Towards a Portal and Search Engine to Facilitate Academic and Research Collaboration in Engineering and Education

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ABSTRACT

International academic and research collaborations are of great importance at this time but currently it is not easy to search and find researchers in the engineering field in Latin America and the Caribbean. Some countries in this region, such as Colombia, have published online the curriculum vitae of its researchers and classify research group according to their productivity, but the information is in Spanish and other countries in the region do not offer the same information. Many universities in the region do not publish the names and emails of their professors. Scholar and citation databases exist but only list publications written in English. Many scholars in Latin America and the Caribbean publish in other languages, such as Spanish or Portuguese. There is a need for a creation of a portal and search engine to find Who's Who in Engineering Education in the Americas to facilitate searching for possible collaborators for future research proposals or exchanges. The Latin American and Caribbean Consortium of Engineering Institutions (LACCEI) proposes to develop such a portal with a database of universities and researchers built on top of an object-oriented architecture and include publications in English, Spanish, Portuguese and French indexed by LACCEI to accomplish their objectives of the cooperation and partnerships among member institutions in the areas of engineering education, research, and technology advancement. Here we present the some aspects of the architecture that allows someone to narrow down searches geographical or by engineering discipline.

Keywords: Academic collaboration, international collaboration, research collaboration, database, search engine.

1. THE NEED FOR AN ACADEMIC AND RESEARCH COLLABORATION SEARCH ENGINE

In this day and age, it is critical for the international competitiveness of the Americas to collaborate in research and academically with the rest of the world and increase the international visibility of its scholars and universities. Those researchers that publish in English are visible in many scholar databases and citation indexes but how can one find a researcher that is publishing in other languages? Many universities in the region do not publish the names and emails of their professors, so it is hard to locate, contact and collaborate with them. Scholar and citation databases exist but only list publications written in English. The Latin American and Caribbean Consortium of Engineering Institutions (LACCEI) intends to develop a search engine to facilitate locating and contacting possible partners for academic and research collaborations through a Who's Who in Engineering Education, a search engine and database with information of professors, researchers and universities in Latin America, the Caribbean and other parts of the world interested in collaborating with this region. It currently has more than 3000 authors in the database that have published within LACCEI and lists their publications. We present here some aspects of the object-oriented architecture of the search engine. We use the Unified Modeling Language (UML) to express the structure and relationships. When completed the goal of the LACCEI portal is to have a complete system where any person could find the information related to Engineering Education and the network of people working in this field, particularly in Latin America and the Caribbean, and at some point in another countries.

2.1. BACKGROUND AND RELATED WORK

There are some sites that offer some information about universities in the region but do not provide for the type of search this project requires. A search of the web resulted in the following databases or listings: Altillo [ALT], Universia [UNI], Universidades24 [UNIV], CEPS

[CEP], COLCIENCIAS [COL], Google Scholar [GOO], LinkedIn [LIN]. More description on this is founded in the student paper.

2.2. THE MODEL

The startup point with the design and search is the geographical area that will make the link to all the countries, states or regions within the country, and then to all the institutions. Initially LACCEI will populate the detailed information provided by their more than 150 member institutions, and provide basic information to other Engineering institutions. Figure 1 (student paper) shows the structure and relationships between the Institution and other classes that permit to narrow down the search by drilling down through the geographical area in Geoarea through its composition relation. The class Country stores de ISO 2 character standard country abbreviation, the countries name, flag, and telephone country code. Not shown are the Subregion of a country, called State for the USA, and varies in name depending on the country. Also the schema captures the complex structure of an educational system, such as University of California System, and its campuses and sub-campuses through the composition relation.

The persons in the database, represented in Figure 2 (Student paper), are associated to Institution through the classes Employee, Student, Alumni, or Member. The Person class stores the given names under PersonName and their last names under PersonLastName to allow for complex and multiple names. The PersonEmail and PersonPhone allow multiple emails and telephone numbers to be attached to a person, to designate if it is their primary email, and whether to display it. All contact information defaults to private. The type designates whether the email is position dependent, work, personal.

All LACCEI publications have been included in the database and linked to their author, permitting the person's publication to be shown in their detail. Each publication is classified by the track under which it was submitted to a conference or publication, allowing the database of publications to be searched by field. The LACCEI publications are published with ISBN number and available free online. They are being indexed additionally by Google Scholar, LATINDEX, Caribbean Search, Fuente Académica Premier de EBSCO Publishing, INSPEC by IET, Publindex in Colombia, and more indexing is being currently submitted [LAC]. This indexing and the LACCEI search engine will provide more visibility to the researchers.

The phases to follow in the project are explained in the student paper in more detail, but the primary key for the internal search and updating of the information by the individual is the email of the person. This will be used as the login in the LACCEI web page that will permit editing of one´s personal information. Moreover it is important to consider in the design the complexity of the institutions, because some universities will have campuses and those campuses will have sub-campuses. Figure 3 (student paper) shows the structure and the link between person, participant of the conferences and author of papers and journals.

3. CONCLUSIONS

This Portal and Search Engine in Latin American and Caribbean Consortium of Engineering Institutions (LACCEI) for Who's Who in Engineering Education will provide access to the database with information of professors and researchers and universities interested in collaborating with the Latin America and the Caribbean and their related work in designated disciplines. The design and development of the proposed search engine of the LACCEI database will benefit any person who needs to search for collaborators. The LACCEI database currently contains information on 3000 registrants and authors and their publications within LACCEI. LACCEI intends to honor the privacy of individuals by allowing them to keep their contact information private, yet allowing the visibility of their research and their university and research groups to be increased to foster international collaboration.

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