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[Field Research]

Identifying New Technologies in Product and Processes through Patent Databanks

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Abstract

Purpose - This paper's aim is to analyze the technological information in patent databanks as a strategy in prospecting for new technologies.

Research design, data, and methodology - We detail the major free electronic database sources for patent information, the patent documents, the patent document structures, INID codes (Internationally Agreed Numbers for the Identification of Data), indexation, references, and classification notions. Additionally, we review and analyze information on the activities of the Center of Dissemination Documentation and Technological Information (CEDIN) from the National Institute of Intellectual Property (INPI) of Brazil for the period 2000 to 2011.

Results - The research shows that the technological information contained in the patents could provide a wide range of functionality within companies and universities.

Conclusions - In recent years, (CEDIN), a specialist in intellectual property, has been serving internal and external users by providing guidance on the basis of patents and other literature, but the number of users served is still small. In order to familiarize more potential users of such technological information, task forces should be created among INPI, universities, and companies.

Keywords: Technological Information, Technological Prospection, Patents, Intellectual Property.

JEL Classifications: O31, O32, O34.

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1. Introduction

The economists have used for a long time data from patents as an indicator of innovative activity and asa source of technological information to the industrial and academic sectors. They have tested explanations and implications of the inventive behavior in industries and countries, and have characterized it as "the nature of the technological environment in which the companies operate". (Schmookler, 1966; Glisman & Horn, 1988; Jaffe, 1989; Georg et al., 1992; Winn and Roome, 1993; Cohen-Rosenthal, 2004; Smith et al., 2005; Pujari, 2006; Jänicke, 2008; Nill and Kemp, 2009; Crane and Meyer, 2011; Sen and Ghandforoush, 2011; Rodríguez and Gómez, 2011; Torrecillas and Brandão, 2011; Balbinot et al., 2012; Salami and Soltanzadeh, 2012; Silva et al., 2012a Silva et al., 2013).

Griliches (1990) has revised this flow in literature, and has verified that the data from patents were only available in an aggregated form, making it necessary to filter the documents from individual patents. The availability of patents information from the international databanks has advanced considerably, making possible to analyze the behavior of the patenting process on these levels.

Nowadays, the ease of access to patents databases has stimulated the research on the possibilities and limitations of use of those data when aiming to analyze the technological performance of companies and universities as well. (Amparo et al, 2012; eixeira and Souza, 2013; Silva et al, 2012b).

Though it could be demonstrated that the data on patents are correlated with other perceptual objectives or measurements on technological power of companies and universities, it shows no effective correlation with the financial performance.(Narin, Noma and Perry, 1987).

However, the scientific studies should highlight improvements in the measurement concerning information usage, beyond patent counting, as well as the development of analytical techniques from those documents. (Basberg, 1987).

According to the World Intellectual Property Organization (WIPO), circa 2/3 of the available technological information around the world are showed on the patent documents (Marmor, 1979). The world collection of documents is estimated in more than 50 million, with in average annual increase of 1.2 million new documents (Wipo, 2009).

A study developed in Germany showed that the costs of Research and Development (R&D) could be minimized in 30%, if the available technical information was used by companies and universities. The usage of these documents contents enables a technical professional of inventions to develop it in a proper and efficient way. It has universal formatting, bibliographical data with specific fields, numerated, and containing the most recent information concerning the state-of-the-art, collections of complete documents centered in national offices or regional patent offices, access through electronic means, covering all technological fields.

This study had as its main objective to analyze the technological information within patent databanks, as a strategy in the prospection of new technologies. It describes the major international databanks, the patent documents, their structure, INID codes "Internationally agreed Numbers for the Identification of Data", indexation, references, and basic notions of classification.

2. Technological Information

According to Parmagnani (2004), "the technological information comprises all type of information on assembling, project and management technologies, which favors the continuous improvement and innovation in the productive sector".

This information is encountered in several sources, with the informal sources obtained in conferences, fairs and expositions, radio and TV interviews etc. And the formal sources obtained from books, technical regulations, theses, news in papers and magazines, electronic means (national or international databanks, internet information, virtual libraries, scientific papers, patents etc. (Kahaner, 1997).

The patent document is one of the richest sources of information, because it has descriptive sufficiency, determined by law, according to the Art.24 (Law of Intellectual Property, n. 9.279/96). The report must describe the object in a clear and sufficient form, making possible its execution by an expert and indicate, when necessary, the better form of execution.

There are two types of documents, the "patent request", deposited document, independent from being granted or not, and the "granted patent", final document, after the request processing.

2.1. Publication of the Patent Document

In Brazil, the official publication appears in the Intellectual Property Journal (RPI), with the bibliographical data and abstract. It is based on the integral document available through a link to Espacenet (2006 on) or through request of a copy of the complete document to the INPI, via mail.

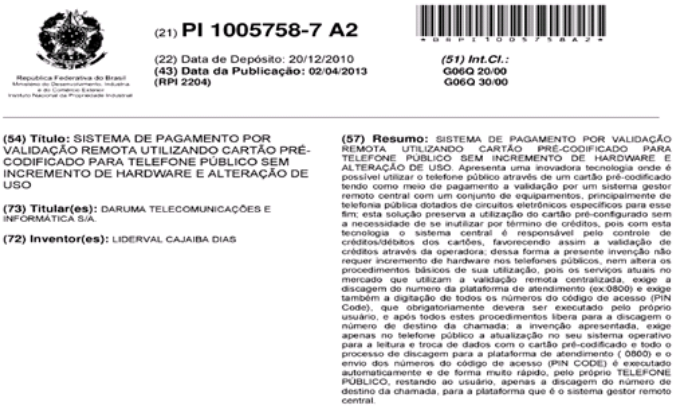
In the U.S. until the year 2000, only granted patents, but nowadays includes the requests as well. It guarantees new numeration to the granted patent (year of publication for the deposited request), and right to not publish non-granted requests which have not been deposited in other countries.

In the E.U., there are requests as well as granted patents that keep the number, but change the status code of the document.

2.2. Structure of the Patent Document

The patent document must include bibliographical information (title page), descriptive report, claiming field, drawings when necessary and summary, as provided by law. Furthermore, the document has numerations, called INID codes "Internationally agreed Numbers for the Identification of Data".

These codes identify all information that are included in the first page or title page, with indications of numbers, dates, origin, property and technique, as exemplified in figure 1.



(21) PI 1005758-7 A2

(22) Data de Depósito: 20/12/2010
(43) Data da Publicação: 02/04/2013
(RPI 2204)

(51) Int.Cl.:
G06Q 20/00
G06Q 30/00

(54) Título: SISTEMA DE PAGAMENTO POR VALIDAÇÃO REMOTA UTILIZANDO CARTÃO PRÉ-CODIFICADO PARA TELEFONE PÚBLICO SEM INCREMENTO DE HARDWARE E ALTERAÇÃO DE USO

(73) Titular(es): DARUMA TELECOMUNICAÇÕES E INFORMÁTICA S/A.

(72) Inventor(es): LIDERVAL CAJAIBA DIAS

(57) Resumo: SISTEMA DE PAGAMENTO POR VALIDAÇÃO REMOTA UTILIZANDO CARTÃO PRÉ-CODIFICADO PARA TELEFONE PÚBLICO SEM INCREMENTO DE HARDWARE E ALTERAÇÃO DE USO. Apresenta uma inovadora tecnologia onde é possível utilizar o telefone público através de um cartão pré-codificado tendo como meio de pagamento a validação por um sistema gestor remoto central com um conjunto de equipamentos, principalmente de telefonia pública dotados de circuitos eletrônicos específicos para esse fim; esta solução preserva a utilização do cartão pré-configurado sem a necessidade de se inutilizar por término de créditos, pois com esta tecnologia o sistema central é responsável pelo controle de créditos/débitos dos cartões, favorecendo assim a validação de créditos através da operadora; dessa forma a presente invenção não requer incremento de hardware nos telefones públicos, nem altera os procedimentos básicos de sua utilização, pois os serviços atuais no mercado que utilizam a validação remota centralizada, exige a discagem do numero da plataforma de atendimento (ex:0800) e exige também a digitação de todos os números do código de acesso (PIN Code), que obrigatoriamente devera ser executado pelo próprio usuário, e após todos estes procedimentos libera para a discagem o número de destino da chamada; a invenção apresentada, exige apenas no telefone público a atualização no seu sistema operativo para a leitura e troca de dados com o cartão pré-codificado e todo o processo de discagem para a plataforma de atendimento (0800) e o envio dos números do código de acesso (PIN CODE) é executado automaticamente e de forma muito rápido, pelo próprio TELEFONE PÚBLICO, restando ao usuário, apenas a discagem do número de destino da chamada, para a plataforma que é o sistema gestor remoto central.

Source: Espacenet Database (2013)

<Figure 1> Title page of the Invention Patent Request in Brazil.

The topics 2.3 to 2.6 describe the meaning of each numerical field informed in the patent document.

2.3. Number indication

(11) Document Number
(21) Designated Number when it is deposited
(31) Designated Number to the first deposit (document priority).

2.4. Date Indication

(22) Date of deposit request
(32) Date of deposit of the first request (date of priority);
(41) to (47) Dates in which the request is available to be reviewed

(41) to (44) It refers to documents of published patents (examined or not, but that don't have the final decision yet (granting or not of the patent) ;
(45) to (47) Refers to the date of the patent granting, generally using the number.

2.5. Identification of origin/property

(19) Name of country or Regional/International Organization that has published the patent document
(33) Country or countries of the first document (priority);
(70) to (76) Identification of the parts related to the document
(71) Name of depositor (to whom the patent was granted);
(72) Name of inventor, if he/she is known
(73) Name of the person who holds the rights on the patent
(74) Name of the agent or procurator
(75) Name of inventor, when being the depositor himself.

2.6. Technical information

(12) Indicates the document type (invention patent, Utility Model, etc.);
(51) International Patent Classification (IPC);
(52) National or domestic patent classification
(54) Invention Title
(56) List of previous documents cited by the depositor (can help the exam) or found by the patent examiner during the search for exam
(57) Summary of the document contents.

2.7. Status Codes of patents

They are standardized codes to the identification of different document types. In Brazil, at the end of 2008, the INPI introduced standardized codes and began publishing the granted patents, according to the model below:

Deposited patent requests:
PI – Invention Patent: ex. PI0900066-6 A2
C1 – Certificate of addition: ex. C10605141-3 E2
MU – Utility Model: ex. MU8900022-6 U2

Granted Patents:
PI – Invention Patent: ex. PI5600001-2 B1
C1 – Certificate of addition: ex. C19605669-0 F1
MU – Utility Model: ex. MU8101158-0 Y1

Pipeline Patents:
PI11 – Granted Pipeline Patents: ex. PI1100008-2K B1

In the European Patent Office, the following standardization is used:
A1 – Patent request publication;
A2 – Patent request publication without the search report;
A3 – Patent request publication including the search report;
B1 – Granted patent publication;
B2 – Republication of patent, due to illegibility.

2.8. International Patents Classification

The International Patent Classification (IPC) had its first discussion around 1920. The text of the first edition of the CIP was established according the European Convention on International Patents Classification, in 1954, with its first edition in 1969 (Wipo, 2009).

Then the Strasburg Agreement entered into force, referent to the IPC in 1974, that establishes a common classification to invention patents. Any country member of the Paris Convention can become a member of the Strasburg Agreement. The classification is periodically reviewed through meetings of experts from the Signatory Members of the World Organization of Intellectual Property, being published in CD-ROM, and the access granted to the INPI and OMPI sites on the web.

One of the objectives of the IPC was to create a tool for the search and backup of documents, being an instrument to organized arrangements of those documents, aiming to facilitate the access to the technological and legal information contained inside them.

Besides, it is a basis to the dissemination of selective information to all patent users, a basis to inquire the state-of-the-art in determined technology fields, and basis to the arrangement of statistical data on industrial property, which allows the evaluation of the technological development in several areas.

Until 1999, they were reedited from 5 to 5 years. The eighth edition came into force in the beginning of 2006, with technical and format changes.

Currently, this classification divides the technological themes on patents in more than 64,000 items, composed by 8 sections, 21 subsections, 120 classes, 628 subclasses, 69,000 groups, besides subgroups, according to the different industrial sectors. The sections are divided as follows:

A – Current human needs;
B – Diverse industrial techniques, processing operations, transport;
C – Chemistry and metallurgy;
D – Textiles and paper;
E – Fixed buildings;
F – Mechanical engineering, illumination, heating, weapons and explosives;
G - Physics;
H - Electricity.

2.9. Searches in the major Free Patent Databases

When performing searches in databases, the goal is to achieve several parameters, among them, prior research and/or official patent ability, legal actions, research and development, and marketing interests.

The main limitation of the search still is the secrecy step (18 months from the documents deposit date). Any database or

used search tool will make a backup only from the already published documents.

There are the following databanks:

1) Patent databanks from national offices;
2) CD-ROM databanks
3) free electronic databases;
4) commercial electronic databases.

This study had as objective to describe only the free electronic databases. Currently, these kinds of databases are the most accessible, because they have search mechanisms capable of recovering information, using several fields chosen from the bibliographical data. Brazil was the first country to provide its patent database on the web for free. The main free databases are as described below:

2.10. European Patent*Office* – EPO

This database allows the search for patents in several countries since 1970. The access of bibliographic data from the European office documents and more than 80 countries, and many complete documents, available in PDF format, key words.

Allow to access until 500 records by searching, after the achievement of this number only via payment. Many documents in the specification and claims in HTML (facilitates the location of search terms). It also allows accessing the patent family documents, showing the progress of the application in countries.

Has 10 specific fields for search, until 10 search terms per field, taking the Boolean operators (and, or and not). The operators of omit terms are an asterisk (*), for unlimited number of characters, the question mark (?) for zero or more characters, and the pound sign (#) for a single character.

2.11. United States Patent and Trademark Office's – USPTO

This database allows the search of all U.S. patents granted since 1790, having two bases, the patent granted (1976 and 1790 full text, digitized texts) and published applications (from 2001/03).

One limitation is that only it contains filed or published documents in the United States. The search can be done in the complete document or in specific fields, and accepts a larger number of terms per field.

Provide documents available in their original format, enabling the recovery of a technology landscape, through cited documents.

The default operator of terms is the currency simbol ($), and enables to use Boolean operators *(and, or, and not).*

3. Methodology

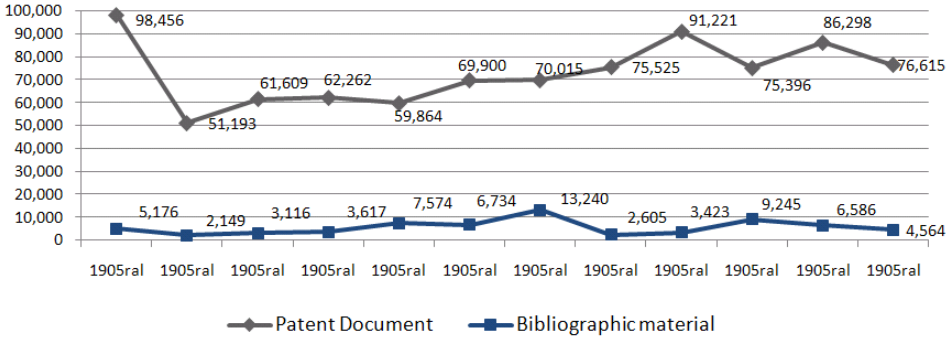
This study was based on a literature research; various sources were consulted, such as books, periodicals, manuals, laws, decrees, and websites. From the point of view of the objectives it was characterized as exploratory and descriptive, it sought specific information from was developed (Gil, 2007).

At first moment a definition and general characterization of information technology in the context of industrial property was performed. Second, elements on the patent document publication were described (structure, codes INID "Internationally agreed Numbers for the Identification of Data",index, references), and the basics notions of the International Patent Classification (IPC).

In a third moment, the main electronic free databases were analyzed and described: National Institute of Industrial Property (INPI), United States Patent and Trademark Office's (USPTO), World Intellectual Property Organization (WIPO) and the European Patent Office (EPO).

The last step was to analyze the statistical activities of the Center of Dissemination Documentation and Technological Information (CEDIN) from INPI in the period 2000-2011.

This information was collected directly in CEDIN in May 2012, for data analysis, descriptive statistics were used, and the data was tabulated using Microsoft Excel 2007.



Source: CEDIN (2012)

<Figure 2> Supply of patent documents copies and bibliographic material

4. Results Analysis

The CEDIN had its deployment in 1976, comprising the Patent Bank and the Library of INPI. As in Art.13 (Decree 77483/76), its purpose is to provide to the interested areas, private and government information about the industrial and technological development, nationally and internationally.

CEDIN is a specialist in Intellectual Property, has a collection of laws and publications from various International Patent Offices, also books and technical journals, attending to internal and external users.

Figure 2 illustrates the evolution of the copies of patent documents supply and bibliographic material by CEDIN over the past 11 years for internal and external customers.

Note that the provision of the patent document is much higher than the bibliographic material, reaching almost 92.000 documents provided in 2008, with a considerable development in recent years. This discrepancy is due to the fact that the patent document is considered as applied knowledge, containing more technical information than bibliographic material, considered basic knowledge.

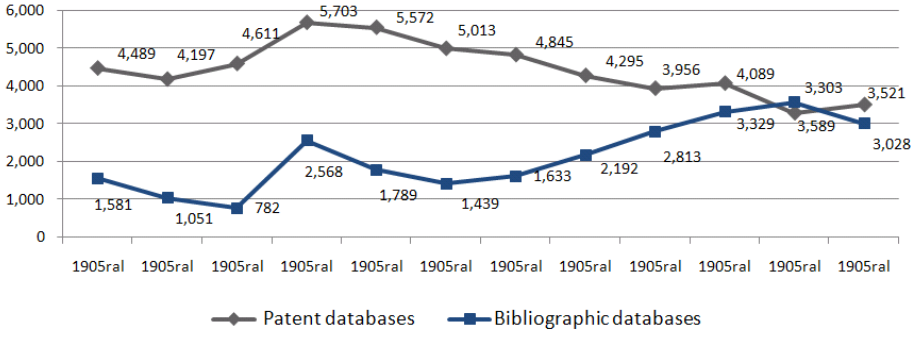
Figure 3 details about the guidance and orientation made by CEDIN in patent databases and bibliography.

The patent databases always had greater number of requests, but since 2006 the bibliographic databases had also considerably grown.

Figure 4 illustrates the searches performed by CEDIN and users, as well as bibliographic searches. It is observed that the searches performed by users always remained higher than those made by CEDIN; only in 2010 and 2011 this indicator was almost equaled.

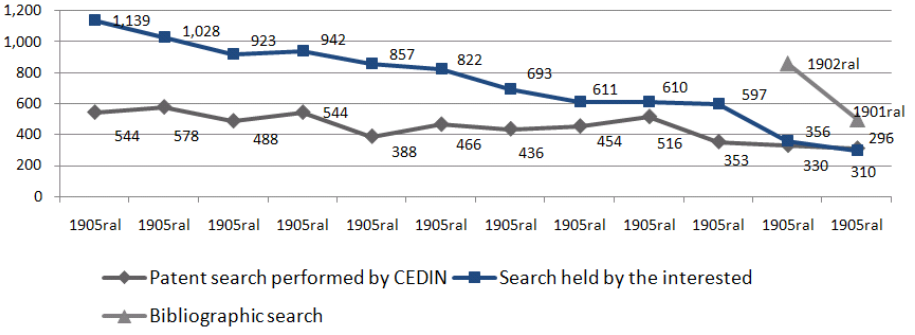
An interesting data is considering the high number of published inventions, wastes of money used on research and development, descriptive failure in many patent applications in Brazil, with the search of technological information made by the users, in many cases are not familiar with these tools. The lack of expert guidance for prior art search provides a larger margin of errors, which may cause the definitive filing request.

Bibliographic search uniquely contains results from the last two years, since this indicator was used from 2010.



Source: CEDIN (2012)

<Figure 3> Treatment and Guidance for Users



Source: CEDIN (2012)

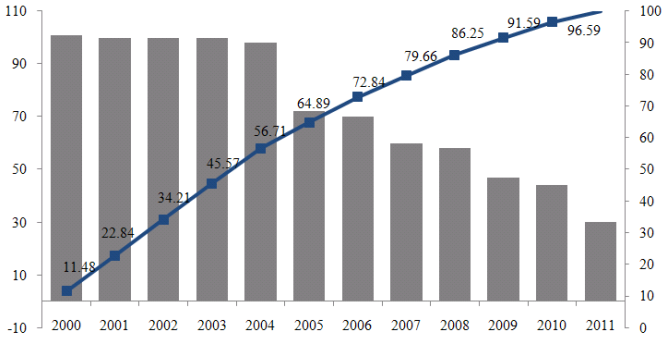
<Figure 4> Searches made by CEDIN and users

Finally, figure 5 provides information about the number of companies registered in Program of Automatic Supply of Technological Information(Profint), which in the last 7 years had a considerable decrease in new registrations.

This program is part of CEDIN, and generally aims to selectively disseminate technological information contained in patent documents, national and international, which is a crucial service for companies.

Once registered, companies receive the documentation in their interest areas, as the documentation is built into the patent database, regularly and automatically.

One of the most important advantages is that the company keeps itself update with technological advances in its area of operation and allows the monitoring of technological activities of competitors in Brazil and in other countries.



Source: CEDIN (2012)

<Figure 5> Number of Profint Companies

5. Conclusion

This study showed that technological information contained in patent applications may be placed for a wide range of use within companies and universities, as there are many advantages in its effective use, among them:

- Set the state of the art from determined technology in order to filing a patent;
- Support investment decisions (better technology purchase);
- Enable to understand potential technical alternatives, identify emerging technologies, market trends and forecasting of new products;
- Define potential routes for improvements in existing products and processes, monitor the competitors activities;
- Evaluate the validity (check the technology available in the country, avoiding lawsuits), to prevent counterfeiting;
- Map patent citations, which allow tracking technologies;
- Allow the resurgence of technologies worldwide per company, inventor and subject;
- Analyze patent families (allow to check the countries where protection is sought for the same invention) and finally, enable the grant technical examination or administrative nullity;

The CEDIN has attend in recent years, internal and external users for providing guidance about patent databases and bibliography, but this number is still small, task force work should be made between the INPI, universities and companies, aiming to familiarize potential users about technological information contained in patent.

Also a similar work should be done in Program of Auto Supply of Information Technology (Profint) since in the last seven years a considerable decrease in new registrations occurred.

However, this tool is essential to enhance the research and development (R&D)of products, processes and services in companies and universities because the bases enable quantity, quality and accessibility of information to users.

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