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WooDB: A DBMS Approach as a Marketing Tool for Wood Entrepreneurship

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Abstract

Within the current trends in the modern society, wood entrepreneurship sector gains increasing interest, globally. A database can be a marketing tool in wood enterprises, as registered wood properties and origin constitute quality characteristics that must be acknowledged by wood entrepreneurs. The particular structure and origin that characterizes each wood type, differentiates its usage and behavior, and determines its final use in wood products. Wood is produced by national forests but it is also imported from various countries and continents. This paper describes the use of this modern marketing tool, a database named as WooDB. WooDB aims to present the most important and utilitarian timber species. At pilot level, scientific records relating to European and Tropical wood, their uses and characteristics have been used. WooDB uses macro commands to create interactive elements for the management of the database, in a user-friendly interface, even for non-experienced users.

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1. Introduction

A major feature of the global economy during this time has been the liberalization of emerging economies and their integration into the worldwide economy [1; 2]. Information and Communication Technologies (ICTs) offer

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huge opportunities for all to progress and benefit and new prospects exist for economic growth, better service delivery, social and cultural advances [3]. Advances in information and communication technologies have been identified as enablers of entrepreneurship [4]. ICT's give the integrated organization the opportunity to access to a large amount of information with a set of online services (e-services) [5]. The ability to access huge amounts of data, effortlessly and quickly, is the incentive for better communication, scientific growth and technology development, thus, the adoption of ICT in public administrations as it is combined with organizational and structural change aiming to improve public services and sustainable development.

A database constitutes an effective tool for management as it is a set of data characterized by some logical structure and grouping. The structure of the database provides data independence, has greater consistency of data, causing improved data sharing, increases productivity, improves accessibility of data and reduces maintenance and program management especially when a powerful database, (DBMS) used [6]. The total approach of data entry in a database has two further advantages, such as reduction in duplicate record and creation data accuracy because of automatic data update [7]. So, a temporal database maintains past, present and future data [8]. The essential feature of database technology is that it provides an internal representation (model) of the external world of interest [9]. Each user can access and use the same data for different purposes at the same time [6]. DBMSs also offer multi-processor support, support for parallel queries and clustering. The data stored in a DBMS package can be accessed by multiple users and by multiple application programs like SQL Server, Oracle and Ms-Access.

Assimakopoulos et al. [10] in their research on business intelligence systems for virtual enterprises summarize that the modern business environment requires fast, efficient and reliable management of vast amounts of information and diverse data. Therefore, the adoption of new technologic solutions and innovative managerial practices are needed, which will offer flexibility, immediate feedback and short decision-making capacity [6]. DBMSs have more recently emerged as a fairly standard part of any company back office. Sales and marketing would be impossible without good database systems [11].

A database is a valuable asset and a great tool for achieving the marketing objectives of an enterprise. A database, also, supports the modern marketing concept, as it can bring together all the necessary marketing information. Many organizations have embraced the marketing concept by using segmentation techniques, specifying marketing strategies, and establishing dedicated marketing departments (staff or line) [12]. Marketing is considered as a core activity [13]. Studies of the role of marketing within a firm may be divided into four key categories. First there is research that assesses marketing's role as an orientation, typically assessing its impact on performance. A second category of research focuses on marketing's influence at the level at which the firm's corporate strategy is formulated. A third category examines marketing as an organizational subunit. Finally, a fourth stream of research considers marketing's role concurrently as a function and an orientation [14]. Business Marketing as a research domain can be conceived of comprising several interrelated or nested layers [15; 16; 17]: 1) Individuals and their behaviours (behaviours of customers and sellers), 2) Groups and their behaviors (sales teams, buying centers, DMUS), 3) Organizations or firms and their behaviors (marketing and customer organizations, other relevant actors), 4) Functions and their behaviors (marketing as a function and its interactions with other company functions), 5) Management (marketing as specialized and institutionalized management), 6) Interorganizational behaviors (between suppliers and customers), 7) Institutional systems and their dynamics (e.g., distribution channels, networked ecosystems), 8) Markets, industries and cultures and their dynamics (forming the context of marketing and consummating behaviors). The elements of marketing mix proposed by McCarthy [18], [19] were the product, the price, the place and the promotion. These elements are the so known 4 Ps. Companies' marketing communications resource allocation decisions have become considerably more complex as the channels available to reach consumers have expanded to include more interactive marketing vehicles, e.g., online display, paid search, mobile, and social media, in addition to traditional marketing vehicles, e.g., TV, print, radio, and personal selling [20; 21; 22]. Modern marketing techniques demand the use of e-environment relation development of the supply chain with the corresponding new partners, geographical expansion e.t.c. [23; 24]. Economic crisis make it imperative to identify ICT innovations, practices, policies and innovative electronic/ mobile business models such as Internet marketing, promotion, consulting in the context of employment, growth and competitiveness [25].

1.1. Wood Enterprises

Within the current trends in the modern society in wood and wood products, wood entrepreneurship sector gains increasing interest, globally. With the development of economy and the improvement of people's living standard, wood enterprises have been developed rapidly in recent years. The wood trade helps shape observed forest change, by relating forest stock change to net trade of wood products by localizing the origin of wood consumed in a given nation. For many nations, traded wood products have a relevant impact on the course of ongoing forest transitions. Wood products trade can influence forest change and place various nations within this framework [26]. Wood is the raw material for different industrial products of primary processing such as poles, sawn timber, veneer, plywood, particleboard, fiber boards; pulpwood, etc., which are materials to produce other products such as secondary treatment furniture and paper. The number of wood products is large and are said to be matching with those products derived from petroleum. Wood is produced by national forests but it is also imported from various countries and continents. European and tropical timber is of a great importance for local wood market in Greece due to their characteristics, features and qualities. Wood has a lot of advantages as a material but also disadvantages. Some of the advantages are: easy treatment, renewable material, easiness to find, beautiful aesthetics (variety of colors, textures and drawing), high mechanical strength in relation to its weight, insulator (sound, heat), cellulose source, non-polluting the environment and relatively low-cost. Some of the disadvantages is the fact that it is a hygroscopic material and its dimensions vary with the recruitment or the loss of moisture, it is an anisotropic material and presents instability in the structure and properties, affected by microorganisms (altered, rot), burns easily, its production is influenced by environment and heredity [27]. The construction of wood, its chemical composition, the content in extracts and whether errors appear or not, determine the physical, chemical and mechanical properties of wood as well as its behavior in the exploitation and use in natural or processed form. The particular structure and origin that characterizes each wood type, differentiates its usage and behavior, and determines, to a large extent, its final use in wood products [27]. Wood properties and origin constitute quality characteristics that must be acknowledged by wood entrepreneurs [27]. European Union (EU) member states should seek to harmonize the forest industry data system and establish a single economic value of forests and consistently link the forest balance with wooden land, timber, forestry economic activities in the cash flow accounts and wood supply and use in the natural and monetary values. In EU is the data system of forest industry, but each European country is necessary to assess its suitability and to adapt to the situation which is in the country.

This paper describes the use of this modern marketing tool, a database named as WooDB. WooDB aims to present the most important and utilitarian timber species. At pilot level, scientific records relating to European and Tropical wood their uses and characteristics have been used. WooDB uses macro commands to create interactive elements for the management of the database, in the form of a user-friendly interface, even for non-experienced users.

2. Methodology

The pilot phase of the WooDB includes recordings from European and Tropical woods, but it is expandable to include all kinds of timber, Greek and non-Greek species. The data of timber originally recorded in the WooDB come from references, scientific literature review [28; 29; 27]. WooDB was designed in order to store data for wood in two-dimensional tables consisting of rows and columns. The data are organized in several tables with fewer fields. The tables have been designed to follow the principles of the first two normal forms, which means that there are no repeated data groups and fields only depend on the primary key. Databases offer access and handling to a vast amount of data, collection of relevant data, independent data processing, common view of the database, increase in productivity and reduction in delay time [30]. WooDB was designed and developed with Ms Access software. During the development of this database, an information system with a friendly interface was designed. The interface includes various forms with interactive buttons that have been designed for inexperienced users in computing. All the screens in the interface are designed to incorporate interactive buttons in both in Greek and English language. WooDB includes data for timber species of European and Tropical regions in the form of tables, queries and forms, and comparison of them. Macros used in the DB were mainly macro for the opening of the form, the addition of records and to delete records and mainly macros to automate menu and the works of the system [31]. WooDB

supports the storing of this information and their effective manage with the help of available integrated tools. One of these useful tools is the creation of queries. By creating queries, users can recover a subset of information from the original database tables that meet certain criteria, already set. The query result is a data table, which contains just the necessary information according to the used criteria.

3. Results

Research resulted in the retrieve of 117 wood species. In the WooDB, five tables have been created named as: "Continent", "Individual timber codes", "Name and features", "Uses", "Encoding uses". These tables have been linked with common areas, creating "relationships". The relationships of the 5 tables are presented in Figure 1.

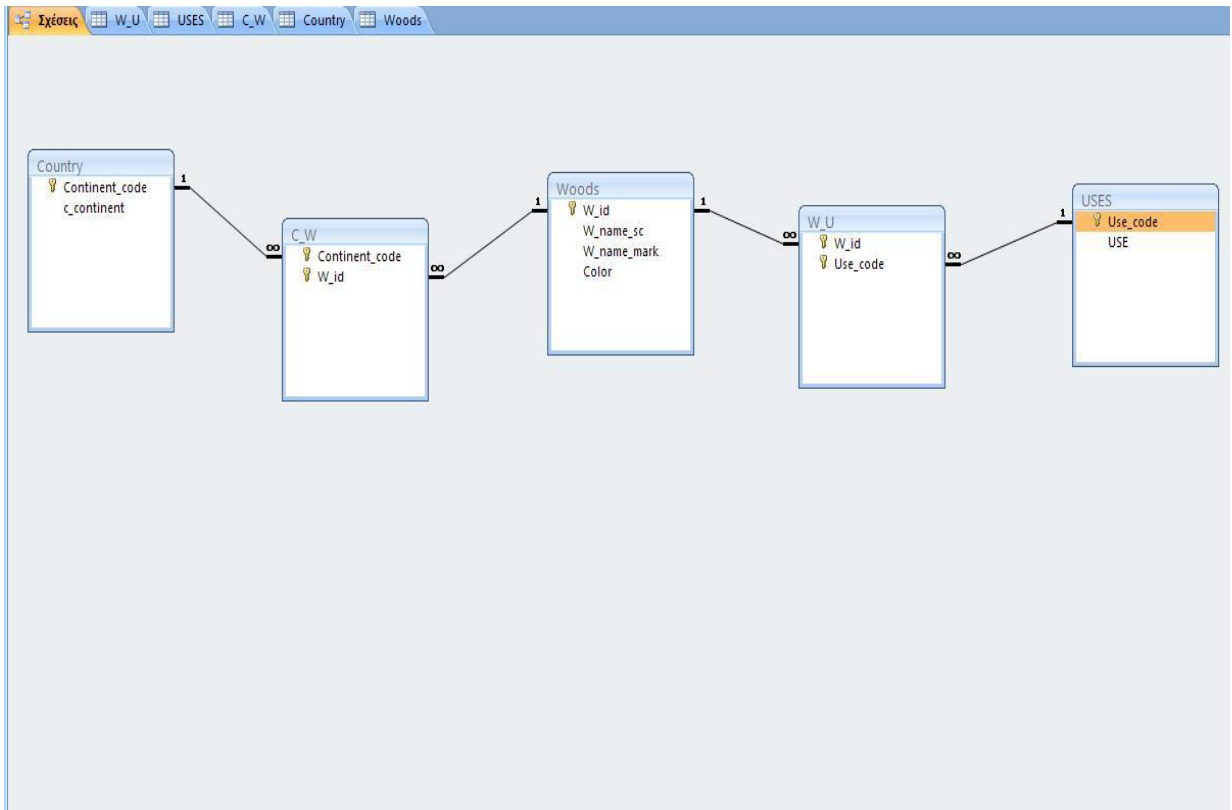


Fig. 1. Relations between the Tables in the WooDB

Figure 2 presents the development of the database table “Name and features” of the European and tropical wood species (scientific name, common name, color) of the available data recorded.

W_id	W_name_sc	W_name_m	Color	Προσθήκη νέου πεδίου
61	Laurus nobilis	δάφνη		
62	Laburnum anagyroides	λαβούρνο		
63	Myrtus communis	μυρτιά		
64	Nerium oleander	πικροδάφνη		
65	Olea europaea	αγριελιά		
66	Paliurus spinosa	πάλιουρος		
67	Phillyrea latifolia	φύλλυρέα		
68	Pistacia lentiscus	σχίνος		
69	Pistacia terebinthus	κοκορεβιθιά		
70	Prunus spinosa	τσαπουρνιά		
71	Pyrus amygdaliformis	γκορτσιά		
72	Quercus ilex	αριά		
73	Quercus coccifera	πουρνάρι		
74	Rhamnus alaternus	κιτρινόξυλο		
75	Rhus coriaria	ρούδι		
76	Rosa canina	κυνοροδή		
77	Sambucus nigra	κουφοξυλιά		
78	Spartium junceum	σπάρτο		
79	Tamarix gallica	αρμυρίκι		
80	Vitex agnus-castus	λυγαριά		
81	Acacia hockii	Mulla		
82	Adina spp	Haldu		
83	Albizia glaberrima	Kassakassa		
84	Allophylus spp	Teba		
85	Anopsysis klai	Bodioa		
86	Azizia africana	Lingue		
87	Anigeria spp	Aningre		
88	Antiaris welwitschii	Antiaris		
89	Aucoumea klaineana	Okoume		
90	Baphia kirchii	Camwood		
91	Canarium schweinfurthii	Aiele		
92	Chlorophora excelsa	Iroko		

Fig. 2. The database Table “names and characteristics”

The data management in the WooDB can be achieved with interactive buttons that activate successive interface screens. Users select through interactive buttons until they obtain the data of his interest.

Figure 3 shows the initial interface screen which automatically enters the user in the WooDB. When the user enters the WooDB, he can choose among 3 options with 3 interactive bilingual keys buttons, leading to respective interface screens.

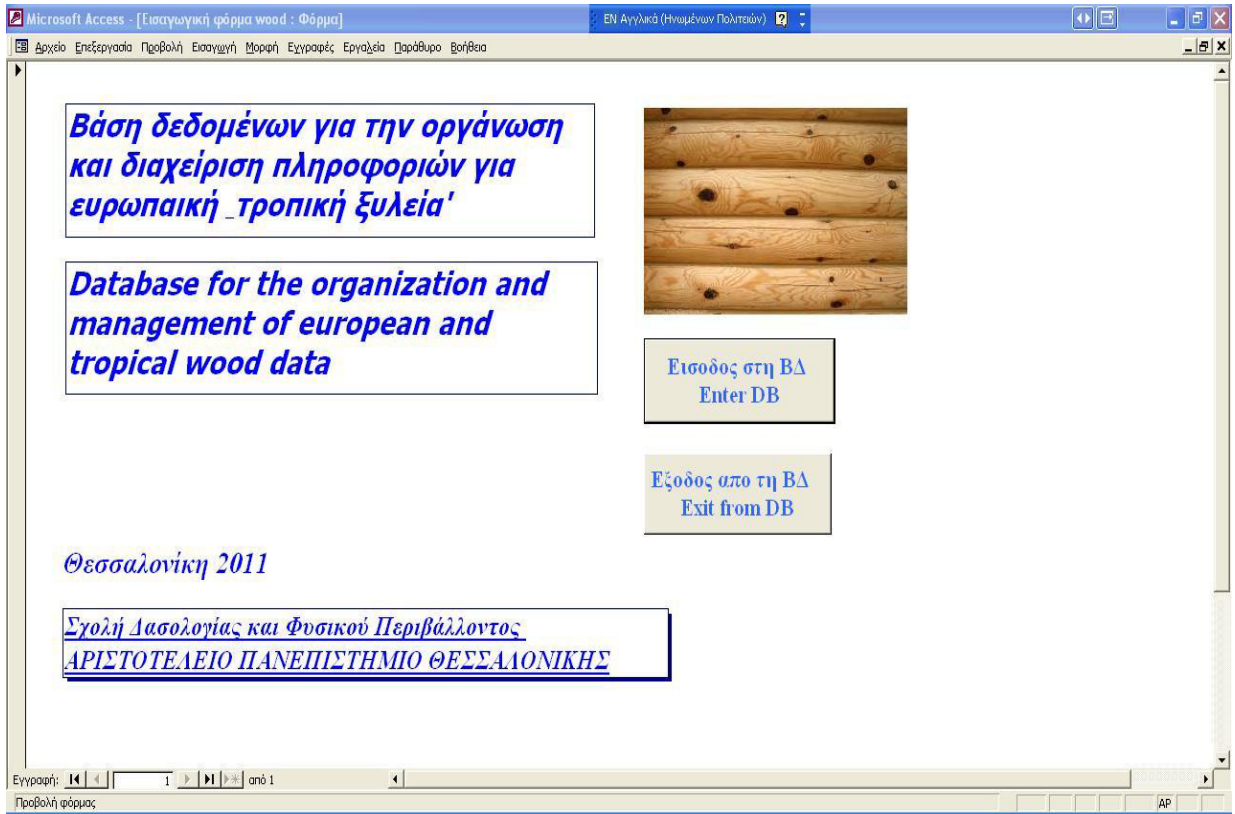


Fig. 3. The introductory interface screen of the Database

With these interactive buttons, the user of the WooDB is able to access to the information derived from queries in the WooDB about: a) "European timber species," b) "Tropical timber species" and c) advanced to the interface screen containing many interactive buttons that trigger questions that have already been designed to answer common questions that users do on the timber species (Figure 4).

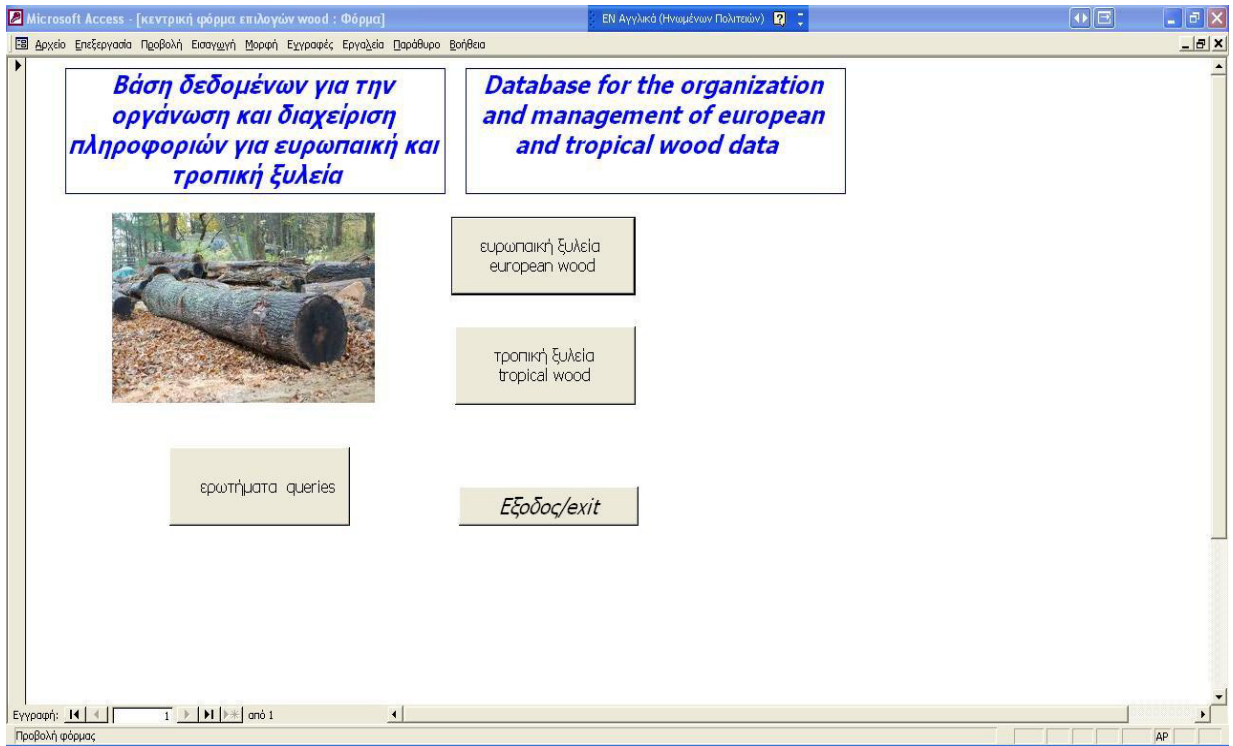


Figure 4. Main Selection Screen

Furthermore, by selecting the interactive key “questions / queries”, the users are headed to the interface screen that includes a plurality of prepared questions for the WoodDB to be selected according to the needs of the user (Figure 5). These questions are typical user queries, but through the main window of the database, more queries can be developed. When the user selects the active button "questions", he is driven to the table that includes several questions about the uses and the wood species that appear in the form of interactive buttons.

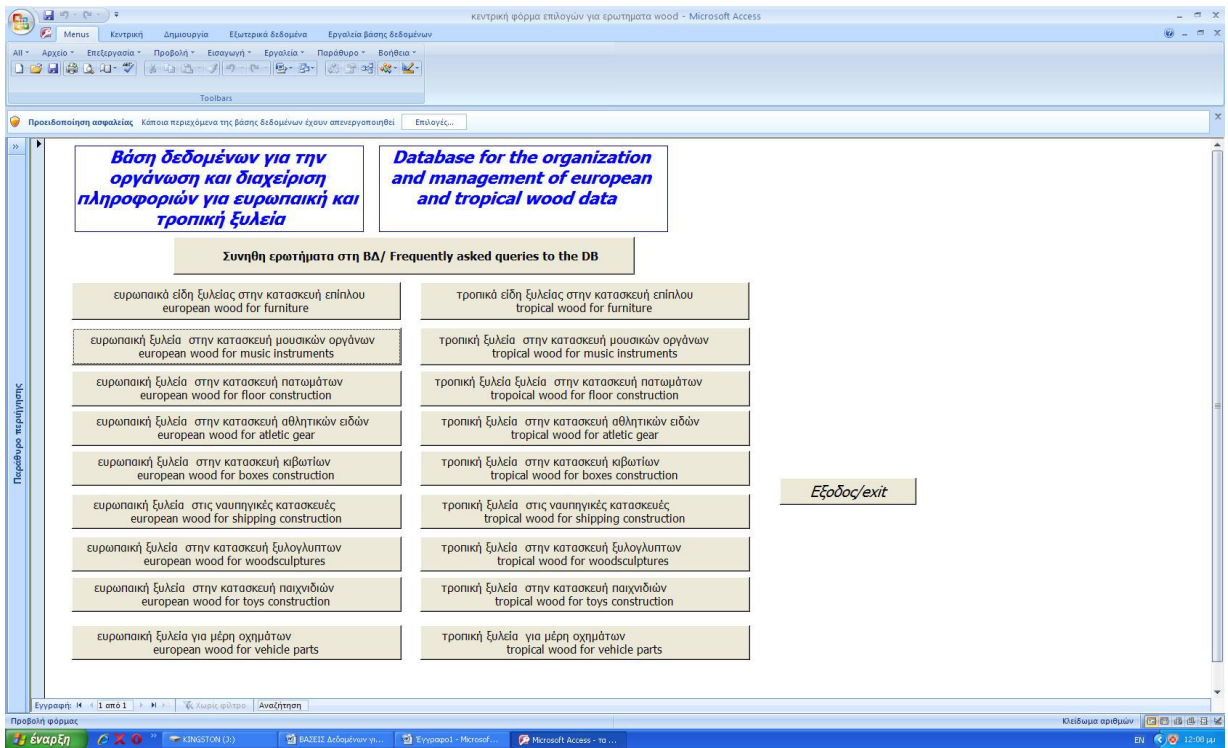


Fig. 5. Interface screen with interactive buttons to select queries from the database

In Figure 6, the results of the query "Tropical timber species for musical instruments" is presented.

Country	tropika mousika organa		
c_continent	W_name_sc	W_name_m	USE
America	Abies spp	ελάτη	Μουσικά όργανα
America	Juniperus spp	άρκευθος	Μουσικά όργανα
America	Picea spp	ερυθρελάτη	Μουσικά όργανα
America	Pinus spp	πεύκη	Μουσικά όργανα
America	Acer spp	σφενδάμι	Μουσικά όργανα
America	Betula spp	σημύδα	Μουσικά όργανα
America	Carpinus spp	γαύρος	Μουσικά όργανα
America	Fagus spp	οξυά	Μουσικά όργανα
America	Juglans spp	καρυδιά	Μουσικά όργανα
Asia	Juglans spp	καρυδιά	Μουσικά όργανα
America	Liriodendron tulipifera	yellow poplar	Μουσικά όργανα
America	Ostrya spp	οστριά	Μουσικά όργανα
America	Platanus spp	πλατάνι	Μουσικά όργανα
Asia	Platanus spp	πλατάνι	Μουσικά όργανα
America	Prunus spp	προύνος	Μουσικά όργανα
Asia	Prunus spp	προύνος	Μουσικά όργανα
America	Tilia spp	Φιλύρα	Μουσικά όργανα
America	Ulmus spp	φτελιά	Μουσικά όργανα
Africa	Aucoumea klaineana	Okoume	Μουσικά όργανα
Africa	Baphia kirchii	Camwood	Μουσικά όργανα
Africa	Entandrophragma angolense	Tiama	Μουσικά όργανα
Africa	Entandrophragma cylindricum	Sapele	Μουσικά όργανα
Africa	Entandrophragma utile	Sipo	Μουσικά όργανα
Africa	Guibourtia ehie	Amazakoue	Μουσικά όργανα
Africa	Khaya ivorensis	αφρικάνικο μ	Μουσικά όργανα
Africa	Mansonia altissima	αφρικάνικη κο	Μουσικά όργανα
Africa	Tarrietia densiflora	Niangon	Μουσικά όργανα
Asia	Tarrietia densiflora	Niangon	Μουσικά όργανα
Africa	Terminalia superba	Frake	Μουσικά όργανα
Africa	Triplochiton scleroxylon	Obeche	Μουσικά όργανα

Fig. 6. Query results to present “tropical wood for musical instruments”

4. Conclusions

Advances in new technology tools and practices have been identified as enablers of entrepreneurship. Databases can become a valuable asset for achieving the marketing objectives of any enterprise. The application WooDB, is an effective bilingual pilot tool for the design of an integrated management and marketing tool of European and tropical timber species, based on detailed scientific records that describe the specific characteristics of these species. All over the world, modern life-style depends highly on wood and wood products; hence, wood entrepreneurship sector has gained much attention. Wood properties and origin, such as European or tropical timber, constitute quality characteristics that must be acknowledged by wood entrepreneurs in their marketing. Wood entrepreneurs can use WooDB as a key reference tool, aiming to organize their tasks, to increase overall business and marketing efficiency. Despite the fact that the application is in pilot form, all the available current data in international references are registered. There are plenty of data (forms, tables) that help in drawing conclusions from computer-illiterate users because the management of the database is succeeded by selecting interactive buttons in successive interface screens. Besides in the DBMS that was developed, an experienced user can enter the WooDB and create additional questions in query forms, and additional buttons or use other tools aiming to modify its own applications.

WooDB may be extended to develop a broader database, which will include most types of timber globally to exploit in scientific, academic, bibliographic and commercial sectors. The DBMS and interface that was designed in a user-friendly type, it is bilingual and it can be further extended in other languages, as to be multi-national.

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