Chapter 48
Towards a Unified Semantic Model for Online Social Networks to Ensure Interoperability and Aggregation for Analysis

Asmae El Kassiri
Mohammed V University, Morocco

Fatima-Zahra Belouadha
Mohammed V University, Morocco

ABSTRACT

The Online Social Networks (OSN) have a positive evolution due to the diversity of social media and the increase in the number of users. The revenue of the social media organizations is generated from the analysis of users’ profiles and behaviors, knowing that surfers maintain several accounts on different OSNs. To satisfy its users, the social media organizations have initiated projects for ensuring interoperability to allow for users creating other accounts on other OSN using an initial account, and sharing content from one media to others. Believing that the future generations of Internet will be based on the semantic web technologies, multiple academic and industrial projects have emerged with the objective of modeling semantically the OSNs to ensure interoperability or data aggregation and analysis. In this chapter, we present related works and argue the necessity of a unified semantic model (USM) for OSNs; we introduce a kernel of a USM using standard social ontologies to support the principal social media and it can be extended to support other future social media.
INTRODUCTION

In this chapter, we argue the advantages of the OSN semantic modeling, the advantages of Unified Semantic Model, and we investigate related works.

The idea is to use a Unified Semantic Model USM to present different social media for aggregating data from these media. The model reuses the existent social ontologies, more precisely FOAF, SCOT, MOAT, AMO, SKOS and SIOC. To respond to needs not covered by these ontologies, it uses three other ontologies ActOnto, InterestOnto and AclOnto extending the SIOC ontology.

The USM is not only an aggregation model from OSN, it is also an interoperability model supposed allowing to a user migrating from a media to another with his profile, his relations and his posts. It will facilitate comprehension between social media to cooperate for a better management of users’ data. It can be used as a storage model for social networks data what allow simplifying the social mining process.

Many factors motivate us to think that the idea of adopting a unified semantic model seems relevant:

- The evolutionary success of OSN;
- The phenomenon of purchasing the small actors of OSN by the giants, such as the purchase of Tumbler by Yahoo in May 2013, and Facebook who bought Instagram, Whatsapp and Oculus in 2014. The USM could allow having the same model for these different social medias and simplifying their data aggregation and analysis;
- The academic attempts to federate and unify some existent ontologies like MUTO (Lohmann, 2011) (Kim, Scerri, Passant, Breslin, & Kim, 2011);
- The necessity of ensuring the interoperability between OSN proved by the OGP;
- The adoption of the W3C of the FOAF, SKOS and SIOC as standards;

BACKGROUND

Mika was the first to thought to a semantic model for OSN (Mika, 2005), and then Chen and al. studied a method based on social network ontology to annotate nodes and edges (Chen., Wei., & Qingpu, 2010). Others proposed their proper ontologies; we cite for example the SNO (Social Network Ontology) (Masoumzadeh & Joshi, 2011), the SNS (Social Network Sites) Ontology (Kumar & Kumar, 2013) and the TPO (Tours Plan Ontology) limited to tourism social medias (Luz, 2010). These models are suited to analyze some kinds of OSN and for some cases but not to ensure their interoperability. While the unified semantic model USM must model the pertinent existent OSN and be easily extended to support other OSN.

The social web has raised lot of attention from the semantic community, so several ontologies are used to represent OSN. We class them into four principle categories: User description, online activities, tagging and access management.

User Description

The FOAF (Friend Of A Friend) (Brickley & Miller, 2014) is the ontology proposed to describe users’ profiles. The FOAF project was launched in 2000 with the objective of creating web documents network. The documents must be understandable by machines and describe persons and their relationships; then