Patent Search For Engineers And Lawyers
Prof. M. Padmavati
Rajiv Gandhi School of Intellectual Property Law
Indian Institute of Technology, Kharagpur

Lecture - 29
Hands on Patent Landscape
(Contd.)

Welcome to the session on the Patent Landscape Search and Analysis in relation to the electrical and electronics area. We continue with the discussion in relation to the technologies in relation to digital pen. We have understood the basic aspects of how to go about with the search in relation to digital pen, utilizing keyword as well as IPC combination, how to look at the analysis of the data. One of the important things that we need to look at it is from the analysis of what we call major assignee portfolio analysis. So, let us understand how to go about to attack from the basic landscape search.

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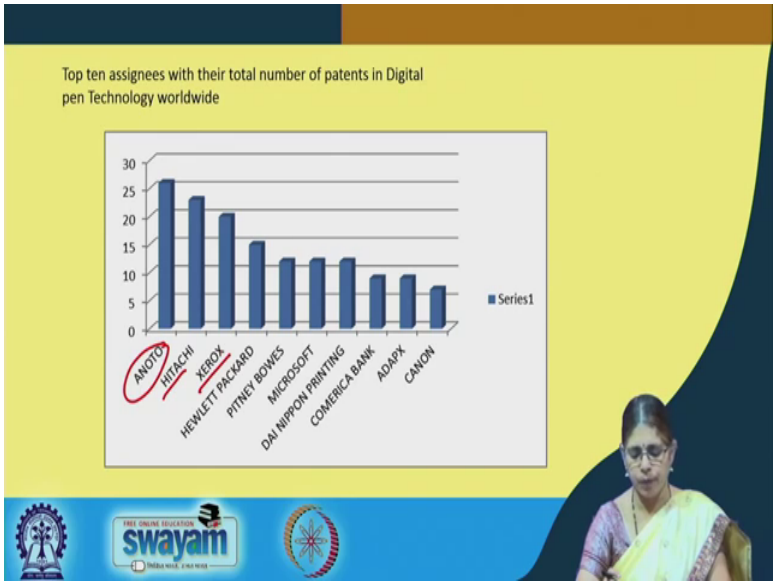

So, what you see on this illustration is the analysis of the data set in relation to the assignee. Here you see the major assignee is Anoto which has the top filings in that particular area and then closely followed by Hitachi and Xerox. It is also important beyond the landscape to understand the growth of the technology in relation to a particular assignee or a set of assignees. And, this also forms the part of what we call

understanding patent portfolio analysis in relation to a given technology in relation to a particular assignee.

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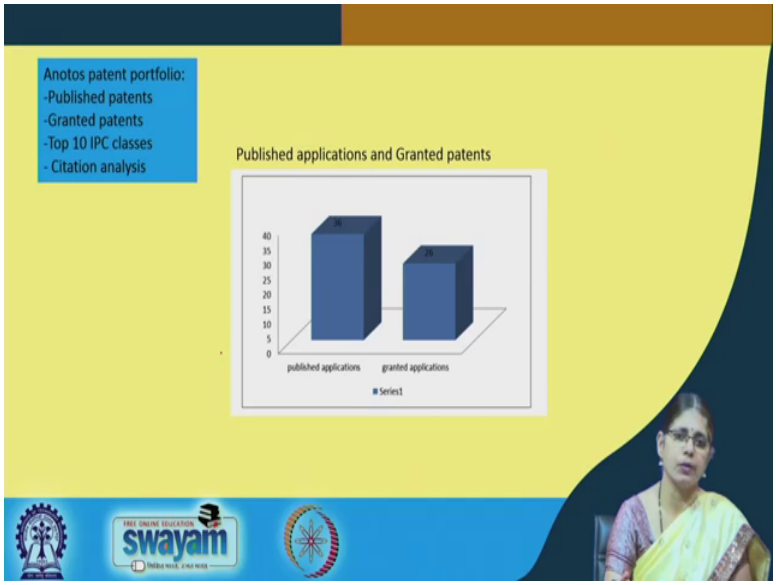

So, how do we go about with the patent portfolio analysis? The simple way to do is once you have downloaded the basic patent data set into an excel sheet, you can filter the patent dataset utilizing the filter option for assignee where you choose only the major assignee. In this case, we are looking at the top assignee who is Anoto and the patent portfolio in relation to this particular assignee. So, all that we do with the landscape analysis, the general landscape analysis can be done with respect to a single assignee as well.

What is it that we can identify as analysis aspects? The publication rate in relation to patents, how many granted patents the assignee has, in which IPC codes do you see the spread of patents and how are these assignee citations coming up in relation to the patents. So, in this illustration we look at the total number of published applications and the granted applications for this particular assignee Anoto and you see that there are a gradual rise in the publications as well as in the case of granted applications. So, you have a lot of granted patents as well along with the published applications.

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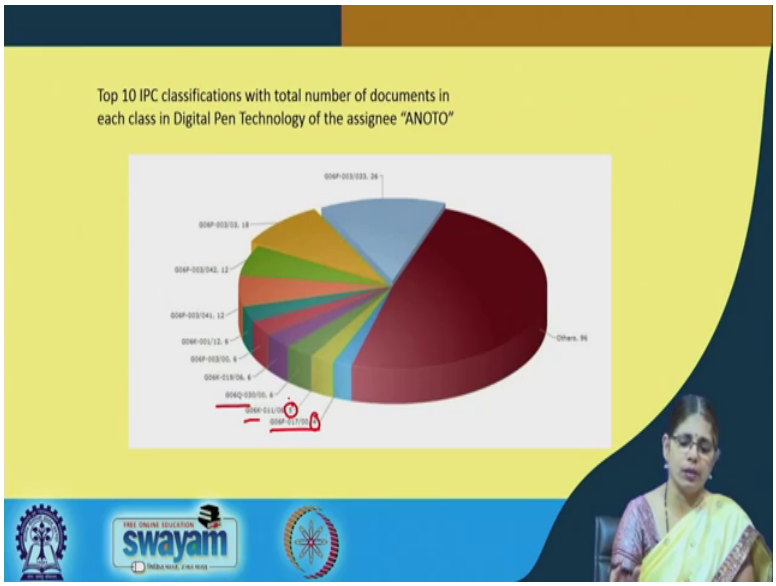

In this illustration we are looking at the aspect of what are the different IPC codes in which these patents are classified. So, the major class is the G-class in this particular case where we are looking at the analysis in relation to the digital pens. And, among the different sub classes you can see the spread of patents which is shown in the numbers just beside the IPC code and other IPCs which are relevant are classified into the separate category as a whole number of ones with respect to what is others.

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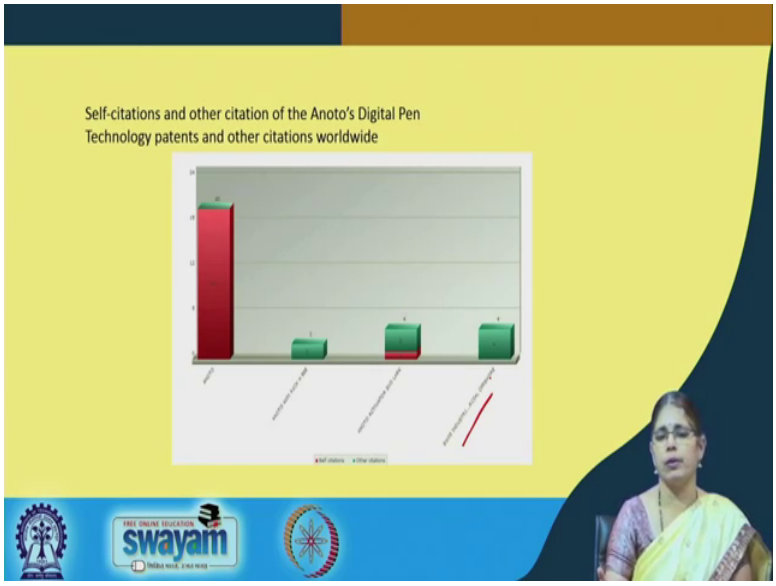

Another important thing we can find out from this sort of data analysis is to understand, if Anato has been the world leader in relation to bringing in the first lead patent in relation to digital pen, how often has this technology been cited and that is how you can see by the citation analysis.

So, there are two different ways in which we can look at the citation analysis; one is the self citation that is citations within the patents of Anato, and then other citations that is other assignees citing this particular technology. So, here you find Anato in the various citation part of it from the graph and others who have actually also cited Anato. So, this gives you an idea on the strength of the technology from the point of view of how the value of the technology is being perceived in a given area.

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Let us look at another interesting and important area of growth in the area of electronics and the telecommunication sector. This is the area of what we call the future development of the space of what we call orthogonal time frequency and space. This encompasses what we call the communication sector where we are looking at the mobile based communications. This is going to bring in a great revolution with respect to the way the spectrum is being looked at in the segment of communication. Let us understand a little bit of a nuance in relation to this particular technology.

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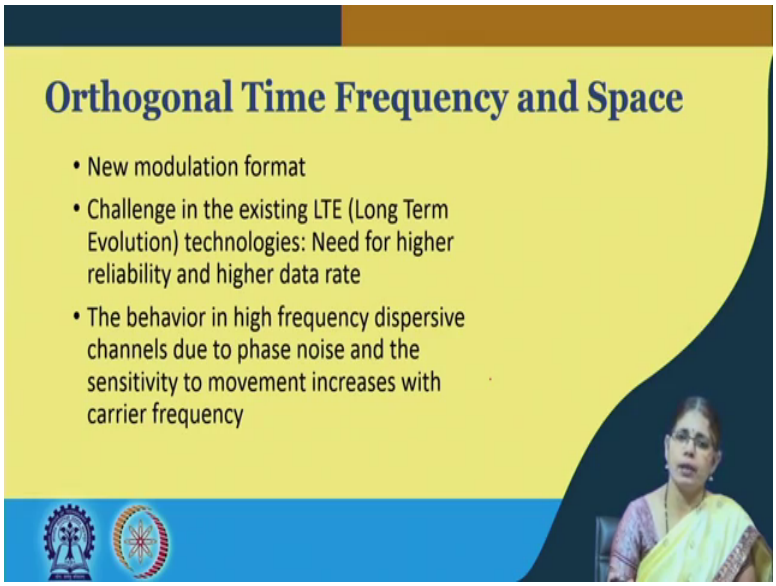

So, if one it we have to embark on a patent landscape analysis in relation to this particular area, one needs to understand where this and comes under the purview of in relation to what technology. So, it comes under the purview of communication technologies and it is what is going to be the future of the expanded aspect of LTEs which is Long Term Evolution technologies.

Every technology brings in a challenge with respect to implementation and so, the improvement of technologies represent the solutions that are being looked at from the point of view of those problems that the implementation brings in. The Orthogonal Time Frequency and Space or in short OTFS is actually a new modulation format which brings in greater communication from the point of view of the communication segment from the point of view of the mobile technologies, simply put.

So, what is the challenge in relation to why this technology is being looked at as the next evolution? The aspect of communication in long range has been a challenge. For instance, when we use a mobile we often have this issue of a call drops; when there is a huge set of landscape disturbance in that case also you find that the data speed comes down and also the network is not very open from the point of view of the one is the call drop and the other is the communication itself is not very clear.

So, what is the problem in this particular area is that there is a requirement of a greater reliability and also the need for higher data rate. So, not only the increasing the speed of

the receiving of the data, it is also important to bring down the noise. So, those who are from this area would be understanding the different aspects of the terminologies that are used in this particular area.

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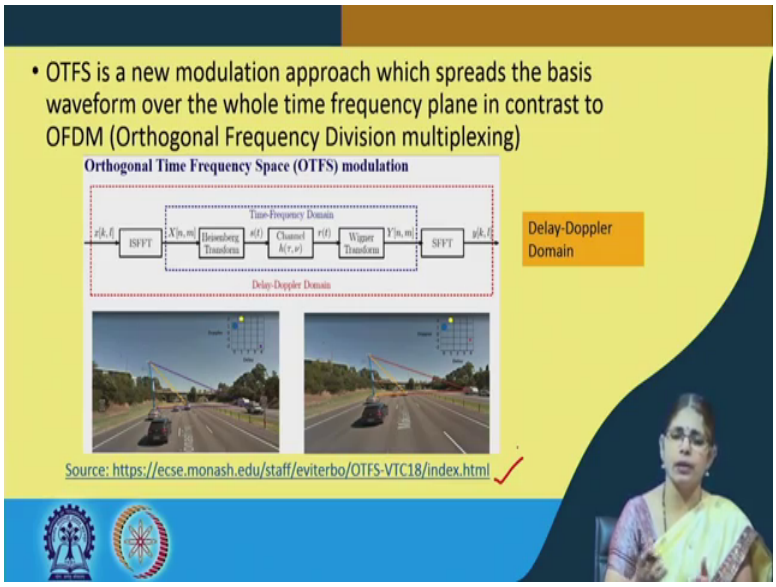

So, let us look at what is the basic aspect that is being looked at from the point of view of the improvement in this technology. It all comes down to this specific aspect of what we call Delay-Doppler domain. So, simply put one we there is a time delay which needs to be attended to which needs to be addressed and then there is also this data itself which needs to be received in the appropriate way.

So, if you look at this particular source which is given in this illustration this very nicely explains to you what is this technology associated with this OTFS; how is this different from OFDM and how it will go beyond the OFDM and how the potential of this technology is realized. So, there have been several improvements in this particular area and many of them are actually captured as patents.

So, if one is looking at understanding the strength of this technology from its developments, one way to look at it is to look at the patenting index because patenting index represents the highest in the innovation index.

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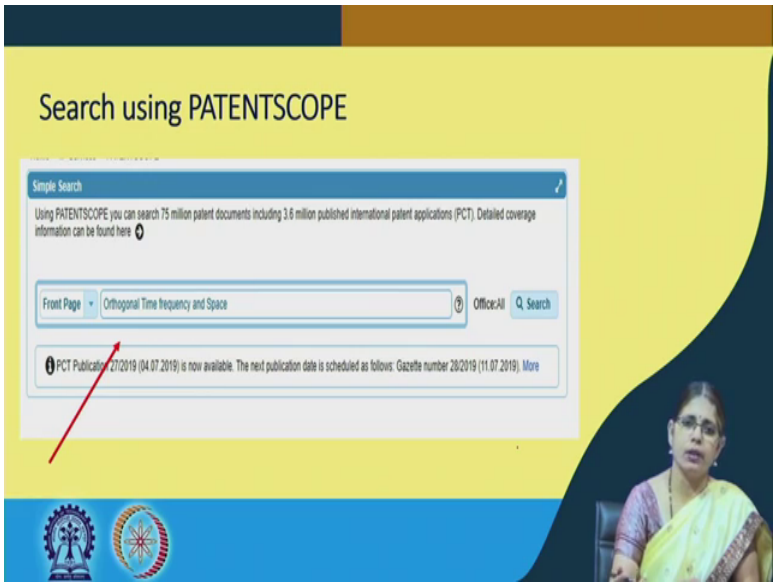

So, let us look at the details of some of the patents in relation to this area. Since this is an emerging area one would expect that the data that we are looking at would be at the micro level which is most likely the set of patent would be less than 1000 since it is an emerging area. So, if you look at the using this particular area for preparing landscape one can utilize patent scope which is a free database available at the WIPO site and in order to look at the relevance of this area one needs to look at beginning with the keyword or the IPC or the combination of both.

Now, from the point of view of utilizing a keyword the technology is represented as it is from the technical classification of where it is called orthogonal time frequency and space. So, all of it together can be put as a keyword as you can see in this illustration and one can actually conduct the search.

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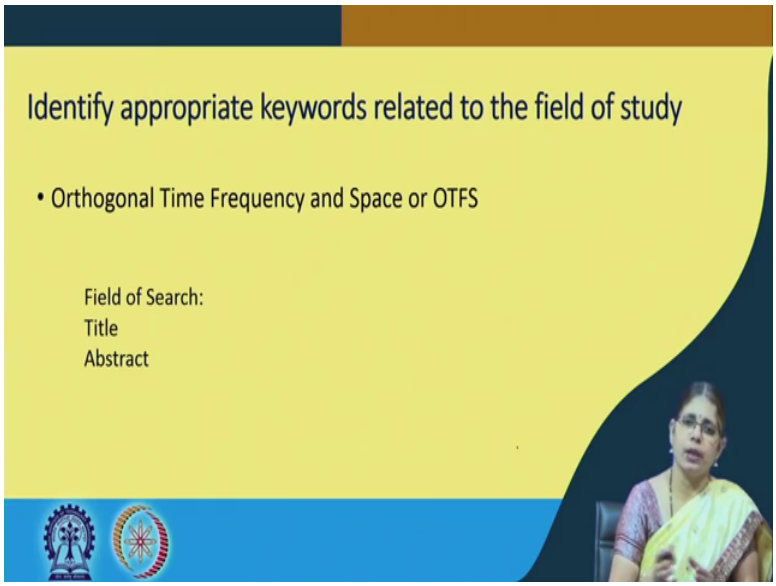

So, where are the places where you would actually go about with the search in relation to this particular technology. The field of search could be the title and the abstract.

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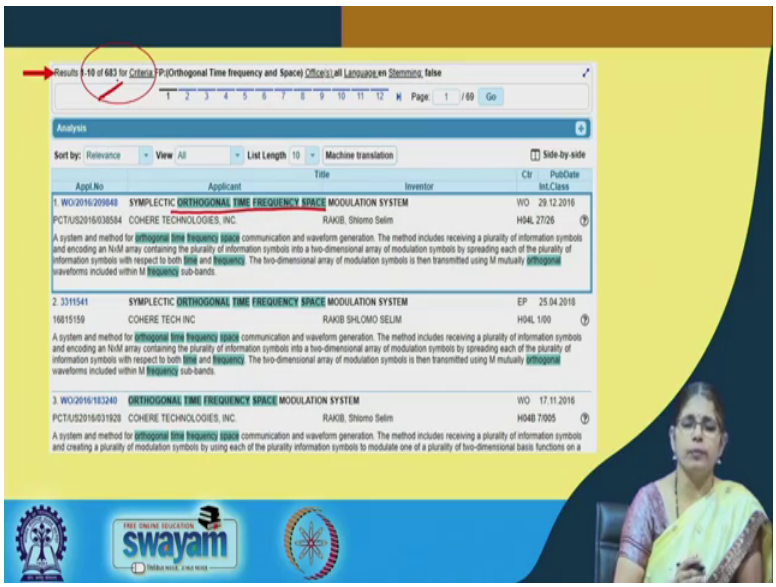

So, if you look at it from the point of view of a searching at the patent scope, after you click on the search you would get the results that are placed here in this illustration where you can see in the title of these patents you have this orthogonal time frequency space specifically which is highlighted in all these patents. So, there are about 683 patents, one can actually refine this further based on several filters.

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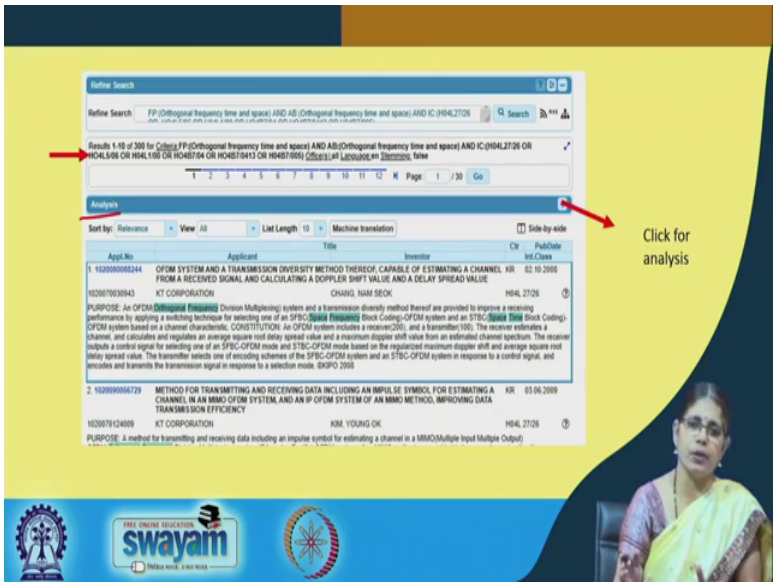

There is an analysis option that is available under the analysis button in the WIPO database which is the patent scope database. Based on the general international patent classifications in this area most of these belong to the code H04L. So, one can also add the IPCs sub classes into by using the advanced search option at the patent scope where you can have the key word as well as the IPC utilized to run the advanced search.

So, in the case of the IPC, one can have several different sub classes built into the same search window and when you hit the search button you get the list of patents that are relevant based on the combination search. So, basically a lot of data can be generated based on the patent data set that is collected from the search.

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So, if you click on the analysis option there are various forms in which the data can be analyzed. So, the basic data that throws up once you hit the analysis button is the organization of the data in the form of separate columns as you can see by countries, by applicants, inventors, IPC code and the publication dates.

So, what you can do is you can actually look at either utilizing the chart, formation part or the pie-chart, pie diagram formation to analyze this data and understand the spread of the data in relation to a given data point and one is either the country, applicants or any of these. Now, what you see in the column beside the name is the number similarly for each of that country name and the number of patents in relation to each of those countries.

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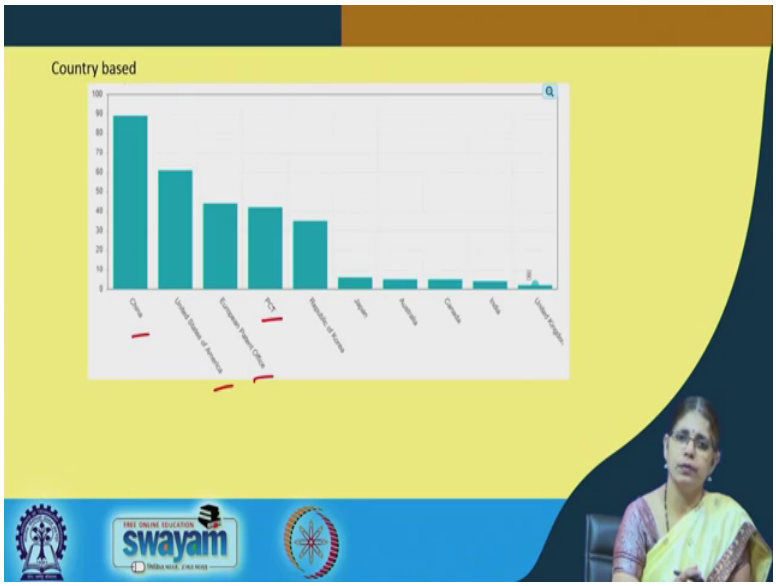

So, here we have the country based information of the entire patent dataset collected for OTFS. It is interesting to note that the China and The United States have the major publications in this particular area followed closely by publications in the European patent office as it is as a entail. So, this actually represents not only country, but the collections at the regional patent offices for instance the EPO, it also represents the entire mode of filing under the PCT.

So, the spread of data indicates the number of publications which are spread across the patent data.

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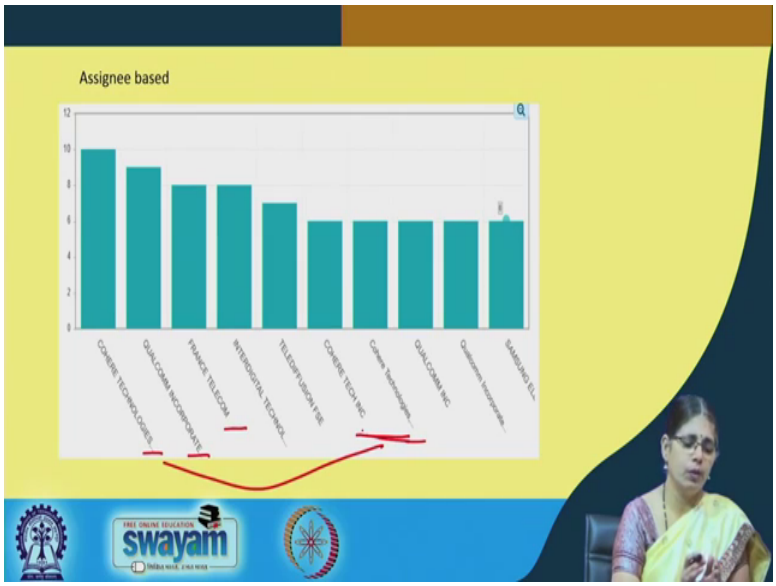

One can also look at the assignee based analysis because here it is not only geography that we would be interested in knowing in terms of where these patents have been filed, one would also be interested in knowing which are the major companies actually working in this area or which are the research institutions working in this area. Here you see in this illustration this is the assignee based analysis. So, if you recall when we go back to this window and click on the analysis options it is provided us the information on countries and then here we are utilizing the applicant information to draw the bar diagram.

So, coherent COHERE TECHNOLOGIES is the major assignee in relation to patents in relation to OTFS, followed closely by Qualcomm, France Telecom and then there are a whole lot of other companies. What happens is many a time the way the assignee name is written on the application is not consistent or rather it is not uniform because, of which in this when you look at COHERE TECHNOLOGIES which is written in the capital letters whereas, Cohere Technologies in small letters is thrown up as two different hits. What normally one should do is download this data into an excel sheet and then pull the data in relation to all these which are essentially one and the same.

So, then what happens is you can actually refine this graph into a specific one with the relevant assignees. Subscribe databases providers what we call the assignee list. So, for instance, if I were to click in the subscribe database list on the assignee and call for all

the different ways in which Cohere Technologies is represented in the database it would automatically throw up a window with all the different ways in which the names are listed including the subsidiaries. So, those will be treated as a one particular assignee.

So, what happens is the assignee pool is collated into one definite set and that helps in actually the better visualization of the data; similarly with respect to Qualcomm this needs to be merged. So, the assignee based analysis is giving us the option of looking at who are the major assignees. The entire patent patenting in this area is held by which companies or which research institutions.

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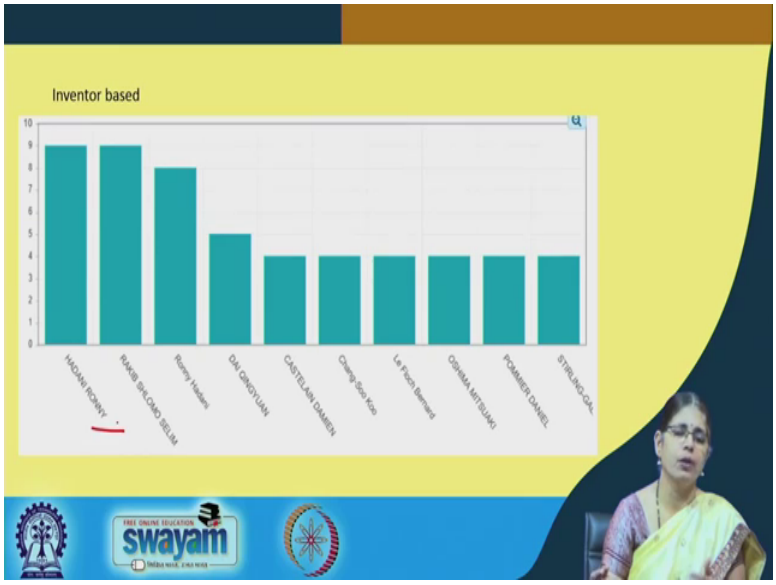

Also one the aspect of the analysis is the inventor based analysis because the component of research and the value to companies is actually generated because of the inventors work in that particular area. So, tracking the inventors in the in the patent application is also important as a part of the analysis.

So, here you have the major inventor in this area is Ronny Hadani. Interestingly, Ronny Hadani started his career as a mathematician and then moved into the area of looking at communication technologies where the area of representative theory has a lot of relevance in relation to communication. So, it is very interesting to note that where we are looking at the next version of 5G from 4G to 5G to even the next versions, a lot of technologies are relevant for that development including the basic aspects of mathematics, physics.

So, if you go to the general search on the internet on this particular inventor, you can understand how this inventor embarked on the idea of developing this technology and how the specific equation in relation to the in this particular area has been implemented to look at this new technology which is the OTFS. So, again this can spark of a lot of research in this particular area by understanding the work done by Ronny Hadani.

Similarly, there have been systematic developments in different parts of the world in relation to this particular technology. So, the inventor based chart provides you information on who are all the different inventors in the world and what are all the areas that are actually they are working on. So, this spread is useful to understand the developments in relation to specific research undertaken by these inventors as either part of their institutions or part of a company.

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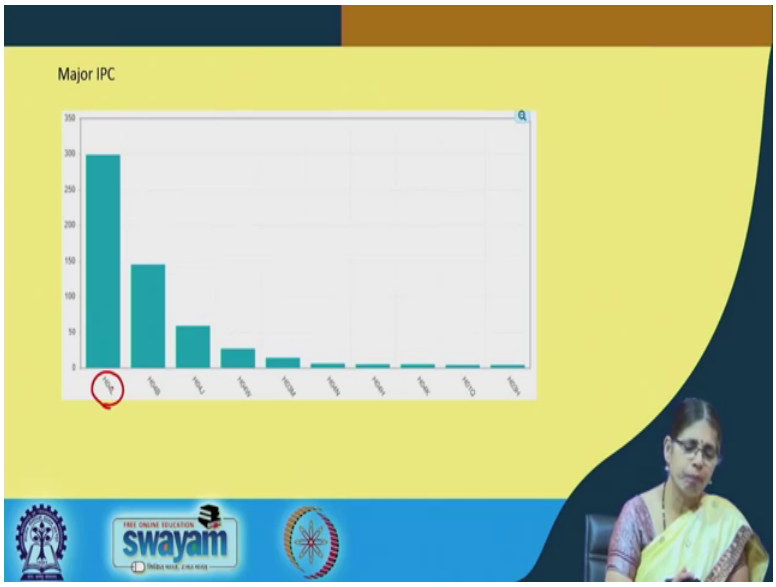

The analysis in relation to technology is also relevant from the point of what the international patent classification code. As we are aware, that every IPC code represents a set of technologies in relation to a particular intervention or a domain. So, if one looks at the area of the OTFS one can understand that there are certain IPCs which are populated with this particular set of patents. H04L is the major IPC in which patents have been clustered; that means, this is the class in which you can find the technology relevant in relation to the classification of that particular patent.

So, when you looking at classification based search one can input the particular classification code to go about with the search there the other relevant IPC codes in relation to this particular technology and what you see here is a spread of the different IPCs which are relevant to this particular technology with H04L being the major IPC.

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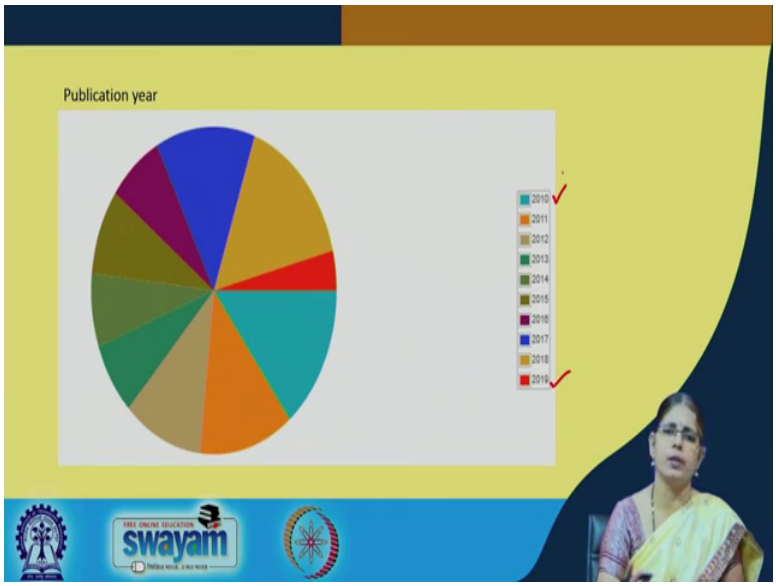

Another analysis point one can repair it is utilizing the publication year. The publication year statistics gives us the spread of the data based on the time period and here you see the data spread between 2019 back in time to 2010. The abundance of patents in a given publication year can be realized with this spread of data. So, which year recorded the highest number of publications in relation to a particular area that also helps us to understand what were the factors that were essential for the rapid filing and publication of these patents in a given year. So, publication information is useful from that standpoint.

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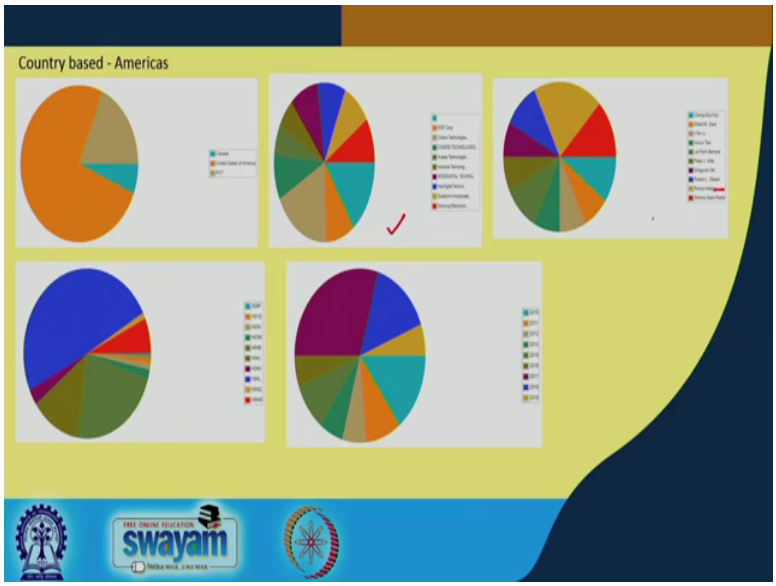

Since this is an emerging technology it is also useful to understand a country based information in relation to this particular technology. If you go to the patentscope website you can also filter the data as per country. So, you can choose Americas, you can choose Asia's. America would be including Canada; similarly you can have different geographies which can be taken into consideration for looking at the patent data spread in those relevant geographies.

So, if you look at Americas itself as the data set so, when you filter the data utilizing the option of country, here you have the data set that comes up. Once again you can use the analysis button to draw the various graphs or the pie charts in relation to country based information. So, in the first instance we have the data set represented in relation to Canada, US and the PCT itself because in PCT again you have designated countries. So, it would pick up the PCT data set as well as a general dataset.

If you go by the analysis of within the Americas the who are the different assignees, in the second figure you can see there are different assignees AT&T, Cohere Technologies, Huawei and many other Samsung, Qualcomm, Inter Digital. So, these are the different assignees who have patents in this particular area and the relative strength of the patents is depicted by this particular pie-chart.

Now, if you look at the information relation to inventors so, one can understand who are the inventors in this particular geography. So, you have we discussed about Ronny

Hadani; Ronny Hadani is here, and then there are a whole lot of other inventors who are listed who are relevant to the patents in this particular geography. It is important at this time point to understand that today the area of research works on a collaborative network which means there could be inventors across different parts of the world who could be working on a given set of technologies.

So, patent applications have typically more than one inventor. More than one inventors on a patent application would mean that all those inventors are inventors as per law and they are working in a collaborative mode and so, therefore, joint invention joint inventors are possible in patent applications. Who is a joint inventor? A joint inventor is someone who has significantly worked for the invention that is significantly contributed to the skill of the invention.

So, here we have a in scenarios in relation to many technologies where inventors are across geographies, from that standpoint this data is relevant and again you have the classification based spread of the data distribution and the publication year based distribution.

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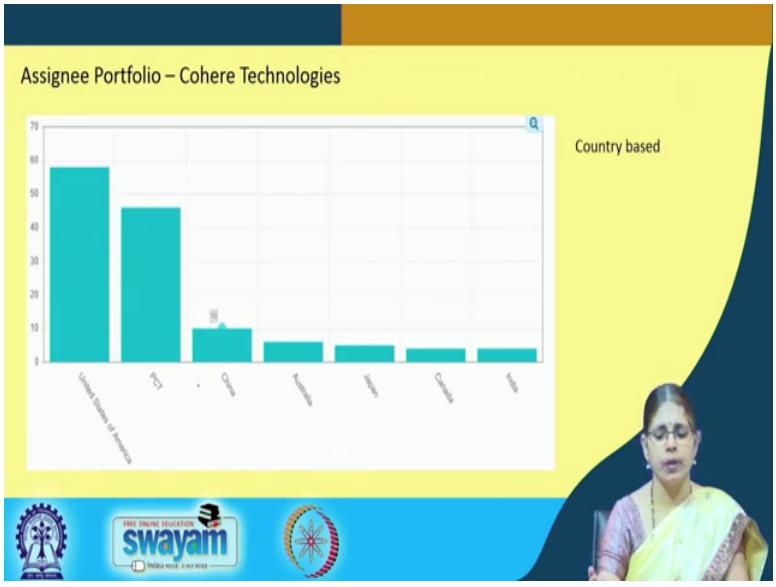

If you look at the assignee portfolio in relation to Cohere Technologies; so, here we are looking at a Cohere Technology specifically; that means, the next option that we have invoked is the assignee based portfolio. The assignee portfolio similarly can be done like

in the case of Anato where we have looked at the assignee based portfolio, one can look at the country based information in relation to this assignee.

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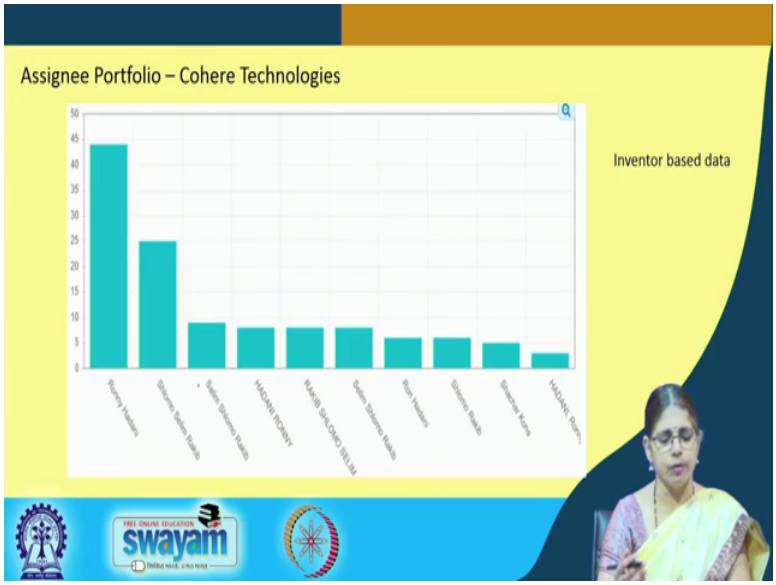

What is the inventor based information, who are the inventors in relation to this assignee portfolio.

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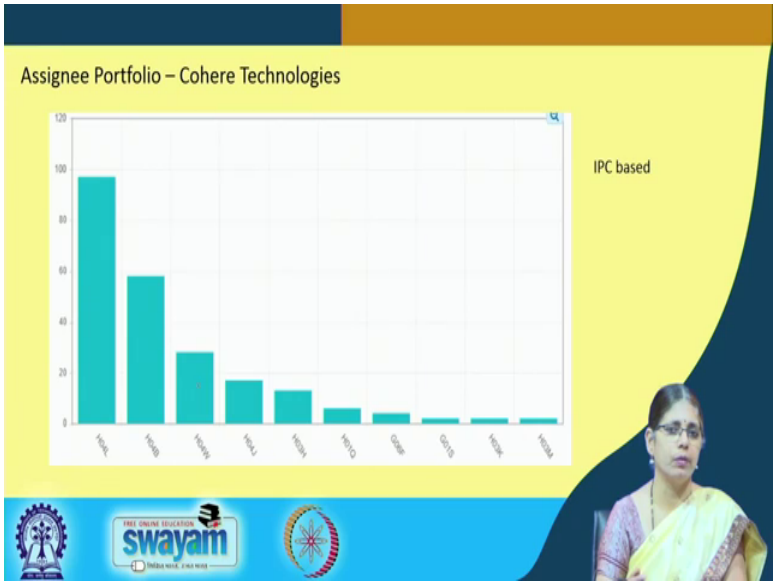

Then, the major IPCs in which the patents are spread for this particular assignee.

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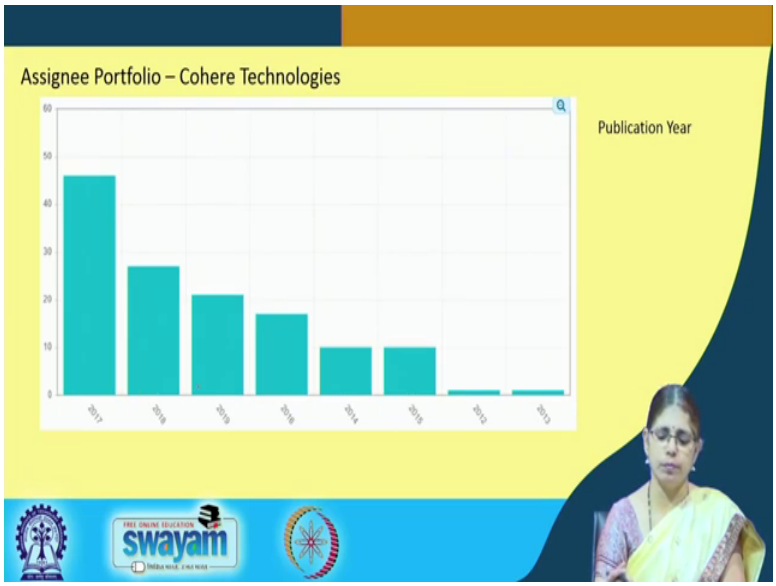

And, the publication of patents in relation to a specific year from where the publications are coming up.

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So, based on the landscape analysis one can come to the aspect of them preparing the landscape report, whether it is for the digital pen or separately for the area of OTFS. So, the report should provide an overall view of the relevant patents, the description of the technology and its growth. What are the developments in relation to in one case the digital pen in other case the area of OTFS; then the data in relation to the bibliographic

data the technology based data and an understanding beyond the patent landscape into the in-depth analysis of the assignee portfolio. So, the landscape report can be prepared in this particular way to derive a lot of insights in relation to a particular area.

Thank you.