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Quality in patent information retrieval – communication as the key factor [1]

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Abstract

The perception of what constitutes the key quality factor of a patent search varies considerably, depending on the customers' background and intended use of the search results. A distinction can be made between what may be termed intrinsic quality as a measure of the search process and its environment combined with the searcher's skills and extrinsic quality, which aims to define the usefulness of the results for the customer. Intrinsic and extrinsic quality factors all require an intensive and on-going communication between the searcher and the customer: quality can only be achieved through partnership.

1. Introduction

For decision makers knowledge of their own patent portfolio and that of their competitors is crucial for aligning their IP assets with their business strategy, thereby providing maximum market value and coverage for in-house inventions. In fact, awareness of the risk factors involved in building and maintaining a patent portfolio is a key success factor in many different markets. Furthermore, using patent analysis for an early identification of innovative trends is also important for staying ahead of the competition. It has been acknowledged for many years that in a knowledge-driven economy, information has a substantial financial value for the actors in the value chain. Accurate, relevant and timely information is key to effective and precise decision-making and trend forecasting [1]. Information is therefore a valuable economic resource comparable to, say, labour, capital, or management. This conclusion stems from evidence that the acquisition, possession, manipulation, and use of information may drive an increase in cost-effectiveness in companies of any size. Since the value of any particular information is determined by its relevance, which can be achieved only for a price, information can, for all practical purposes, be treated like any other marketable commodity for which there is a demand [2].

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2. Information as a commodity

However, information differs somewhat from physical goods such as grain, metals, etc. traded on commodity exchanges. For corporate management, the usefulness of any piece of information largely depends on its customization, accuracy and timeliness, which, by the same token, help to define the quality of the information itself. Business, scientific, economic, and regulatory data as well as information on intellectual property are needed by corporate management for the company to achieve strong market performance. Many service providers offer this type of information, some of which specialize in the field of intellectual property (IP). Today, value-driven management, specifically in branches with highly reputed brands or with a strong high-tech focus, depend on these services [3]. Well informed management boards strive to base their strategic decisions, such as selecting R&D projects and building a strong IP portfolio, through the protection of the company assets on the strength of the best IP information available on the market. Such IP portfolios may later be transformed into valuable corporate and financial assets. Thus, IP management is mainly information management; awareness of the company's own assets and risks as well as those of its competitors should be paramount at all times. Patent information is particularly important for high-tech companies with global business activities and a need to avoid patent litigation and infringements and to combat threats from third parties such as patent trolls.

3. Current challenges for information retrieval

High quality patent information to be used for decision making is not obtained easily. Substantial know-how and access to specialized databases are needed to retrieve, evaluate and prepare patent information ready for use [4]. One of the challenges involved in the selection of relevant documents is the fact that every 14 seconds a patent or utility model is filed somewhere in the world today [5]. This accounts for over 2.2 million new documents every year. The majority of these filings will eventually enter the respective worldwide databases. Furthermore, on the background of the rapidly rising flood of patent and utility model applications in countries such as China, India or even Russia, language barriers increasingly prevent the efficient search for, and retrieval and evaluation of, many documents. Overcoming these obstacles will be vital for assessing the significance of the documents for different purposes. One solution to the language problems could be improved machine translation tools. Such tools exist already and work sufficiently well for a couple of language combinations. However for translations of languages from the above mentioned countries into English, significant improvements will be necessary during the next years or decades. Furthermore, tools to translate English search terms into another target language are either existent or under development. These tools allow to search foreign language documents using English terms and are especially relevant for searches in the original

language full text databases. Although the tools today may be sufficient for English speaking patent information searchers for getting an idea of the significance of the document for the customer, the detailed description of the invention as well as the scope of the protection is in most cases only vaguely recognizable. Furthermore, interdisciplinary inventions, as in the field of nanotechnology, make it difficult for a single searcher with only one specific scientific background to find relevant documents in two or more scientific areas. This obstacle will have to be overcome by teams of specialists working on the same patent search rather than a single searcher trying to understand the search matters stemming from different fields of technology. Such an approach implies that a service provider employs a sufficiently large team of patent searchers form all technical fields or that a network of individual patent searchers is able to work on one mandate in a coherent and efficient way. And last but not least, search tools become ever more sophisticated, i.e. text mining, statistical analysis, full text searching and the many different search approaches that professional databases make available call for highly educated and trained information specialists.

4. The different types of searches

For making informed business decisions throughout every single stage of a product cycle, a continuous surveillance of the market and relevant technology trends and competitors is required. Thus, during the innovation process, several different searches need to be performed timely and at different stages of the process (Fig. 1). Their specific timing may differ from business to business and have to be customized to suit different requirements.

The types of patent searches described below might be called differently by different customers or service providers. Furthermore, additional searches, combinations of the types of patent searches, and specifically customized patent searches that are not listed below are also an option [4].

4.1. Prior art search

This type of search is more or less the professional counterpart of the assisted patent search. It will provide an overview of the state of the art and allow the customer to make decisions about R&D investments and other IP-related business matters. Prior art searches usually are also conducted at the beginning of the innovation process and might have a rather large impact on further during the innovation process.

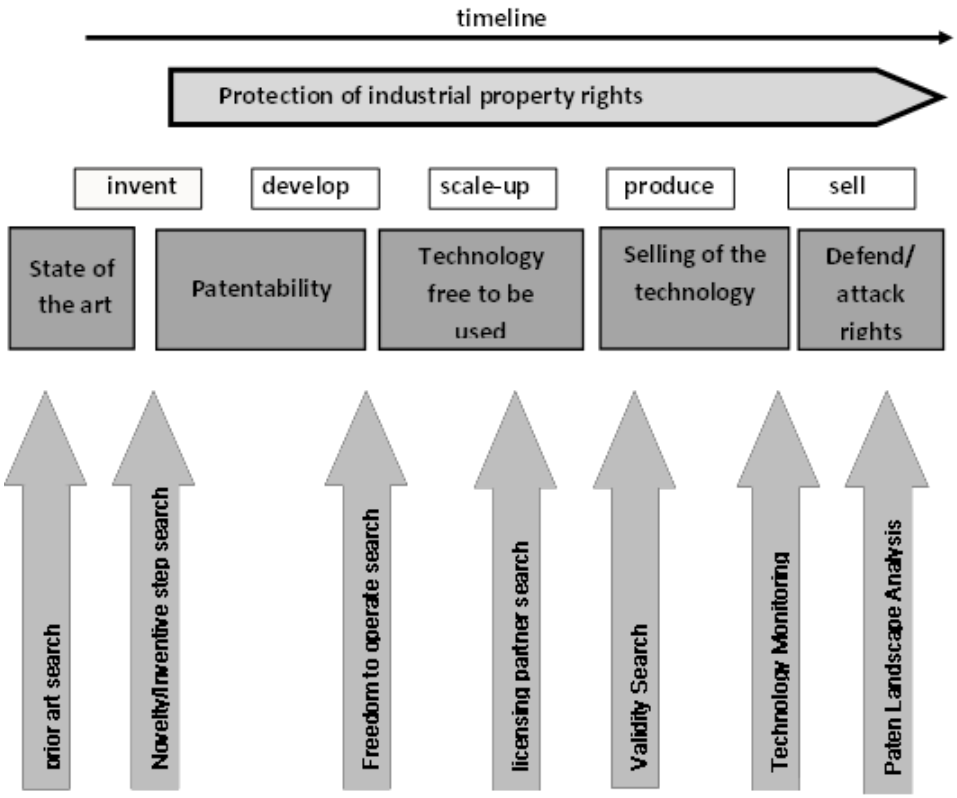

Fig. 1: The innovation process. A key purpose behind patent searching is to allow for decision-making with a better grasp of existing or possible benefits and threats to future patent, and therefore, business plans. This lowers the possibility of, and costs associated with, errors due to either under appreciation or over appreciation of the scope of patent claims.

4.2. Novelty/inventive step search

This search is in general connected with a patent application. Thus the customer needs to have a clear perception of the invention to be protected. The patent application might still be somewhat downstream the innovation process but the decision to continue a specific development needs to be made a different time points. This search also includes in most cases a clarification of the state of the art in the technical and scientific literature.

4.3. Freedom-to-operate search

This type of search is also often called infringement search, right-to-use search or clearance search. A freedom-to-operate search is usually used to determine whether a commercialization of a product or the use of specific technologies can be conducted without infringing valid IP rights of third parties in specific jurisdictions. Thus this type of search is not only necessary for holders of patent rights, but equally important for those who do not want to patent their inventions but need to avoid costly infringement litigations.

4.4. Search for licensing partners or buyers

At least at the point when the innovation process evolves into a working prototype of the invention, in many cases a search for partners helping to commercialize the product is needed. This search in the patent literature can help to identify potential industry partners that work in the same field of technology and are strong and innovative enough to carry on the development of the innovation or its commercialization.

4.5. Validity search

A search conducted with the goal to find prior art that can be used to have a pre-existing patent invalidated, i.e. challenging novelty or inventive step. Invalidation of existing patent rights might be considered when a patent of a third party hinders the business, might result in a costly design around or licensing negotiations. Furthermore, when infringement litigation is on the horizon, the defendant will often try to invalidate the plaintiff's patent or the defendant might want to determine whether his patent will withstand the litigation. Another example where it might prove useful is in assessing the value of the patent in licensing negotiations or in process of raising investment capital.

4.6. Technology or legal status monitoring

This search is in general a monitoring for infringement, i.e., examining other firms' patents for a possible infringement. But it may also be a regular update on the patent documents published in a specific technology field. This type of monitoring may enable a company to avoid costly "reinventions of the wheel" or check on the technology advances of the competition. A technology monitoring can be performed at any time interval such as monthly or yearly. It should keep the customer up-to-date with all developments in the respective technology field and allow early detections of possible infringers. Often, the direct customers for such monitorings are R&D people rather than patent attorneys.

4.7. Patent landscape analysis

Patent statistics are an excellent tool for measuring the R&D activities in industrial sectors or to identify technological trends and competitors. The visualization of such trends can be improved by using additional tools such as text mining and often results in patent maps. Such maps allow identification of areas of intense activities of areas that virtually free of patent activities. This information is intended to support business decisions on the company level. Thus, the customers of patent statistics and mapping is in general the management personnel involved in strategic business decisions.

5. Quality in the eyes of an SME

Since external as well as in-house customers of patent search services rely on the quality of the search results, the Swiss Federal Institute of Intellectual Property conducted a survey among Swiss small and medium enterprises (SMEs) in 2008 [6]. In this survey, the management of 182 SMEs were asked about the criteria deemed to be relevant for an excellent service. The key quality factors for the provision of IP services are shown in Fig. 2. Only the answers pointing to either high or at least moderate relevance are shown. This study is similar to an earlier study commissioned by the European Commission, DG Enterprise [7]. First and foremost, the *competence of staff* is seen by far as the major factor bringing about a quality service. The second most important factor is ease of *access and identification,* which refers basically to how easily the service can be found and accessed. Almost as important is a *timely delivery* since timing is an essential aspect of using IP information for decision making. Interestingly, *individual contact* and *costs* are not among the top factors that define quality.

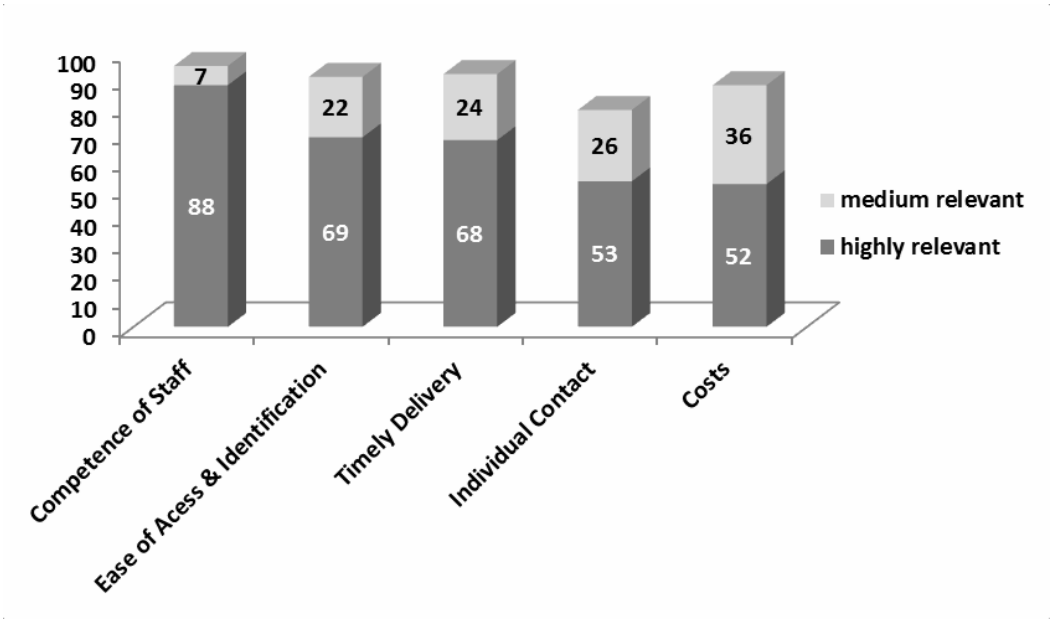

Fig. 2: Key quality factors for the provision of IPR services, perceptions of Swiss users of such services according to relevance, service users in %, aggregated answers for all services benchmarked

The findings of the Swiss survey show that the customers' views of the key issues determining patent search quality differs somewhat from the views held by the service providers. This means that there are two perceptions of the quality of search results, an intrinsic and an extrinsic perception. The intrinsic perception is the quality experienced and deemed to be important by the service provider or individual information search expert. This perception has its roots in the processes used to ensure quality within the organisation of the service provider itself and the correctness of the databases searched.

This contrasts with the extrinsic perception of quality, which is the usefulness of the end result, i.e. the information presented by the service provider, to the customer. The perception of quality by the customer is the crucial factor likely to determine the conclusive quality of the services. Thus, judging IP information services with intrinsic perceptions only will lead to false quality assumptions.

6. Intrinsic quality factors

For service providers, there are first some requirements of the searchers to be met (Table 1). First of all, searchers must have a higher degree in engineering or natural sciences, e.g. they must have an excellent education in a specialized technical area. Second, they need to have excellent knowledge of both the patent system as such and the information contained in a patent document. In most cases, service providers need to make an effort to educate their staff in patent knowledge, since employees with such a curriculum are rarely found. The service providers therefore need to have high-quality educational routines in place and provide the necessary expertise for IP knowledge. Third, the searchers should be able to handle several different command languages for different commercial and non-commercial databases and other search support tools such as the different classification systems. The searchers must be capable of selecting and combining the right tools for a specific search from a vast toolbox. Fourth, staff should be as multilingual as possible, e.g. master at least three of the world's important languages. English, French, German and Spanish are all major languages in the western hemisphere but Chinese, Korean or Japanese could be even more important in the light of the quantity of patent and utility model applications worldwide. The service providers should, as a fifth requirement, make sure that their staffs obtain a continuous education in the respective technical areas, the patent know-how and the mastering of the search tools. Sixth, with regard to the increasing importance of interdisciplinary patent applications, the searcher needs to be able to work in a team of specialists. A final, key factor is the skills to communicate well with the internal team as well as the customers (which can be patent attorneys, management, F&E people, patent information specialists or other third parties). Depending on the service to be delivered, the order of importance of all these may need to be rearranged.

Table 1: Requirements for researchers.

Master degree in engineering or natural sciences Excellent patent knowledge
Search skills in different search systems and databases
Multilingual
Continuous education of professional competences
Teamwork
Communication skills

A further set of quality criteria to be met for service providers concern the databases used by the searchers. The quality of a patent search can only be as good as the databases he or she uses. Four main requirements can be identified (Table 2): the individual records in the databases need to be clean; they must not contain incorrect information in the data fields; the database should be as complete as possible with no missing records, no missing or empty fields and no missing entries in the information pertaining to a field. This last deficiency is common in the sense that the amount of information in a specific field can vary dramatically from record to record in the same database. Another requirement is that all data should be current allowing as little a delay as possible for entry in the database. Furthermore, the data within one database should, to the highest degree possible, be standardized across all national authorities and regional offices. And finally, the data needs to be easy accessible by qualified and trained searchers, requiring the command language to be logical and well structured. Furthermore, the tools available for the database to be used need to be sophisticated, practicable and up-to-date all at once; the best database is useless if its search tools are inadequate, preventing an efficient and accurate search. Many of these requirements or intrinsic factors determining quality of the service have been published by the German Association of Patent Information Centres [4].

Table 2: Requirements for databases

Correct: records have no errors
Complete: all available data is included, i.e. no missing records, no missing fields in the records
Current: all data is up-to-date
Standardized: data are in the same format within the same database

7. Extrinsic quality factors

The extrinsic quality of searches largely depends on tailoring them to the needs of each customer segment and, even more so, the needs of each individual (Table 3). These segments may consist of individual inventors with little experience with the patent system and the interpretation of patent information or equally inexperienced academic researchers who have a strong need for solutions to basic research problems, patent attorneys with no need for interpretation of the search results but a desire for as complete as possible a search, to name but a few. The search must then be tailored to the type of request, e.g. novelty, validity, freedom-to-operate, etc. Additionally, it should be aligned with the legal environment, in which the results will be used, for example the customer's country, the stage of the legal process, the customer's position in the legal process, the customer's alliances, etc. Last but not least, the scope of the search is determined by its costs. Consequently, the search must be tailored to the risk the customer is willing to take, i.e. the amount of money he or she is willing to spend and the degree of accuracy needed for the search results.

Table 3: Individual searches

Tailored to the clients segment (individual inventor , academic researcher, patent attorney, etc.)
Tailored to the needs of the individual customer
Tailored to the type of search (novelty, validity, freedom-to-operate, etc.)
Tailored to the legal environment (clients country, clients position, clients alliance, etc.)
Tailored to the amount of money the customer is spending

Finally, the way the results are presented is another key issue in satisfying the customers' needs. The presentation must offer answers to all requests from the customer, be well structured, consistent, legible, and adapted to the customer's background. Furthermore, it needs to explain what has been done in its entirety and mention any steps not taken by the searcher. These requirements can only be met if a continuous and comprehensive communication between the customer and the searcher is established before, during and after the search process (Fig. 3). The search strategy, the choice of the databases and search tools as well as the time and money to be invested should be identified interactively between both partners who together should review the results of the search. Further action, such as additional searches with a different focus should also be included as options to be discussed [4].

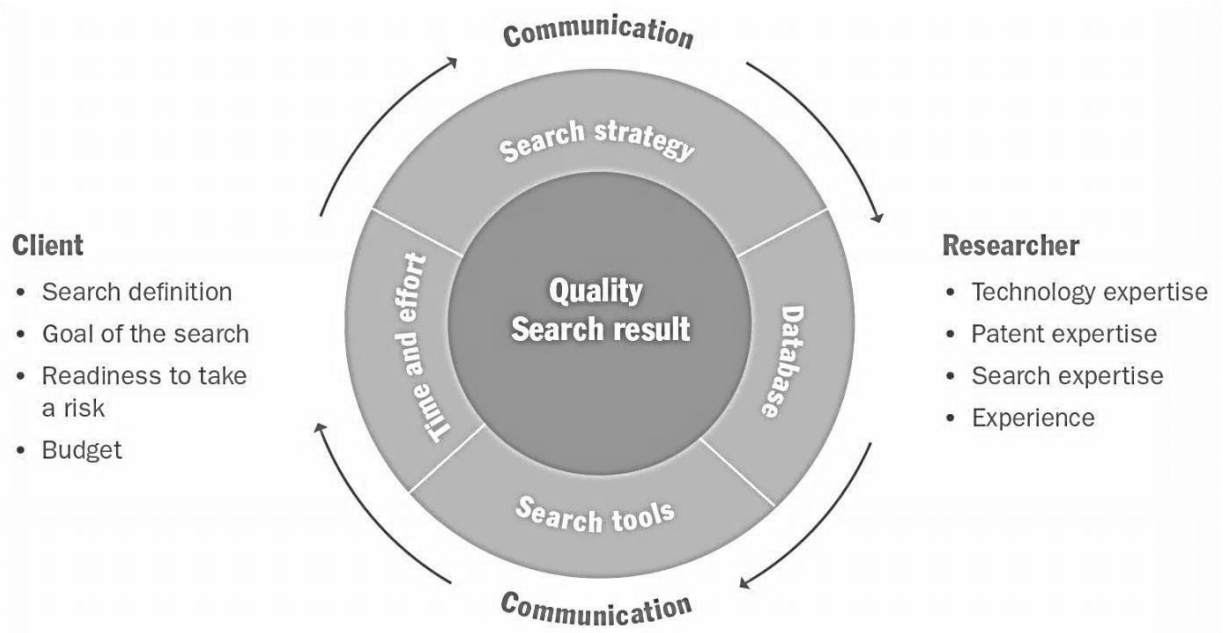

Fig. 3. The role of the communication between customers and searchers

8. Conclusions

Together with the client, the searcher has to define the purpose, the subject and the scope of the search. For patent attorneys both in the corporate world and in private practice, checking novelty, obviousness, freedom-to-operate or validity are the most important prerequisites for making decisions for proceeding with their work. As for researchers and developers, the wish to avoid reinventing the wheel might be their prime incentive for looking through the patent literature. Obviously, some customers will focus on the completeness of a search, whereas others just need one or two relevant documents. In any case, defining the needs of the customer is the most important quality factor for service providers as it serves as a basis for tailoring the search to the customers' requirements. The searcher needs to have a higher education in engineering or natural sciences as well as considerable experience in order to be able to perform a thorough and customized search. A key quality factor the customer has to make sure of is that the right search will be conducted at the right time in the innovation process, yielding accurate results generated with the help of professional tools and in several of the world's major languages. If all quality measures listed in Table 4 are in place, the search will be very likely to meet the exact needs of the customer, reducing to a minimum any risk of a significant discrepancy between the intrinsic and extrinsic quality of a patent search.

Table 4: The key quality factors

Communication
Service tailored to the different needs Highly educated and experience searchers Timeliness of the searches
Accuracy of the results (practically) no language barriers
Double check of search strategy and results
Customized and structured report Professional tools

Acknowledgement

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