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Orchid database of Sikkim and Darjeeling, West Bengal, India

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Abstract

Orchids are known to have medicinal properties and about 7500 species are being used in Indian system of medicine (ISM) and also utilized in other various purposes like spice e.g. vanillin, herbal tea, vegetables, pickles, ice cream, floral ornaments, religious uses, perfumery, dried flower craft, essential oils, etc. The orchid database is a web-based repository that is home to 172 species. The database provides the data regarding the orchid species of Sikkim and Darjeeling, West Bengal, India. It consist set of computer programs, API (Application Program Interface) which is commonly known as web interactive interface and it is capable of accessing and retrieving the data from the database that will facilitate the creation, maintenance and provides data especially for decision making and planning. The database has become one of the primary sources for enhancing the data. One of the commonly used RDBMS (Relational Database Management Systems) is MySQL (Structured Query Language) which is free and open source RDBMS under the terms of the GNU (General Public License) and is also available under a variety of Proprietary Licenses. As per now the orchid database incorporates the entire main objective related to its design which implements HTML, PHP, CSS, JavaScript and jQuery and database which implements MySQL. In this report, we illustrate the principles and practical considerations of curation. These examples demonstrate how our work allows users to enhance and access the data which helps the planners and researchers to develop and access the orchid's data which has focused on data exchange and analytical capacity.

Keywords: Orchid database, biological field, information-exchange.

Introduction

The relational database industry is now generating revenues of over \$14 billion in 2005 [4] the requirement of the database in the Biological field is a necessary factor to have quick access and free information exchange at various levels. The last decade has witnessed tremendous advance in making databases that are self-managing and easier to operate but it still needs improvement with regard to server response time and too much expertise to set up, configure, tune, test, deploy, maintain, and enhance during implementation of the database. India is bestowed with 45,000 flowering plant species out of which about 15,000-20,000 species are known to have medicinal properties [1]. Orchidaceae is one of the oldest known and world's largest family plants which ranks second among all the family within the angiosperm which comprises of about 22,500 species grouped under 779 genera [2]. The project 'World Checklist of Selected Plant Families' a total of 27,230 accepted taxa have been enumerated and the family Orchidaceae exhibits the peak evolution amongst the monocots. In India, the family Orchidaceae is widely distributed from Alpine to Coastal region and islands but their maximum diversity occurs in the Eastern Himalayan and Peninsular Region and according to the reports (Misra, 2007) [6] the family has about 186 genera, 1298 species five subspecies and 28 varieties in India [3]. The principal objective of this study was to provide efficient database with recent information on the Orchid's. The orchid database basically deals with the precise information about orchids which will be assisting the scientific community, researchers, educationists and students of orchid's domain to retrieve and access the orchid information. The database holds a simple flow of the data as shown in Figure 1. This paper describes an effort to design and build a useful database which is reliable and comprehensive. Focusing on the important requirements of the institution and working backwards to define the software and hardware needed to meet the requirements. This process has resulted in a new architecture that integrates software and hardware into a high-function and easy-to-manage the data. Compliance being designed and coded at ICAR- National Research for Orchids which will be capable of storing, retrieving, searching and displaying of the data which will assist the researchers, educationists basically for their research and data related to orchids.

Why Curate?

The researchers who would like to access to the accurate and much more relevant high-quality data in the field of orchids; the importance of database is obvious. However, curation is not always seen as a critical part of scientific work. Here, we want to emphasize the importance of curation and the database for the importance of science and technology in Biological field. If new data sets are not curated into databases for long-term sustainability and integrated with pre-existing data, they may lose their accessibility and utility over time. The data organised, standardised and captured which are accessible by the committee will have a significant and long-lasting impact [5]. If Scientific Community couldn't access and finds the required data from the web, then the use of the database and the demand for the database will be affected and also it will have a considerable effect in the decrease of database and their curation in various fields. Thus, the recommendation for the database in the market will decrease. Online database is also one of the most effective ways to access the data but the data relevancy and the interface are some of the problems faced as those who are not from the technical background would find complicated and complex to operate, access and retrieve the data instantly. It is also one of the major factors that will result in decrease in the demand of database. Thus, the user friendly interface and highly

responsive server and the manageable database will have a huge impact on the use and recommendations of the database.

Data sources

The contribution of the data is from mainly two levels those are identified as: - Scientists/Researcher and Farmers/Orchid growers. And the data feed into the database are basically collected from analysing the species at various locations and thus compiled for future assist of Orchids data. As per now some of the details of species are Not Allocated (NA) but depending on the time factor there data will be updated time to time with respect to their valid data accomplishment.

1. Scientist/Researcher

Scientists/Researcher includes personnel working in ICAR-National Research Centre for Orchids, extension and development departments. Their information requirement can be related to research and extension carried out in various disciplines: Botanical/Scientific Name, Habitat, IC No., Morphological description, Duration of flowering and results of previous research at various levels.

2. Farmers/Orchid growers

The farmers may require information mainly on Distribution Area, Morphological Description, Duration of Flowering and there uses. And according to the requirements some of the

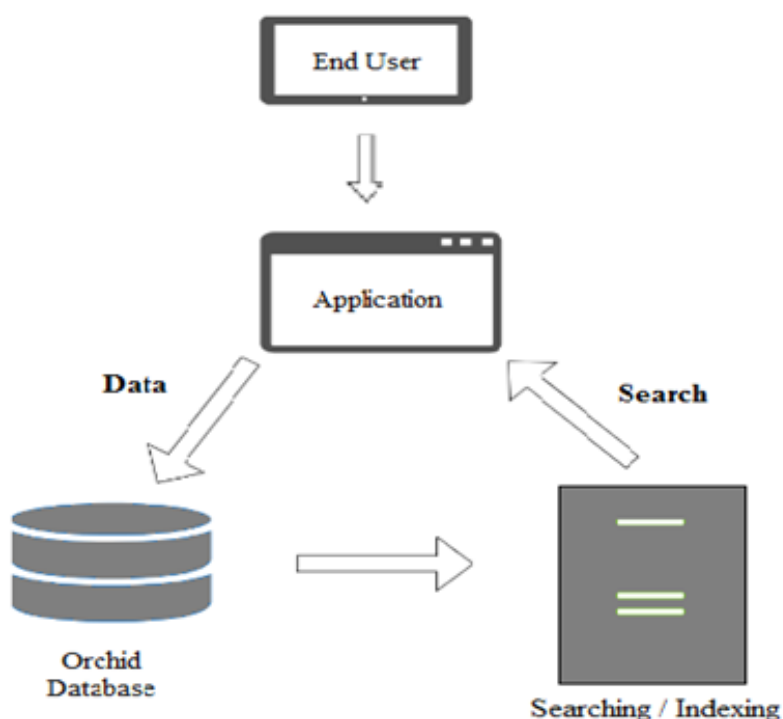


Fig 1: Flow diagram of orchid database

attributes and other useful information about Orchid's will also be integrated shortly for the better assist to the Farmers/Orchid growers.

Database & Web applications

Database has been in use and it is one of the most implemented methods used in many of the essential places within different levels for the effective use of data basically for the researchers to enhance decision making and planning. Applications commonly known as Application Program Interface (API) which consist a set of precisely defined methods of communication among various GUI (Graphical User Interface) components as these API's will play a vital

role that will act as a communication tool between the user and the database server to retrieve the data from the database. Flow chart of request from the end user and the response from the server is shown in Figure 2.

1. Database

The database is one of the primary sources to provide a structured set of data and store the data in the database server as MySQL RDBMS (Relational Database Management System) is one of the efficient source for information retrieval. Thus there are many other various types of database like MS Access, Sql Server R2, MySQL, Online Database, etc. but the implementation and the

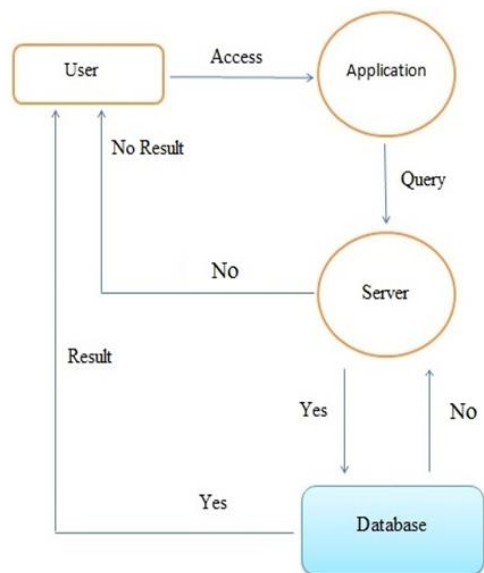


Fig 2: Flow chart of request & response of orchid database

deployment and many other factors are the drawbacks that hold a variance in implementation of low-cost database. MySQL database is one of the commonly used low-cost, ease to manage and maintain database. However, it also has some of the weaknesses like server response time, data backup, deploy, enhancing and maintaining but depending on the time factor and update in the

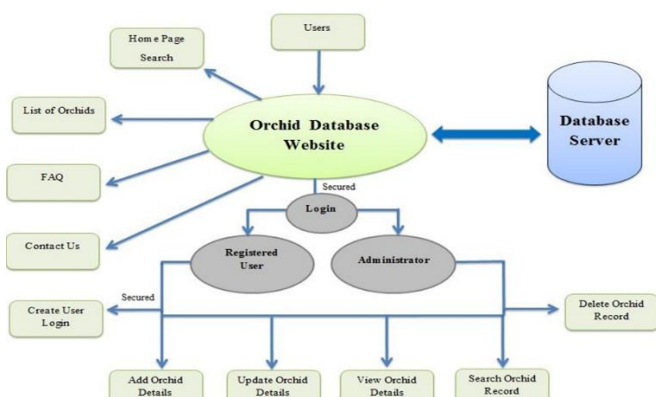


Fig 3: Flow diagram of orchid database website

field of Science and Technology this drawbacks are likely to be overcome. As the database will be playing a vital role to provide a set of structured data in an effective way related to various fields basically, in the field of Research. The diagram of Orchid website and Relational Database Management System (RDBMS) access from Server is shown in Figure 3. As looking at the rapid changes and vast requirement of the database in the market the database of orchid's is an essential factor for the Institute to provide the accurate and reliable data to the users basically the farmers, researchers and to the students related to orchid domain. Though, there are many other sources for gaining the information on orchids but depending upon the time factor, the database can result in one of the important sources for gaining the information regarding the orchids of Sikkim and Darjeeling, West Bengal, India. Moreover, these records or data will be more relevant as the institutions and the researchers belonging to orchid domain will only be able to feed the data into the database by using their credentials which will result in reliability and ease of access of relevant data. Total fourteen attributes/data-sets are incorporate which are used for the displaying of the data and

they are likely to be changed, updated and increase as per the requirements. The data design format is shown in Figure 4. The application holding the essential and vital option of displaying and adding the images which will be saved in a database and displayed from the folder with respect to the name fetched from the database. As this is one of the main options facilitated to enhance the data relevancy and to identify the data correctly of orchids.

2. Web Application

The Web application interface provides the facilities to every user to search and enhance the high quality data. The vital part of this application is basically for the registered user which is operated by admin and only by the registered user to add, update and delete and also to manage the data of the orchid's database. The registration process will be facilitated only through official e-mail addressing the authority and the details is provided on the menu link know as FAQs.

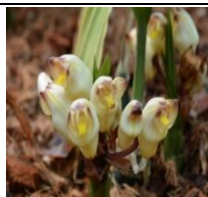
Image	Varchar	
Botanical Name	Varchar	Acanthephippium sylhetense Lindl.
Distribution	Varchar	Global-Bangladesh, China, Japan, Myanmar, Taiwan, Thailand, India.
Habitat	Varchar	Wild
Altitude (m)	Int	1182
ICUN Status	Varchar	Rare
IC No.	Int	0617677
Morphological Description	Varchar	This is a terrestrial species, 80 cm tall having short rhizomes. The oblong and fleshy pseudobulbs are 25 cm tall.
Key Characters	Varchar	Waxy Flowers
Flowering Time	Varchar	March to May
Duration of Flowering	Varchar	5-8 days
Spike Length (cm)	Int	3.9
Special Characters	Varchar	Flowers are highly fragrant
Uses	Varchar	Ornamental

Fig 4: Data design format used

FAQs on the menu links is provided to clear some of the users queries related to orchid database. The users and the admin can manipulate or change the data but the vital role is played by the admin to maintain the entire application and the database covering front end and back end overall. The application interface (Orchid Database/Home Page) is shown in Figure 5. The web interface implements HTML, PHP, CSS, JavaScript, jQuery are implemented and the web page to add, update and delete the data for the authenticated users after the login credentials provided in the "Login Page" of the application and the login process with screenshots is shown in Figure 6(d). Thus, it enhances the privilege to add, insert, and update the data of the orchids with their appropriate pictures option. Thus, to enhance the user friendly option to add the images is integrated in one web form. Thus, the web interface has the user friendly and ease of use feature overall.

Data Flow & Security

Here, the critically focused part is the data flow which will be

defining the flow of the data using the application interface to access and display the data from the database server. For every user the application provides the information for their valid search query. The Application Programming Interface (API) will be providing the facility to add the data and the users having the credentials will only be facilitated to add, delete, manage and manipulate the data as this process will be going through the credentials for the registered users for the

efficient and reliable use of the data. This facility will ensure the data security and manipulation of the data. The Firewall also prevents the unauthorized internet users from unusual interruption which will result in data security and unauthorized access. For required information about the orchid which incorporates the orchid details can be accessed or retrieved from the “Search” fields

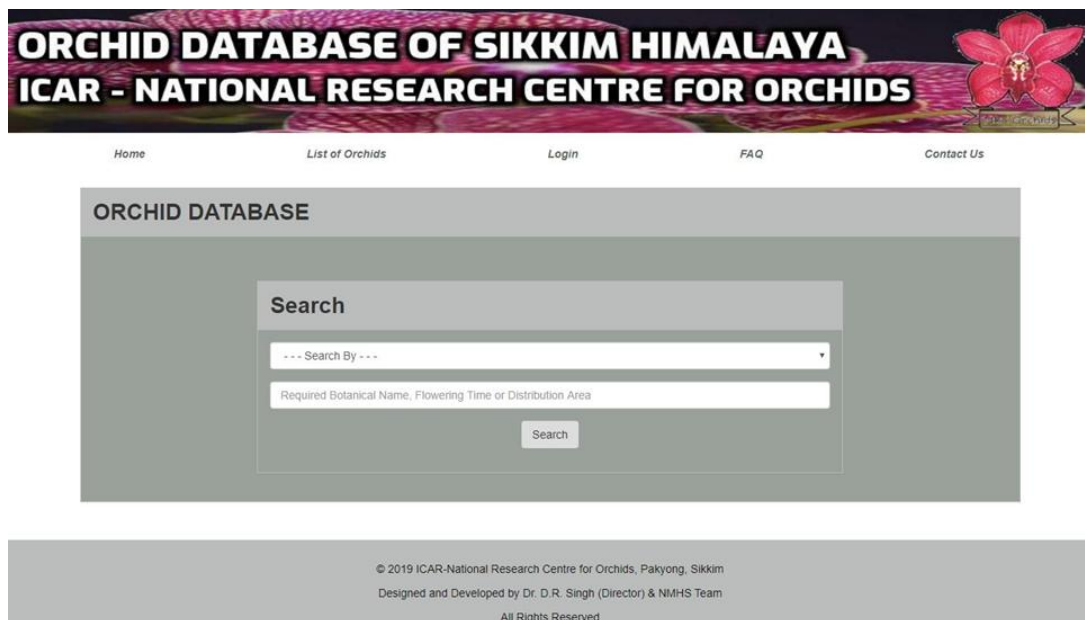


Fig 5: Screen Shot of Orchid Database (Home Page)

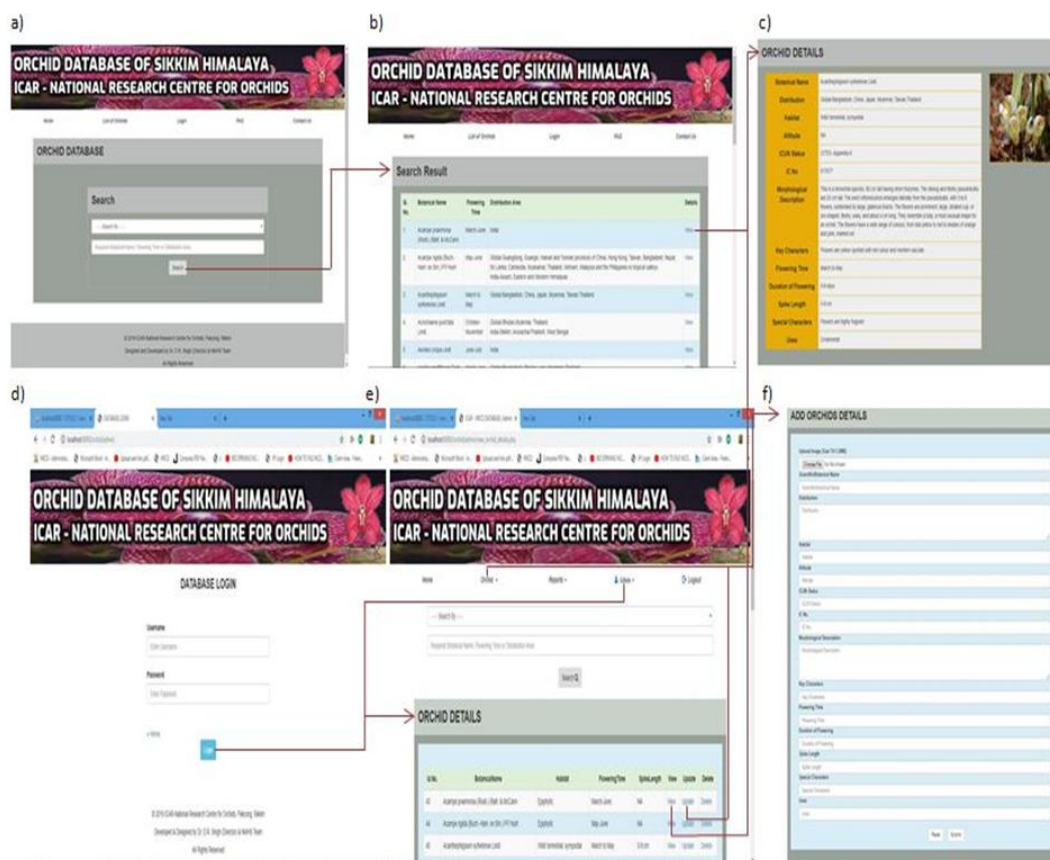


Fig 6: Screenshots pages of Orchid Database. a) This is the home page which allows the users to search the data; b) View button with search result displayed in table list form; c) Display of detailed data; d) Login page for registered user; e) Admin page after login to search record to update, view & delete data; f) Add details menu link to insert data.

present in the home page screen, the screenshot is already shown above. Here, in this search field the user will be

facilitated with three options through which they can search the required data. They are listed below as follows:

1. Botanical Name
2. Flowering Time
3. Distribution Area

By using the web interface any of the above listed options, the data can be retrieved by the end user. One of the central focused parts for this search option is that it searches through the letter indexing and provides the data by which the users will be facilitated only to give the alphabets if the name of the orchid species is unknown or incorrect as this will enhance the indexing process and the data will be displayed in a list followed by a link "View" to enhance the detailed data of the selected orchid species and if the data which is not present in the database then the "No Result Found" message will be displayed in the page. Thus, this search option is also facilitated for the registered users to search the data followed by the three vital links as "View, Update and Delete" the record/data. Overall data which will be fetched from the database server and then it will be communicated to the user through the interface with the detailed data integrating fourteen datasets and displaying image options which is shown in Figure 6(c). Thus, the diagram describes some of the main process related to its interface (design/data) and also some of the main output displayed to the end users depending on their search input/query.

Users

It includes training scientists and other technical staff to use computers and the application. Thus, this training will facilitate to interact with the application which will act as a user-friendly tool. The authenticated users will only have the privilege to add, delete, update and even manipulate the data according to their requirement as the process of login is shown above in Figure 6(d). One of the main feature for the registered users to input their login id and password in the web form and to enhance the principal privilege to add, delete, update and manage the data according to their requirement the "FAQs" menu link is provided in the menu bar for some of the useful query to operate and also to acquire the login id and password from the admin to access the required privileges for the orchid database website.

Conclusion and Future Prospectus

The paper describes compliance, a suitable appliance that is currently developed and designed at ICAR-National Research Centre for Orchids, Pakyong, Sikkim. The goal for compliance is to produce an efficient database of orchids which holds the possibility to become more practical that is capable of storing, retrieving and analyzing all types of data related to orchids. The orchid database will be migrated to Joomla, an integrated and open-source database schema and content Jun Rao, Robert Rees, Frederick Reiss, Eugene Shekita, Garret Swart, Impliance: a next generation information management appliance, 3rd Biennial Conference on Innovative Data Systems Research (CIDR) January 7-10, 2007, Asilomar, California, USA. management system. The vital future objective is to incorporate this application with the Orchid's database mobile app for the ease of retrieval, access and storing of the data in a reliable efficient way instantly. The major aspect is to merge with the current ICAR-NRC for Orchids website and to prepare this database for primary source of data related to Orchids.

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