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Decision Support and Database Management System "AroMed" on Commercially Exploited Medicinal and Aromatic Plants of India

Rahul Agarwal[1], C.S. Chauhan[2] and Rajeev Kr. Sharma[3]

[1, 2] Department of Botany, M.M.H. PG College, Ghaziabad, Uttar Pradesh, India
[3] Pharmacopoeial Laboratory for Indian Medicine, Ghaziabad, Uttar Pradesh, India

Correspondence should be addressed to Dr. Rahul Agarwal, rahulom76@gmail.com

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Abstract Identification of plants and commercial promotion of plant species can be achieved by utilizing information technology based database development; new technology can help to improve quality and cataloging procedures to organize the botanical species. Further, we can share the same information with any other interested parties via the Internet. Now personal computers with large memory-storage-systems have brought the computing and database maintenance procedures to the desktop of users. In recent years, the Internet has literally tapped into all desktop computers. The "Information Technology Network Highways" opened the doors of many remotely located libraries or other information repositories to data seekers by simply logging on to a web site. Development of database on electronic media and development of a web site on medicinal plants will provide the necessary exposure the world regarding the plant species of commercially exploited Aromatic and Medicinal Plants of India. Substances derived from plant material have been used in perfumes, most of cosmetic items, flavor, very useful Ayurvedic, Unani, Homeopathy Medicine etc. Since time in memorial for medicinal purposes. For example, plants such as Ginger, Tulsi and Alovera are well known for their positive effects of maintaining and restoring health. Furthermore, it is generally not common knowledge that Mango Seeds- used in asthma, diarrhoea, dysentery, haemorrhage, and menorrhagia and bleeding piles some plants extract like Laung used as pain-killers, however, medicinal plants have not lost their significance as natural alternatives to synthetic drugs even in the modern world. Since the number of commercially available drugs derived from plant sources is increasing day by day, there is a distinct need for an easy accessible data collection that provides detailed scientific information on such plants and its medicinal uses. AroMed India new medicinal plants database, hopes to improve the current situation. This distributed web-based information system stores, organizes and will provides combined text and multimedia data on AroMed India as well as pharmacological properties of medicinal plants, in particular from the multimedia point of view. From the technical point-of view our system presents 3-tier architecture, a WAMP server with MYSQL database and Joomla 1.5 Application as a front end.

Keywords *Aromatics and Medicinal Plant Database, Herbal Plants Database, Plants Chemical Properties, RDBMS, Genome Information, Trader's, Digitization, Bibliography Information*

1. Introduction

India has one of the richest medicinal and aromatic plant wealth in the world. Medicinal and aromatic plants are remarkable contemporary relevance for ensuring health security to the teeming millions [1]. It is expected that there are around 25,000 helpful plant-based formulations, used in folk medicine and known to rural communities in India [2]. Given the rapid growth of the herbal industry and medicinal plant related to drug development research work required all the information of those plants [3]. Ready information regarding as Identifying characters, pharmacological action/use, chemical properties, pricing, regulatory status and patent information etc., are not readily available in case of most of the medicinal and aromatic plants [4]. Non-availability of planting material and lack of awareness among the farmers on identification, improves the package of cultivation practices and farm processing of medicinal plants, are also lacking. Kinds of incentive required to encourage farmers to cultivate medicinal plant and what requires for the industry to encourage buying of medicinal plants from the farmers [5]. These are the questions one has to answer to achieving sustainable utilization of medicinal and aromatic plant resources is an objective that requires the application of a variety of methods, one of which is the development of practical guidelines for the sustainable exploitation of selected species [6] For this, Scientist will have to develop an Information Technology (IT)-based modern tools such as decision support systems or Artificial Intelligence System (AIS), and a toll which can be stored, retrieve and manage data, and can be improve cultivation, production and research work.

Computational methods have been frequently used by the private/public sector now a day [7]. Computer is the best way to data storage, accessible and easy to use by everyone. The proposed study is to develop data base management system for aromatic and medicinal plant related herbal industries and research sector at commercially level, which can be used at national and international level [8]. This methodology will provide the efficient information such as identification characters, chemical markers, pharmacological Information, cultivation information etc., which would be helpful to increase cultivation technology and Industrial research work [9].

The proposed system will be based on client-server approach, in which MS Access (Primary Storage) and MySQL database (Secondary Storage on Server) will be taken as back-end for data storage and Front end application will be designed in Joomla 1.5(CMS) or MS Visual Basic 6.0 for Menus, data screening and searching. The proposed system will be menu-driven and simply designed for data entry by the user. Recent and renewed interest in medicinal plants coupled to developments in information technology has fuelled an explosion in the range and content of electronic information concerning medicinal plants as a re-emergent health aid [10]. Recently reviewed diverse sources of such information in traditional abstracting services as well as in a variety of online electronic databases [11]. As a result of such developments, access to indigenous peoples and cultures concerning medicinal plants are greatly facilitated [12]. Furthermore, the active participation of such natural custodians and practitioners of valuable knowledge is guaranteed in the generation of research focusing on screening programmes dealing with the isolation of bioactive principles and the development of new drugs.

1.1. Aromed India Database Application

In the scope mentioned above, we designed AroMed India as a distributed information system relying on object-relational database technology. Our system is not limited for special scientific users but also useful to doctors, Students as well as home users and farmers, who is interested in medical plants and its products. Therefore, the access to this database is free of charge, but registration is required to be able to gather ideas about the user's reason why to access to AroMed India. The content of the database is designed in such a way that scientific users and researchers can benefit, as well as the interested home users. The demands on these different applications have been realized by

introducing two user main roles, one for the scientific user and one for the home user. The scientific user may be interested in botanical characteristics, pharmacology and Genome information, whereas the home user has a more general context approach. By using different weights for the queries, users can personalize AroMed India to one's own requirements (Table 1).

Table 1:

Home User's	Doctors, Pharmacist Farmers	Researcher, Biologist, Scientist	Students, Teacher's
Botanical interest	Botanical Interest	Botanical Interest	Application in: Physiology, and Plant biotechnology
Medicinal Plants Uses Information	Ayurvedic, Unani and siddha information	Medicinal uses and for Genome information	Self-Study
As a Home Remedy	For Identification	Genome Analysis Tools	Botanical Interest
Herbal Products	Pricing system for trade purpose	Development of plant drugs	As a Identification Key
Botanical guide	Medicinal uses and side effects	Target research	Molecular biology
For knowledge	For Business, import and export information	As an identification Key	Plant Genome Information

2. Materials and Methods

It is necessary to analysis all tools and technologies required to develop the proposed system. When I have considerate requirements to develop this project, there are two prospects, which have to examine, are following:

2.1. Text & Literature Requirement

Charaka samhita', 'Susrutha samhita', 'Vastuguna Deepika', 'Yogaratnakara', 'Vastuguna prakasika', and from medicinal plants treatises etc. (scientific journals, pharmacopoeia books & scripture).

2.2. Computational Requirements

Operating System	Windows XP and above
IDE	Joomla 1.5, internet explorer 6 or above
Back-End	WAMP SERVER, MYSQL

2.3. Minimum Hardware Requirements

Processor	500 MHZ
RAM	32 MB SDDR
HDD	20 GB or More

3. Result and Discussion

"AroMed India Database" has been design to exhibit the significant of commercially exploited Medicinal and Aromatic Plants of India. In this project no attempt have been made in reinventing a wheel but sincere attempts have been made in demonstrating a computer based "AROMATIC AND MEDICINAL PLANTS DATABASE" using the facilities of Joomla 1.5 CMS, a PHP based application for its commercially utilization through internet.

The project begins with the separate on different topics of as menu bar items. Each heading possesses a number of models as its menu items. The project provides a user-friendly environment revealing the functioning for each type of users like researchers, scientist, students, trader's and farmer's also.

In this project sincere efforts have been made to develop a simple and easy Computer Based Database of Medicinal Plants. The users can fill up his or her own data giving up appropriate constraints be able to manipulate the functioning of various highlights of system. The user provided with remarkable facilities of adding, printing, saving, deleting, modifying, closing as well as editing the data that has been entered currently or in the past. In addition to these the system also accepts complains, views, suggestions from the user's and facilitate to sort out those problems through online, using internet.

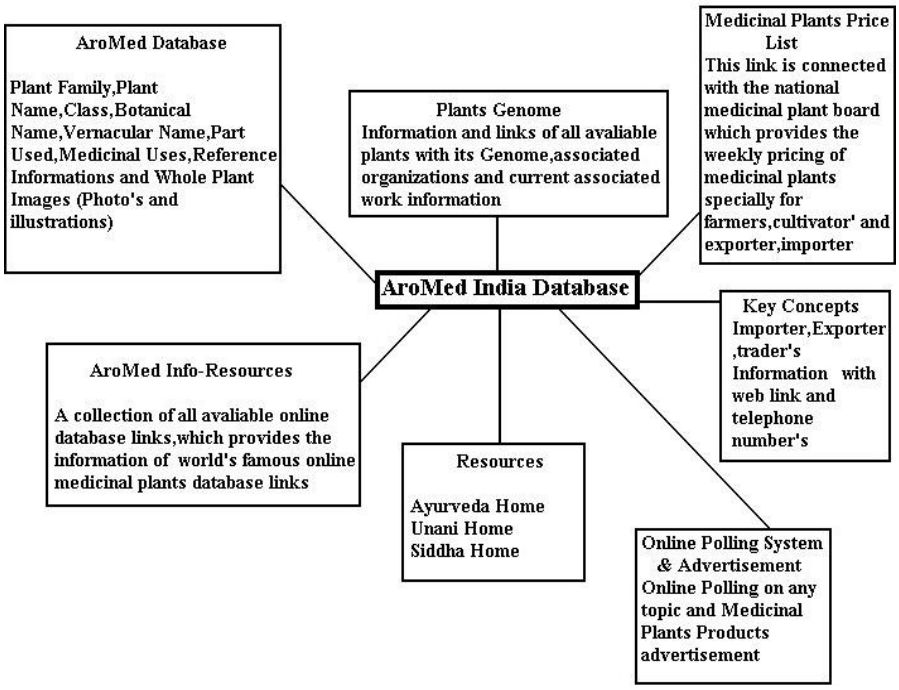

Figure 1: *Flow Diagram of AroMed India Database by Different User Group*

Figure 1 Gives an overview of the content organization with the main sections: of AroMed India Database AroMed database, AroMed Info Resources, Resources, Online Polling system, Key Concept, Online Pricing system. The AroMed Database section contains plants family wise information when you click on any selected family a list of plants associated with this family will appear and when you click on any plant name the bibliographic information will appear such as plant Image, Name, Family, Botanical Name, Vernacular Name in different languages and medicinal and therapeutic uses, Images and colored drawings help here to identify the text-described plant species. The AroMed Info Resources section provides the information of world's famous online database

information and its links if you click on any database it will connected with that online database directly. The Resources section is associated with Ayurveda ,Unani and Siddha web page which gives the details about what is Ayurveda?, What is Unani Medicine and Siddha Medicine?. The Pricing system gives the information of weekly medicinal plants price, this section is especially for trader who wants to buy and sale or import and exports their cultivated medicinal plants in the market. The Key Concept section provides the information of importer and exporter of India who is associated directly with medicinal and aromatic Plant industry, we provide trader's address, email id, contact number for trade inquiry and for business purpose and finally polling system section is an special part of this application with the help of this section we can collect view and answer's for a particular query from all of the user who is accessing AroMed database through Internet and can show the polling report at the same time.

3.1. Query Mechanism

AroMed India offers very simple search mechanism for browsing data and information. The Simple Search allows searching the whole database in a Google search engine like manner. In case of hits, the results are presented as resulted window web page.

This research work presents the experiences of creating the Information technology based database management system "AroMed India" (a Commercially exploited Medicinal and Aromatic Plants database of India) which is built to data collection and to provide interactive graphical user interface to the user for its information retrieval and related image, genome information ,medicinal uses and product information which is available in the market used by this plants and daily current price list of medicinal Plants and its importer and exporter information for its commercially exploitation.

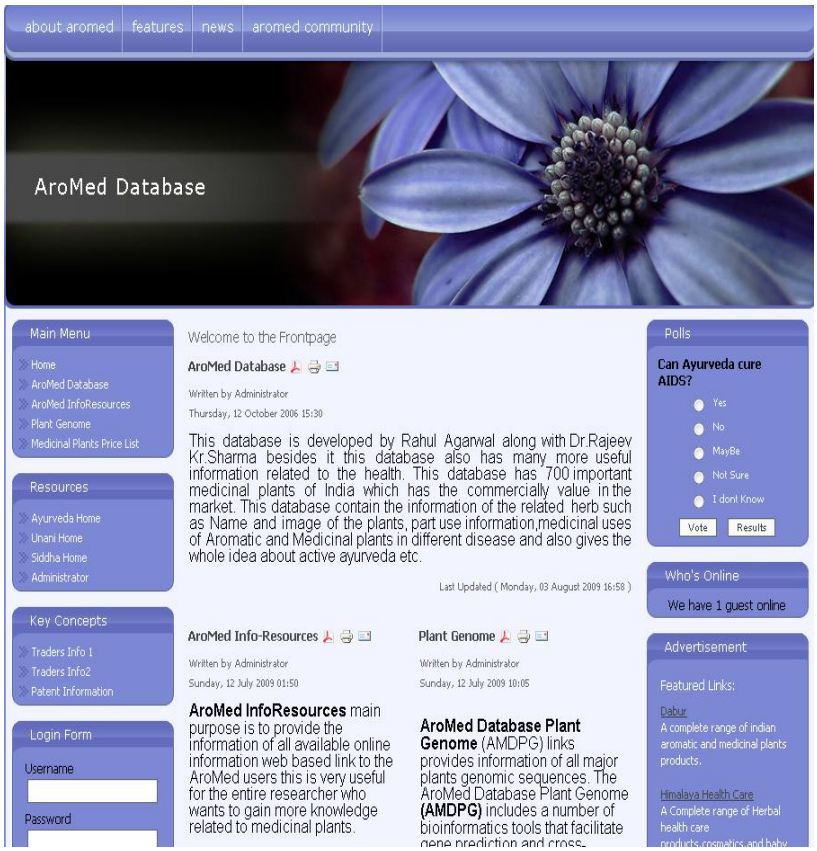

Figure 2: *AroMed India Database Main Web Page*

4. Conclusion and Future Prospects

Today's world running on technology and Internet. Every organization, company, research institute even most of the people are connected through internet and exchange many information using internet. So AroMed Database will also be run on internet through Joomla utility tools around the world with different languages and any user from different parts of the world can easily access its resources and can use its information on daily basis anytime from anywhere. And even Users can pass and share own views and idea's through online chatting, mailing, blogging world widely.

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