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THE ARINET PLATFORM: AN ICT TOOL FOR AGRICULTURAL RESEARCH DISSEMINATION

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G. Adamides

SUMMARY

The use of Information Communication Technologies (ICT) offers the potential of a direct and continuous access to a mint of information. The directness of information, the elimination of place (distance) and the ease with which one can have timely access to valid information makes the World Wide Web (WWW) a useful tool for everyone. The Agricultural Research Institute, in its continuous effort to contribute to the best possible enlightenment of the Cypriot farmer, is offering the ARINET system as a medium to access scientific data and to improve communication among agriculturalists.

ΠΕΡΙΛΗΨΗ

Η χρήση τεχνολογιών επικοινωνίας και πληροφορικής ενδυναμώνει τη δυνατότητα της άμεσης και συνεχούς επικοινωνίας. Η άμεση πρόσβαση σε πληροφορίες, η εκμηδένιση της απόστασης και η ευκολία με την οποία μπορεί κάποιος να έχει πρόσβαση σε έγκυρη και έγκαιρη ενημέρωση, έχει καταστήσει τον Παγκόσμιο Ιστό (World Wide Web) ένα χρήσιμο εργαλείο για τον καθένα. Στο Ινστιτούτο Γεωργικών Ερευνών, μέσα στα πλαίσια της συνεχούς εκσυγχρόνισης και αναβάθμισης του έχει αναπτύξει την υπηρεσία ARINET μέσω της οποίας παρέχει πληροφόρηση σε θέματα γεωργικής έρευνας στον Κύπριο αγρότη.

INTRODUCTION

The Internet offers a plethora of information to those who have access to it. Internet users can find a wide range of timely information. It allows rapid communication and exchange of information to any part of the globe. People of all ages, races and educational background use it to find information or for other purposes including education, entertainment and most often communication [1].

To improve communication and access to scientific and technical information the Agricultural Research Institute (ARI) participated in a Regional Action Program (RAP) related to the Conservation and Management of Natural and Renewable Resources, funded by EC-CIHEAM [2]. Through this project the ARI received a server, a teleconferencing unit and software to facilitate the implementation of an information system based on Internet technologies.

The ARINET System

The ARI, within its efforts to take advantage of the new technology and within its research project Manipulation and Transformation of Scientific Data for Dissemination through the ARINET e-Network, has developed four websites which make up the ARINET platform. These are:

- The ARI's official website (http://www.ari.gov.cy)
- The ARI Webmail (http://www.ari.gov.cy:3000)
- The ARICAT website (http://library.ari.gov.cy)
- The ARINET website (http://ce.ari.gov.cy)

The overall objective of the ARINET system is centered towards the implementation of an Information System, based on the Internet to promote the exchange and the diffusion of scientific and technical information. A description of each website's scope and its use follows below.

The ARI's Official Website

The main purpose of the ARI's official website, shown in figure 1, is to inform the visitor about its mission, its organizational structure and the ongoing research projects. Based on statistics [3], in 2004, it is estimated that approximately 774 users visit the ARI website every week. For 2005, in January and in February the weekly visitors, as shown in Table 1, have increased. The design of the website is based on a user-centered approach

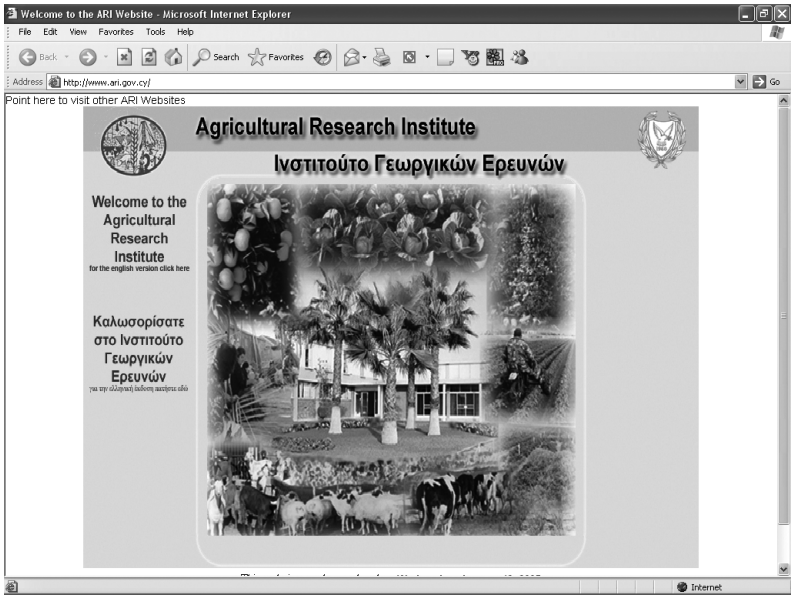

Figure 1. The Agricultural Research Institute Website.

to develop a website taking into account usability guidelines [4] and guaranteeing the web user rights according to [5].

The visitor of the ARI website can find general information (in Greek and in English), such as the history of the Agricultural Research Institute, its organizational structure, the Library, the Chemistry Laboratory, the Molecular Biology Laboratory and the Reproductive Physiology & Radioisotope Laboratory. In addition, the site also lists, Research Activities and Training. In Research Activities one can find information about the current research projects at the ARI. In Training, there is information about the training programs offered at the ARI. There is also a list with the Staff members of the Institute and their contact information. Finally, a new addition to the website was the search engine feature. The search engine, powered by FreeFind [6], enables users to search the contents of the entire website or even the whole World Wide Web, using keywords. Figure 2 shows the number of monthly users of the search engine facility.

Table 1. Weekly Data for 2005 Visitors

January 3–January 9	540
January 10–January 16	908
January 17–January 23	930
January 24–January 30	884
January 31–February 6	1023
February 7–February 13	934
February 14–February 20	951

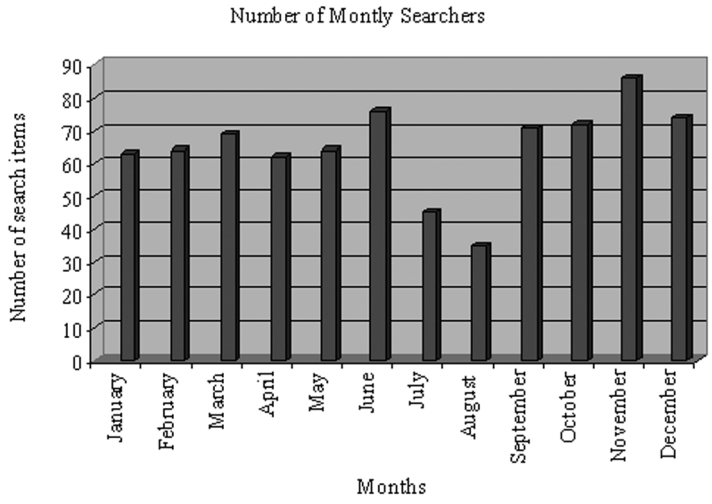

Figure 2. Number of Monthly Searches.

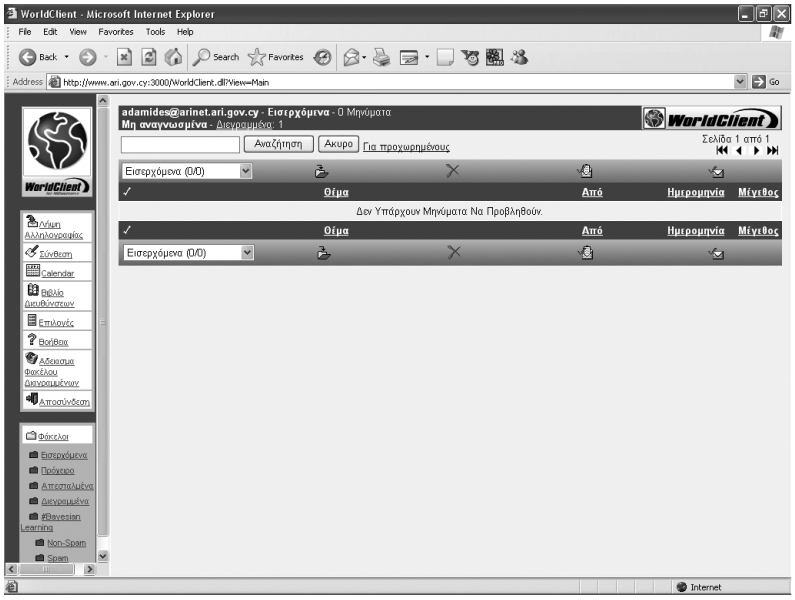

Figure 3. The ARI Webmail.

February 21–February 27 111

The ARI Webmail

The ARINET Webmail provides e-mail services to the scientific staff of the ARI. By using the ARINET Webmail the researchers can have access to their email account 24/7 from any computer at work or at their home, in Cyprus or abroad. Through the ARINET Webmail users have all the services provided by conventional email and hence they can communicate with other colleagues or partners seamlessly.

The ARICAT

The library is an integrated part of the ARI since its establishment. Its purpose is to provide bibliography data in the various disciplines of agricultural science to the researchers of the Institute. With the introduction of the ARINET the catalog of the library is now available through the Web. The user can search for books, journals and other printed material that the library holds. They can also see a list of all the magazines that the library gets by subscription.

The ARINET

Last, the ARINET website offers its services to registered users only. Registration is free and easy; all that is required is an email address. Since its launch in January 2004, it has attracted more than 145 registered users (according to September 2005 data) and the number is expected to grow.

The ARINET offers a personal website with features such as a personal calendar, electronic forum, news and announcements, notes page, search and a file storage area. There are many advantages why someone should join ARINET, which can be characterized as the first online facility addressing issues for the agriculturalists and the farmers of Cyprus. The major advantage is that registered users are members of a community from which they can learn from each other, exchange ideas in forums, communicate with researchers, ask questions, learn news and read about new activities, such as seminars, conferences and lectures that take place at the Agricultural Research Institute and in Cyprus in general.

An integral part of the ARINET website is the Research Data site at http://ce.ari.gov.cy:8000 where the user has access to scientific results and to research programs of the various sections of the Institute. This website is still in a pilot project and we have added only a limited amount of information. More specifically, we have data only from a research project by the Soils, Water Usage and Environment section. The online information is related to greenhouses, hydroponic cultures and irrigation and fertigation systems. The information is database driven and is presented in the form of text and photographs. There is also the capability to add other multimedia and audiovisual material

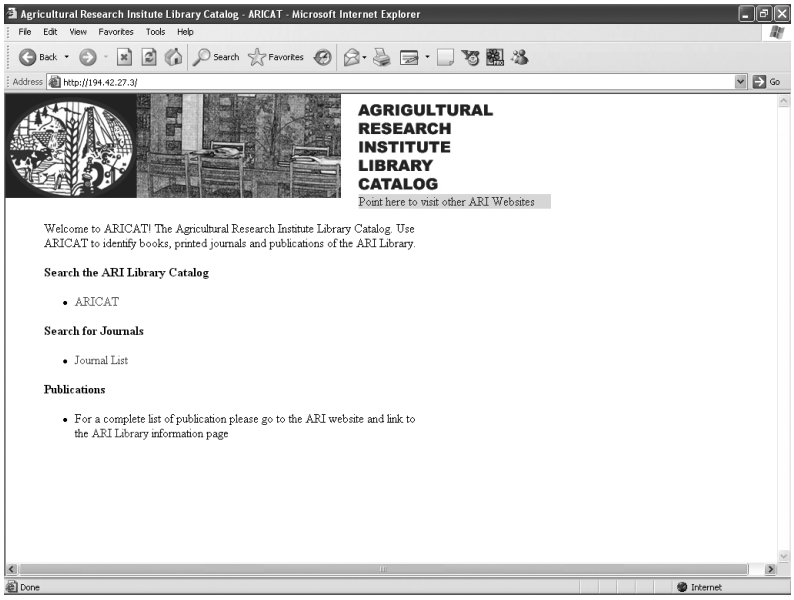

Figure 4. The Agricultural Research Institute Library Catalog.

in the near future.

Implementation of the ARINET platform

The system is running on a DELL Power Edge 2500 with the RedHat Linux 8.0 operating system. The ARINET website is built on OpenACS (http://www.openacs.org), an advanced toolkit for building large, scalable, community oriented websites. The research data are managed using PostgreSQL (http://www.postgresql.org) a true ACID-compliant RDBMS. The OpenACS is running on AOLServer, which is America Online's open-source web server. The AOLServer is a multithreaded TCL-enabled web server used for large scale dynamic websites.

Users Feedback

In early 2004 we requested from the registered users to give us their feedback on the system's usability. Our aim was to see what the users think about the system's usefulness, ease of use, their comments on the services offered and other information that could help us improve the usability of the ARINET. A survey questionnaire was posted online and email announcements were sent to the registered users.

The preliminary analysis of the data (based on 55 responses out of 112 then registered

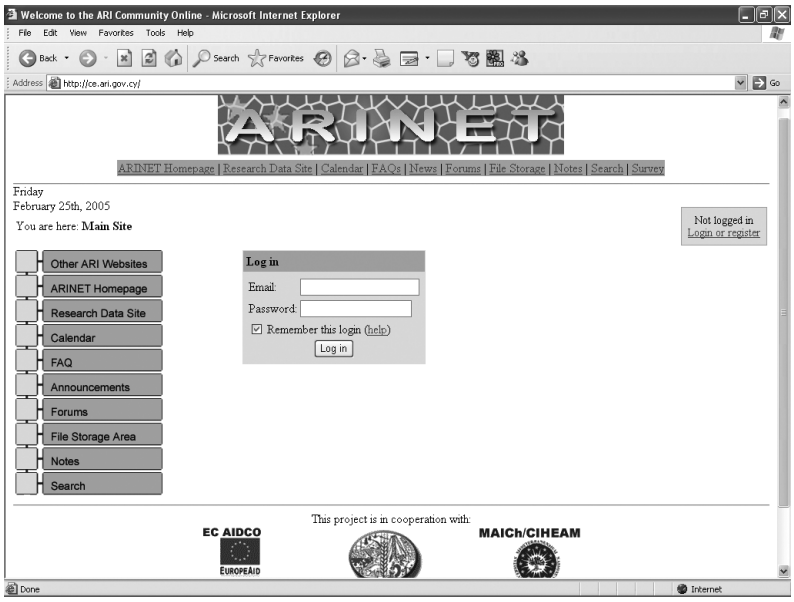

Figure 5. The ARINET System.

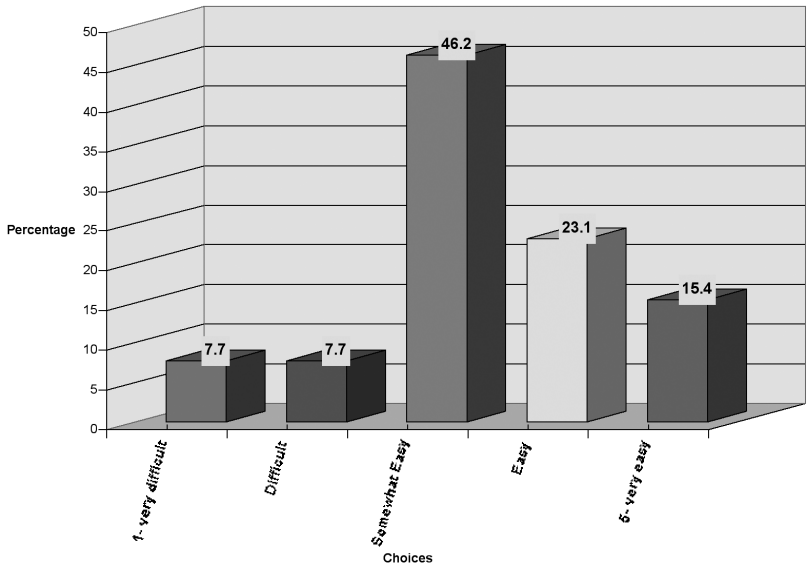

Figure 6. Ease of Use Responses

users), shown in Tables 2-6, for *Usefulness*, showed that the most useful application was the ARINET website with more than 69% stating that it is a useful service followed by the ARI website with 61%, the WebMail and the ARICAT, both with 53%, and finally the ARINET Data Site with 46%.

Regarding the *Ease of Use* for each of the websites, the data analysis showed (see Figure 6) that the overwhelming majority of 84% found the ARINET system, as a whole, easy

Table 2. Webmail Usefulness

Choice	Percentage of total sample (%)
Extremely useful	46.20
Somewhat useful	7.70
Neutral	7.70
Not very useful	7.70
Not at all useful	15.40
No answer	15.30

Table 3. ARICAT Usefulness

Choice	Percentage of total sample (%)
Extremely useful	30.80
Somewhat useful	23.10
Neutral	23.10
Not very useful	15.40
Not at all useful	0.0
No answer	7.60

Table 4. ARINET Usefulness

Choice	Percentage of total sample (%)
Extremely useful	30.80
Somewhat useful	38.50
Neutral	23.10
Not very useful	0.00
Not at all useful	0.00
No answer	7.60

Table 5. ARINET Data Site Usefulness

Choice	Percentage of total sample (%)
Extremely useful	23.10
Somewhat useful	23.10
Neutral	46.20
Not very useful	0.00
Not at all useful	0.00
No answer	7.60

Table 6. ARI Website Usefulness

Choice	Percentage of total sample (%)
Extremely useful	46.20
Somewhat useful	15.40
Neutral	30.80
Not very useful	0.00
Not at all useful	0.00
No answer	7.60

to use. We believe that these results reflect on the simple design we employed, with limited images and easy-to-navigate menu. In addition many users found the feature of knowing where you are, on the top of each page, very useful, as it helped them navigate more easily through the web pages.

Future Work

At the completion of the pilot project by the end of 2005, the ARINET system will be made available to all sections of the Agricultural Research Institute so as to offer a plethora of information from various disciplines of agricultural research, like crop breeding and genetics, fruit trees and vegetables production, viticulture, floriculture, animal production, biotechnology and tissue culture, plant protection (entomology, plant pathology, nematology and weed science), insect toxicology and pesticide residues, soil fertility, plant nutrition, irrigation, environmental impact, experimental statistics and agricultural economics.

We will also start using the videoconferencing unit that was offered to us by the Mediterranean Agronomic Institute of Chania (http://www.maich.gr) and start presenting lectures, conferences and talks to a wider audience both in Cyprus and abroad.

Our aim is to provide a free service that will promote agricultural practices, timely and accurate information and be accessible by the Cypriot farmer.

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