Joanna ZIELIŃSKA, Jolanta DZIEŚLEWSKA
Institute for Sustainable Technologies – National Research Institute, Radom

COMPUTER-AIDED SYSTEM FOR SUPPORTING INDUSTRIAL PROPERTY RIGHTS IN THE AREA OF MACHINES, TOOLS AND DEVICES INVENTING

Keywords

Machines, patents, computer system, database, authorisation, PHP, intellectual property rights, industrial property, competitiveness, SME, information society, invention, innovativeness.

Abstract

This article presents some of the complex aspects of intellectual and industrial property rights in the area of innovative machines, tools, devices as well as chemical compositions, software processes, manufacture articles, etc. The main aim of the paper is to stress the importance of industrial property right in patenting procedures. Moreover, the author's computer-aided system dedicated to industrial property rights is particularly described.

Introduction

Maintenance has to respond to an increasing meaning of intellectual and industrial property rights as a condition of developing a balanced and accessible international intellectual property system, which rewards creativity and stimulates innovation in the maintenance area.

One of the main elements of European Commission Strategy is strengthening the European economy's competitiveness [1] through the transformation of European citizens in a global information society.

Within diverse industrial branches' development and the realisation of innovative projects, the knowledge contained in the patent publications is often omitted. The opportunities of using specialised patent publications and taking advantage of patent offices may lead to the competitiveness increase, as well as to producing products with a clear intellectual property status.

There is a necessity to developing knowledge-based systems to acquire, organise, personalise, share and use intellectual and industrial property rights indispensable in inventive practices and very often referring to machine exploitation [2].

As a result of the inventiveness processes in the Institute for Sustainable Technologies – National Research Institute, the institute recognises the benefits of patent development, and an intellectual and industrial query tool would be useful and fully functional for the Institute's strategic activity.

In the paper some problems regarding patenting procedures have been presented as well as the computer-aided system designed for the purposes of supporting the intellectual and industrial property rights. Due to the fact the Internet is a tool used for knowledge acquisition and modelling, after carrying out a number of analyses on the designed tool environment, the main way to access it is the World Wide Web.

1. Industrial property rights in machine exploitation area

The present law is designed to protect inventions, the models of use, the industrial models and drawings, industrial and commercial secrets, trademarks for products and services, collective and warranty trademarks, the trademarks of origin, origin denominations, commercial names, advertising slogans and signs.

There are some regulations regarding industrial property rights that are content of the Law of Property as well as Law of Inheritance. However, for representatives of SME sector in the area of machine or machine parts inventing or innovative modifications and improvements, it is a significant matter to have an access to a specialist that will do the following:

- explore interactions between the new solution and existing market products and technologies, and
- help to contribute to the understanding of the intellectual and industrial property rights by providing a verified and genuine law-based knowledge.

Referring to World Intellectual Property Organization [3], industrial property rights include inventions (patents), trademarks, industrial designs, and geographic indications of source. According to international agreements, the protection of intellectual property begins immediately with their establishment without registration required. Industrial property objects, such as testers, chambers, microprocessors are subject to different laws. To obtain full legal

protection over the invention, there must be a registration in Polish Patent Office carried out.

An invention is a novel and useful idea relating to processes, machines, manufactures, and compositions of matter. It may cover such things as new or improved devices, systems, circuits, chemical compounds, mixtures, etc.

Not all inventions are patentable. Questions related to patentability are often complex and usually require professional assistance. One of the general criteria for patentability is that an invention must not be obvious to a worker with ordinary skills in that particular field. It also must not have been publicly known or used by others in this country or patented or described in a printed publication anywhere prior to the date of invention.

2. Industrial property issues in the machine inventing area

When a new machine or technology is generated by the SME, it is necessary that the designated authorities review and make determinations in regard to industrial property rights. This is the appropriate moment for using the query computer-aided system. It gives an inventor a simple and efficient way of industrial property knowledge acquisition.

A patent is a grant issued by the Patent Office giving an inventor the right to exclude all others from making, using, or selling the invention within the Republic of Poland for a period of 10 years [4]. In order to secure broad patent protection, it is necessary for the inventor to file an application as soon as the invention can be adequately documented. When a patent application is filed, the Patent Office of the Republic of Poland reviews it to ascertain if the invention is new, useful, non-obvious; and, if appropriate, it grants a patent.

The web-based system for intellectual and industrial property rights protection recognises that exploitation of proprietary rights in the form of a patent license are often necessary, particularly with inventions derived from basic research to encourage a company to risk the investment of its personnel and financial resources to develop the invention. However, in most cases, an initial, limited-term exclusive license is necessary to make it feasible for a company to undertake commercial development and production.

Taking advice from Polish Patent Office directly, may be time consuming and to persuade SMEs to obey intellectual and industrial property rights, and there should be an opportunity to use a generally accessible system. Additionally, to make the system more attractive and to make public more aware of industrial property rights, it is advisable that the system would be free of charge.

3. The intellectual and industrial property web-based query system

The main objective of the task refers to designing a relational database [5, 6] enabling users to formulate queries to specialists in intellectual and industrial property rights from the Republic of Poland territory. The list of currently active patent agents was delivered by the Polish Chamber of Patent Agents in the area of intellectual and industrial property rights. To make the query system accessible to a broad public, for instance, for representatives of the SME sector, the web-based tool has been designed and made available through the Internet (Fig. 1 – http://www.rzecznikpatentowy.org.pl/pirp1/index.php).

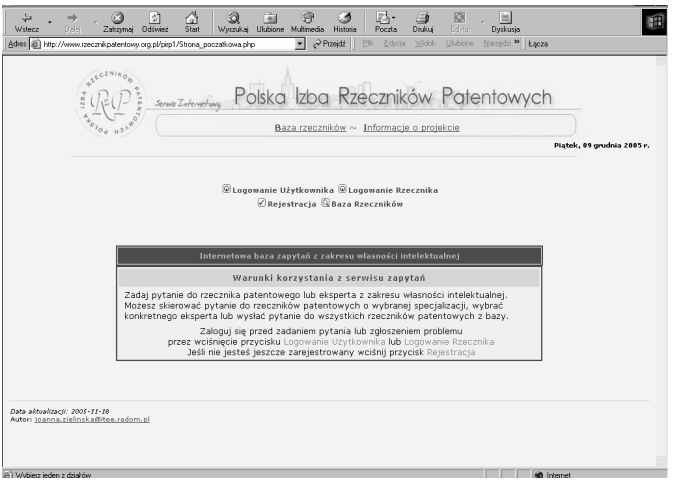

Fig. 1. The user interface of the designed query system

The role of the presented computer-aided query system in discovering and transmitting knowledge and providing public service create an environment which is highly conductive to the conception and development of intellectual and industrial property. There is also the possibility that the advice received from patent agents advices may have commercial value, which could be enhanced through the right use of patents, copyrights, trademarks, etc. The system supports the development of inventions and other industrial property for public use.

Designing of the query tool required the realisation of the following tasks:

- identification of the system information scope,
- establishing the main objectives to be achieved by the query tool,
- defining authorisation procedures for database access,
- designing the database of patent agents from the Republic of Poland's territory,

– designing database tables and defining relationships between them,
– implementing user interface for database access,
– verifying the correct running of the application in the web environment.

On the basis of the prepared information range, database tables with specific data are presented, which are the bases for the tool query as well as for patent agents' database. An example of the database table GOSC, that collects information about person, who requires an information is depicted in the Fig. 2.

	Table Column Name	Data type	Size [bites]	Column contents
1.	***Kod_goscia***	INTEGER	10	Identification number
2.	***Nazwisko***	VARCHAR	40	Surname
3.	***Imie***	VARCHAR	30	Name
4.	***Email***	VARCHAR	40	e-mail Address
5.	***Telefon***	VARCHAR	40	Telephone number
6.	***Nazwa_uzytkownika***	INTEGER	8	User name
7.	***Haslo***	INTEGER	8	Password
8.	***Status***	VARCHAR	1	Person status 0-registered 1-unregistered

Fig. 2. The structure of the database table

MySQL [6] standard was used to implement the database. To ensure the high security of the tool some coding procedures were deployed.

4. Authorisation procedure

Let us establish that a query system must be accessible through the Internet for a certain group of users. To accomplish the goal mentioned before, a login procedure has been performed. Login script is a very common requirement of many websites. There are tree steps involved in developing a login script. First asking a user or member to login using a form; then, checking the entered information with one existing table of database; finally, allowing the member to enter into restricted area based on successful login.

The code used in the query system to create a form asking the member to enter their login and password is shown in the Fig. 3. It will display the login form for the user in the aim to enter the required information in the provided

text boxes. On submitting the login and password, gets carried to the page *Logowanie.php,* and all the entered values are checked (to get the reply SQL query is used – Fig. 1) against existing data in the table (Fig. 4). Then, if the PHP in the proper condition returns true, we can allow the member to login, otherwise, an error message is shown.

```
      <?php
$user = $_POST["nazwa_uzytkownika"];
      $pass = $_POST["haslo"];

      /* Database connection*/
      $server = mysql_connect ("server name", "database", "user");
           if ( !$server ) {print "Connection error!";}
      $baza_zapytan = mysql_select_db("pirp1",$server);
            if ( !$baza_zapytan ) {print "Selection error!";}

      /*Database query*/
       $query = "SELECT * FROM gosc WHERE nazwa_uzytkownika
= '$nazwa_uzytkownika'
              AND haslo = password('$haslo') AND zablokowany='0'";
      $result = mysql_query($query);
      ?>
```

Fig. 3. SQL query used for validation form

The authorised data, together with logins and passwords are gained in the Oracle standard database table. In the project, all users that would like to use designed *Query Database* are held in a table GOSC (Fig. 4). The table has got the following structure:

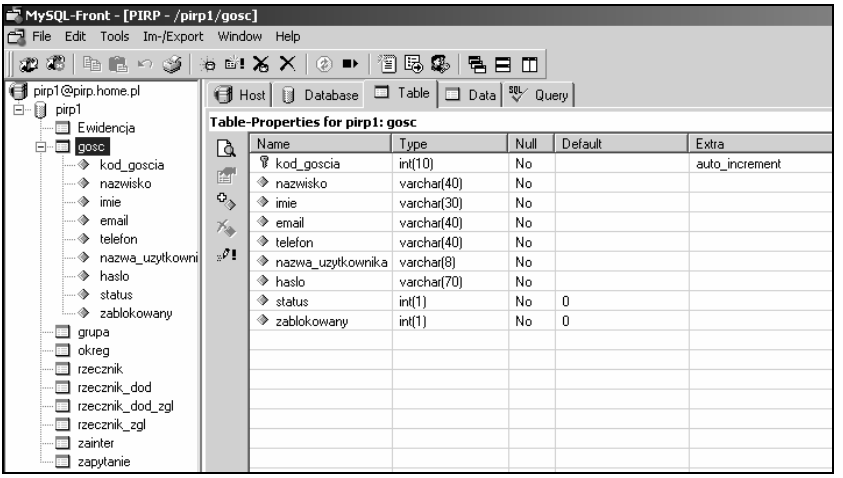

Fig. 4. Structure of the table GOSC

Fields *haslo (password)* and *nazwa_uzytkownika (user's name)* are destined for the corresponding storage of the password and user name. The *Kod_goscia (guest code)* is the unique key in the table GOSC. The password should be stored in coded way.

While analysing text coding in PHP [7], a programmer is able to use a few functions to perform it: crypt, password, md5, and sha1. Due to the fact that two first functions are appropriate when data is stores in the MySQL database [8], those will only be presented.

5. Crypt and password functions

The crypt function (Fig. 5) is one of the ways of string encryption. The structure of the hashing procedure is as follows:

crypt (string str [string salt])

The described function crypt() will return a string using the standard Unix DES – based encryption algorithm or alternative algorithms that may be available on the system.

Some operating systems support more that one type of encryption. PHP, at the install time determines the capabilities of the crypt function.

The standard DES-based encryption crypt() returns the salt as the first two characters of the output. It also only uses the first eight characters of *str*, so longer strings that start with the same eight characters will generate the same result (when the same salt is used).

```
    <?php
$password = crypt('mypassword');

    if    (crypt($user_input,    $password)    ==
$password)                                      {
          echo        "Password        verified!";
}
    ?>
```

Fig. 5. Function crypt() example

If coded data were saved to the file, only the crypt() function is possible to use. Otherwise, the second function password() is needed for implementation. The hashing procedure is presented below:

password('string')

As a security measure, storing only hashes of passwords in the database increases its safety and makes the system more controllable by having all users stored in the database structures.

Conclusions

Patents are by far the most technically demanding branch of intellectual property. In basic terms, a patent is given to an inventor of some novel machine, process, or a product that has utility to the public. In exchange for disclosing this new invention to the public, the government gives back to the inventor an exclusionary right to prevent anyone else from making, using or selling the invented device or process in Poland.

Due to the fact the patent agent is employed in the process of investigating for machine 'patentability' and then its patenting, it is important to provide for SMEs a query in particular to enable contact with specialist. To make the exchange of information more efficient and secure computer-aided systems are required, since the Internet and IT area it is still gaining more users.

The presented computer-aided system makes information regarding intellectual and industrial property more manageable and offers an easy access to professional patent agents who provide reliable knowledge, particularly useful for SME's representatives.

Acknowledgements

Scientific work financed by the Ministry of Science and Higher Education and carried out within the Multi-Year Programme "Development of innovativeness systems of manufacturing and maintenance 2004–2008".

References

1. http://www.mnii.gov.pl/mnii/index.jsp?layout=2&page=text&place=Text01 &news_id=399&news_cat_id=492, November 2006.
2. Bubnicki Z., Grzech A.: Inżynieria wiedzy i systemy ekspertowe. Wrocław, 1997 (in Polish).
3. http://www.wipo.int, November 2006.
4. Własność przemysłowa w działalności gospodarczej – przewodnik dla średnich i małych przedsiębiorstw. Urząd Patentowy RP, Polska Agencja Rozwoju Przedsiębiorczości, Warszawa, 2003 (wybór tekstów i opracowanie Marianna Zaremba – Urząd Patentowy RP), (in Polish).
5. Date C.J.: Relacyjne bazy danych dla praktyków. Helios, Gliwice, 2005 (in Polish).
6. Whitehorn M., Marklyn B.: Relacyjne bazy danych. Helion, Gliwice, 2003 (in Polish).
7. Meloni J.C.: PHP, Podręcznik tworzenia stron WWW. Mikom, 2001 (in Polish).
8. Ullman J.D., Widom J.: A first course in database systems, 1997.

Reviewer:
Adam MAZURKIEWICZ

Komputerowy system wspomagania ochrony własności przemysłowej w obszarze procedur patentowania maszyn, narzędzi i urządzeń

Słowa kluczowe

Maszyny, system komputerowy, baza danych, autoryzacja, uwierzytelnianie, kodowanie, PHP, ochrona własności intelektualnej i przemysłowej, konkurencyjność, MSP, społeczeństwo informacyjne, wynalazczość, innowacyjność.

Streszczenie

W artykule zaprezentowano wybrane aspekty ochrony własności intelektualnej i przemysłowej w obszarze patentowania innowacyjnych maszyn, narzędzi, urządzeń, jak również kompozytów chemicznych, produktów produkcyjnych itd. Głównym celem artykułu jest podkreślenie wagi ochrony własności przemysłowej w procedurach patentowania. Co więcej, przedstawiono autorski system informatyczny dedykowany w szczególności ochronie własności przemysłowej.