are available, if you look at the USPTO there are a number of sites which are dedicated to the patents. Full text and image database is available in the US Patent Office. Similarly, the entire repository of applications is available as full text as image database. Then there is a global dossier, the gazette notifications related to patents they are also available.

So, one needs to go through all of these to be able to decide whether the invention is patentable and if so, what kind of patent application should one make? This itself points out to the fact that ideation is one part of an organizational job. Creation of prototype and the testing of it as per this specification is another part of the job.

But patenting itself is one holistic, complete job, which requires dedicated personnel and it cannot be done as a part time job by others, R&D engineers, commercial specialists, operations specialists who are involved in the ideation in prototype phase can certainly contribute to the development of patent to the analysis of patentability and various other parameters.

But the actual responsibility and accountability for understanding the invention from the patentability angle and making the patent application is a very specialized job which an IP attorney or an intellectual property professional in the company can only do. So, it is

important for a start up to look at having these kinds of support accessories in organizationally or have support capabilities within the organization.

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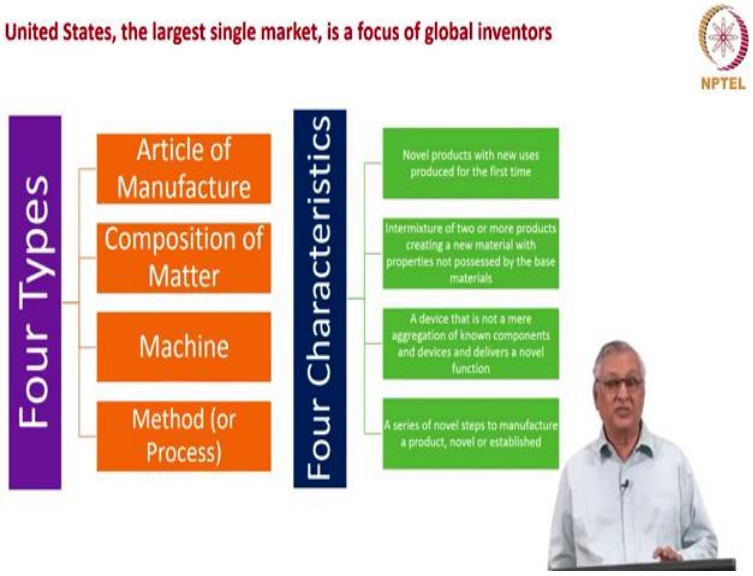

United States, which is the largest market, largest single market, is obviously focus area for global inventors. There are 4 types of patenting which are allowed in the US. One is an article of manufacture, which is roughly corresponding to a product patent. Second, composition of matter patent which is very relevant in fine chemicals, pharmaceuticals and by other biological products.

Third, machine or equipment or device can be the subject matter of invention and patenting. And fourth method or process that could be the subject matter of patenting. Now, all products with new uses produced for the first time, qualify for product patents under the article of manufacture classification.

Composition of matter which is two ingredients, which are well known in the technological space, when they are combined in a novel way and they create a third product, which is of completely different characteristic that qualifies for a composition of matter patent.

Machine, a device that is not a mere aggregation of known components, but delivers a novel function that is qualifying for an invention under the device or mission category. A series of novel steps which are used for production of a product which is otherwise known, qualifies for a process patent. This is particularly relevant in the space of chemistry or in biological sciences.

The product may be known, a drug which is used for human consumption may be known, it may be having 10 steps, in the previously understood prior art which is part of the earlier product patent. However, if somebody is able to reduce those 10 steps into 2 steps or in doing so, able to improve the product characteristics as well as the process parameters, that new process will qualify for the method patent or the process patient.

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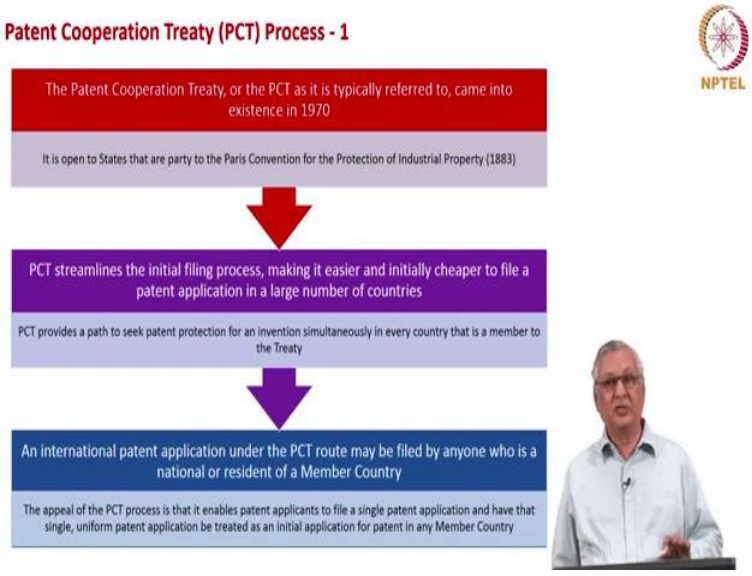

While US and PSPTO continue to remain as very important foresight for patenting. Over the years, patent cooperation treaty process has come into being as an extremely relevant and very useful aspect of patenting. In the increasingly globalized world, every startup or every firm would like to as many markets and as many nations as possible for the invention. That said, it is impossible from a financial perspective to simultaneously launch patent applications in all the nations and because themselves would be very prohibitive.

Therefore, the patent cooperation treaty or the PCT which came into existence in 1970 has come up as a boon to the patenting efforts of individuals as well as corporations. This is open to stairs that are party to the Paris convention for protection of industrial property. What PCT does? It streamlines the patenting process whereby if you make an application in one particular member state, it is considered as an international patent application that has been made for the applicability in all the member states.

Therefore, it provides a path to seek patent protection for invention simultaneously in every country that is a member to the treaty. An international patent application under the PCT route can be filed by anyone who is a national or resident of a member country. The appeal of

the PCT process is very obvious. It enables the patent applicants to file a single patent application and have that single uniform patent application be treated as an initial application for patent in any member country.

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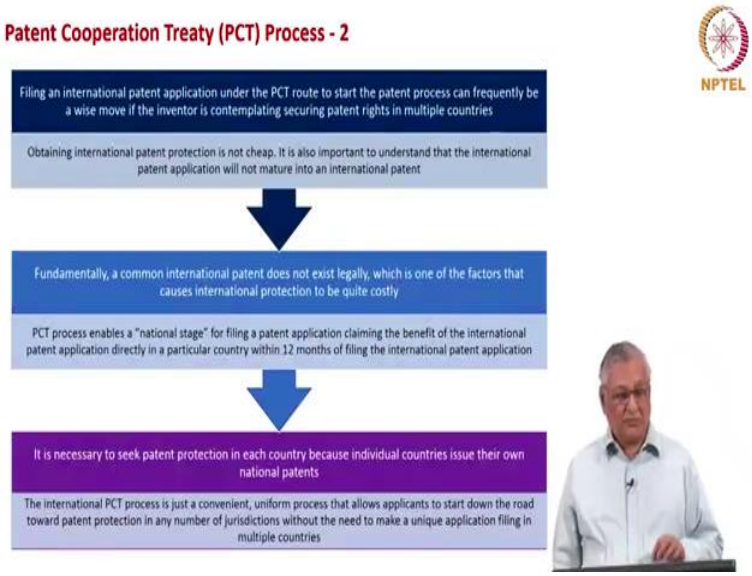

Filing an international patent application under PCT route to start the patent process can frequently be a very wise move if the inventory is contemplating securing patent rights in multiple countries. However, given that the product is a new invention, it becomes very difficult for the inventor or the startup to imagine or visualize whether the product and the invention would be having market potential in all the member countries. Therefore, the product needs to be brought up to a particular stage before such a commitment can be made in terms of patenting.

Therefore, there is a time span which is available for the inventor to be able to assess the relative market advantage versus the investment cost of making simultaneous or sequential patent applications in number of countries. That said, we cannot assume that having a PCT route and a PCT international patenting approach makes the patenting process cheap.

It is making the initial patent application for a number of countries cheap, but it does not mean that the final patent application would be cheap, if one were to say make the patenting applicable for all the 153 countries, all the formalities related to the 153 member countries and the cost thereof have to be born.

Therefore, PCT route is a pathway but is not necessarily an automatically cheap route to make global patent possible. In fact, there is nothing like a global common international

patent. Each patent is a national patent but is respected amongst the members of all the PCT states.

The PCT process enables a national stage for filing a patent application claiming the benefit of the international patent application that has been made earlier. A time span of 12 months is made available within which the inventor and the startup company can decide whether the patenting should be done in other countries as well.

In any case, it is important for the inventor to make a thorough analysis during the 12 months and seek patent protection in all the countries which are considered important for the patentability of the product. It is the convenient and uniform process nevertheless and it enables the inventor and more so a startup which does not have the resources to navigate multiple jurisdictions with a single international patent application in the member state in which the startup or the individual is normally resident.

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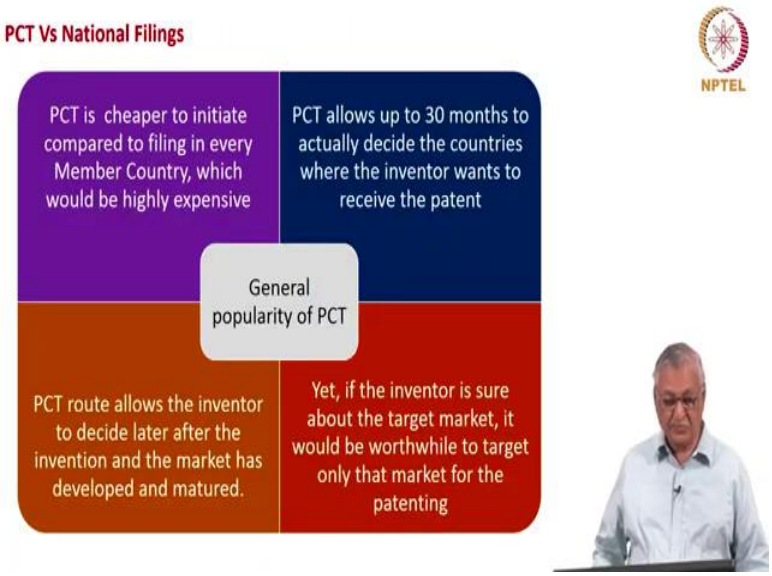

So, if you compare the PCT process with the national filing process, the PCT process is generally popular. The reason is it is cheaper to initiate compared to filing in every jurisdiction, one would like to even think of. Second, it allows under certain circumstances, even up to 30 months to actually decide the countries where the inventor wants to receive the patent. It allows the inventor to decide later after the invention and after the market has developed and matured.

But that said, if the inventor is extremely confident that this product is going to be finding the maximum potential in only one market, making the national application for that particular

product in that particular market is a more worthwhile route and could be even faster route to get the patent application granted.

So, somebody who is startup in India, but a envisages a big market in US and Japan. Probably should do three national filings in India under the PCT route probably and then directly in the US and directly in Japan that would be a way to ensure that there is a good balance on getting the patent early on. And also ensuring that the costs are optimized because the market potential is understood very well in the beginning itself.

On the other hand, for products which have got universal application, for example, the pharmaceutical types of products, where the products are supposed to be required in all the geographies, it makes sense to go through the PCT route and have a common application which could be leveraged in different markets subsequently.

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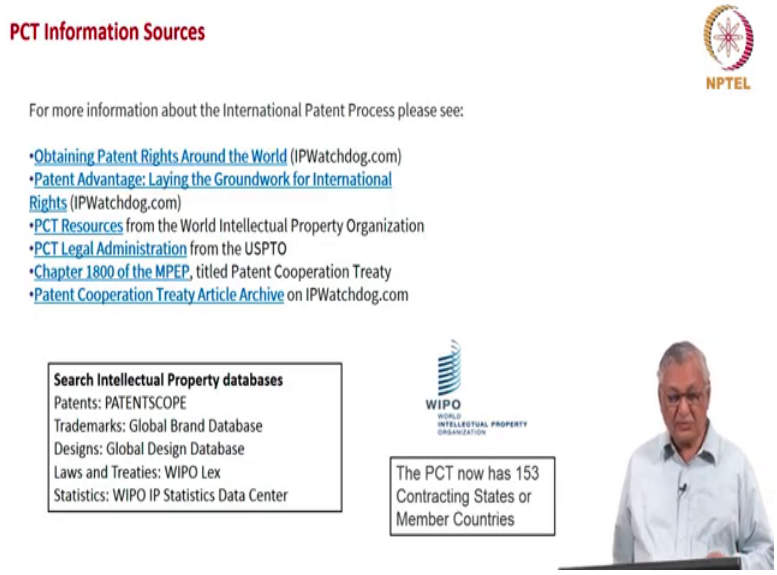

Just as USPTO has got number of data sources and information sources, PCT also provides a wealth of information for inventors and patent seekers. Some of these things are listed here. They are also such intellectual property databases. Loss, then presidents and statistics, World Intellect Property Organization manages this entire ecosystem. As update we have got 153 contracting states or member countries in the PCT system.

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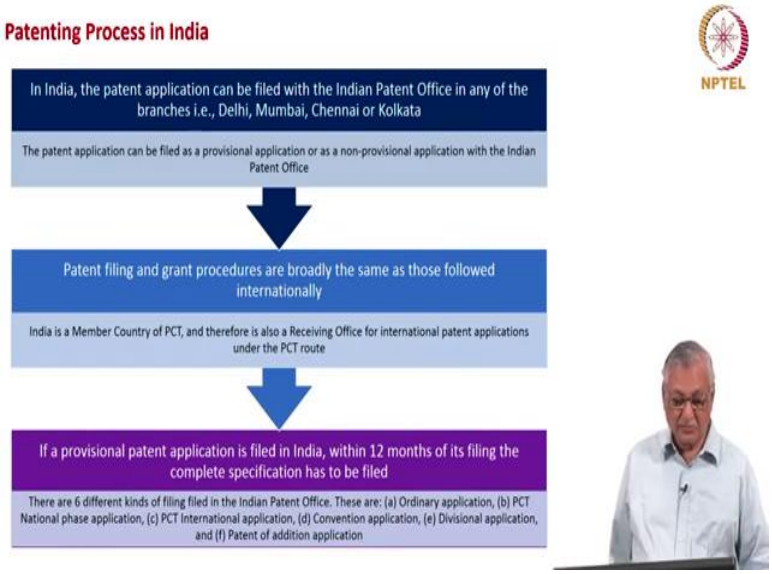

In India, the patenting process is broadly similar, the patent application can be filed in any of the patent offices located in the metropolitan cities of Delhi, Mumbai, Chennai or Calcutta. It can be made as a provisional application or a non-provisional application with the Indian Patent Office. Patent filing and grand procedures are broadly similar to those followed in other countries which we have discussed in the earlier sections with reference to US Patent Office.

India being a member country of the PCT system, India also acts as a receiving office for any of the International PCT patent applications. And if a provisional patent is filed in India, the provisional application has to be converted into a final application within the period of 12 months that enables the Indian patent filer to come up with a quick solution in terms of a provisional patent, which gives the overall concept, the overall working model, the initial results. And then take further time of 12 months to embody the patent application with the full set of design and full set of result parameters.

There are 6 types of filings which are possibly India. One is the ordinary applications, second is the PCT national phase application as receiving office. PCT international application again as the receiving office, convention application, divisional application and patent of addition application each of them can be understood once you search the databases.

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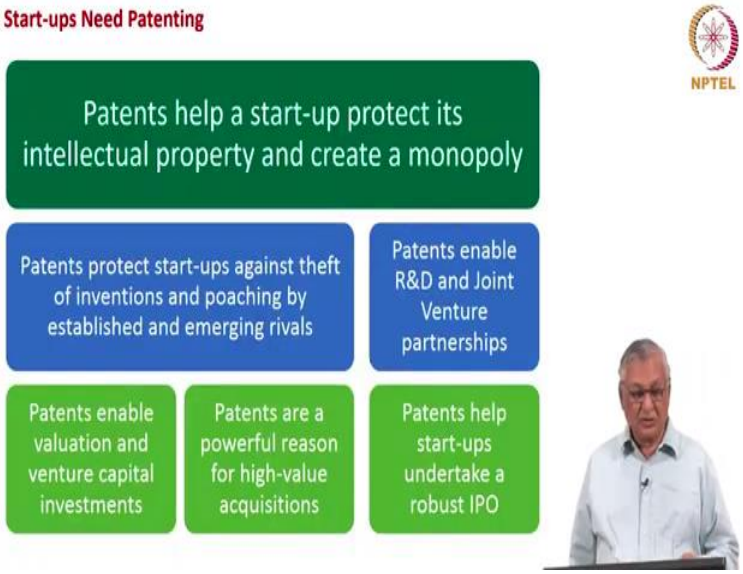

Startups certainly need patenting, patents help, a startup protect its intellectual property and create a monopoly. Patents protect startups against theft of inventions and poaching by established and emerging rivals. Patents also helped the startup secure R and D and joint venture partnerships based on the invention they possess. Patents create valuable intellectual property therefore, increase the business valuation and attract venture capital investments.

Patents are also a very powerful reason why certain startups get acquired at high cost by various tech giants. Because patents are important for the tech giants as the grow and patents help startups achieve a very robust IPO. Some of these aspects are discussed in the next few slides.

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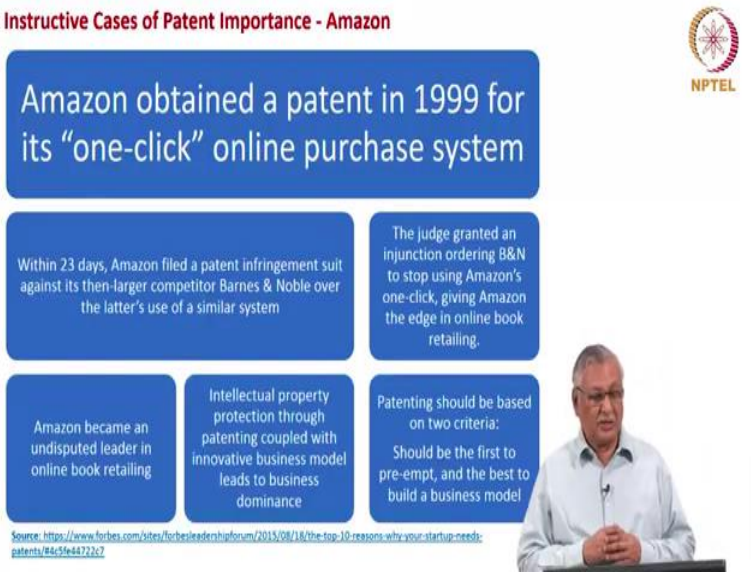

There are several instructive case of patent importance. One of them is Amazon. In 1999, Amazon obtained a patent for its one click online purchase system. Within 23 days of the grant of patent, Amazon filed a patent infringement suit against Barnes and Noble which was the largest online competitor.

Within 23 days, Amazon filed a patent infringement suit against its largest competitor Barnes and Noble over the letter's use of a similar system. The judge granted injunction ordering B and N to stop using the Amazon one click system and that has helped Amazon build a monopoly around its digital marketing capability.

And Amazon became an undisputed leader in online book retailing. Therefore, intellectual property protection through appropriate patenting, coupled with innovative business models or innovative ways of doing business will lead to business dominance. Therefore, patenting should be based on two criteria, one should be the first to pre-empt any other inventor and B the best to build a business model.

When these two criteria fulfill that is first in terms of invention to best in terms of building a business model, patenting is likely to lead to monopoly revenues and monopoly profits.

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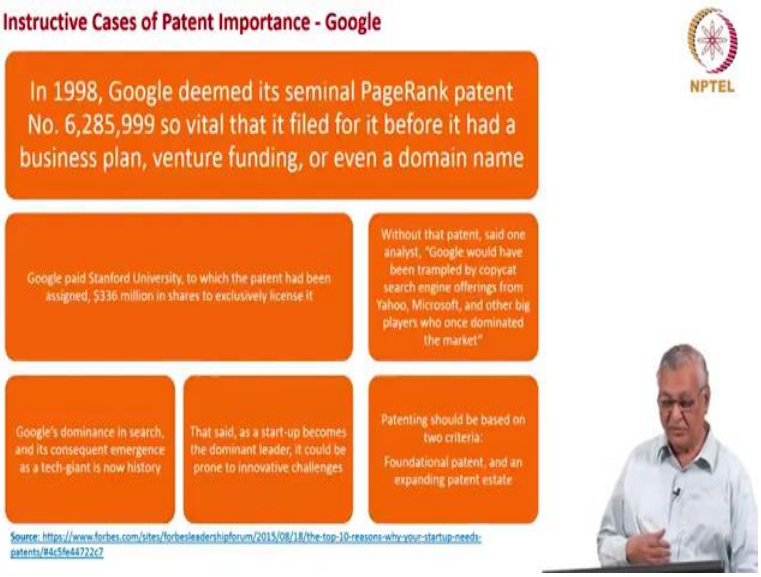

The case of Google is also equally instructive. In 1998, Google deemed its seminal PageRank patent number, 6285999, so vital that it filed for it, even before it had a business plan, venture funding or even a domain name. This patent was assigned to Stanford University and Google paid 336 million dollars in shares to exclusively license it. Without that patent protection,

Google would not have become the leader in search. And Google would not have become what it is today in terms of tech-giant.

Therefore, Google's dominant in search and its consequence emergence, as tech giant, which is now history is linked to just one patent which the company has patented, protected and developed into a business, with diligence and with vision for ahead of its formation as a company. That said as a startup becomes the dominant leader. It could be prone to innovative challenges. Patenting should be based therefore on two criteria, one there should be a foundational patent and B there should be an expanding patent tested.

This again is common in pharmaceutical industry, when you develop an active pharmaceutical ingredient or a formulation based on certain characteristics. And with time, you would be able to make improvements and the formulation itself can be made in such a manner that its purities enhanced its particulate levels are reduced, its ability to have side effects is significantly arrested. Therefore, the formulation becomes completely different.

So, by filing extension patents for those, the company would be in a position to in a way evergreen the patent and the ability to generate a patent estate around the core patent is also one of the important ways in patenting becomes an important business development strategy.

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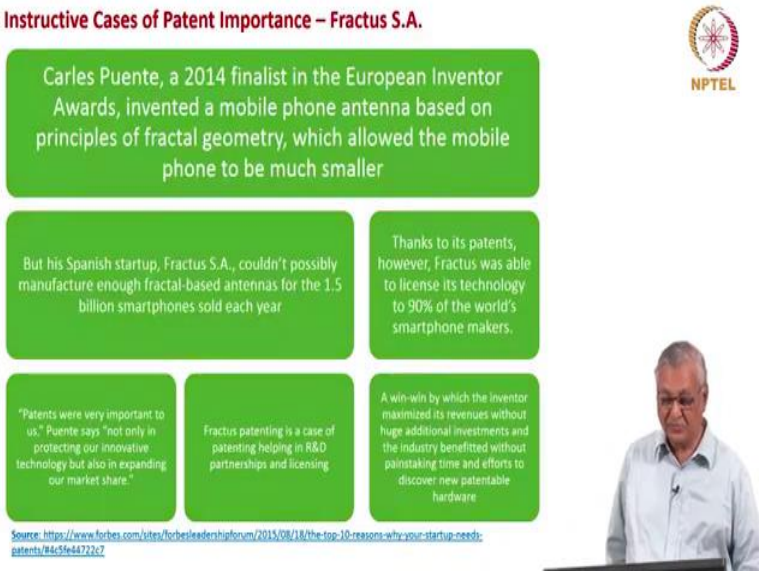

The third case is one of cellular industry, Fractus S.A. is a Spanish firm, which was founded by an European inventor. He had a mobile antenna, which could provide cellular functionality to these cell phones. If you recall how the cell phones were there when they were first operationalized, they were as huge as one-foot devices. If this mobile phone

antenna which dramatically compress the size of the cellular phone was essential, it could also not be offered by Fractus to the whole lot of companies which were engaged in cell phones.

Therefore, the company went on to a model of R and D partnership licensing its antenna technology to the billions of cell phone production possibilities that existed, whether it was Ericsson or whether it was other companies who had huge cell phone production plans. They all licensed these technological developments through the phone antenna system, the invention which was done by Fractus. Patents were really important to us discovery says not only in protecting our innovative technology but also in expanding our market share.

It is a case of patenting helping in R and D development, partnerships, and also in licensing. It was a win-win, because the industry did not need to make additional investments to re discovered the wheel to circumvent Fractus innovation and also make huge investments in the antenna technology. It also helped Fractus to get its due through licensing without making addition investments to manufacture all by itself, so it was a win-win opportunity that came through patent licensing.

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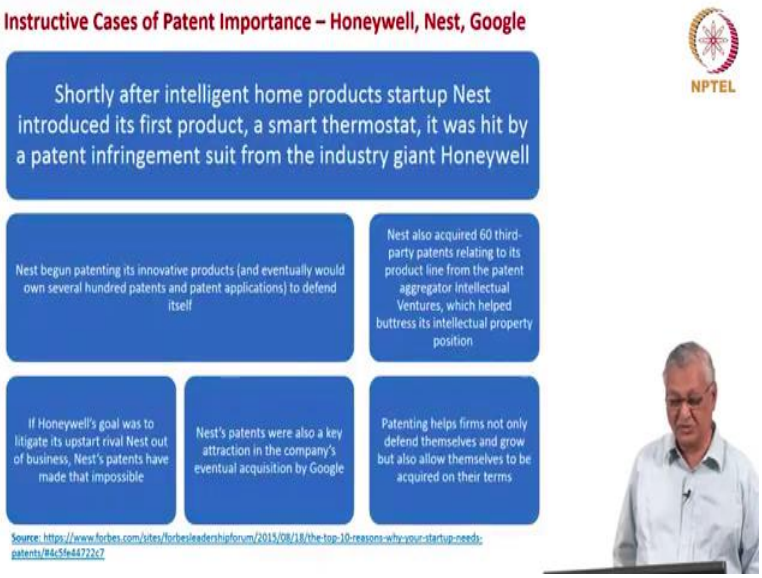

As I said patents helped companies defend themselves. Patent also help companies be open to acquisition. Nest was a intelligent home product startup. It introduced a product called start thermostat, and it faced competition from Honeywell. And the only way in which Nest could protect itself is to rapidly increase its patent estate.

So, it began patenting its innovative products and eventually owned several 100 patents and patent applications to defend itself. It also acquired certain important third party patents, so that the patent estate was comprehensive, complete, and rather invincible against any attempts by the larger rival to challenge the capability of Nest to be smart appliance manufacturer.

So, Nest patents have made it impossible for Honeywell to compromise the position of Nest. Having done that Nest intellectual property database. Intellectual Property capability has become so impressive that Google found it important to acquire Nest at a valuation of 3.2 billion dollars in cash. Therefore, patenting helps firms not only defend themselves and grow but also allow themselves to be acquired at attractive terms.

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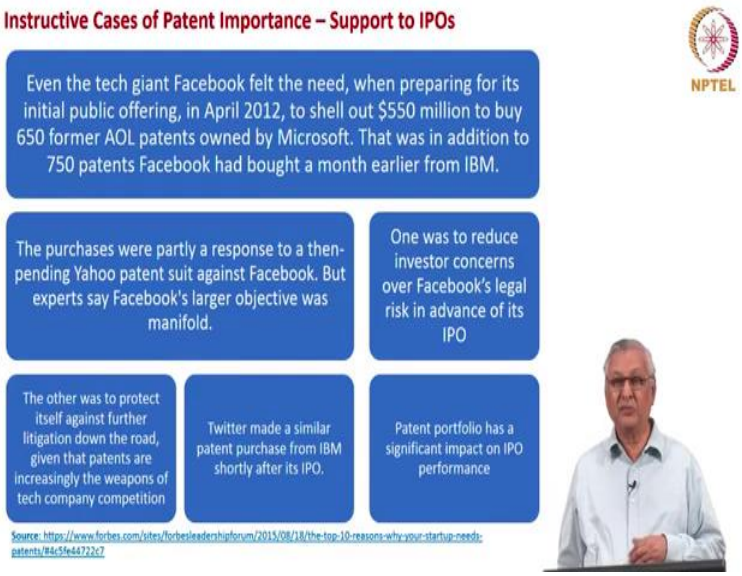

There are also several instructive cases of patents being important in supporting IPOs. Even the tech giant Facebook felt the need when preparing for the IPO in April 2012 to shell out 550 million dollars to buy 650 former AOL patents owned by Microsoft. This was in addition to 750 patents Facebook had bought a month earlier from IBM.

This purchase was made to bolster the legal position, the intellectual property position of Facebook. And also address the investors concerned that Facebook was only a social media phenomenon, and it did not have an intellectual property backbone. So, it reduced the investor consent and strengthen the IPO.

It also helped the firm defend itself against possible litigation down the road. And patents as we can recognize or the only armory in the tech companies mutual competition. Similar to

Twitter made an acquisition of patents from IBM after the IPO. Patent portfolio therefore has a significant impact on IPO performance.

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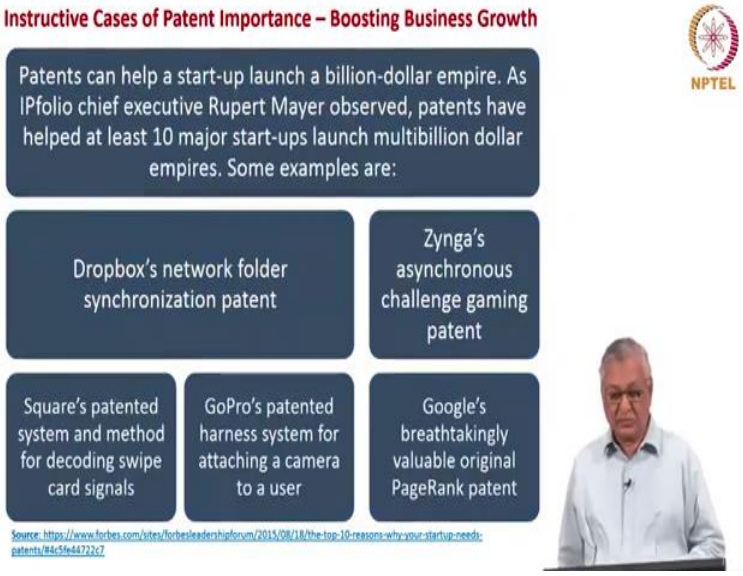

There are many other examples where business growth has been boosted by patents. It can help start up become a billion dollar enterprise if the patenting strategy is done right. And the patenting strategy can be done organically or through inorganically. We have the example of Drop box, Network Folder, synchronization patent providing the patent strength for Drop box. Zinga's, asynchronous challenge gaming patent, Squares patented system and method for decoding swipe card signals.

GoPro's patented harness system for attaching camera to a user and we all already saw Google's breathtakingly valuable original PageRank patent. So, patenting helps startups become completely different, differentiated and ahead in the game.

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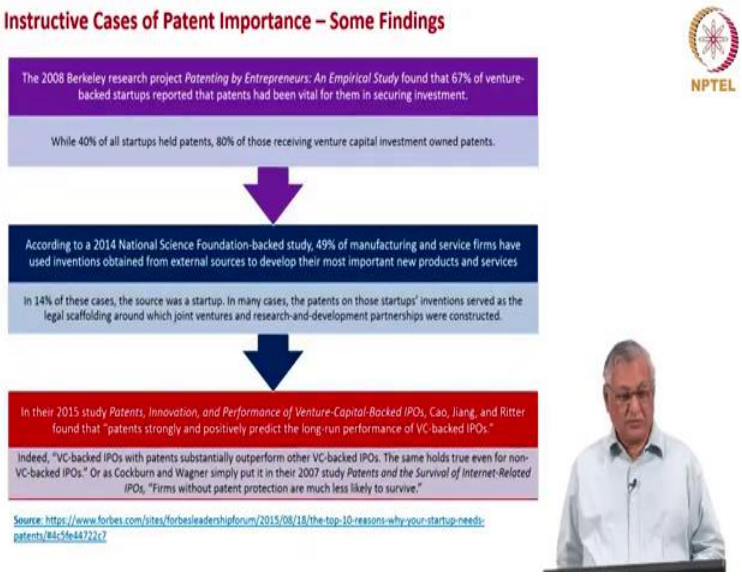

There are studies as well, in 2008, Berkeley, did a research project on patenting by entrepreneurs. In this entrepreneurial study, it was found out that 60 percent of venture backed startups reported that their patents had been vital for them in securing investment. 40 percent of all the startups surveyed held patents. However, 80 percent of the startups which received capital investments by venture capital firms had patents. So, you can have a start up without patenting.

But if you want to have venture capital funding, it is important that you have patent protection. According to a 2014 National Science Foundation-backed study, 49 percent of the manufacturing and service firms have used inventions obtained from external sources to develop their most important new products and services. So, it is not that every patent has to be done organically. It is also possible to fuse third party patents with your own patenting approaches.

In 14 percent of these cases, the source was a startup. In many cases, the patents on those startup's inventions served as a legal scaffolding around with joint ventures and research and development partnerships were constructed. So, two capable entities in the intellectual property field can come together and create a larger scaffolding of patenting and legal protection which will maximize the value for both the companies.

In the 2015 study, titled patents, innovation and performance of venture capital backed IPO's, the researchers found that patents strongly and positively predict the long run performance of VC-backed IPOs.

They substantially outperform other VC-backed IPOs. The same holds true even for non VC-backed IPOs or as other researchers put in their 2007 study. Firms without patent protection are much less likely to survive. So, patenting is not merely for growth, it is also definitely for survival and sustenance.

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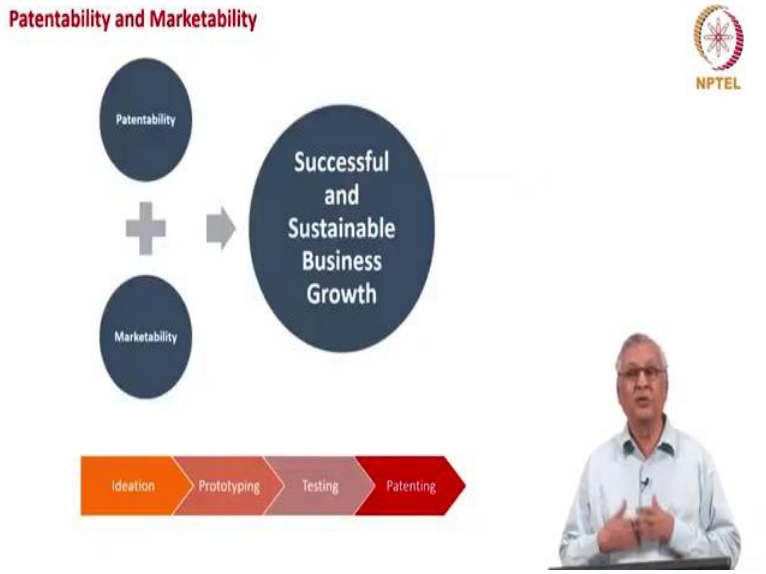

But patentability by itself does not do the magic. A patentable invention has to be also marketable. A gold plated process and a gold plated product may not be price competitive and may not be marketed at all. Therefore, marketability of the invention is as important as patentability and when they combine successful and sustainable business growth happens.

And the whole idea of bringing in the patenting domain within the discussion, part of this ideation and prototyping thematic module is that the genesis of patenting happens in the ideation and prototyping as well as the testing phases.

These are the three phases which are in the initial months and initial years of a startup development that are very important for ensuring the patent is developed and sought for grant by the startup.

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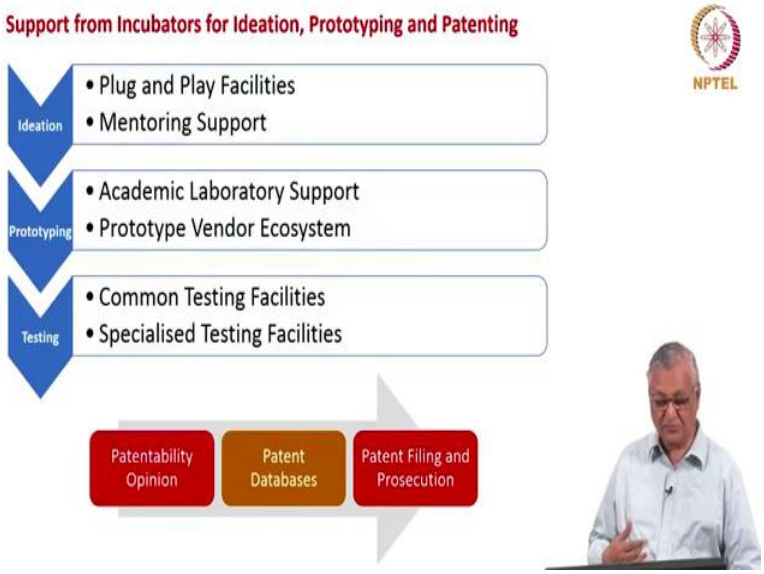

We know that startups have got their own resource constraints. So, how do startups go about the patenting challenge? There are incubators that are available today to help companies do the patenting with more ease. In the ideation phase, incubators provide plug and play facilities, they provide mentoring support.

In the prototyping phase, the academic laboratories are available to support, research can be conducted. Prototype vendor ecosystem is available when the incubators are there as an agglomeration of different startups and are well connected through industrial consultancy and research with other vendor systems.

Testing is available in the incubators through common testing facilities as well as specialized testing facilities. They also provide patentability opinion, they provide patent databases and they also provide patent filing and prosecution support. So, incubators are very helpful for startups in the ideation, prototyping and patenting phases.

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Today, virtually every IIT, the Institute of Higher importance has got an incubator cell attached to the institution. And in fact, many of these have got Innovation Research parks or startup research parks, as given here 4 examples of IIT Bombay, IIT Delhi, IIT Kharagpur and IIT Madras having their own research parks, and also incubation cells. It does not mean that other IITs do not possess such capabilities, they do have and several other educational institutions committed to higher educational research also have.

These incubation centers are available for both alumni as well as non-alumni to set up their startups and also undertake their inventions as part of the startup development. Thank you.