



Maestría en Ingeniería en Sistemas y Computo Inteligente

Title

**Content management of Mlnv based on social
networks analysis**

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1. Introduction

A **social network** (SN) is a service that allows individuals to 1) construct a public or semi-public profile in a system, 2) have contact lists and 3) view and traverse their own contact lists and those made by others within the system [Boy and Ellison 2007].

Frequently, the nature and nomenclature of these connections vary from one SN to another. The literature classifies SNs according to the study area in horizontal SN and vertical SN. According to [Ponce 2014], a vertical SN (also called a thematic social network, TSN) is focused on a specific topic.

MInv is a TSN with content about research methodology, this includes contents such as presentations, text and videos. Users provide feedback about these kinds of materials.

2. Aims

The **general aim** is to implement a decision support system about MInv content based on static and semantic social network analysis. The **specific aim** reported in this paper is to construct an ontology that describes MInv content and relationships between users.

3. Design and implementation of social ontology MInv

According to [Gruber 1993], ontologies have five components: concepts, relationships, functions, axioms and instances. The following sections describe how these components are used in a social ontology of MInv.

3.1 Concepts

The concepts or classes define a hierarchical structure or taxonomy that models the vocabulary of a domain. Figure 1 shows the main concepts of the proposed ontology. These concepts are grouped in types of users and types of documents.

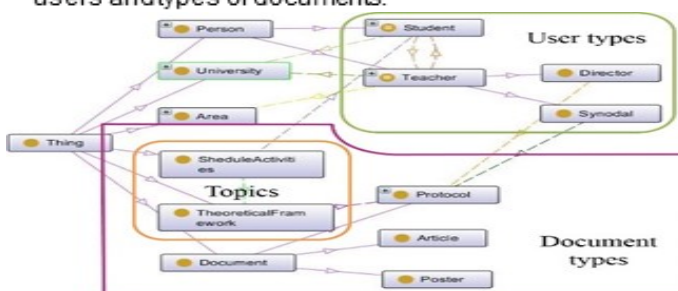


Figure 1. Hierarchy of concepts of the social ontology for MInv

3.2 Relationships

Interactions, relationships or object properties represent links between concepts of a domain. Figure 2 shows some relationships of social ontology of MInv.

Data properties are another type of relationships, they are used to assign attributes that can define a concept

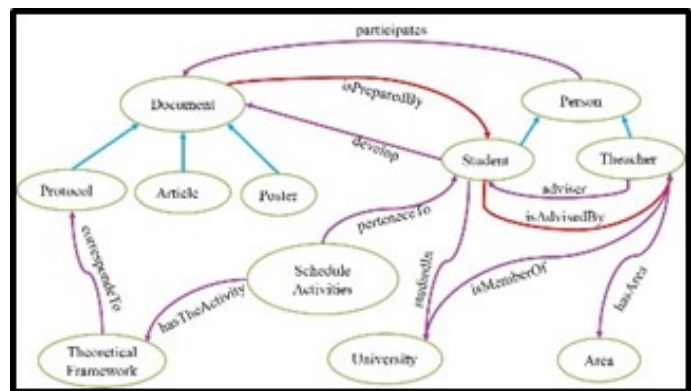


Figure 2. Examples of object properties of the social ontology of MInv

3.3 Functions

Functions are a special type of relationship where an item is identified by calculating a function (operation) that involves some elements defined in the ontology. For example, a function is used to model the number of credits that a student has coursed.

3.4 Axioms

Axioms are used to model facts, they declare the relationships that are assumed to be truth. Axioms allow a reasoner to infer knowledge that is not explicitly stated in the hierarchy of classes. Axiomatization of object properties types may be functional type, inverse functional, transitive, symmetric, asymmetric, reflexive or irreflexive.

Table 1. Axioms of some object properties

Relationships/ Axioms	adviser	develop	isPreparedBy	has/Area	isMemberOf
Functional	X	X	X	X	X
Inverse functional	X		X		
Transitive					
Symmetric					
Asymmetric	X	X	X		X
Reflexive					
Irreflexive	X	X	X	X	X

3.5 Instances

Instances represent specific objects of a concept. Figure 3 shows some examples of instances that populate the social ontology of MInv.



4. Proof of concept implementation

A proof of concept is defined as the process of using quantitative methods and qualitative methods to evaluate feasibility, the purpose is to verify that any concept or theory has potential to be used.

In our case, the objective of a proof of concept is to evaluate concepts, relationships and instances of the social ontology for MInv through the feedback of potential users. We have designed a questionnaire to collect this information and we have applied it to the sample that is shown in Table 2. The abbreviations of the columns refer to four academic programs of the Postgraduate Department at the Universidad Politécnica de Puebla (UPPuebla)

Table 2. Population of the Postgraduate Department at the UPPuebla

Population					
	MIAPI	MIDB	MISCI	MGIT	Total
Teachers	4	3	5	4	16
Students	17	7	11	30	65
Sample 20%					
	MIAPI	MIDB	MISCI	MGIT	Total
Teachers	1	1	1	1	4
Students	3	1	2	6	12

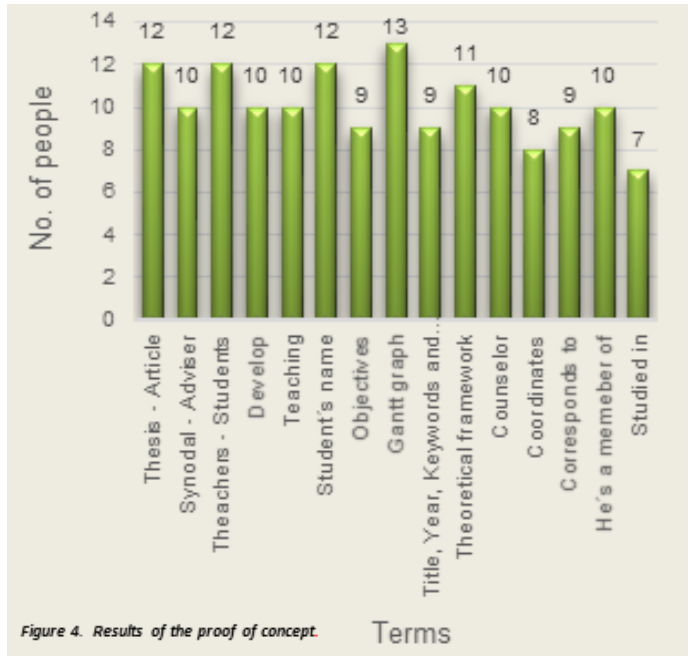


Figure 4. Results of the proof of concept

5. Conclusion

The results obtained through the questionnaire that implements a proof of concept showed favorable indicators about the terms used in the social ontology of MInv for concepts and relationships. Most people surveyed found that these elements are often used to represent the style of work in our academic community. As future work, we plan to design a set of queries that allow us to exploit the proposed ontology.

References

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