IPR Information: Analysis and Drafting of Patent Claims for R&D Scientists

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The paper highlights the importance of the role of intellectual property rights (IPR) information for R&D scientists. In particular, an attempt is made to describe the salient features of IPR information contained in patent claims. The paper describes how useful analysis can be made of the claims in a patent document in order to identify new routes in R&D. The basic features of drafting good quality patent claims have been delineated. A case study on analysis of patent claims in the area of piperine has been presented. The role of IPR information scientists has been delineated in undertaking such an analysis.

The government grants patent rights to inventors so as to exclude others from practicing the patented inventions for a certain period of time. In return the government obtains the disclosure of the invention and the technical information contained in the patents for other inventors with the hope that they will learn from the information and use this learning as the basis for more innovation, thereby, improving the economic health of the country. The concept of patent is unique to R&D organizations. The concept enables R&D scientists to seek protection of R&D results while it also provides an extremely useful source of technical information for day-to-day R&D work.
Patent Information

Patent information refers to the information contained in patent documents and is an important component of the IPR information. There are two types of information in the patent documents that can be made use of by R&D scientists. One is the bibliographic data concerning the patents. This information is given mostly on the first page of the patent document and contains information on parameters like patent number, title of the invention, name of the inventors, application number, date of filing, international classification code, national classification code, assignee, field of research, prior art and references cited.

The other type of information contained in the patent document relates to the technical information about the invention. It gives complete technical description and other details of the invention including suitable drawings / formulae. The basic features of the invention are disclosed in this section and to the extent possible, the results are substantiated with illustrations and experimental data. In addition to the descriptive technical information disclosing the invention, there are other sections in the patent specification which provide useful information for the R&D scientists. The sections that contain key technical information include:

(i) Prior art describing the work already done in the published literature or patents relating to the invention;
(ii) Description of the invention giving the complete technical description and the practical illustrations; and
(iii) The claims describing the inventive features and the disclosures made with respect to the invention.

In most developing countries, R&D scientists spend a lot of their time and effort in obtaining, organizing and analysing patent information and would be more than willing to seek the cooperation of information scientists or IPR experts to undertake some of these tasks. For example, information scientists can provide appropriate information to R&D scientists on patent searches - bibliography on patents, patent abstracts, analysis of patent information to identify research or technological trends, or reading, writing and analyzing the patent claims.

IPR Information in R&D

In R&D organizations, R&D scientists are the key players in creating, organizing and processing of scientific and technological information to generate new knowledge and R&D information. The understanding of the technical and legal aspects of IPR has an influence on the approach of R&D scientists in utilizing such information within the framework of their R&D projects. Conceptually speaking, IPR information refers to the specific scientific and technological information, which is a proprietary knowledge or information. The intellectual property laws will determine the nature of proprietary rights in a particular piece of scientific and technological information. During the process of R&D, the proprietary nature of the existing technical information will be examined and analyzed to identify specific scientific and technical dimensions in order to create new and novel routes to R&D. The R&D information so generated need to be protected and processed to define appropriate proprietary rights.

The integration of IPR information into the process of R&D would, therefore, mean developing an R&D strategy to:

(i) circumvent the legal rights of the existing intellectual property and find out new or alternative options,
(ii) build upon the existing IPR to improve upon the inventions already made, or
(iii) to obtain gainful technical information to identify altogether new directions of research.

According to Nonaka and Takeguchi, knowledge creation is achieved through recognition of the synergistic relationship between tacit and explicit knowledge in the organization. Applying this model in R&D organizations, two distinct perceptions are possible on the use of IPR information in the R&D process and creation of new and novel information and inventions.

The IPR information, as a tacit knowledge, will consist of the factual information on IPR available to individual scientists on the one hand, and its subjective understanding by them in the context of their R&D work, on the other hand. One's insight, intuition and personal knowledge in interpreting the IPR information in the patent documents will guide the individual R&D scientists in defining specific approach in respective R&D contexts. Such skills of interpretation of IPR information would need to be properly nurtured and cultivated amongst individual R&D scientists. The tacit knowledge is hard to formalize or communicate to others. The main task before individual scientists will be to acquire the skills to integrate IPR information within the conceptual strategy and cognitive domain of their R&D work. There is a possibility that the IPR information scientists may supplement this task by evolving a structured approach to provide relevant analytical inputs and information to R&D scientists for this purpose.

The IPR information, as an explicit knowledge, would mean formal knowledge systems in the form of specific information products like rules, procedures or guidelines on IPR. The creation of formal information products on IPR information for R&D scientists will facilitate updating of their technical capability and skills of analyzing IPR information. Based on this capability they can take initiatives to properly utilize such information within the framework and requirements of their R&D projects. Accordingly, within R&D laboratories, it should be possible to establish formal mechanisms:

(i) to equip individual R&D scientists in the laboratory with necessary IPR information to deal with matters relating to intellectual property in their R&D projects; and
(ii) to provide necessary analytical tools and support to interpret existing IPR information in patent documents so that they can make use of the same in the process of R&D.

According to Nonaka and Takeguchi, the two knowledge systems, namely, tacit knowledge and explicit knowledge, are complementary. Explicit knowledge is nurtured from the seeds of the tacit knowledge in an organization. In R&D organizations, there are a number of formal training programmes on IPR that attempt to update the awareness of R&D scientists on matters relating to IPR. Accordingly, the tacit knowledge of R&D scientists about intellectual property rights is subject to updating through well thought out formalized interventions. Such formal interventions are a part of the explicit knowledge system on IPR. R&D scientists may also be provided with practical guidelines on IPR. In this sense, there is a continuous interaction between the explicit and tacit knowledge systems on IPR in R&D organizations.

Further, explicit formal knowledge systems can also be established to cater to the IPR
information requirements of the R&D scientists. These systems could take the form of support units or cells within the R&D organizations to provide requisite services on IPR. They may be required to develop the essential analytical tools for converting tacit knowledge on IPR into explicit knowledge through innovative means and *vice versa*. From the practical point of view, it will be essential that the key elements of each of these processes are clearly identified and suitable information guidelines developed for R&D scientists on various aspects of IPR. This may include aspects such as protection of R&D results, handling IPR issues in international R&D collaboration projects, analysis of prior art cited in patents, and analysis of patent claims. Such a need was also expressed by R&D scientists during a pilot survey undertaken by the first author on the IPR information requirements of R&D scientists.

In this paper, an attempt is made to understand some of the salient features of the concept of patent claims. It will examine the ways and means of drafting good quality patent claims and utilizing the information contained in the patent claims for purposes useful to researchers in R&D organizations, particularly, national R&D laboratories within the Council of Scientific and Industrial Research (CSIR) in India.

**Concept of Patent Claims**

According to the Indian Patents Act, 1970, the patent specification should contain a section on 'claims' wherein the inventor should clearly mention the portion of the invention, which is claimed to be owned by him. This technological formulation of the claims determines ownership of the inventors over the intellectual property in the actual invention. Historically, there was no specific requirement of stating claims in a patent application. For example, in the United States, the Patent Act 1793 did not provide for claims but only required the applicant to deliver a written description of the invention in complete, clear and exact terms, so as to distinguish the same from all other things known before. The situation changed around 1836 when an applicant was statutorily bound to particularly specify and point out the part, improvement, or combination, which he claimed as his own invention or discovery. In the United Kingdom, initially, the patents included only a general description of the invention. The writing of the patent claims was made compulsory at a later date. By 1949, the statute required that a patent specification should conclude with one or more patent claims defining the scope of the invention claimed. There was no specific practice of writing claims in Germany in the beginning. Presently, it is essential to draft the patent claims in specific language to ensure the compliance with patentability requirements. In Japan, the laws have been in place since 1885 governing the claiming system in patents. The Japanese laws define the specific legal requirements and procedures of drafting patent claims.

The practices of the national patent systems vary with respect to the interpretations on the scope of protection afforded to the patent, particularly in the drafting and allowance of patent claims. In some countries, the patent system allowed a restricted scope of the patent protection and drafting of the claims while in some others it followed a practice of broad scope of protection and, accordingly, a broad drafting of the claims. For example, the practice in United Kingdom is both to restrict the scope of patent...
protection as well as to allow broader claims phrased in more generalized language. In contrast, there is a practice of narrower and more specific patent claims in Germany. The European Patent Office maintains a median scope of protection between that of the United Kingdom and Germany. The United States has developed a median scope of protection. It also has developed a practice of allowing a median scope of claims. The Japanese patents tend to have single narrowly defined claims covering a technical improvement.

The practices followed by the patent systems in different countries clearly indicate that the listing of claims in a granted patent is the legal description of the intellectual property owned. In a patent application for which a patent is yet to be granted, the claim will legally describe the intellectual property that the applicant wishes to own.

It, therefore, becomes necessary for R&D scientists to clearly and correctly understand the meaning and scope of the information described in patent claims and consider its implications for their R&D projects.

What are the practical ways and means of understanding the information contained in patent claims? How can R&D organizations make use of this information in sharpening the focus of the R&D projects? An attempt is made to examine these issues in the subsequent sections.

**IPR Information in Patent Claims**

The patent claims serve as an instrument to disclose information about the inventive features and the true nature of the IPR of the inventors so as to inform the public what they could and could not do during the period the patent is legally active. For research purposes, such information can be used without any restriction. In R&D organization, it may not always be possible to interpret the patent claims, in the strict legal sense. Any general indications of the main features of the invention may itself be quite useful for the purposes of R&D scientists.

There are two important dimensions of IPR information in patent claims for R&D organizations:

1. Analyzing technical information contained in the existing patent claims and interpreting its scope and proprietary nature, and
2. Drafting of patent claims in order to: (i) distinguish the new R&D information from the existing technical information, i.e. highlighting the new and novel features of the technical information, and (ii) define the scope of the new proprietary rights in a best possible manner.

In the case of first dimension, the crucial task for R&D scientists is to identify and understand the most significant features of the invention or technical information described in the existing patent claims. The next step will be to interpret the meaning of the information contained in these claims in the context of R&D strategy of respective projects. An essential aspect will be to define the exclusivity of the R&D work being done by R&D scientists from the existing information. They can utilize this information to define the scope of experiments in R&D projects so as to avoid infringement of any other patents. This approach can also help them to establish a framework and contour of the research programmes in order to generate new and novel R&D information - the intellectual property - that can be of value to their R&D organization.
In the case of second dimension, R&D scientists are required to protect the new and novel features of an invention made by them by properly drafting the patent claims. The definition of new patent claims will depend upon the description of the scope of protection of the new invention. R&D scientists would need to explore and take a view as to whether the patent claims would need to be restrictive or broad. This would mean drafting of patent claims in the patent application in a manner that provides the best possible coverage and scope of protection to the R&D results. In other words, the drafting of patent claims will define the degree of exclusivity that can be obtained by the R&D scientists on the basis of the inventive features of their invention.

It will be essential for national laboratories and institutes to initiate steps to enable R&D scientists to obtain requisite IPR knowledge and information for analysis of patent claims. Development of appropriate guidelines for this purpose will indeed be useful to R&D scientists.

**Analysis of Patent Claims**

(a) **Defining Exclusive Research Directions**

One of the main reasons of extracting technical information from the patent claims is to utilize such information in defining new directions during the process of research and clearly delineate the exclusivity of R&D work being done by R&D scientists. It will mean assessing the true boundaries of the scope of protection of the existing invention. While finding technical solutions of a problem, it will also mean avoiding duplication of research that has already been done. Such information will also help in examining the trends or gaps in research and directions for further research so as to avoid problems with other people's intellectual property.

The starting point for examining whether a proposed research work is exclusive or not is to determine whether or not someone else has already publicly done or disclosed any invention related to the research work. The chances of obtaining a patent for an invention that is not known in the prior art are much better. Therefore, while developing a R&D programme, one of the key features to be examined is to find out whether or not what is claimed in existing patents restricts planned R&D operations, and whether or not the technical disclosure made in the patents are of interest to them. There can be a possibility that a patent may affect current or future R&D operations. In such a case, it will be essential to review the claims of existing patents and undertake a comprehensive analysis of what are the various options for R&D. This will give the R&D scientists an idea of the basic invention claimed and what more needs to be done in order to avoid what has already been done.

There is a possibility that during the course of research, R&D scientist may come across an already patented invention or a publication in the prior art that is close in nature to the R&D results or invention intended to be patented. In such a case, R&D scientists would need to go into the alternative forms of interpretations of the patent claims in the prior art and use this information in order to define exclusive features of the new invention as distinct to those mentioned in the prior art. In such a case, the legal formulation of a claim may become important. The interpretations could vary from literal interpretation to a broader and flexible interpretation. The description in rest of the patent specification may also be useful to understand the terms defined in the claims. In case
of the likelihood of infringement, specialized knowledge of legal experts in legally interpreting claims may be beneficial in the final analysis of patents. Scientists in the R&D organizations would need to develop adequate skills to perform this task.

Determining R&D exclusivity is similar to what Pearson Hilary calls, viz. designing around patents. According to Hilary, there are two ways to deal with this situation. One way is to obtain a licence from the patent owner. If the patentee refuses to license or demands a licence fee, which is more than one can afford to pay, the only other way is to adopt an R&D strategy to develop an alternative solution without infringing upon the said patent.

In order to establish an exclusive framework for doing novel R&D, it may be desirable to consider how one might accomplish the same result that is claimed in a patented invention, in a different way. If this analysis is done during the R&D phase of the invention, the inventor can generate additional information and examples that will better support and broaden the claims of the invention so that it will also cover more competitive developments.

(b) Basic Steps of Patent Analysis

The basic steps to define an R&D strategy so as to exclude what has already been patented will include the following:

(i) The first step is to undertake an independent and detailed analysis of the scope of the patent claims. Someone who is experienced in preparing such an analysis should do this. This person could be a patent agent, or an IPR information expert. In particular, it is vital that this analysis should not alone be left to R&D scientists who will be involved in the R&D process.

(ii) The next step will be to prepare guidelines and instructions for R&D scientists so as to clearly inform them what they should do or not do while defining research experiments. The guidelines should include at least the following aspects:

- The technical requirements with respect to the product or process, clearly indicating any thing that needs to be avoided.
- A detailed description of what must be avoided. This information should be translated into terms clearly understood by people with the technical background.
- R&D scientists should try to get as far away from the things to be avoided as is compatible with the requirements they have to meet while planning R&D projects.

(iii) The proposals by R&D scientists should be reviewed for an infringement analysis and opinion. If the opinion is that R&D results could be found to infringe, a further set of guidelines should be prepared, reviewed and approved, telling the R&D scientists exactly what is unacceptable about the new R&D strategy or designed experiments.

This process should be repeated until the chances of infringement of any other person’s intellectual property are reduced to the minimum.

(iv) A detailed written assessment as to why the final R&D strategy or results so obtained do not infringe the patent should be prepared. This should be
done in close cooperation with R&D scientists.

(iv) A search for related patents should be carried out, and the outside patent expert should study these patents to ensure that the final R&D results will have no infringement problems with these patents.

(v) Even if R&D scientists are convinced that enough information has been generated for the patent application filing, a decision should be taken whether or not it is important enough to continue to further develop the invention or continue to do R&D on improvements of the basic invention.

(vi) The amount of exclusivity an R&D organization/scientist will have on the invention will depend on the amount of effort and money expended to examine variations and extensions of the inventions. Inventors should be given fairly enough time to do R&D so that they fully understand the critical components of the invention that need to be protected through patent application.

(vii) One of the keys to exclusivity is the extent to which a new invention is suggested by prior inventions, then in a very general sense, the degree of exclusivity a patent can provide is inversely proportional to the number of prior inventions previously disclosed in the technology area. This is because as more information is generated in the technology area, the chances increase that someone will describe some feature of the invention.

(viii) The closest prior art to an invention does not always have to be in the technology area with which the invention is most commonly associated. Sometimes a disclosure in one area can impact a patent application in totally different technology areas, causing the invention claimed in the patent to be significantly narrowed.

(ix) A key feature of the exclusivity in a patent application is associated with the creative stimulus that may emanate from analysis of the claims in existing patents. R&D scientists can use their training and experience to mentally picture various alternatives on which they may need to pursue further research or come out with alternatives. They may also come out with a definition of the claims of the invention that would later cover the various alternative embodiments of the invention. This may in many cases call for additional experiments to confirm whether these alternative embodiments of the invention could be truly claimed in the patent.

Drafting of Patent Claims

One reason for discerning technical information from existing patent claims in the prior art is to determine the novelty of new R&D results and use this information while drafting patent claims to protect such results. It will imply comparing the output and results of an R&D project with what is already known or claimed in the existing patents. Based on this comparison, the next step will be drafting of patent claims in a manner so that the scope of the claims provides best possible coverage to the new R&D results. This will involve a great deal of analysis to assess the true nature of the invention, examine the scope of already existing patents and writing of claims so as to reflect the critical features of the new R&D results.
There are two key aspects of the analysis in drafting of patent claims:

(i) the description of patent claims in prior art should be examined so as to ensure novelty of the R&D information which is required to be encapsulated into drafting of new patent claims; and

(ii) how to write a good quality patent claim so as to best protect the new R&D results or the new invention.

This section will explain some of the basic concepts relating to drafting of good quality patent claims.

There are two major types of claims. First, there are independent claims or principal claims, which define the full scope of the invention. This type of claim clearly indicates the technical features of the invention, which serve as a solving concept. Also, referred to as the generic claims, these claims stand above as a legal description of the owned intellectual property.

The second type of claims are known as dependent claims or subordinate claims. These claims are dependent on other claims. Dependent claims either restrict: (i) the breadth of the independent claims, or (ii) add new elements to independent claims or do both. There is an advantage of writing dependent claims. If due to some reason, the main independent claim is found to be invalid, the dependent claims may not, and still provide the patent owner the protection to the invention in a narrower sense.

The independent claim could be defined using broad and relatively general expressions. Such an expression then may be further elaborated in a more specific manner in a dependent claim. A dependent claim should not contain any subject matter that will make such claim clearly distinguishable from an independent claim on which such claim depends. Moreover, a dependent claim should introduce an additional technical limitation with respect to the component of the independent claim on which it depends.

According to the Indian Patents Act, 1970, the claim or claims of a complete specification should relate to a single invention'. The claims should be clear and succinct and should be fairly based on the matter disclosed in the specification. The claims are usually shown in separate paragraphs. There can be as many claims as required for covering the full scope of the invention to be protected. A dependent claim should not be placed before a claim on which it depends.

The drafting of claims in a patent specification requires a correct grasp of the technical features of the invention and an understanding of the legal significance of the claims. The objective of writing claims is to show with sufficient degree of accuracy as to what is the invention and to indicate the novel features of the invention that are described in the main body of the patent specification. The claims define the scope of protection of the invention and also show what is not claimed. The patent also indicates the amount of technical information that has been disclosed in the main body of the patent specification but remains open to public use. The claims should, therefore, be drafted carefully to meet the legal requirements as well as optimize the scope of protection. The information that is not claimed will be available to other scientists without any restriction.

A claim should neither be too general or too narrowly defined. For example, a broad claim may be drafted as - instruments for the purpose of writing. This will include, for in-
stance, fountain pens, ball-point pens, and felt tipped pens. A narrow or more specifically defined claim may be for only one or more of these kinds of pens.

For drafting a good quality claims, R&D scientists or the IPR information scientists in the laboratories should consider the following ground rules:

(i) The technical objects and the R&D results providing solutions to the technical objects and defining the invention should be explicit and clear.

(ii) The technical features representing the technical solutions and the concept of the invention should be broadly claimed.

(iii) The claims for each specific embodiments of the invention are written describing the basic essential features of the invention.

(iv) The technical information in the claims should be based on the disclosures made in the detailed description of the invention in the patent specification.

(v) In order to establish the clarity of the technical objects or technical solutions or the essential features of the invention, it is essential to conduct a search of prior art patents and information during the R&D stage itself. This is because the position and objective value of the new invention can be established by undertaking some additional R&D and experiments to clearly bring out the distinguishing features of the invention different from those already described in the prior art.

(vi) Drafting of patent claims also depends upon the patent strategy or the competitive strategy of the R&D organization filing a patent application.

A patent application may be filed to protect an invention having a certain degree of originality and to exclude possible future copying by others in the field. In this case, it may be important to disclose a variety of embodiments of the invention and write claims in such a way that the main claim is comprehensively covered by further dependent claims so as to include all possible alternatives.

In some instances, a patent application may be filed to circumvent already existing patent. In this case, a patent claim may be drafted covering protection only for a specific mode. The drafting of a broad claim may not be possible in such a case.

The purpose of getting such a patent is to use it to block some later development that researchers may come up with and are critical for R&D strategy of the organization. Typical examples where such a patenting is often used are the chemical, pharmaceutical, biotechnical and semiconductor industries.

(vii) The exclusivity will be of less value if a competitor can perform an equivalent function or generate an equivalent product or service through the use of an entirely different method, which is not embraced by the claims of the patent. For a food quality patent claim, sufficient R&D should be carried out to distinctly define the exclusivity of R&D results or the invention.

A structured approach may facilitate in drafting a good quality patent claim. In this approach, in order to seek protection of an invention through a patent, one may first list the key elements of the invention. Each of these elements could then be analyzed with
respect to its role in (a) describing the functionality of the invention, and (b) distinguishing the invention over the prior art.

Case Study on Piperine

Pepper is one of the most ancient crops cultivated in India. Several types of pepper are known in cultivation. Their precise identification is rather difficult, since some of them go by different names in different regions. Generally, the choice of a type depends on its yield and resistance to diseases and pests. The alkaloid piperine is stated to occur in pepper in amounts usually ranging from 4 to 10 per cent in crude form, the content of true piperine being lower.

In the traditional Indian system prescription like 'Trikatu' (Piper nigrum, Piper longum and Zingiber officinale in equal proportion) has been one of the most commonly used constituent in ayurvedic drugs. Its use dates back to about 3rd century B.C. References to its use can also be found in Charak Samhita, Sushruta Samhita, and Ashiang Hridaya.

Recent scientific studies revealed that piperine, the active principle of the piper species, is responsible for increase in the bioavailability of the drugs in blood and thereby enhancing the efficacy of the drugs. An Indian patent (application no. 1232/DEL/89) of CSIR claimed a process in which piperine is used in combination with a known anti-tuberculosis and/or anti-leprosy drug for the treatment of tuberculosis and/or leprosy, as such a combination imparts synergistic effect on the resultant composition resulting in the increased therapeutic efficacy to the anti-tuberculosis and/or anti-leprosy drugs. A US patent bearing no. 5,439,891 was obtained for the same invention. The patent was entitled 'Composition containing pharmaceutical composition with enhanced activity for treatment of tuberculosis and leprosy'.

On the basis of the disclosure made in these patent documents, the pharmaceutical company known as Cadila continued research to find out the reason for the synergistic effect of piperine with the anti-tuberculosis and/or anti-leprosy drugs. Its inventors found that the reason for the selective behaviour of piperine is attributed to the following:

(i) the invention is of particular use in respect of absorption of such drug through the membranes of the gastrointestinal tract of the human body;
(ii) the invention helps to retain certain drugs when combined with it in the human body for a longer period of time without allowing the drug to be eliminated from the body;
(iii) it has the property to increase the binding of the serum proteins and thereby retaining the major part of the drug combined with it in the body for a longer period of time; and
(iv) it has the property to stimulate the natural immune mechanism of the body so as to enhance the production of antibodies against microbial infections.

Based on this research, Cadila obtained a US patent bearing no. 5,616,593 in 1997. The patent was entitled 'Composition containing piperine'. An European Union patent (application no. EP 0 709 098 A1) was also made for the same invention. The patent claimed enhanced bioavailability of the pharmaceutical composition containing piperine and a drug wherein the drug is an antimicrobial agent, antiprotozoal agent, anthelmintic agent, central nervous system drug, non-steroid anti-inflammatory drug, antihistaminic, prokinetic drug, corticosteroid,
steroid hormone, oral vaccine, haematinic, vitamin, antiulcer, muscle relaxant, or anticancer drug.

This claim shows that the claim in the earlier CSIR patent was quite narrow and those R&D scientists did not consider the possibility that the invention made by them could have applications in other drugs as well. No further R&D was done by them in this direction. The claims of the patent taken up by inventors of the US patent no. 5,616,563 are based on extending the research claimed in CSIR patent into new directions.

There are other related patents on piperine. These are US patent no. 5,744,161 entitled ‘Use of piperine as a bioavailability enhancer’ and US patent no. 5,536,506 entitled ‘Use of piperine to increase the bioavailability of nutritional compounds’. The main claim of these patents is an invention wherein the properties of piperine were used in entirely new direction, namely, in enhancing the nutritive value of a variety of nutritive compounds. The analysis of patent claims of these patents indicates that the inventors have explored an entirely new direction of applications of the properties of piperine. R&D scientists could further examine these patent claims in order to identify newer opportunities for research in this area.

Role of IPR Information Scientist

Choo points out that information is an intrinsic component of nearly every activity in an organization. Without a firm grasp of how it creates or transforms and uses information, it would lack the coherent vision to manage and integrate its information processes, information resources and information technologies. R&D scientists would have to play a key role in understanding the changes that are taking place in the field of IPR in their external environment. They would be required to examine the importance of IPR information in the planning and execution of R&D projects and develop an appropriate strategy to respond to the changes. This indeed is a complex task. In most developing countries, there is no explicit knowledge base in R&D organizations to guide R&D scientists how to handle such information. Information scientists with a specialized training on IPR information and skills can facilitate R&D scientists to perform such tasks more effectively.

In R&D laboratories of the CSIR, small units have been established to handle matters relating to IPR in their respective organizations. These IPR units or cells also serve as the interface between the Intellectual Property Management Division of the CSIR and the working R&D scientists in the respective laboratories. Each R&D laboratory nominates an IPR coordinator to interface with CSIR who is supposed to provide dedicated support to R&D scientists on IPR matters. There is a need to examine the role and functions of these IPR scientists. For example, one of the important functions of IPR scientist can be to enhance the general awareness of R&D scientists in the laboratory on the basic concepts of IPR. They can also assist the R&D scientists in organizing and analyzing patent information to facilitate execution of R&D projects.

Rozov stresses the importance of the use of monographs and general reviews of the state-of-the-art in specific subject areas to assist scientists to understand what is happening in their speciality and assist innovation process in that area. He argues that such a system will greatly enhance the value of patent information and its dissemination. One of the key aspects of the patent information service is the provision of the information in the minimum possible time but with
the maximum probability of retrieving relevant documents. This can greatly facilitate the work of R&D scientists. Recently, much of such information is also accessible on Internet. In most cases, with a little guidance, R&D scientists themselves can access such information expeditiously. What is important for them is to obtain more analytical information through patent analysis to carry out a comprehensive and deep analysis of particular technical solutions, classify them, identify existing patterns and new trends in solving conventional tasks. In other words, it should be possible for R&D scientists to obtain new knowledge whose final form is not contained in any source documents.

An overwhelming majority of patent information users need concentrated information in the form of reviews, reference guides, analyzed value-added information. One may use known methods of scientometrics for providing such services. Processing of information contained in the primary patent documents and converting them into useful information for R&D scientists will indeed change the role and purpose of the patent information service significantly. The latter will become more purposeful and effective. IPR information scientists may use their analytical skills and scientometrics techniques to examine the patent information and provide required evaluations, which do not rely on the technical knowledge of the individual R&D scientists.

Growing importance is being attached to the IPR information for R&D scientists and in assisting them in a variety of tasks involving IPR matters in CSIR. R&D scientists find it important to examine inventions claimed in various patents for their R&D work and would like to evaluate without loss of much of their time and efforts which patents are indeed valuable to their R&D work and which are not. Monitoring the bibliometric information on patents or the patent abstracts can do this. R&D scientists will also want to review the actual claimed inventions to see whether these are of value of their R&D work. For this purpose, IPR information scientists may undertake compilation and documentation of claims in patent documents. They can provide this information to R&D scientists as such. Also, they can undertake analysis of patent claims and provide analytical and critical information on the scope of protection, identification of research gaps and opportunities for further research. They also have a role in assisting R&D scientists in drafting of quality patent claims. They also have a role in assisting R&D scientists in drafting of quality patent claims.

It is essential that the analytical skills of IPR scientists in the national R&D laboratories of the CSIR are appropriately updated. This will enable them to perform a variety of tasks involving IPR information and its transformation into day-to-day requirements of effectively implementing R&D projects and catering to the needs of R&D scientists.

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