Implementation of a Web-Based Information Exchange with a Directory and Data Repository for International Education and Research Cooperation

Radim Farana [1], Trond Clausen [2], Peter Hicks [3], John Mead [4], Vaclav Roubicek [1], Luis M. Sanchez Ruiz [5], Luiz Scavarda [6], Victor Schutz [7], Che-Ho Wei [8], Max Yen [4], Win Aung [1,4]

[1] VSB - Technical University of Ostrava, Ostrava, Czech Republic
[2] Telemark University, Porsgrunn, Norway
[3] UMIST, Manchester, UK
[4] Southern Illinois University, Carbondale, IL, U.S.A.
[5] Universidad Politecnica de Valencia, Valencia, Spain
[6] Pontifical Catholic University of Rio de Janeiro, Brazil
[7] IEEE Education Society, Philadelphia, PA, U.S.A.
[8] National Chiao Tung University, Hsinchu, Taiwan

iNEER
College of Engineering
Southern Illinois University at Carbondale
Carbondale, IL 62901-6603
(618) 453-4321
http://www.ineer.org
radim.farana@vsb.cz
win_aung@altavista.com

August, 2000

Abstract: A new information exchange for international engineering education, incorporating a database for developing collaborative linkages, is being implemented under sponsorship by the International Network for Engineering Education and Research (iNEER). An informal, volunteer, networking group formed to promote advances in engineering education and research through international partnerships, iNEER provides guidance and is the main motivating force for the International Conference on Engineering Education (ICEE). The main focus of iNEER is to help develop and cement collaborative efforts emanating from the ICEEs. In this paper, we first briefly summarize the objectives of iNEER and ICEE. Then, with a view toward obtaining feedback and input that will aid further development, we describe in some detail the current status in the design and implementation of the iNEER website, which is now operational. Its main feature is the international directory and repository for information on international collaboration, wherein researchers and educators around the world may key in information about themselves, as well as look for potential counterparts for future collaborative projects. The data structure is explained in details in the present paper.

Keywords: ICEE, iNEER, education, research, network, international engineering

INTRODUCTION

International Conference on Engineering Education (ICEE)

Engineering schools in regions around the world are engaging in a critical and comprehensive examination of their undergraduate and graduate education systems. In order to meet the development needs of the 21st Century, new efforts have been implemented that seek to improve the quality of the education experience for students. Among the many issues of concern are the applications of information technology as a teaching aid, hands-on experience for undergraduate students, and distance and life-long learning. Unlike past engineering education

reforms, the current activities have involved a wide range of engineering schools around the world working in partnership with each other, and with industry, government, and professional organizations. These efforts are put in place in recognition of the need for a structural change in how and what engineering students should be taught.

The collaborative or partnership approach in engineering education is central to many of the efforts. Examples include the engineering education coalitions that began in the United States in the early 1990s. Similar programs are now being initiated in other nations.

Organized as an information dissemination and exchange forum, the International Conference on Engineering Education (ICEE) emphasizes the importance of advancing the state of knowledge through collaboration, partnership and networking. It is a conference series that highlights the worldwide progress and experiences in engineering education; it is also a platform for creating mutually beneficial collaborative efforts.

Formed by interested professionals in engineering and science around the world, ICEE is a forum open to all without regard to national origins. Organized around a two-part format, ICEE usually includes a 1-2 day workshop to discuss plans for cross-regional collaboration in addition to a traditional 2-3 days meeting for contributed papers and invited talks. Participation from academia, industry and government funding agency representatives are welcome. Keynote remarks by leaders in science, engineering and technology are a regular feature. Booths for conference-related exhibits may also be arranged for sponsors and attendees.

While each ICEE is identified with the host institution and city but not with the country, the venue is rotated to different regions around the world, so that the same region does not play host more than once every five years when there is a new host able and willing to organize a conference. ICEE is co-sponsored by the International Network for Engineering Education and Research (iNEER) and by industry and academic institutions, and led by the International Steering Committee (ISC).

As of December 1999, the following ICEEs have been convened or are being planned. Numbers in parentheses are the estimated numbers of participants.

ICEE - 1994: Taipei (120)
       1995: Taipei (120)
       1997: Chicago/Carbondale (250): http://www.siu.edu/~coalctr/icee2.htm
       1998: Rio de Janeiro (550): http://www.ctc.puc-rio.br/icee-98
       1999: Ostrava/Prague (400): http://www.fs.vsb.cz/akce/1999/icee99/welcome.htm
       2000: Taipei/Tainan (350): http://icee2000.nctu.edu.tw
       2001: Oslo/Bergen (400): http://www-pors.hit.no/tf/icee01/
       2002: Manchester (400)
       2003: Valencia (tentative)
       2004: Buenos Aires (tentative)
       2005: Krakow (tentative)

International Network for Engineering Education and Research (iNEER)

The International Network for Engineering Education and Research (iNEER) has been established through a resolution promulgated at the February 2000 meeting of the International Steering Committee of the International Conference on Engineering Education (ICEE). The goal of iNEER is to enhance the value and concept of ICEE, by enabling and promoting further progress in education and research through international partnerships and information exchange.

iNEER is an independent, volunteer networking organization. It implements its goal by: (a) providing continuity of co-sponsorship and facilitating the organization of high quality ICEEs; (b) initiating other international forums, specialist workshops and conferences at selected sites as needed; (c) developing new mechanisms and programs that promote international cooperation; (d) developing and maintaining a directory and repository of information for international cooperation in research and education; and (e) assembling and disseminating updated information on related topics.

The iNEER "virtual" secretariat or headquarters are rotated among academic institutions that volunteer their support and sponsorship as their contributions to the ideals of mutual progress through international cooperation. The current hosts are Southern Illinois University at Carbondale (SIU), Carbondale, IL, USA, a long-standing co-sponsor of ICEE; VSB – Technical University of Ostrava, Ostrava, Czech Republic; and New Jersey Institute of Technology, Newark, New Jersey, USA. iNEER is also supported by other academic, industrial and government institutions.

iNEER accomplishes its mission in part through a continuously updated directory and repository of information on international collaboration, in which researchers and educators interested in collaborative activities may: (1) find partners for collaborative activities including exchange programs and longer term joint programs; and (2) key in updated summaries of their education research activities for information dissemination and for establishing potential contacts for future collaboration. The incorporation of such a capability is a major goal of the iNEER information exchange housed within its website.

FEATURES OF THE iNEER INFORMATION SYSTEM AND WEBSITE

The iNEER information exchange is accessed through the iNEER website. This website contains selected information on engineering research and education relevant to international partnerships. As the principal co-sponsor of the ICEE series, iNEER provides updates of information on ICEE, including recent and future ICEE conferences around the world. Announcements on key events and new programs related to international cooperation and partnerships are also an important feature. Links to other relevant sites, such as ICEE-1998, 1999, 2000, 2001 are provided. Timely links to available resources for collaborative efforts in engineering education and research are also provided.

As a means of implementing the goals of iNEER, its website has a continuously updated directory and repository for information on international engineering education and research. The iNEER website is located at: http://www.ineer.org.

In short, the iNEER website:

- maintains and updates a directory and repository of information on international collaboration, through which researchers engaged in collaborative activities, or are interested in developing new collaborative projects, may identify cooperating partners or submit and display summaries of their activities with names and addresses of contact persons;
- contains a web page showing the rationale and concept for iNEER, including its International Advisory Board;
- contains a web page showing the concept and rationale for ICEE, including its International Steering Committee;
- provides information on upcoming development, programs and events, such as major program announcements, international conferences and workspaces, and progress on projects of a collaborative nature;
- provides links to other relevant sites such as ICEE-1998, 1999, 2000, 2001, etc.; and
- contains other features that may be added from time to time.

BASIC STRUCTURE

The iNEER information exchange has been conceived as a web-based information system. Initial support comes from the College of Engineering and the Materials Technology Center at Southern Illinois University and Technical University of Ostrava, with a grant from Motorola Inc. All information is accessible via the Internet using a standard browser such as Microsoft Internet Explorer or Netscape Navigator. The overall system includes static HTML pages and database connection based on the Active Server Pages (ASP) technology. Figure 1 shows the current look of the iNEER homepage.

The web master and administrator of the iNEER information system may be contacted by e-mail at: radim.farana@vsb.cz or win_aung@altavista.com. Further details of the system properties are given below.

INITIAL FEATURES

Currently, the web-based information system of iNEER includes the following menu, and each menu item has a separate web page containing further information:

About Us - This contains basic information about iNEER such as its conceptual framework and addresses of its "virtual" office.

News Update - Timely items of interest to the iNEER community. News items are based on items submitted to iNEER by an informal network of correspondents. Also found here are recent minutes of the International Steering Commitee of the International Conference on Engineering Education.

Announcements - Calls for papers and program announcements are grouped under this heading.

Past Events - Links to past ICEE (ICEE-1997, ICEE-1998, and ICEE-1999) websites are available here.

Upcoming Events - This heading includes information on future ICEEs and other relevant information.

Directory - This provides access to the iNEER interactive database for international cooperation.

Archives - Grouped under this heading are reports of interest to the international engineering education and research community, such as proceedings of past ICEEs. Selected reports on international cooeration may also be accessed from here.

Sponsors - Listing of iNEER sponsors.

The website is managed by a webmaster. Each user can change the information in his/her own entry in the Directory. The Directory system is further described below.

DIRECTORY AND REPOSITORY

The iNEER Directory and Repository is the most important part of the iNEER information exchange. Its basic database structure and operation is similar to the web-based business-to-business electronic commerce sites developed by many industrial firms around the world. Stated simply, the Directory is a platform that enables potential partners – the "buyers" and "sellers" – in international partnership projects to find each other and team up. To this end, users are invited and urged to key in information about themselves into the database. The information is protected by a password, chosen by each user that allows the user, and nobody else, to access the information to update it when necessary. Other users can see the information but not alter it. The webmaster reserves the right to edit or delete objectionable materials in the Directory.

The database structure is given below with a sample data set. Required fields are written in bold italics:

- ***Nick Name***   User name for future entry into the Directory to make changes
- ***Password***   Password for future entry into Directory to make changes
- ***First Name***   Radim (example)
- Middle Name
- ***Surname***   Farana
- Titles   Ph.D.
- ***Institution***   VSB-Technical University of Ostrava
- Address   Dep. ATR - 352, 17. listopadu 15, 708 33 Ostrava-Poruba
- ***Country***   Czech Republic
- Phone Number   +420696994380
- Fax Number   +420696916129

- ***E-mail***   radim.farana@vsb.cz
- Web Page   http://www.vsb.cz/~far10
- ***Fields of Interest***   Information systems, Database systems, web pages design and web-based learning systems.
- ***Summary of Ongoing Education/Research Activities***
  > Author or co-author of more than 190 publications, 20 international, 10 textbooks in field of computer science, some are available on the Internet too.

- ***Current and Past International Cooperative Activities***

  > Designed iNEER website; designed ICEE-1999 website; Visiting Scholar to Southern Illinois University at Carbondale: March – June, 2000; visit to University of Missouri-Rolla: May, 2000; visit to U.S. National Science Foundation, Washington, DC: April, 2000

The Directory operation is shown in Fig. 2. To access it, start at the iNEER Homepage, and click on the Directory logo. Users then have the option to choose "Information Retrieval" or "Information Input."

To retrieve information from the Directory, users first key in the name of the country. Current entries from the selected country are displayed in summary form as shown in Fig. 3. The summary contains the name, affiliation and fields of interest of the individual. To send an e-mail to any individual, click on the name. To display the complete information on that individual, click on the button to the right of his/her name.

To input new information or change current information, a user selects Information Input from the Directory webpage. A password is selected and retained by the user for future access to the Directory when the information must be updated.

To update existing entries for the first time, pre-registered users must employ pre-assigned passwords. The webmaster must be contacted by e-mail at the e-mail address given above to obtain these pre-assigned passwords. Only registered users can access their own data for updating or deletion. A typical data input page is shown in Fig. 4.

CONCLUSION AND INVITATION FOR FEEDBACK

The iNEER information system is in the initial phases of development. The initial system is currently operational. Access to the website and Directory is free of charge. New users are invited to spend a few minutes to key in the applicable information. At present, the Directory contains information transferred in from the databases for ICEE-1997, -1998, -1999 and –2000 as provided in their websites, Ref. [1] – [4]. Authors who submitted papers to these conferences are invited to enter the Directory and input updated and more complete information. We hope that this system will be useful in helping users with disseminating information on their current research projects, as well finding potential collaborators for future collaboration.

To aid us in improving the usefulness of this information system, we invite you to provide us with feedback and suggestions. As with all websites, the iNEER information system will be updated to the extent permitted by volunteer manpower and available resources. We invite you to be part of the iNEER community.

REFERENCES

[1] ICEE ' 97 **-** International Conference on Engineering Education -- Progress Through Partnerships, August 13-15, 1997, Chicago Marriott O'Hare Chicago, Illinois, U.S.A. http://www.siu.edu/~coalctr/icee2.htm

[2] ICEE '98 - International Conference on Engineering Education-- Progress Through Partnerships, August 17-20, 1998, Rio Othon Palace, Rio de Janeiro, Brazil http://www.ctc.puc-rio.br/icee-98/

[3] ICEE '99 International Conference on Engineering Education -- Progress Through Partnership, August 10 - 12, 1999, Technical University of Ostrava + Czech Technical University in Prague, Czech Republic http://www.fs.vsb.cz/akce/1999/icee99/welcome.htm

[4] ICEE 2000 International Conference on Engineering Education -- Progress Through Partnerships, August 13 - 18, 2000, Taipei & Tainan, Taiwan http://icee2000.nctu.edu.tw/

[5] ICEE 2001 International Conference on Engineering Education -- Progress Through Partnerships, August 6 - 10, 2001, Oslo/Bergen, Norway http://www-pors.hit.no/tf/icee01/

Fig. 1. The iNEER Home Page
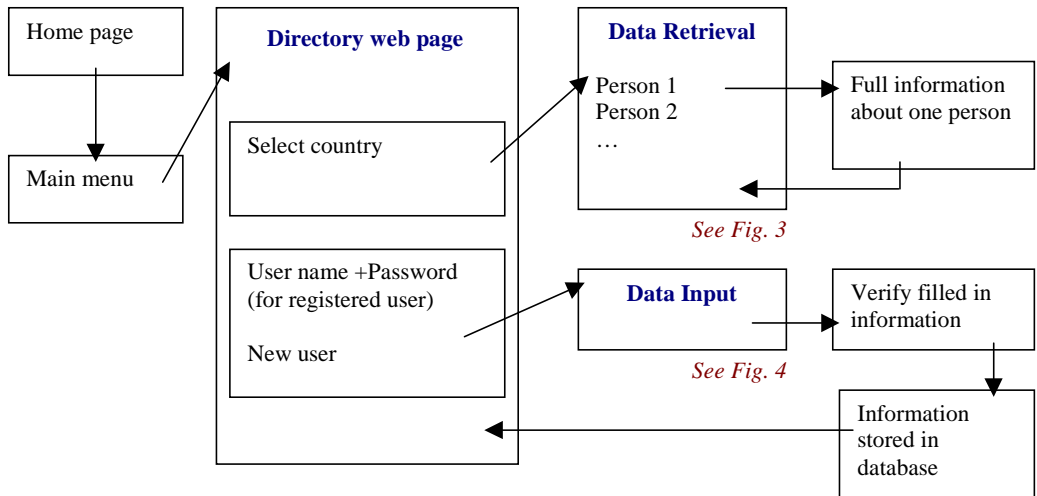
Fig. 2 Flow Diagram for the iNEER Directory
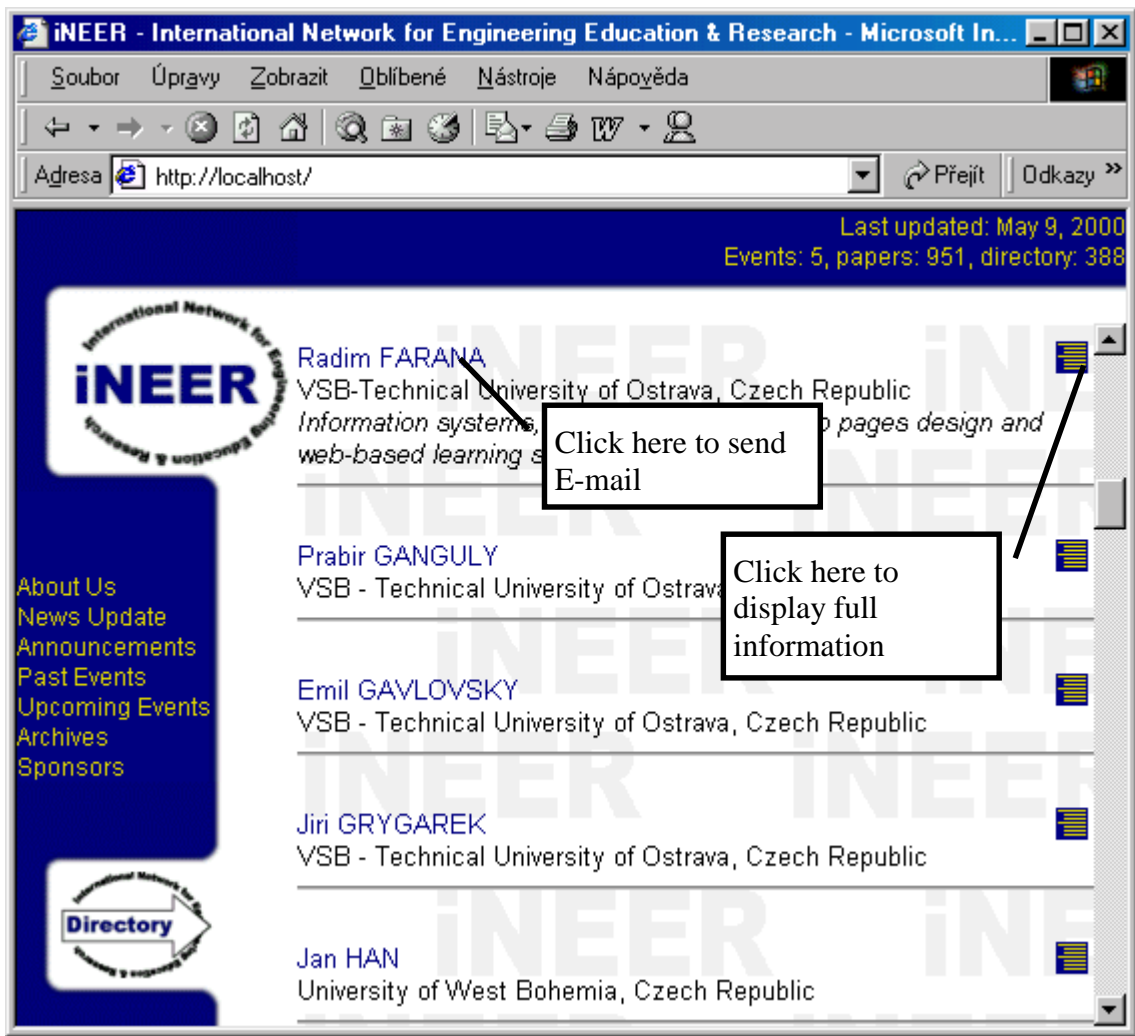
Fig. 3 Sample Results using Data Retrieval from iNEER Directory

Fig. 4 Data Input