# OU Social: Reaching Students in Social Media

Miriam Fernandez, Harith Alani, Stuart Brown

Knowledge Media Institute, UK
m.fernandez, h.alani, stuart.brown@open.ac.uk

**Abstract.** This work describes OU Social, an application that collects and analyses data from public Facebook groups set up by students to discuss particular Open University courses. This application exploits semantic technologies to monitor the behaviour of users over time as well as the topics that emerge from Facebook group discussions. The paper describes the architecture of OU Social and provides a brief overview of the analysis results obtained from 44 different Facebook groups examined over a 6 year period (2007-2013)

**Keywords:** semantics, social media, education

## 1 Introduction

The Open University (OU) is the largest university in the United Kingdom and the leading distance teaching institution in the world. The OU courses are directly available throughout Europe and, by means of partnership agreements with other institutions, in many other parts of the world.

Given its on-line learning profile, one of the key goals of the OU is the constant research and development of online learning and teaching solutions based on the analysis of usage data and on the feedback provided by the users about their experiences. To acquire this feedback the OU has created several websites and applications were students can discuss the different courses and share their learning experiences. This information, as well as OU's website usage data, is currently being collected and processed as part of the OU's usage data analytics process. However, there are other rich and rapidly growing sources of user feedback that are external to the OU, which could also be collected and investigated. With the emergence of social media, online learning is no longer restricted to particular in-house sites, but there is a clear tendency for students to share and discuss their learning material, methodologies and experiences on popular social networking sites, such as Facebook and Twitter. [1]

This paper presents OU Social, a prototypical tool for collecting and analysing content from a large set of relevant Facebook public groups. These groups have been specifically set up by Facebook users to bring together other students who

[1] http://www.eric.ed.gov/PDFS/ED535130.pdf
http://www.topuniversities.com/sites/qs.topuni/files/Students-Online-Useage-Global-Trends-Report-2013-nc.pdf

enrolled in particular OU courses or modules. The designed tool integrates two semantic analysis modules: (i) the behaviour analysis module, which categorises users into different behavioural roles (leaders, followers, etc.) by using a semantic-rule based methodology and, (ii) the topic analysis module, which extracts and monitors the concepts that emerge from Facebook groups discussions (using a semantic annotation system). Data extracted from these modules is enriched via the OU's liked data portal (data.open.ac.uk) to provide a better overview of the courses under analysis.

The rest of the paper is structured as follows: Section 2 presents the architecture of the system and provides a brief overview of the semantic analysis modules. Section 3 presents some preliminary results obtained by this tool after analysing 44 different Facebook groups over a 6 year period (2007-2013). Section 4 concludes the paper and outlines future work.

## 2 System Architecture

This section describes the architecture of OU Social and provides an overview of its components. A video of this demo is available under http://people.kmi.open.ac.uk/miriam/OUSocial/OUSocialVideo.mov. The demo is not publicly accessible to avoid disclosing private student information.

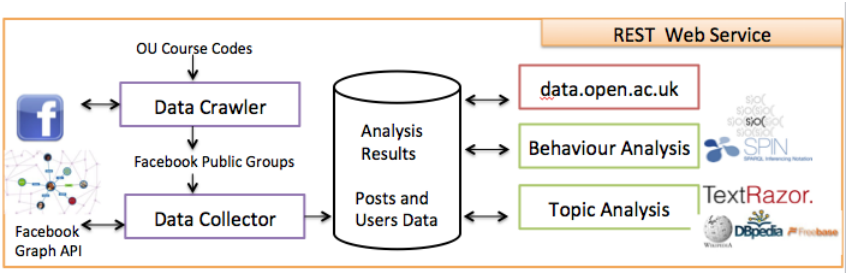


**Fig. 1.** OU Social Architecture

***Data Collection:*** Departing from the list of OU course codes, a crawler has been developed that extracts the name of all those Facebook public groups and pages containing a course code (e.g., B120) and the words "Open University" or "OU". For each of these groups information about users and posts is extracted (by using the Facebook Graph API[2]) and stored in an internal database.

***Behaviour Analysis:*** The Behaviour Analysis component shows the type of people discussing a particular topic or concept of interest with regard to their online behaviour. It allows the OU's course managers to focus on a smaller, more manageable, set of students (read their contributions, monitor their opinion, etc.). The analysis module not only identifies those students that are mostly active (e.g., leaders, contributors) but also those who are generally inactive and may need additional learning support (e.g., lurkers, followers). Specifically, this

[2] https://developers.facebook.com/docs/reference/api/

analysis distinguish among eight types of user roles: Lurker, Follower, Daily User Contributor, Broadcaster, Leader, Celebrity and Super User. This analysis module makes use of the OUBO (Open University Behaviour Analysis Ontology) and the SIOC (Semantically Interlinked Online Communities ontology) ontologies to model the behaviour of users in the different Facebook groups. To infer the different roles that a user adopts over time the module applies semantic rules encoded using SPIN (e.g, if popularity=high and contribution=high then role=leader). For more details of this model, the ontologies and the role extraction process, the reader is referred to the following publication [1].

***Topic Analysis:*** Questions, answers, discussions, learning material, etc. are distributed and shared via social networking sites. Detecting what are the topics that emerge from these discussions can help to identify emerging issues with respect to certain elements of interest to the OU. To obtain the topics for each post the analysis component makes use of TextRazor [3], a natural language processing tool based on knowledge bases such as Wikipedia, DBPedia and Freebase. TextRazor identifies key entities and topics in a piece of text, returning a mapping between each posts and a list of URIs.

***Data Enrichment*** To complement the results of the analyses with concrete information about the courses discussed in the Facebook groups, course information is extracted via SPARQL queries from the OU's linked data site (data.open.ac.uk). E.g., the OU maintains a taxonomy of course categories (science, chemistry, ...) that complements the results obtained by the topic analysis.

## 3 Analysis Results

An initial analysis have been conducted for 44 different Facebook groups over a period of six years, from 2007 till 2013, including a total of 136,704 posts and 19,094 users. The demo aims to show conference attendees how different analyses can be performed using this tool and how the use of semantic technologies can help course managers and university staff to productively exploit social media to obtain relevant feedback. Figures 1a and 1b display two examples of the OU Social analyses. Figure 1a displays a tag cloud visualising the relevant topics across all Facebook groups. Among these top topics we can find People, Works, Network Protocols, Behavioural Sciences and Educational Technology. This visualisation can also be obtained for each group individually. Additionally, the tool also allows the visualisation of the evolution of topics over time. Wikipedia links are provided for each of the displayed topics thanks to the information provided by TextRazor. Regarding the behaviour analysis, Figure 1b displays an example of the role composition for the community built around the M263 Facebook group. We can see the evolution of the different roles over time. At the beginning, during the creation of the group, it was mostly composed by inactive users (lurkers and followers) but between the end of 2011 and the beginning of 2012 a mixed of different roles was present in the community, including leaders

[3] http://www.textrazor.com/

and super users, which are the most active an engaged roles. The application allows monitoring the role composition over time for all Facebook groups as well as monitoring the behaviour of individual users. For a particular user the application displays her role path (the different roles that the user adopts over time) in all Facebook groups where the user has participated. Studying the user's behavioural paths can help us to detect particular patterns that students follow before dropping or loosing interest about course. Note that each of the studied Facebook groups is linked to a particular OU course. To obtain information about the course, therefore complementing the results of the analyses, we make use of the OU's linked data portal (data.open.ac.uk). Using different SPARQL queries we can obtain information about OU courses, their title, description, available locations, required level and categorisation, among others.


Figure 2.1 Top Topics across Facebook groups

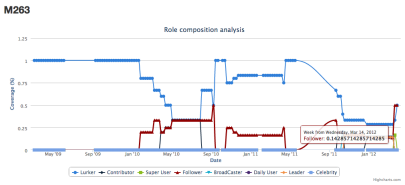


Figure 2.2 Behaviour analysis for group M263

## 4 Conclusions and Future work

This paper presents OU Social, a semantic social media analysis platform developed to collect and analyse students' feedback about OU courses expressed in Facebook public groups. The prototype is based on two semantic analysis modules that identify the behaviour of users and the emergent topics over time. Information about the courses is also integrated into the system by exploiting the OU's linked data portal. As seen by the video, extensions can be added to this prototype to facilitate the daily work of course managers. We are currently looking at tools like Google Trends (http://www.google.co.uk/trends/), Meltwater Buzz (buzz.meltwater.com), etc. to select visualisations that can better display the result of the analyses. Despite the existence of many other social media analysis tools in the market, OU Social is specifically designed to fulfil the needs of OU course managers. Apart from the interface extensions we are currently working on the integration of students historical data. This will enable correlating their behaviour and topic interests with their performance in different courses, providing the bases for more sophisticated analyses.

## References

1. M. Rowe, M. Fernandez, S. Angeletou and H. Alani. (2012). Community analysis through semantic rules and role composition derivation. Web Semantics: Science, Services and Agents on the World Wide Web.