



# *Extending MOOC ecosystems using web services and software architectures*

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**Interacción 2015**

**7 - 9 September 2015, Vilanova i la Geltrú - Spain**



# Outline

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1. Introduction
2. Aims and goals
3. iMOOC Platform
4. Architectural Proposal
5. Services and crawlers
6. Results
7. Conclusions
8. References





# Introduction

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MOOC paradigm opened new possibilities in eLearning, breaking some traditional limits and establishing new ways of interaction with knowledge and people involved in learning processes

# Introduction

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The combination of MOOCs platforms and other systems used nowadays for enhance eLearning (social networks i.e.) allows enhancing the learning process, building up ubiquitous learning ecosystems where the knowledge is available in a multi-context way for the students



# Introduction

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We use a services-oriented software architecture to allow teachers and managers of MOOC platforms know how the students utilize external tools like social networks and allowing them to gaining insights about how they interact with the knowledge outside the MOOC platform



# Introduction

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These insights retrieved from analyzing the students interaction with tools and knowledge can be used to improve MOOC platforms and fix certain flaws of this kind of systems like high dropout rates, etc.





# Aims and goals

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1. Define workflows and models for obtaining information about users' interaction in MOOCs and auxiliary systems utilized
2. Build a minimal system that allows to retrieve this information
3. Provide tools to determine the users' interests and preferred topics related to the MOOC's contents
4. Based on the information retrieved and the analysis, understand the students' interaction with knowledge outside the MOOC and determine the kind of learning students perform, understanding by this way how are learning the users

iM00C

### 3. iM00C Platform





# iMOOC Platform

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1. Emerged in 2013 due an agreement among Technical University of Madrid, University of Zaragoza and University of Salamanca
2. MOOC platform based on a non-traditional approach that introduces adaptivity in the learning process
3. This MOOC platform is based on Moodle technologies
4. Each different course hosted could include other learning strategies apart of the adaptivity, such as gamification, services for cooperative learning, etc.

<http://gridlab.upm.es/imooc/>

# iMOOC Platform

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1. The iMOOC platform hosted the course “Social Networking and Learning” used for tests the proposed approach and technical solutions developed by researchers
2. The course had 793 students enrolled, finally 183 students finalized the course
3. The course incorporated activities, discussions and videoconferences using social networks to complete the MOOC course. This research tries to gain insights from these activities



Image by Sven Brendel  
<https://flic.kr/p/dToVGL>

## 4. Architectural Proposal





# Architectural Proposal

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The software architecture proposed intermediates between iMOOC platform (Moodle) and social networks (Twitter, Google+) to retrieve and analyze the information about MOOC students

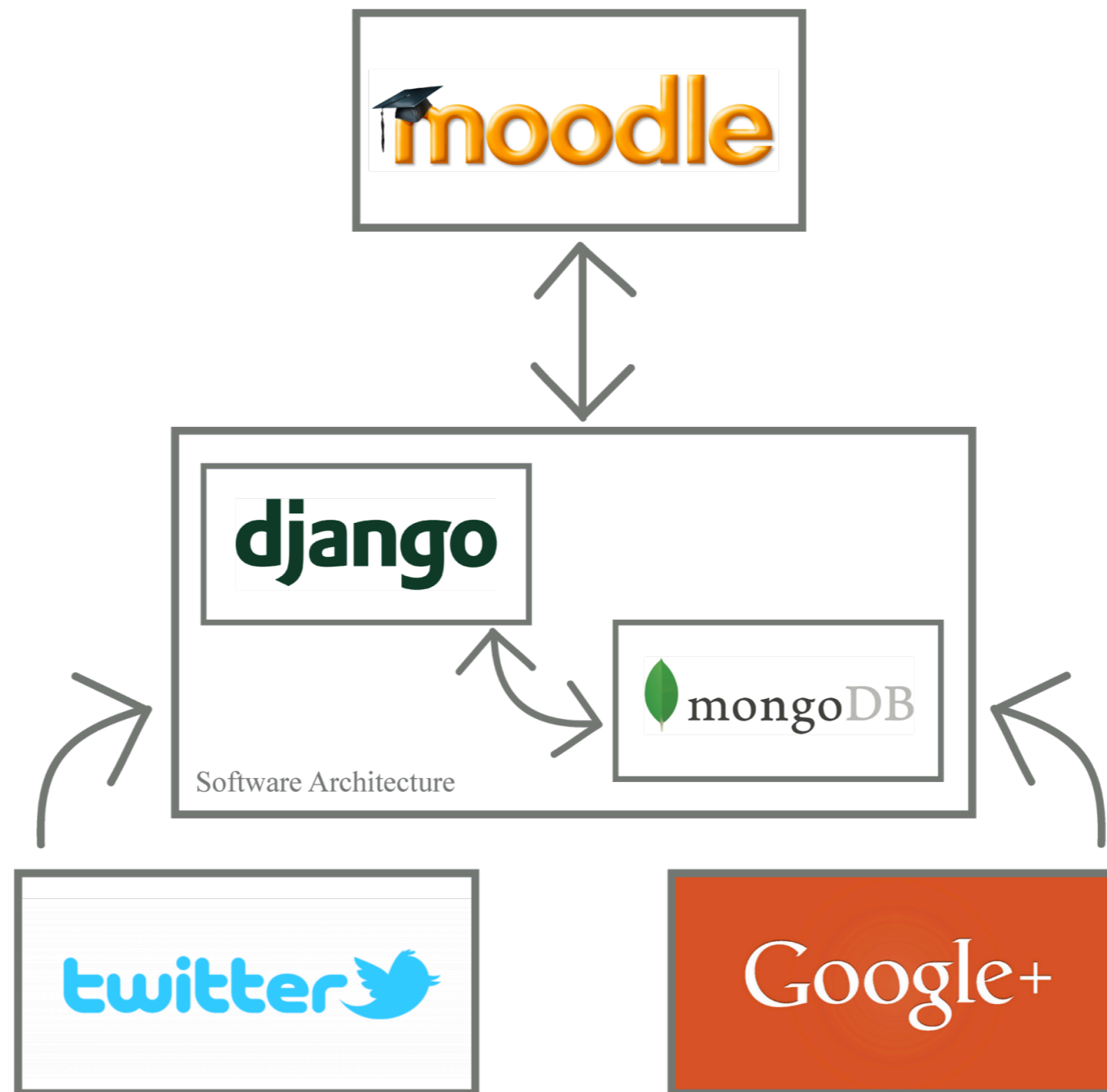


# Architectural Proposal

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The technology used for the architecture is based on Django (Python Web framework) and MongoDB (NoSQL database)

# Architectural proposal





{ REST }

Image by  
<https://techjoomla.com/rest-api-for-joomla>

5. Services and crawlers



# Services and crawlers

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The services are facilities provided by third-party software to facilitate the communication and interconnection with other systems, applications or clients. In this case, researchers have used services for retrieve Information from Moodle and Twitter



# Services and crawlers

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The crawlers are software applications that find automatically information in third-party systems when they do not provide services for pull and push information between systems

In this case we are working on crawlers for getting information from Google+ Communities (Google+ does not provide API or other services to get and post activities and other information within the communities)

# Services and crawlers

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Example code of APIs utilization available in Github

<https://github.com/juan-cb/interaccion2015>



## 6. Results



# Results

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Using the architecture, services and crawlers, authors were able to retrieve information of more than 300 publications in Google+ and more than 100 tweets from Twitter (as well as users' interaction with these publication, including +1s, replies, retweets, etc.)

<b>Total interactions</b>	<b>Twitter</b>
<b>Publications</b>	108
<b>Replies</b>	17
<b>Retweets</b>	42
<b>Favorites</b>	45

Interactions with MOOC contents and proposed hashtags in Twitter

# Results

Depending the hashtags and information related to the publications in the social networks, researchers are able to distinguish the kind of learning performed by students

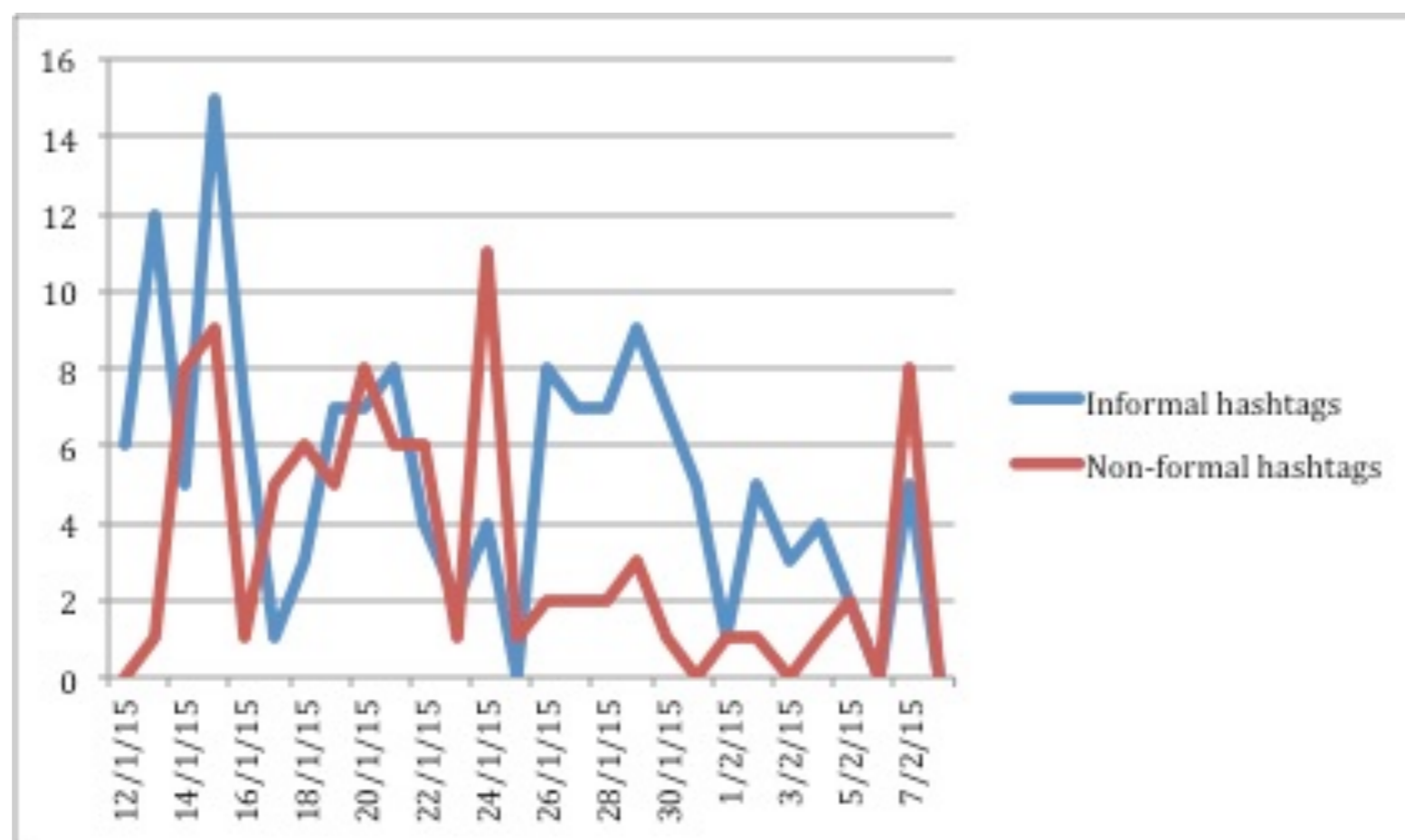
	<b>Total #</b>	<b>Different #</b>	<b># misspelled</b>	<b>Users using #</b>
<b>Non-formal</b>	128	8	8	37
<b>Informal</b>	144	82	-	43
<b>Total</b>	272	90	-	23 (both types)

Distribution of posts and contents in Google+ community

# Results



Depending the hashtags and information related to the publications in the social networks, researchers are able study the learning process related to the different activities







Digital-eye by onix15  
<http://www.deviantart.com/>

## 5. Conclusions



# Conclusions

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- The integration of MOOCs and social networks is currently adopted by MOOC courses to expand non-formal and informal learning
- This integration expands the students' interaction with MOOC contents and other users (students, teachers, etc.)
- Using software architectures, services and crawlers, the MOOC managers can retrieve information about the activity related to MOOC in social networks
- The analysis of this information retrieved can help to assess students' learning performance and the kind of learning performed
- These analyses and integrations can help to open new possibilities in MOOC results and performance, by using the information analyzed to improve, for example, the adaptivity and collaboration in MOOCs



Books by vladstudio  
[www.vladstudio.com](http://www.vladstudio.com)

MadStudio

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# Citation

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This paper may be cited as following way

Cruz-Benito, J., Borrás-Gené, O., García-Peñalvo, F. J., Fidalgo-Blanco, Á., & Therón, R. (2015). *Extending MOOC ecosystems using web services and software architectures*. Paper presented at the 16th International Conference Interacción 2015, Vilanova i la Geltrú, Spain.



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