

Online Wood Industries Database

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ABSTRACT

In our everyday life, we are surrounded by tools that aid us in our work or improve our comfort. A significant proportion of these products are made of wood or some wood based composite. In the past 10 years, the wood products industry was significantly restructured in Hungary. The number of small plants and joineries where domestic and tropical species are used is on the rise. Superior quality and durability became important factors. To achieve this, being able to access the newest research results and innovations in this area, as well as trade information (both as consumers and suppliers), is in the interest of woodworking companies. Some professional journals do publish scientific findings, but there is a lack of comprehensive, widely accessible sources. Not to mention that industry professionals and trades people are often too busy to browse the literature, and find that searching for and processing relevant information is too time-consuming. Wood industry is a strategic trade in our region. Establishing a service to store and, later, publish the professional knowledge accumulated at the Faculty of Wood Sciences, University of West Hungary, as well as the practical experience generated in various plants, could be very helpful in achieving the goals. The creation of a professional database, the goal of which was the assessment of parameters belonging to various specialties, has started. The goal of the project is creating a database encompassing a wide range of information for the industry, which allows authorized industry professionals to access and extend the content of the database. The extension of the database is aided by special tools as well. The present structure of the database was established based on the advice of many of the experts at the Faculty of Wood Sciences. Since the onset of the project, the configuration of the physical database needed for storing data in the area of wood materials, wood mechanics and wood based panels has been created. This contains parameters defined by the experts. The structure was shaped through multiple consultations, and it may also be extended and modified, according to needs arising later. The connections necessary for use have been defined in the database. This database may be used as a prototype. The web-based user interface for the management of the wood material database is also ready. The newest available web based technology was used in programming the web-based interface. Our further goals include finalizing the structure of the further databases besides that of the wood materials, and extending the functionality of the web interface. Another goal is designing the service content of the knowledge base.

INTRODUCTION

The West Hungarian University is the most important Hungarian research institute of forestry and wood industry. The project of Online Wood Industries Database was started in 2006 in cooperation with RET (regional university knowledge centre) and the Institute of Informatics and Economics. The main goal was to create a database structure and a web surface, which is clear and can be used easily. During the planning and the collection of data, we surveyed the expectations of the wood industry experts who work at our university. We can say that the completed work meets their needs because there was no comprehensive online database of wood industry before. The wood industry experts and students can store, retrieve and publish their research results.

Structure

The users can connect to the database and to the application surface on the Internet, with the usage of any browser. We use the Apache HTTP web server to publish the data (Apache HTTP Server 2.0.55). The advantages of this system are that it is free, frequently used and the minimum hardware specification is low.

The user can access the actual database construction and the stored data on the SQL Server 2005 through the mentioned web server. There is a HTTPS connect between the client and the web server which makes our system safer. Besides, there is a built-in firewall between the client and the server. You can see this structure on *Figure 1*. The safe configuration, developed in this way, protects the private, uploaded data in the database from the potential Internet attacks.

The web surface was created basically in PHP, which is embedded in HTML code. (PHP 5.1.2)
7. The advantage of this script-language is its speed as the code is not interpreted by a browser, it runs

on the server. It is perfectly suitable for making dynamic web pages, processing forms and also communicating with databases⁶. To improve it, we used CSS (Cascading Style Sheets), with which we could create style sheets so the appearance and the content could be separated. We used JavaScript and DHTML⁹ in the interest of the easier usage, so we can change the content of the pages without downloading them¹. We realized the prototype of client-server architecture with the help of the mentioned devices and technology.

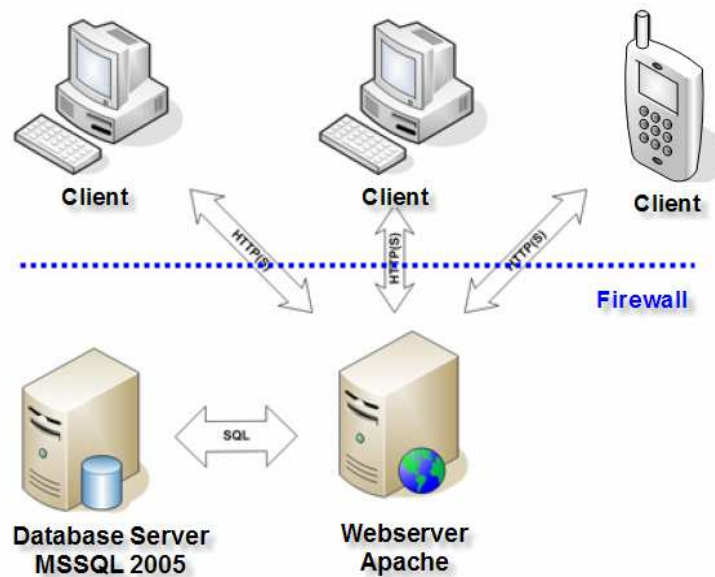


Figure 1

Our professors' and teachers' notes helped to create a good structured database^{5; 8}. We can separate the database into three units according to the area of the specialties. We can split these specialties into other smaller, logical components.

- Wood science specialty
 - o Wood species and characteristics
 - o Wood protection and characteristics
- Wood composites specialty
 - o Composites and characteristics
 - o Adhesives and characteristics
- Mechanics and physics specialty

Functionality

The system has basically three functions: uploading the data, modification of the uploaded data and query the data from the database. Nevertheless, there is a registration and an authorization system to handle the users' accounts safely and clearly. Both of the web surface and the database support the multi-language structure.

Data uploading

The "upload module" is an integral part of the web surface, users can upload data to the database through these forms. Naturally, we place the functions, which contain data about the database structure (e. g. SQL commands), in separated files, unreachable by the web server in order to make the surface safer.

However, users can select another type of uploading. If they have a lot of data with the same structure, they can upload them with the help of a Word or an Excel file.

Data modification

Users can also modify data with the help of forms. If a user has the rights to modify data (see also authorization system) then the data can be modified. The queried data are represented in a table. However, there is a Modification button in the last column. After pressing it, you can see a surface which is similar to the uploading form but you can not change the basic data, only the attributes. Users can delete the data also.

Data query

There are two ways of querying data. On the one hand, there is a conventional characteristic query. Users have to select from a list which data they would like to query and then these data will be shown in tables. It is possible to save the resulted data into Excel format. The displayed data are pageable if need be. There is an option to hide the source of the data. On *Figure 2* you can see the result of a query - characteristics of the speed of sound (sound velocity).

http://seth.nyme.hu - RET - Faipari Online Adatbázis - Query module - Mozilla Firefox

The result of the search

Latin name + +	English name + +	Speed of sound Lower value + +	Speed of sound Higher value + +	Speed of sound Average value + +	Unit + +	Direction + +	Measurement standard + +
-	-	1674	1890	1800	m/s	radial	-
Acer campestre L.	Field maple	1721	1943	1850	m/s	radial	-
Acer negundo	-	1674	1890	1800	m/s	radial	-
Acer platanoides L.	Norway maple	1814	2048	1950	m/s	radial	-
Acer pseudoplatanus L.	Sycamore	1767	1995	1900	m/s	radial	-
Aesculus hippocastanum L.	-	1535	1733	1650	m/s	radial	-
Ailanthus altissima (Miller) Swingle	Tree of heaven	1581	1785	1700	m/s	radial	-
Alnus glutinosa (L.) Gaertn.	Common alder	1488	1680	1600	m/s	radial	-
Artaur argintiu	-	1767	1995	1900	m/s	radial	-
Castanea sativa Mill.	Sweet chestnut	1302	1470	1400	m/s	radial	-

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Figure 2

On the other hand, we can query data through a hierarchical query page. The base attributes and the characteristics make a tree structure on the query page. Users can open the characteristics, and the previously uploaded data. You can see this method on *Figure 3*.

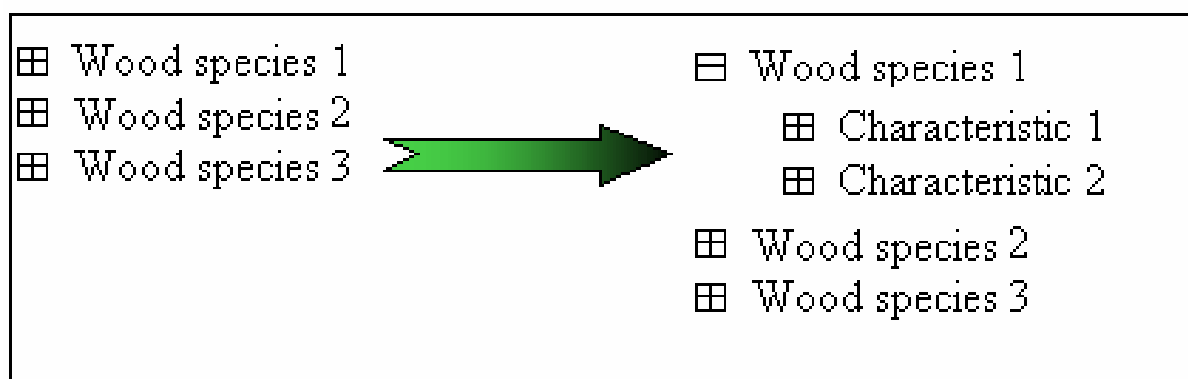


Figure 3

The multi-language surface

The web surface supports other languages (not only Hungarian), so users can select German and English language too. The system is prepared to building in other languages, but then the surface and the database structure need to be modified. You can switch between the languages by clicking the flags on the main page. For example if we select English, then all of the form texts will be English on the surface, but the language of the queried data will not change. It is possible to store and visualize some data in foreign languages (wood species, parameters etc.).

Registration module

On the registration form only the most important data need to be given: a username, a password, the user's real name and an email address. Because of the automated attacks on the Internet, users have to type the characters can be found on the security image. After giving the data, the system sends an email to the given email address. The user must confirm the registration with using the link in the email to activate the account. The registration and the log in are important^{2;3}.

Authorization system

The handling of the privileges is related with the registration system. After registration, there are two ways users can get privileges. On the one hand they can get privileges individually; on the other hand they can get them of the group which they belong to. We have created groups for an easier handling⁴. These groups are the 'developers', 'administrators', 'authors', 'readers' etc. We have created an admin surface to manage the users and groups.

CONCLUSION

The framework of the online wood industries database and the connected web surface is working in test environment. Our further tasks are to improve the database and create the framework of further special science specialties. The web surface has a number of functions. Experts can upload, modify or delete their data in user-friendly environment and they can query in several ways with a number of additional facility. Besides, the program is able to work safely and reliably.

Our further task is uploading more and more data with experts, improving the functions of the surface and completing it with the missing special fields. Besides, it is important to put the program into an environment which can be used widely by users and researchers.

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