

# **A comparison of most common social networks to create an UML model 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. Many universities in the region do not publish the names and emails of their professors.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 in the areas of engineering education, research, and technology advancement. In the current paper, it has been researched about some common social networks such as Facebook, LinkedIn and Academia. It has been developed their database model and it has been studied in order to produce a proposed model for LACCEI. Here there are some aspects of the architecture that allow someone to narrow down searches and find pairs in the academic research area.

## **1. OVERVIEW**

LACCEI intends to develop a social network to facilitate locating and contacting possible partners for academic and research collaborations. It will be 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. The UML

model developed in this work will represent the basic structure of a social network for academic purposes. The most important aspects of a search engine and a social network model are shown in an object-oriented architecture. It was used the Unified Modeling Language (UML) to express the structure and relationships. It contains a complete research as a comparison with some of the most common social networks used nowadays by people. It also involves the approach of some social networks considered most relevant such as: Facebook, LinkedIn and Academia.

## **1.1 MODELS COMPARISON**

It corresponds to the Grounded Theory approach, which systematically analyzes the recorded data with an established qualitative research method. Martin and Turner (1986) stated by Walter D. Fernandez, indicate that they created the Grounded Theory approach as an "inductive theory discovery methodology that allows the researcher to develop a theoretical account of the general features of the topic while simultaneously grounding the account in empirical observations of data".

By merging all the authors's ideas, the procedures will allow the identification of patterns in data, and by analyzing them, a theory can be derived as valid. Additionally, the construction of Cooperative Information Systems helps any system to integrate the different entities considered as data, application, model, process and others, to have a global view of all information systems with the objective to communicate and cooperate. In the following paragraphs, the comparison between the models will reproduce the integration of the three. This integration will follow two basic steps:

1. Comparison: It will be based on a set of rules. The purpose will be to identify the correspondence between all the elements from the models.

2. Integration: It will integrate the models mapped in the previous step. The integration strategy to pursue will depend on which elements will be organized and are expected for the result model. Some rules of incorporating elements that do not belong to the original model and enhance the result model.

For instance, another aspect that was considered in the comparison was the specific approach. It could include: syntactic approach, semantic approach, local structural approach, global structural approach, and hybrid approach. In this case, the approach used was hybrid, which combines two, three or four types of comparison. The semantic approach compares the meaning associated with the compared items and a global structural approach where the comparison of the elements are related to the elements to compare. It compares the global structure of two relations which corresponds to the comparison of the classes connected by these relations. (S. Benabdellah Chaoui, M. Fredj, and S. Mouline, 2011).

## 1.2 COMPARISON OF COMMON CLASSES

The analysis of the common classes includes the classification into categories of some of the elements, classes and association classes; also, they determine the relations between categories and describe each category according to its properties. The categories were classified into core categories considered as the most important to compare such as:

- Person- Relationship- Education Work- Experience- Interest Area & Skill- Organization & Group & Network- Message

For each core category, the design of each class and its association classes that is been involved will be shown by model. For the rest of the classes the figures will be included in another publication but are listed in the current appendix.

## 2. ENHANCEMENTS

Each of the models analyzed have a particular area in which they emphasize their behavior, a complete organization of an special category (class), or some aspects that are considered original. These elements do not belong to all of them, but they represent an enhancement separate from the common classes with the aim to point out those aspects for future reference in a proposed model. They are:

University- Education- Paper- Interest& Research  
Area- Event- Skill

In summary, by the analysis given previously from the comparison between Facebook, LinkedIn and Academia social networks, there are some common aspects to consider in the creation of new models. Using the Grounded Theory, the research developed a discovery of various enhancements and original classes to be part of the observation data. The next chapter demonstrates the development of the second step called integration that organizes and matches all the information from previous steps for an expected proposed result model.

## 3. CONCLUSION

This social network and search engine in 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.

## REFERENCES

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