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How Do Universities Use Social Media?
An Empirical Survey of Italian Academic Institutions

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Abstract: This work describes how Italian universities use social media, with a focus on Facebook and Twitter. Empirical data about the online features and behaviour of the social media accounts of Italian universities was gathered using several qualitative and quantitative data collection techniques, including automatic data collection, ad-hoc Application Programming Interface (API) queries and information obtained from the university personnel managing the accounts. The results of the 'SocialUniversity' project show that most Italian universities have active social network accounts; that Facebook is the platform of choice to answer the students' questions, while Twitter serves mostly as an online news channel; that Italian universities on average use social media platforms generally better than the Italian public administration; that in the specific subset of technical universities, a few Italian institutions have an online footprint comparable to some of the top European technical universities (e.g., the Swiss Federal Institute of Technology in Zurich).

Introduction and Motivation

Public agencies consider Facebook, Twitter, and other social media platforms (SMPs a cost-effective method to reach large audiences (Bertot et al., 2010, Ab Hamid et al., 2007). Universities do not represent an exception: their communication strategies, in fact, increasingly rely on SMPs to complement the traditional communication channels.

Assessments of the use of SMPs by universities are starting to appear (Aquilani and Lovari 2009, Aquilani and Lovari 2010, Giglietto and Lovari 2012, Jeopen 2012), but the topic is still largely

underexplored. In this work we present the results of SocialUniversity, an empirical analysis of how Italian universities use SMPs, with a specific focus on Facebook and Twitter. The latter are respectively the first and third most popular SMP in Italy, both among the entire population with internet access (41.3% are on Facebook, 5.4% are on Twitter) and the young (69.6% of people with internet access in the age bracket 14-29 have a Facebook account and 7.5% have a Twitter one)[1]. SocialUniversity'scope is bound to the inspection of marketing, press and administration-to-student communications in the witten form, thus it doesn't focus on the second most popular SMP in Italy, YouTube[2], as it's a video sharing platform. YouTube is widely used by universities for posting promotional and informative footage, but usually this latter is shared via Facebook and Twitter too.The case of the Italian universities is particularly amenable to empirical research for two reasons. In the first place, because the number of Italian universities is relatively small[3]. Secondly, because Italian universities are fairly homogeneous, i.e., there is no formal distinction between research and teaching universities, facilitating comparisons.

To better understand the dimension of the Italian universities presence on the SMPs, we benchmark the Italian universities SMP presence with the SMP presence of the Italian public administration; also we benchmark the Politecnico di Torino with the SMP presence of five top European and Italian universities. To perform the comparison with the Italian public administration, we use the data collected by Giovanni Arata's #socialPA study (Arata 2012, 2013), with which we share elements of the methodology as well as some data collection techniques[4]. To perform the comparison with a few European universities, we use the data specifically collected for this study. The rest of this paper is organized as follows. In Section 2 we describe the related works. In Section 3 we describe the data collection methodology that we adopted. In Section 4 we present the data that we collected, including the comparison with the Italian public administration and with a few top-level European universities. In Section 5 we draw the conclusions.

Related Works

Regarding the academic use of social media, Aquilani and Lovari investigated the opportunity and necessity for Italian universities to be active on SMPs. They inspected grassroots communities at "La Sapienza" university in Rome to assess whether students were interested in talking about campus life on Facebook, and to assess which topics they discussed (Aquilani and Lovari, 2010). In a follow-up work, they also surveyed students on their willingness to interact with their university (Aquilani and Lovari, 2012). A related study focus on the definition of performance indexes to measure the Italian universities' overall social media presence (Lovari and Giglietto, 2011), following the methodology introduced by Jeopen, who measured the social media visibility of several UK universities (Jeopen, 2012).

The #socialPA study by Giovanni Arata (Arata, 2012, 2013) was the primary blueprint for this work. The #socialPA analysis encompassed all levels of Italian public administrations, from

[1] Censis/UCSI

[2] 38% of Italians with internet access have an account on Youtube, (Censis/UCSI)

[3] According to the Italian Ministry of Education, University, and Research (MIUR), in fact, in 2012 there were 96 universities that served over a million and a half students (MIUR, 2012).

[4] In particular, we use an enhanced version of the tools that Giovanni Arata used in the last version of the #socialPA report to perform custom queries using the Facebook API.

municipalities to regions, and includes data on social accounts management, level of openness of Facebook accounts, recognizability (i.e., the correct usage of the profile information), existing policies, posting frequency and awareness of social-networking-sites inherent features, e.g., hashtags and mentions.

Unlike the other parts of the Italian public administration, which are highly-diversified, Italian universities represent a fairly homogeneous set, at least as far as institutional purposes are concerned. Moreover, the number of Italian public administrations (about 8,000 according to the Italian National Institute of Statistics (ISTAT, 2013) is significantly larger than the number of Italian universities, i.e., 96 according to the Ministry of Education, University and Research[5]. However, the #socialPA data collection and analysis methodology (which is detailed in the next Section) remains valid also in the university context and therefore was adopted for this work. The computer[6] code developed by one of the authors of this paper to query the Facebook APIs for the last #socialPA report was enhanced and employed to collect data about universities.

Methodology

To collect information on the Twitter and the Facebook accounts of Italian universities we used the following workflow, which is based on the #socialPA workflow:

1. we manually searched for the universities accounts on the universities' websites, as well as on Facebook and Twitter; also, in some cases, we also manually inspected the Facebook pages, to extract information that it was not possible (or practical) to retrieve by using the Facebook APIs;

2. also, we added the Twitter and Facebook accounts that we found to the Social Proxy[7] data-collection platform, developed by Net7[8], that we used to automatically follow the online behavior of such accounts;

3. moreover, we used a Java program, which is a significantly-enhanced fork of the code used for the last #socialPA report, to perform more specific Facebook-and-Twitter API queries that were not possible with Social Proxy;

4. finally, we contacted the people in charge of managing the social media accounts of each university, to ask questions on their management strategies.

Of course, because of the social nature of the survey, and because we used many input sources, the process that we describe above was far from being linear. We had, in fact, to adjust our databases and the process itself, because, e.g., we discovered new accounts, or we noticed that an account was not the official account of a university (even if the name of the account seemed to imply such status).

As anticipated in Section 1, we also compared the SMP presence of our institution (the Politecnico di Torino) to the SMP of five selected European universities. We selected four technical universities — the Swiss Federal Institute of Technology in Lausanne, the Swiss Federal Institute in Zurich, the Technical University of Munich, the Politecnico di Milano (Polytechnic University of Milan) — and the other university in Turin, the Università di Torino (University of Turin). Of

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[5] http://cercauniversita.cineca.it/ seen on December 5, 2013
[6] https://github.com/fiorenzaoppici/socialuniversity .
[7] http://www.netseven.it/portfolio/social-coop/ seen on December 4, 2013
[8] http://www.netseven.it/ seen on December 4, 2013

course, we are well aware that the five selected universities are not an exhaustive sample of the European universities; yet, they help us to build an initial, limited characterization of the online presence of our institution.

In the following Sections, we describe more thoroughly the steps 1-4 above.

Manual Search and Manual Inspection Of Pages

Because the research handles a small set (< 100) of universities, and because Twitter doesn't support exact-match search for users, it was both feasible and necessary to manually search the Italian universities social networks handles both on the universities websites and on Twitter, Facebook, and other SMPs (e.g., YouTube, Google+, LinkedIn).

We also manually browsed the universities pages to gather the information that was not available (or hard to get) via the Facebook APIs, e.g., the response rates, the date in which the Facebook profile was opened, the openness of channels to other users.

Social Proxy: Automatic Online-Activity-Data Collection

Social Proxy is an online platform for social media monitoring — developed by Net7, a company based in Pisa, Italy — that automatically collects and provides a wide range of marketing-oriented data analytics. However, for this survey, we mainly used Social Proxy to follow the online activities (i.e., Facebook posts and tweets) of the universities accounts. Once we added the accounts handles to the online Social Proxy interface, in fact, we could follow the daily activity of the universities on Facebook and Twitter.

For most universities, we started the Social-Proxy data collection process on June 20, 2013 and we stopped the data collection process on September 30, 2013, the day in which we downloaded the whole body of tweets and posts from Social Proxy.

Regarding posts or tweets created before June 20, 2013, because Social Proxy is (of course) bound to the Facebook and Twitter APIs limits, for each account we could collect the latest 200 tweets or posts only. Yet, for the many accounts that post two-three times a week, we were still able to gather a significant portions of their history (for some accounts, in fact, we were able to go back as early as 2012). For the few accounts that post once per day (or more), instead, the first piece of collected data depends on the mean posting frequency and also depends on the day in which we added such account to Social Proxy (we added most accounts on June 20, 2013, but some accounts were discovered and added at a later time). We tried to minimize the impact of such an incremental approach by ensuring that every account had a sufficient timespan for post collection, and by weighing the absolute amount of posts from every account by the number of days in such timespan.

For each post or tweet, SocialProxy saves the following pieces of information: the author's username; the date and time; the post-or-tweet content. Of course, as regards Twitter, Social Proxy attributes a retweet to the retweeter, rather than to the author of the original tweet.

After we downloaded the data from Social Proxy, we used Excel to perform some basic data analysis tasks. For more complex tasks, we wrote a Java program[9] that allows us to remove the duplicate posts; to compute the average posting frequency and the standard deviation; to extract hashtags, mentions, and URIs; to compute statistics, e.g., the 20 most used hashtags.

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[9]https://github.com/fiorenzaoppici/socialuniversity

API Queries

Social Proxy was a valuable tool to automatically follow the online activity of the universities accounts, however, it did not collect lower-level information that is useful to characterize the universities activity, e.g., the amount of likes and followers, the date in which an account was created, the total number of tweets, the location, the self description.

Therefore we wrote some Java code to gather these pieces of information directly from the Facebook and the Twitter APIs. Such codes — that is based on the Twitter4J[10] and BatchFB[11] libraries — receives a list of Facebook and Twitter accounts, and generates, for each account, an .odf file that contains the low-level information that we mentioned above.

As part of our future work, we plan to enhance our Java code to collect data like, e.g., the number of likes to a post and the thread of comments related to a post. Also, as regards Twitter, we aim to study the followers of academic accounts (including in this category not only the accounts of universities, but also the accounts of professors and researchers).

Surveys

The first survey was carried in mid-July via e-mail among the group of five selected foreign and Italian universities that were included in the comparison to our institution, the Politecnico di Torino (Polytechnic University of Turin).

We contacted people in charge of managing the social accounts (if this information was available on the university's website) or people in the press office (as a fallback), and we asked them (1) the links to their social media channels and (2) whether they had social-media statistics that they could share with us.

Everyone responded to the inquiry; the responders eagerly provided us their social-media handles, and few of them (e.g., Politecnico di Milano and the ETH) even proposed us a follow-up phone-or-skype interview, in which they provided us much more details. As regards the second question, all the responders told us that they do not keep any kind of social-media statistics.

The second survey was carried out in the last days of August 2013 among all Italian universities found on Facebook, using the Facebook private messaging feature. Universities were not queried via Twitter due to the limited size of the tweet messages, deemed unpractical for an effective communication. Survey participants were kindly asked to describe their social-media-management strategies. On 74 Facebook channels accepting private messages, 49 of them (the 66%), from 46 universities answered, and showed great interest for our work.

However, because the second survey did not reached the Facebook channels for which private messages were not enabled (as well as universities with just a Twitter account, and universities that didn't show on Facebook), in early October we carried out a third survey, in which we wrote to the press offices of the unreached universities and asked them to provide brief information on their social-media-management strategies. The response rate was slightly inferior (52%), and in particular, universities who did not enable private messages on Facebook were less responsive (40% responded) than universities not showing on Facebook (71%).

[10]http://twitter4j.org/en/index.html

[11]https://code.google.com/p/batchfb/wiki/UserGuide

Data Analysis

The methodology described above allowed us to collect a series of interesting measures about the Italian universities presence on Facebook and Twitter. For example, the creation of new academic Facebook accounts had a peak in 2011, with 30 new accounts; and, more than 20 institutions joined Twitter each year in the 2010-2012 period (Figure 2). Note that these data are based exclusively upon the foundation date of Facebook and Twitter accounts existing in the research's timeframe; no piece of information on the deletion of accounts through the past years is thus available. The average frequency of posting is 1.8 daily messages on Twitter and 1.4 on Facebook, but most universities (67% on Facebook and 61% on Twitter) update their channels less than daily.
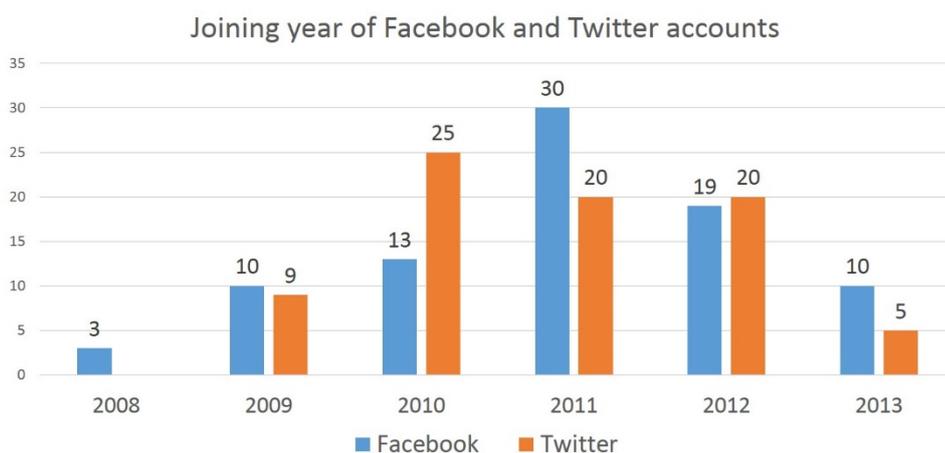

Figure 1: The number of institutions that joined Facebook and Twitter per year

Also, an estimate of the audience[12] of every channel was computed. Rather than examining the audience in absolute terms, the number of Likes/friends on Facebook and the number of followers on Twitter was weighed considering the expected social media population of each university. The expected population was computed as follows:

$$Pop = (s * Us) + (p * Up)$$

Where s and p are, respectively, the number of students and professors, and Us and Up are a rough estimate of the percentages of Facebook (or, alternatively, Twitter) adoption in the two groups according on Censis' 2012 survey on social media penetration in Italy13. 11% of students and 3.7% of professors are expected to have a Twitter account and 79% of students and 47% of professors are expected to be on Facebook. Those are just some proxy measurements; in fact, they take into account only the age factor and leave out other important factors of Facebook and Twitter users (such as income); yet, they allow to draw the following interesting observations: only large (> 10.000 students) public universities figure in the first ten positions in

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[12] We define the audience as the number of accounts that can potentially read a messages posted by the account of a university. That is, on Twitter the audience is the number of followers of the university account, while on Facebook the audience is the number of likes of the university page.

[13] The number of students and professors in every institution was drawn from the Italian Ministry of University, Education and Research (MIUR) data for 2012, the last official version when SocialUniversity was carried out. Stats on the penetration of social networking platforms for different ages groups were drawn from the 10th Censis/Ucsi report on social media in Italy (Censis 2012).

the ranking for absolute audience on both Facebook and Twitter (for obvious reasons), but small to medium-sized private universities and Superior Graduate Schools14 are preponderant in the weighted ranking. This confirms the general lack of visibility of larger universities exposed by Jeopen (2012), and by Lovaro & Giglietti (2011)4.1 Presence on Facebook, Twitter and other social networks.

We found 85 Facebook accounts that we mapped to 80 Italian universities (i.e., 84% of the Italian universities are on Facebook). A few universities have more than one account: typically, they have the main account and a secondary account that provides counseling services to students. Also, five of the 85 accounts are not pages, rather they are personal profiles. Of these five personal profiles, three are secondary accounts that provide counseling services to students: OrientaNet UniPd[15] for the University of Padua, Orientamento UniFe[16] for the University of Ferrara, and the account of counseling for disabled students Sod Orientale[17] at the Università Orientale in Naples.

On Twitter, we found 79 profiles for 73 different universities (i.e., 76% of the Italian universities are on Twitter). In addition to the 73 institutional profiles, there are six secondary profiles dedicated to diverse activities, e.g., employment counseling ("La Sapienza" - @JobSoul18), student counseling (LUISS "Guido Carli"- @GianoLUISS19), communication of new publications available in the open-access institutional repository (Politecnico di Torino's Open Access System - @OAPoliTorino20), foreign-language news for foreign students communities (Politecnico di Milano - @polimi_zh21 for chinese students).

We also found that YouTube is the third most used SMP after Facebook and Twitter (61% of the Italian universities have an account), and, according to the results of our manual inspection, is used for posting extracts from conferences, campus life events, advertising campaigns, and video lectures. In this vein, nearly a fifth (19%) of the Italian universities is listed on iTunes U[22], the iTunes section for video lectures.

Other SMPs that Italian universities use are: LinkedIn (13%), Google+ (11%) and Flickr (10%).

Who is in Charge Of Managing Social Media Accounts?

Table 1: Which office is in charge of managing the SMP account(s)? (%)

Office in charge	Facebook	Twitter
Communication	50%	56%
Student Counseling	11%	5%

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[14] Superior graduate schools are institutes who offer primarily third-level higher education (i.e., doctoral studies courses).

[15] https://www.facebook.com/orientanet.unipd

[16] https://www.facebook.com/orienta.unife

[17] https://www.facebook.com/sod.orientale

[18] https://twitter.com/jobsoul

[19] https://twitter.com/GianoLUISS

[20] https://twitter.com/OAPoliTorino

[21] https://twitter.com/polimi_zh

[22] http://www.apple.com/apps/itunes-u/

Online communication	10%	10%
Social Networking communication	7%	9%
Public Relations	7%	3%
Other	15%	20%

This data was collected by means of direct surveys as described in section 3.2. The managers of 60 Twitter accounts (out of 79) answered to our questions, while 59 managers of Facebook accounts replied (out of 85).

General communications' offices manage the majority of accounts both on Facebook and Twitter, while the Students' counseling offices are less represented on Twitter (11% vs. 5%). Because 7% of Facebook and 9% of Twitter accounts are managed by specially-created social media offices, we can argue that universities are increasingly recognizing social media as a peculiar area in communication.

Other management strategies (aggregated by the "other" definition of Table 1) include: account management in cooperation between the IT systems and public relations office; the Dean's secretary office; volunteer students. Interestingly, there was also one case (the University of Palermo) in which the social media accounts were managed by an external communications firm that won a procurement for performing that task.

How the Social Media Accounts Interact With Other Users (Mainly Students)

We measured the number of answering tweets in the accounts timeline with an ad-hoc API query launched on October 27, 2013: we fetched the last 200 tweets by each account, and we counted the number of tweets that were in response to tweets by other accounts. We found that, on the average only 2% of the tweets are responses. The account with the highest rate of responses was the Politecnico di Milano's main account (@polimi), in which 22% of the tweets were responses. Such higher rate could represent a higher engagement from both parts: users interact more with the institution and the university is context-aware as it uses the Twitter "Answer" tool. As regards Facebook, because it was complex to gather the rate of answers using the API, and because manually recording responses was unfeasible for all the accounts, we selected the five accounts which had in their timeline more questions posed by other accounts. On this small sample, we collected the last 10 university-related questions and answers (if any) posted up to October 25, 2013. Interestingly, the Politecnico di Torino (that was the third account with more questions posed by other accounts) never publicly responded; however, an employee of the Politecnico later confirmed via email that they, in fact, responded via private messages in that time span. As for the other universities' accounts, the response rates are very good (all the institutions answer to more than 80% of questions posed); also, (as Figure 2 shows) on the average the institutions respond within one work day This small sample is already characterized by very high participation rates (i.e the ratio of posts from other users on the total number of posts), but interestingly enough, accounts in the sample are fairly below the average in terms of audience; their average likes/expected_population value is 0.5 while for the whole sample of the Facebook account of Italian universities it is 1.7. As SocialProxy (the tool used for data harvesting) can keep just first-

level comments, it's impossible to fully determine the engagement level, since users usually answer back in comment threads.
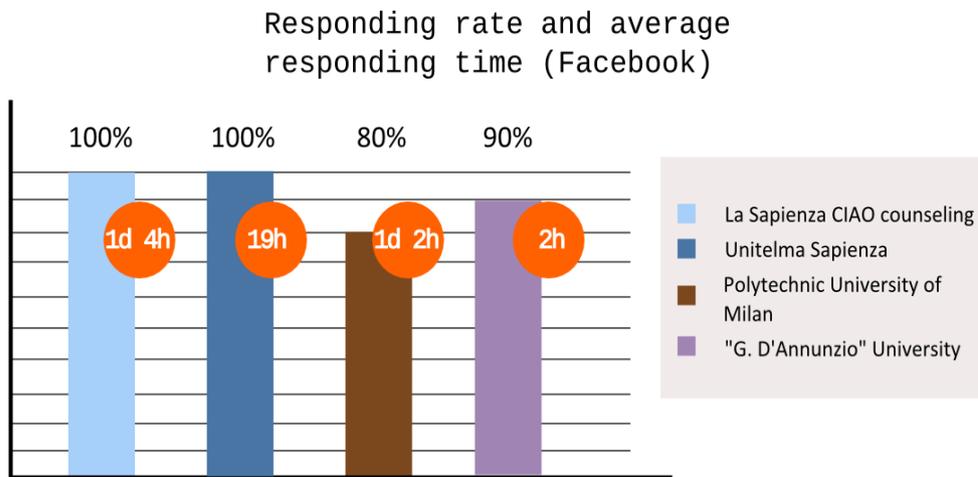

Figure 2: Responding rates and average responding time of the Facebook profiles that received more questions from other Facebook users on their timelines

In the case of Facebook, more than half (56%) of the accounts have their walls open to others' posts. But the openness of the wall is not the only index for openness; in fact, admins can configure many diverse levels of openness, i.e., they can selectively enable the following features: Private messages; Users' reviews; Comments to posts.

The vast majority of the Facebook accounts had a medium-high level of openness: only 7% had just one of the openness features enabled (i.e., one of: private messages, users' reviews, comments to posts, and the wall open to others' comments); 12% of them had two features enabled; 46% had three features enabled; and 35% enabled all the four features.

A Comparison with Selected Foreign Universities

In order to broaden the research's scope the Politecnico di Torino (PoliTO) was compared to other similar institutions: the Swiss Federal Institute of Technology in Lausanne (EPFL), the Swiss Federal Institute of Technology in Zurich (ETHZ), the Technical University in Munich (TUM), the Politecnico di Milano (PoliMi), and the other university in Turin, i.e., Università di Torino (UniTO).

As for the weighted audience, also doctoral students were computed in the expected population, while the rates of Twitter and Facebook adoption have been obtained from the PEW Internet Project's survey (Smith and Brenner, 2013). The main account of the EPFL is the leading for the weighted audience on both Facebook and Twitter (respectively with values of 2.3 and 1.8). The average posting frequency is 0.7 daily posts on Facebook and 1.3 daily posts on Twitter; in spite of this last data, 70% of the Twitter accounts of international universities post, on the average, less than one message per day. Responding rates were retrieved for all universities with the same methodology discussed in section 4.2; the Twitter accounts with the highest rate of responding tweets are: the main account for the Politecnico di Milano (@polimi) (22%), the EPFL's English channel (@EPFL_en) (14%), and the main account of the Politecnico di Torino (@poliTOnews)

(13%). On Facebook, a direct inspection (as in the 3.1 section) of the 30 last university-related questions from October 27, 2013 found that the Università di Torino and the Politecnico di Milano were the institutions with the highest responses rate, respectively, 93% and 83%.

The more relevant difference among social media accounts that we noticed is the different rates of internationalization, especially on Twitter. Swiss universities show an higher rate of international students; in fact, both the ETH and the EPFL have an English-tweeting account in addition to their main account (which, respectively, is in German and in French). Interestingly, the two English channels of the ETH and the EPFL are less followed than the main accounts: @EPFL_en has just 0.1 followers / expected_population while @EPFL has 1.9 followers / expected_population; @ETH_en has 1.0 followers / expected_population, while @ETH has 1.4 followers / expected_population.

Table 2: The different rate of internationalization of Twitter accounts

	Foreign students (%)	Twitter accounts:	Tweeting in:
EPFL	40%	3	French, English
ETHZ	29%	3	German, English
TUM	18%	1	German
PoliTo	15%	2	Italian, English
Polimi	9%	2	Italian, Chinese, English
UniTO	6%	1	Italian

Conclusions and Outlook

In this paper we describe the methodology and the results of the SocialUniversity survey that describes how Italian universities use the social media platforms (SMPs) channels (mainly, Facebook and Twitter). In particular, we describe how we collected qualitative and quantitative information on the behaviour of Italian universities on SMP channels, and we describe the main insights that we extracted from the collected data.

To start the data collection process, we listed the Twitter and Facebook accounts of most Italian universities. Then we used the Social Proxy SMP data collection platform, developed by Net7, as well as ad-hoc API queries, to monitor the online activity of the universities' Facebook and Twitter accounts. In parallel, we contacted the people in charge of managing such accounts, to gather qualitative data. Finally, in some cases, we manually inspected the accounts to collect data that we could not collect automatically.

The data shows that on average Italian universities are well aware of the potential of SMPs; in fact, some universities even have people whose only job is to manage the university's online accounts. The data shows that, while Facebook is used for counseling and answering to student's questions, Twitter is used primarily as the official, online news channel. Also, even though few Facebook accounts post - on the average - multiple times per day, the vast majority of them

updates their timelines less than once per day. Another insight is that private universities (typically small, selective and well-funded) and Superior Graduate Schools are relatively more popular than large public universities (which in recent years have been affected by steep cuts in both funding and staff).

To better understand the extent to which Italian universities use well the SMP channels, we compared their online behavior to the previously studied behavior of the Italian public administration; also, we compared the online behavior of a few, selected Italian universities to the behavior of few, selected European universities. For the former comparison, we used the latest #socialPA report data (Arata, 2013) as a benchmark, while for the latter comparison we used data specifically collected for this case study. Compared to the public administration, the universities seems to be more aware of the SMP channels best practices and features (e.g., 44% of the universities already use hashtags on Facebook, despite their recent introduction). Compared to the European universities selected for this study, Italian universities are on average less popular (in terms of the audience weighted for the number of students). However, there are Italian universities that, like the European ones, have multilingual accounts.

Regarding future developments, we plan to perform a detailed analysis of the target audience of the Twitter accounts of scholars, e.g., by harvesting the biographies. We also plan to enhance our data collection tools on Facebook, to follow the comment threads and to gather the related number of shares and likes. In turn, we expect this enhancement to allow us to better measure the response rate and the popularity of an account.

Finally, this case study only focused on the universities own accounts, but universities are complex organizations, whose online footprint goes well beyond their institutional SMPs accounts; therefore, we look forward to also following and analyzing the online activities of research centers, departments, professors, and students-associations accounts.

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About the Authors

Fiorenza Oppici

Fiorenza Oppici holds both a bachelor and master degree in Cinema and Communication Engineering at the Politecnico di Torino. The present paper is a synthesis of her Master Project, "How do italian universities use social media". She plans to pursue the research project discussed in the present paper.

Simone Basso

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