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Design and Implementation of Online Groundnut Abstracts Database using Webspirs

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Abstract - Development of web based abstract information system is an attempt to address the problem of retrieving and providing the wider access to the abstracts present in CD format and need to be distributed to the scientists physically for accessing the abstracts. CAB Abstracts is a comprehensive file of applied life science information containing all records in the 44 abstract journals published by CAB International [CABI]. Online implementation of these abstracts increases the scope of the distribution of scientific information among the scientist of National Research Centre for Groundnut and to other groundnut research groups spread over India. The main goal of this software is to give working solutions to researchers in identifying and retrieving the required information from vast abstracts that are available at NRCG for the period of 1972 to 2005.

Initially the Linux based Samba server is used for implementing as Samba server was deployed rapidly, which solves the difficulty in sharing cab abstracts among different systems in the local network. Later to enhance the access of these resources over internet, web based system was implemented using WebSPIRS software. This enhanced the robustness, makes resource share and shares abstracts more conveniently over worldwide web. The online sharing of abstracts is practicable and was implemented successfully at National Research Centre for Groundnut.

Key Words: Online Groundnut Abstracts, WebSPIRS

Introduction

Development of online groundnut abstract information system is an attempt to address the problem of retrieving and providing the wider access to the abstracts which were purchased from CAB International. The National Research Centre for Groundnut has purchased all the field crop CAB abstracts from 1972 to 2005. CABI has provided 26 CDs in this regard. For retrieving information from these discs, scientist has to load all the CDs in to their desktop computer systems which is very time consuming. Also, loading all the abstracts in to desktop PC slows down it considerably and take more than 500 giga bytes of storage space which makes the whole process of access cumbersome. Because of these inherent problems these abstracts are not being used much even though they are highly sought in the scientific community.

CAB Abstracts is a comprehensive file of applied life science information containing all records in the 44 abstract journals published by CAB International [CABI]. Online implementation of these abstracts increases the scope of the distribution of scientific information among the scientists and officers of National Research Centre for Groundnut and to

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scientists of ACIRP-G spread over India. The main goal of this software is to give working solutions to researchers in identifying and retrieving required information from vast information that are available at NRCG for the period of 1972 to 2005 through web based platforms.

Samba server was deployed rapidly, which solved the difficulty in sharing cab abstracts among different systems in the local network. The effectiveness of samba safety mechanism, such as security level, encrypt password and firewall are implemented. Later to enhance the access of these resources over internet, web based system was implemented using WebSPIRS software. This enhanced the robustness, makes resource share and shares abstracts more conveniently over worldwide web. The online sharing of abstracts is practicable and was implemented successfully at National Research Centre for Groundnut.

1) Materials and Methods

The system was developed with following hardware and software tools:

(A) HARDWARE

Server : Intel Pentium IV 2.4 GHz Dual Processor, Original Intel Server Board4 GB RD RAM and 400GB HDD

Client : Any ordinary desktop with minimum 1 GB RAM.

(B) SOFTWARE

Following is a reference list of software used to develop and implement the software:

Operating System : Red Hat Linux 9.0 (Linux operating system) with WebSPIRS installed.

Set – I:

Client-Side Interface : WinSPIRS shortcut is pushed into all desktop systems.

Databases : All CAB Abstracts copied into the File System of Server

File Server : Samba Server 3

Set – II:

Client-Side Interface : Standard Browser, WebSPIRS URL is provided to all.

Databases : All CAB Abstracts copied into the File System of Server

File Server : WebSPIRS

A CAB abstract database information system is designed and developed based on client-server approach and has been implemented in Red Hat Linux 9.0 Linux server using Samba Server as File Server and WinSPIRS as software for accessing and browsing the abstracts. The CAB-IS is designed to permit users to query the database at concurrently by many users at any single point of time. All this information was shared from digital library server using WinSPIRS and set in all the computers in the ARIS CELL for quick search and downloading required abstract in the floppy. The scientist/tech. staff of the institute are downloading the required images/information/abstracts for their research purpose using this facility.

Later feedback from scientists of NRCG were collected and they wanted to access these abstracts from anywhere in the world which currently restricted to NRCG LAN only. Then it was decided to go for a Web based server called WebSPIRS to enhance the access of the information through worldwide web.

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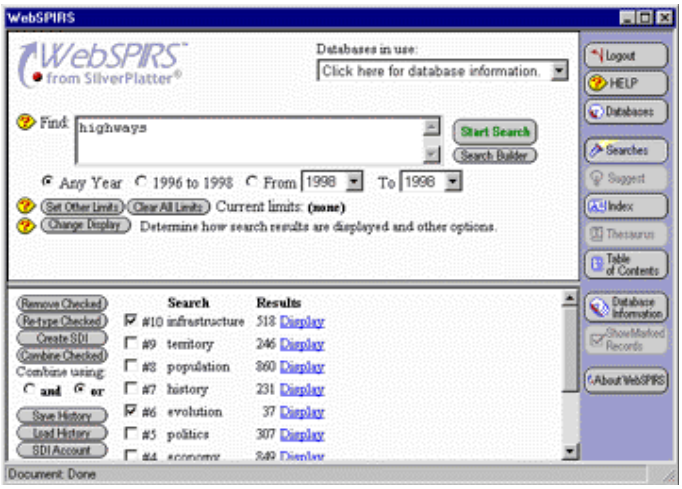
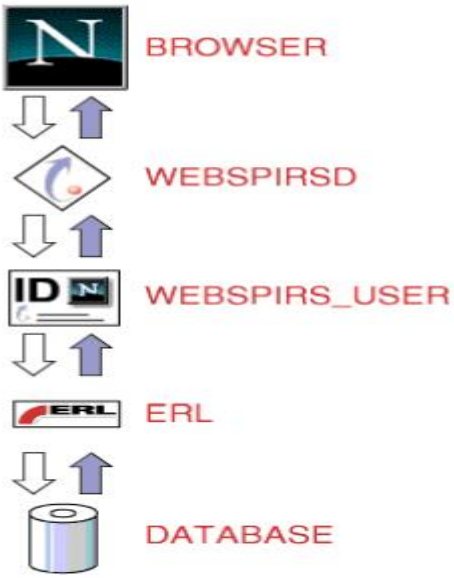
WebSPIRS is SilverPlatter's Information Retrieval System for the Worldwide Web. With this one can provide access to server databases allowing users to search databases from anywhere – local workstations, home computers, dormitory rooms, faculty offices, remote sales offices, etc. At client side users need to have standard Web Browsers and an internet connection. WebSPIRS incorporates frames and JavaScript to give users an interface that looks and performs like a sophisticated search client.



WebSPIRS is of more convenient in terms of accessibility of datasets. WebSPIRS can communicate with ERL Server with a simple internet connection. WebSPIRS consists of two processes, webspirsd and webspirs_user, which move information back and forth between the user's web browser and the ERL database server.

The following is the brief overview of how online abstract information system communicates between the user's web browser and the databases they are searching:



Architecture of Online abstract information system

At the core of the system is implemented by Apache Server which is a open source software and Cab Abstracts has to be purchased from Silver Platter. CAB Abstracts is the largest professionally-produced database covering international issues in agriculture, forestry, and allied disciplines in the life sciences. The database contains over 6.3 million records (with 300,000 abstracts added each year) from over 7,500 journals. books, and conference proceedings. It is an applied life sciences bibliographic database emphasising agricultural literature, which is international in scope. Being NRC for Groundnut is a national agricultural institute working in the area groundnut, NRCG has purchased agricultural abstracts from CABI. Horticultural Science Abstracts is a fully searchable abstracts database of internationally published research on agriculture, from genetic resources to gene expression, and propagation to

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storage. Developed from CAB Abstracts, the original applied life sciences database, Agricultural Science Abstracts' coverage includes genetic resources, breeding, propagation, crop management, pests and diseases, plant physiology, storage and marketing.

For sharing these abstracts, we installed Samba server 3 in Cent OS Linux server. We created a file system with path "/opt/shares/CAB" and copied the content of all CDs that were purchased by NRCG. Samba's core functionality derives from its implementation of the Server Message Block (SMB) protocol. SMB client- and server-side support comes bundled with all the versions of Microsoft Windows. Samba is reliable software that runs on reliable Unix operating systems, resulting in fewer problems and a low cost of maintenance.

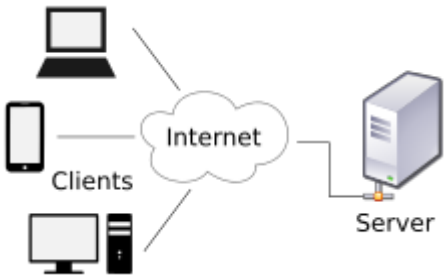
Samba is a suite of Unix applications that speak the Server Message Block (SMB) protocol. Microsoft Windows operating systems and the OS/2 operating system use SMB to perform client-server networking for file and printer sharing and associated operations. By supporting this protocol, Samba enables computers running Unix to get in on the action, communicating with the same networking protocol as Microsoft Windows and appearing as another Windows system on the network from the perspective of a Windows client. By using this character we pushed the WinSPIRS shortcut to all the desktop systems to enable them to access the CAB abstracts.

Later as per the new requirements, we developed and implemented WebSPIRS who uses a combination of Apache HTTP Server and Tomcat Java Engine. All requests for static content is served by Apache and requests for dynamic content is forwarded to Tomcat engine.

Apache HTTP Server is free and open-source cross-platform web server software and is developed and maintained by an open community of developers under the auspices of the Apache Software Foundation. Apache HTTP Server is cross-platform, meaning that it is built for Unix-like systems (e.g., macOS, Linux and FreeBSD) as well as Windows. Tomcat Server, is an open-source Java Servlet Container and implements several Java Enterprise specifications including Java Servlet, JavaServer Pages (JSP), Java EL and provides a "pure Java" HTTP web server environment in which Java code can run. Tomcat is developed and maintained by an open community of developers and is open-source software.

2) Results and Discussion

The system architecture of CAB-IS is implemented by using Client – Server architecture which is shown in the following figure.



The salient features of this software are as follows:

a). Server: The Apache Server receives requests from clients for various operations. The server is responsible for concurrency control, recovery, transaction and storage management. The Server is responsible for query processing and all the operations on CAB-IS database through Tomcat engine. After initialization, the server waits for a query from its client. The results of the query that are obtained by processing it are sent back to the client through Apache server in case web

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based solution and through Samba server in case of LAN based solution.

This is the middle tier between the Client and the Database is WinSPIRS and WebSPIRS software. The user interacts with the WinSPIRS/WebSPIRS form based GUI from the client and the request that is sent to the Server is served by the Apache-Tomact / Samba Server. The both the cased Apache-Tomact / Samba Server waits for the result of the request from the file system/database and sends it back to the client in proper format.

b). Client: A shortcut for WinSPIRS has been pushed to all the windows based client machines of NRCG. In case of web based solution an up to date Browser will serve the purpose. The system should be developed in such a way that it becomes user friendly.

Conclusion

An efficient sharing of research publications has become very essential for researchers, agricultural scientists and policy makers for research and reference purposes. An attempt was made to address the problem of online sharing of data related to research abstracts initially in LAN through WinSPIRS. Later web based solution proved to be more efficient method by providing any time and any wahre access through worldwide web. An efficient retrieval system like CAB-IS proved very useful in providing the required information from the millions of records that are available in CAB Abstracts.

REFERENCES:

O. Gene Norman, (1997) "The impact of electronic information sources on collection development: a survey of current practice", Library Hi Tech, Vol. 15 Issue: 1/2, pp.123-132.

WANG Yang, ZHU Zhao-xia, ZHANG Shi-lu 2004. Design and Implement of Samba Server based on the Webmin Tool,2004 Accessed at Google Scholar.

Ivan T. Bowman, Richard C. Holt, Neil V. Brewster, "Linux as a Case Study: Its Extracted Software Architecture", University of Waterloo, Canada 1999. http://plg.uwaterloo.ca/~itbowman/papers/linuxcase.html

ANSI/IEEE Std 1003.2, IEEE Standard Portable Operating System Interface for Computer Environments, IEEE, 1992**.**

Powell T and F Schneider (2002) Java Script The Complete Reference. Tata McGraw Hill**.**

Senn James A, 1989 "Analysis and Design of Information Systems", Tata McGraw Hill**.**

Mishra, O.P, Yadava, N and Bisht, K. "Internet Utilizations Pattern of Undergraduate Students." University News, 2005, 43(13), 8-12

Shamin Renwick (2005), Knowledge and use of electronic information resources by medical sciences faculty at The University of the West Indies, Journal of Medical Library Association. 2005 Jan; 93(1): 21–31