

The Use of Hashtags in the Promotion of Art Exhibitions

Marco Furini¹, Federica Mandreoli², Riccardo Martoglia², and Manuela Montangero²

¹ Dipartimento di Comunicazione ed Economia,
Università di Modena e Reggio Emilia
`marco.furini@unimore.it`

² Dipartimento di Scienze Fisiche, Informatiche e Matematiche
Università di Modena e Reggio Emilia
`{name.surname}@unimore.it`

Abstract. Hashtags are increasingly used to promote, foster and group conversations around specific topics. For example, the entertainment industry widely uses hashtags to increase interest around their products. In this paper, we analyze whether hashtags are effective in a niche scenario like the art exhibitions. The obtained results show very different behaviors and confused strategies: from museums that do not consider hashtags at all, to museums that create official hastags, but hardly mention them; from museums that create multiple hashtags for the same exhibition, to those that are very confused about hashtag usage. Furthermore, we discovered an interesting case, where a smart usage of hashtags stimulated the interest around art. Finally, we highlight few practical guidelines with behaviors to follow and to avoid; the guidelines might help promoting art exhibitions.

Keywords: Art exhibition, Twitter, hashtags

1 Introduction

The simple query *current art temporary exhibitions* placed on Google on December 2016 returns more than two millions results. Obviously, this does not imply that there are more than two millions distinct art temporary exhibitions, but it gives a clear indication that there is a large number of exhibitions going on all over the world. A more accurate investigation, done by checking the Web pages of some well-known museums in the world, shows that all of them have at least one active art temporary exhibition at any time during the year. Indeed, temporary exhibitions became more frequent and important in recent decades [15] and tend to attract not only local visitors, but also tourists that take such exhibitions into consideration when organizing their trips.

There are two very important issues that a museum has to address when setting up a temporary exhibition: promotion and evaluation. The former should be done to reach as many potential visitors as possible, in order to let them

know all information needed to properly organize a visit during the period the exhibition is open. The latter should give organizers a clear overview of the level of success of the exhibition and of the reasons for that outcome. These two issues obviously arise in general also for permanent museum exhibitions, but are really critical for temporary ones: a certain amount of money has to be invested in an exhibition that lasts for a (relatively) short time and this investment should return in this short period.

For what concerns promotions, traditional channels can be used, such as advertisements on newspapers, playbills, fliers, radio etc... or new channels, in particular Web sites and social media. Needless to say, the potential of these new channels is huge: the possibility to reach visitors world wide, to update and disseminate information in real time and especially at low costs. It is nevertheless important to point out that new media require constant maintenance and activity, or the visitors might get the impression that the site or the accounts are neglected and this bad impression might be translated to the exhibition itself.

In this paper, we focus on the promotion aspect of temporary art exhibitions and investigate the benefits of using social media for such task. To the best of our knowledge, this is the first paper that addresses promotion rather than evaluation. In particular, we focus on Twitter and the use of hashtags that is done by organizers and visitors. Recent studies show that Twitter can be successfully employed in a wide range of situations in many different environments, such as understanding citizens feelings concerning life conditions in towns and cities [7], or identifying influencer users that can be employed to efficiently spread information and/or marketing campaigns [17].

In the specific case of temporary art exhibitions, Twitter can be regarded as an interesting tool for promotion, due to its one-to-many publicly available communication. In addition, the use of hashtags associated to the art exhibition itself makes it very easy to follow conversations concerning the exhibition. The use of hashtag is successfully done in the entertainment industry, for example for popular TV talent shows. Needless to say, the costs associated to this kind of promotion is extremely reduced compared to the ones of traditional channels. Our main goal is to understand if and how hashtags are actually used to promote and stimulate interest around temporary art exhibitions.

Our investigation shows a very fragmented and incoherent use of hashtags for temporary exhibitions, pointing out many levels of criticality. Hence, we conclude with a reasoned list of guidelines that can be followed to make an effective use of Twitter and hashtags in the context of temporary exhibitions.

2 Related work

Twitter is one of the biggest and most popular social network platforms. Every day, on average, 500 million tweets are posted on Twitter and monthly number of active users exceeds 300 million [1]. Beyond its institutional role where it is used to display news and report, Twitter is mainly a worldwide place where users share their real feelings freely, tell where they are, what they are doing and

express and exchange opinions on a wide range of topics, such as places, people and products [20]. Twitter users use hashtags to add context and metadata to tweets. Hashtags are community-driven keywords or phrases used to categorize messages and highlight topics. The extensive and accurate use of hashtags makes Twitter more expressive [19].

Various approaches have been recently proposed in the literature that analyse Twitter. Most of them can be classified in two main streams of research. As tweets are text, a large body of work has concerned sentiment analysis and opinion mining. Here the main goal is to understand opinions, sentiments and attitudes concerning different topics, as expressed in the text. One typical application scenario concerns enterprises that can discover opinioned information and detect the sentiment polarity of their customers about their products or their competitors [18]. Twitter represents a novel and very challenging domain for sentiment analysis and opinion mining [11, 10, 9]. Tweet length and textual informalities are the main issues that must be faced in this context. The majority of the proposed approaches applies machine-learning approaches to message contents and/or tags (e.g. [12, 2]) while the remaining approaches are mainly lexicon-based (e.g. [13]). The other stream of research concerns social network analysis. Most of the research in this context is focused on the identification of social influencers [21, 17, 4] and their role in diffusing information [3]. Moreover, the fact that Twitter is most used via mobile devices makes the issue of finding relationships between the social network or the terms in the messages and geographic proximity worth of being investigated [22, 8].

The diffusion of Twitter and other social network platforms can have a great impact on the Cultural Heritage sector. Some papers already investigate this phenomena, mainly concentrating on the evaluation aspect. [16] proposes a social-based solution for a fast and effective gathering of feedbacks from museum visitors. The idea is to engage online users as contributors through a mobile application that allows visitors to post their ideas, feelings, and feedbacks on Twitter and Facebook at any time in the exhibition. [5] introduces a set of Key Performance Indicators (KPIs) for quantitative estimation of Cultural Heritage Sensitivity as expressed by social network users. The approach is data driven: it analyzes terms and concepts belonging to Twitter users' messages and compares them to concepts from domain specific and general ontologies, such an analysis is then integrated with geo-referencing and temporal analysis. [6] provides a quantitative and qualitative study of the messages sent on Twitter during the MuseumWeek event. "MuseumWeek" is a communication event that was designed and planned by Twitter in 2014 together with various European museums to improve their visibility. The organization principle was simple: each day was dedicated to a theme, with specific hashtag, and users were encouraged to use the hashtag of the day as well as the generic hashtag #MuseumWeek. The outcomes show that the main goals of this promotional event were achieved. [14] studies how the relation between archives, museums and users is changed thanks to the large diffusion of social networks. The analysis is based on case studies of Danish archives and museums using Instagram for digital curating, outreach

and communication. The conclusion shows that the relation between cultural heritage institution and user is not even. The media offer a room for involvement, even if it seems to be the institution not the audience that decides the arena in most cases.

3 Experimental Evaluation

Our goal is to measure the interest around topics related to art and whether it is possible to stimulate it towards art topics. From this analysis, we plan to design practice guidelines for a profitable and effective usage of hashtags in the art exhibition field.

3.1 Preliminary Investigation

As a first preliminary investigation we analyze the use of hashtags done by organizers of current (December 2016) temporary exhibitions. We look for specific hashtags explicitly created for temporary exhibitions organized by some of principal museums in Europe and U.S.A.. Table 1 reports some representative results³. We check whether official hashtags are reported on the exhibition Web Site and on the museum Twitter account. Moreover, we check if, on the Web Site, there is a Twitter share button. Whenever an hashtag is not reported, this means that we did not find one⁴; if an hashtag is reported but the first two check boxes are not checked, this means that we found an hashtag that is actually used in tweets but it is not clear who created it (users or organizers). A particular case is the Dalì exhibition in Pisa: the museum Web site dedicates a page to the exhibition with a link to dedicated Web site. The latter shows a small Twitter button that redirects to the exhibition Twitter account containing an official hashtag (#DaliPisa).

The situation depicted by our investigation shows that the attention on hashtags creation and diffusion by organizers is quite scarce. Moreover, it is worth mentioning that: (1) the share button presents a default tweet in which the exhibition hashtag is not reported; (2) hashtags reported in the Twitter account are usually only of the most recently opened exhibitions.

3.2 Dataset Collection

We collected Twitter data (`text,UTC-creation_time,number_of_retweets,user_id,number_of_followers`) for 7 days filtered by hashtag of current exhibitions and of popular painters. Please note that while the first three entries are related to the specific tweet and the time is the local time of creation the last two ones concern the Twitter user. In particular, we considered exhibitions

³ Others are omitted due to lack of space, but no significative result has been elided.

⁴ We did not make a too big effort to find one, as we assume that users are not willing to do.

Museum	Exhibition	Exhibition hashtag	# on Web Site? # on Twitter? Share Button?
British Museum London	South Arica The art of a nation	#SouthAfricanArt	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
	Modern design and graphics . . .		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Tate Gallery London	Wilfredo Lam	#wilfredoLam	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
National Gallery London	Beyond Caravaggio	#BeyondCaravaggio	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Louvre Paris	Miroirs	#expoMiroirs	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Centre Popmpidou Paris	René Magritte	#ExpoMagritte	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Milan Museum Milano	Escher	#EscherMilano	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Uffizi Firenze	L'alluvione e gli Uffizi		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Palazzo dei Diamanti Ferrara	Orlando Furioso	#OrlandoFurioso	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Palazzo Albergati Bologna	La Collezione Gelman	#MexixoFrida	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
Albertina Museum Wien @AlbertinaMuseum	Seurat, Signac, Van Gogh	#SerautSignacVanGogh	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Guggenheim New York	Agnes Martin	#AgnesMartin	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
MoMA New York	A Revolutionary impulse	#ArevolutionaryImpulse	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Table 1: Investigation of the use of hashtags in current temporary exhibitions (on December 2016).

organized by well-known museums in Italy, Austria, UK and France and we used the official hashtag (e.g., #dalipisa, #mexicofrida, #seuratsignacvangogh, #beyonddcaravaggio, #orlandofurioso and #expomagritte) and we considered well-known and famous painters (e.g., #cezanne, #monet, #chagall, #pollock, #goya, #picasso, #klimt, #klee, #escher, #vangogh).

3.3 Dataset Composition

The resulting dataset is composed of 10,376 tweets and its composition is shown in Table 2. First rows are related to painters' hashtags, whereas the last 6 rows concern official hashtags of current art exhibitions.

Hashtag	Percentage of tweets	Volume of tweets
#cezanne	3,24%	337
#chagall	2,44%	254
#escher	1,27%	132
#monet	15,84%	1646
#goya	6,18%	642
#klee	5,28%	549
#klimt	4,48%	465
#miro	2,52%	262
#picasso	25,10%	2608
#pollock	1,83%	190
#vangogh	27,85%	2894
#vermeer	3,75%	390
#beyondcaravaggio	1,18%	123
#dalipisa	0,00%	0
#expomagritte	0,08%	8
#mexicofrida	0,07%	7
#orlandofurioso	0,32%	33
#seuratsignacvangogh	0,06%	6

Table 2: Dataset composition: first rows are related to painters, whereas the last six rows concern official hashtags of current art exhibitions.

The absolute number of tweets shows a large difference between tweets concerning painters and tweets related to art exhibitions. For instance, during the observed period, more than half of the contents concerned only two painters (i.e., Van Gogh and Picasso), whereas very few were related to official hashtags of art exhibitions. To understand the reasons for this diversity, we deepen our analysis by focusing on contents published around the most tweeted painter (i.e., Van Gogh) and on those related to the most successful art exhibitions hashtags (i.e. #beyondcaravaggio and #orlandofurioso). By looking at the #vangogh tweets, we observed that the interest towards the painter is stimulated by @VanGoghDetails, a single Twitter account created on June 2016 that has around 2,500 followers. The most successful art exhibitions hashtags are promoted by the National Gallery museum with the official Twitter account @NationalGallery (created on April 2010, 741,000 followers), and by Palazzo Diamanti museum with the official Twitter account @PalazzoDiamanti (created on January 2013, 5,009 followers).

3.4 Content Analysis

The three official Twitter accounts post contents very differently. Before analyzing the contents in details, it is worth noting that, on average, @VanGoghDetails posts 2.1 tweets per day, @NationalGallery posts 0.6 tweets per day concerning #beyondcaravaggio, @PalazzoDiamanti posts 2.5 tweets per day concerning #orlandofurioso.

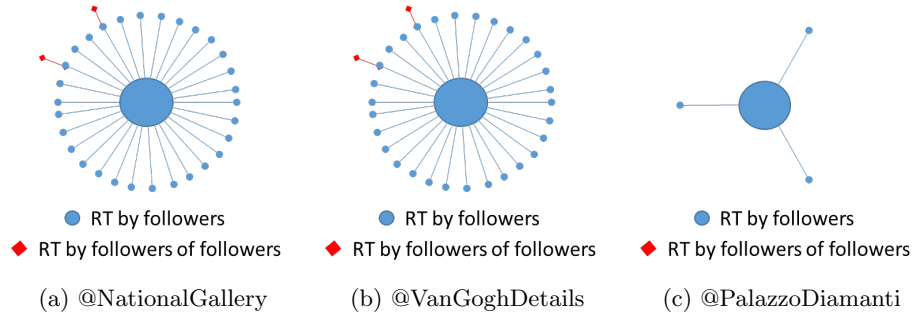


Fig. 1: Average number of followers and followers-of-followers who retweet tweets published by the official account.

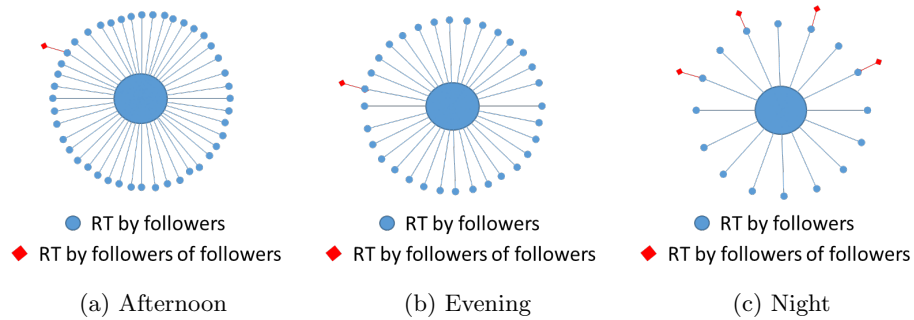


Fig. 2: Average number of followers and followers-of-followers who retweet tweets published by @VanGoghDetails grouped into three different periods of the day.

Number of users who retweet messages

Figure 1 shows the average number of users who retweet tweets published by the official account. The tweets related to the Caravaggio Exhibition and published with the official hashtag (#beyondcaravaggio) by the official Twitter account of the National Gallery are retweeted on average by 25 different users. VanGoghDetails achieves a similar number: every published tweet is retweeted on average by 26 different users. However, on average, two retweeted messages are retweeted again by people who are not followers of the VanGoghDetails account. The situation is completely different for the @PalazzoDiamanti account: tweets published with the official hashtag (#orlandofurioso) are retweeted, on average, by 3 different users.

If the number of people who retweet a message is a measure of the interest around the topic, it seems clear that @VanGoghDetails and @NationalGallery diffuse the most interesting posts. However, the number of followers cannot be overlooked. Indeed, by considering that @NationalGallery has around 741,000 followers and @VanGoghDetails has around 2,500 followers, it is clear that @VanGoghDetails publishes very interesting tweets.

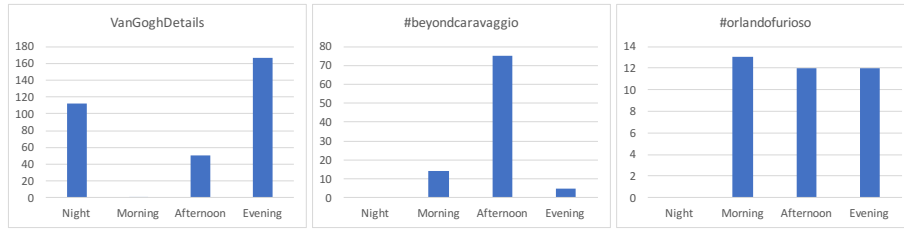


Fig. 3: Total number of retweets per period of day of original message for analysed cases.

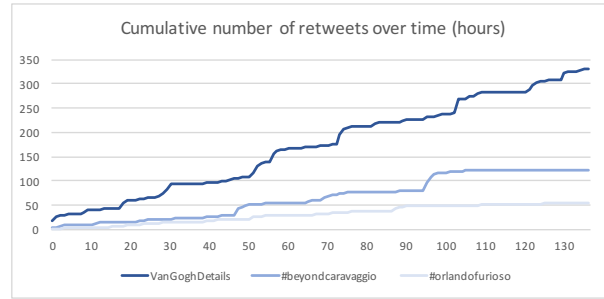


Fig. 4: Cumulative number of retweets over time (hours) for analysed cases.

Figure 2 shows the average number of users who retweet tweets published by @VanGoghDetails grouped into three different periods of the day. On average, a tweet is retweeted by 44 different users if published during the afternoon, is retweeted by 31 different users if published during the evening and is retweeted by 16 different users if published during the night. In addition, the retweeted message is retweeted again by people who are not followers of the @VanGoghDetails account.

These numbers show how important is to post contents throughout the day, even if tweets posted at night receive less interest than others. It is not clear the reason why @VanGoghDetails does not post tweets in the morning hours.

Number of retweets during the day

Figure 3 shows the number of retweets that the messages posted by @VanGoghDetails, @NationalGallery and @PalazzoDiamanti get depending on the period of day. @VanGoghDetails produces the largest number of retweets, in particular for tweets posted in the afternoon and, above all, in the evening/night. This is even more evident for #beyondcaravaggio, where the retweets are centered around the afternoon. In the case of #orlandofurioso a lower number of retweets is triggered and the original tweets appear more scattered throughout the whole day, i.e. less focused on the most favorable moments of day.

Figure 4 shows the cumulative number of retweets that all the messages posted by @VanGoghDetails, @NationalGallery and @PalazzoDiamantmessages

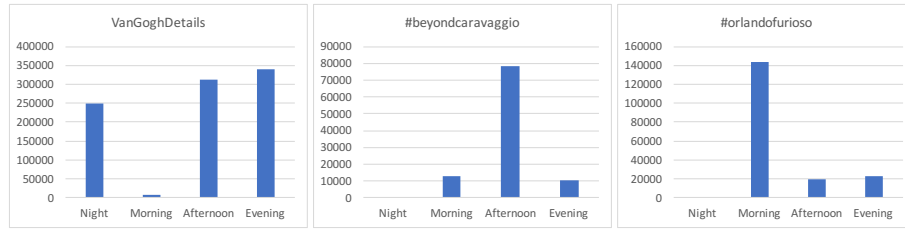


Fig. 5: Total number of followers per period of day of original message for the analysed cases.

get over time. @VanGoghDetails has the most positive trend, reaching nearly 350 retweets over the monitored time span, as opposed to #beyondcaravaggio and #orlandofurioso, which reach 120 and 60, respectively.

Number of users reached by tweets

Figure 5 shows the number of people reached by the retweeted messages. Also in this case, it is possible to observe that @VanGoghDetails reaches more people than the other two cases, confirming the quality of the used approach when posting messages. It is worth noting that the spike of the #orlandofurioso is due to a single popular Twitter account (i.e., more than 120,000 followers) that retweeted one of the messages.

Characteristics of the posted tweets

To understand if there are characteristics that affect the spread of a tweet, we analyze the presence of three information within a tweet: sentiment, spam and link. Results are shown in Figure 6. Note that, sentiment is computed using the AFINN python library and messages are considered as spam when more than 4 hashtags or more than 1 link or more than 3 mentions are present in a tweet [17].

@VanGoghDetails posts neutral tweets, 97% of the followers reached by #beyondCaravaggio tweets are due to 55% of positive tweets; 11% of the followers reached by #OrlandoFurioso tweets are due to the 5% of positive tweets.

@VanGoghDetails posts tweets without spam; 100% of the followers reached by #beyondCaravaggio and by #OrlandoFurioso tweets are due to tweets without spam; 11% of the followers reached by #OrlandoFurioso tweets are due to the 5% of positive tweets.

@VanGoghDetails posts tweets with a link to Van Gogh painting; 94% of the followers reached by #beyondCaravaggio tweets are due to tweets with a link (79%); 90% of the followers reached by #OrlandoFurioso tweets are due to the tweets with a link (84%).

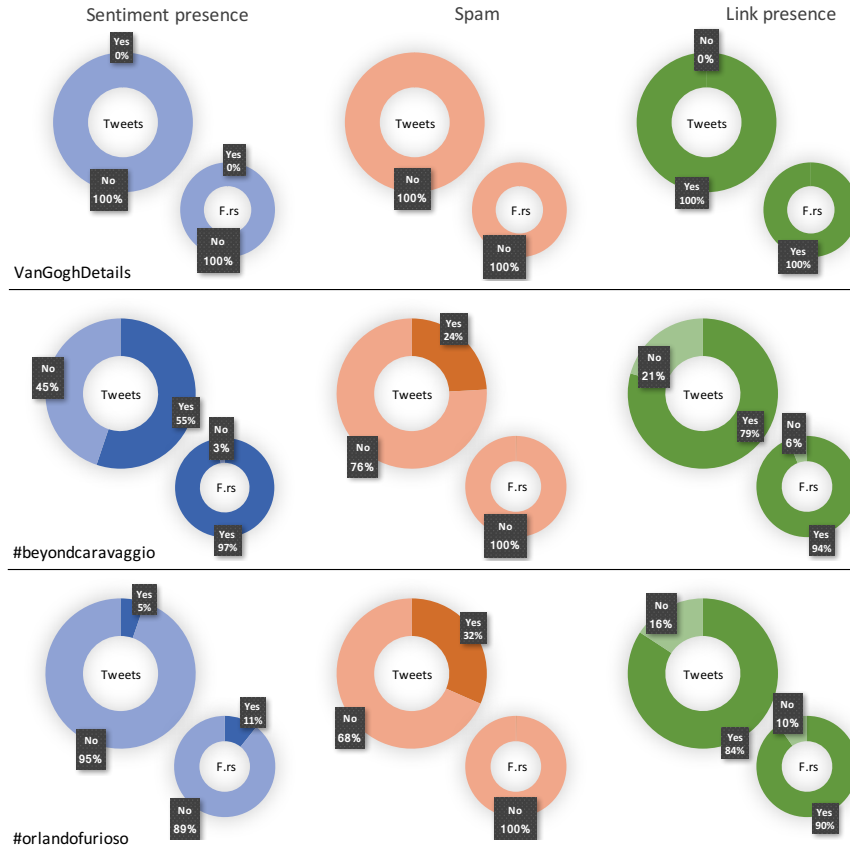


Fig. 6: Analysis of the tweet contents for VanGoghDetails (upper), #beyondcaravaggio (mid) and #orlandofurioso (lower). Large pies refer to the number of tweets, small ones to the number of followers.

4 Findings and Guidelines

The dataset analysis allowed us to outline some guidelines to advertise and stimulate the interest around art exhibitions through the use of hashtag and of Twitter.

- Create and divulgate a hashtag, use it every time and on every means (e.g., fliers, websites, newspapers, magazines, playbill, etc.) when advertising the art exhibition.
- Post tweets with the official hashtag throughout the day. Indeed, it is important to post contents not only during the opening hours of the exhibition, but also when the exhibition is closed (e.g., at night and during the evening). This allows reaching people with different habits.

- Always insert a picture into the tweet, preferably a framework of the exhibition. Data show that these messages are more retweeted and, therefore, they reach more people.
- Avoid using multiple hashtags in the message to increase its spread. Multiple hashtags produce negligible positive effects, and greatly reduce the interest around the message and around the accounts who post it.
- Avoid retweeting messages that embed the official hashtag. It only confuses followers. People who want to follow the conversation around the official hashtag can do it without any problem and without the official account to retweet it.
- Be focused on the exhibition contents, thus avoid posting mere courtesy messages like “Thank @user for visiting us” or “Welcome @user to our exhibition”. These messages greatly reduce the interest around the account who posts them.

5 Conclusions

In this paper we focused on the use of hashtags to promote and stimulate the interest around art exhibitions. We observed very different behaviors: those who do not consider hashtags at all in the means used to promote the exhibition (e.g., fliers, playbill, webpages, etc.); those who create official hashtags, but hardly mention it; those who create multiple hashtag for the same exhibition; those who create an official hashtag, but hardly use it; those who create an official hashtag, but are very confused about their usage. We analyzed the tweets posted with hashtags related to famous painters and with official hashtags of art exhibitions. We observed that a smart usage of hashtags might stimulate the interest around art. Indeed, we highlighted positive aspects and behaviors to avoid and we outlined few practical guidelines that might help in better use of hashtags while promoting art exhibitions.

Finally, we observe that a good use of hashtags and Twitter resolves in the creation of a large corpus of tweets that can be used to evaluate the art exhibition in terms of measuring the visitors feelings and their geographical origins, their opinions, their involvement and engagement and many other useful information that might be helpful to propose and promote future art exhibitions.

References

1. Twitter Usage Statistics - Internet live stats. <http://www.internetlivestats.com/twitter-statistics/>, 2016.
2. N. Aston, J. Liddle, and W. Hu. Twitter sentiment in data streams with perceptron. *J. Comput. Commun.*, 2(3):11–16, 2016.
3. E. Bakshy, I. Rosenn, C. Marlow, and L. Adamic. The role of social networks in information diffusion. In *Proc. of the 21st WWW*, pages 519–528, 2012.
4. A. Bujari, M. Furini, and N. Laina. On using cashtags to predict companies stock trends. In *Consumer Communications and Networking Conference (CCNC), 2017 14th Annual IEEE*, Jan 2017.

5. A. Chianese, F. Marulli, and F. Piccialli. Cultural heritage and social pulse: A semantic approach for CH sensitivity discovery in social media data. In *Proc. of the 10th ICSC*, pages 459–464, 2016.
6. A. Courtin, B. Juanals, J. Minel, and M. de Saint Léger. The museum week event: Analyzing social network interactions in cultural fields. In *Proc. of the 10th International Conference on Signal-Image Technology and Internet-Based Systems, SITIS*, pages 462–468, 2014.
7. J. C. de Albornoz, L. Plaza, and P. Gervs. Sentisense: An easily scalable concept-based affective lexicon for sentiment analysis. In *Proceedings of the Eight International Conference on Language Resources and Evaluation*, may 2012.
8. M. Furini. Users behavior in location-aware services: Digital natives vs digital immigrants. *Advances in Human-Computer Interaction*, 2014, 2014.
9. M. Furini and M. Montangero. Tsentiment: On gamifying twitter sentiment analysis. In *2016 IEEE Symposium on Computers and Communication (ISCC)*, pages 91–96, June 2016.
10. M. Furini and V. Tamanini. Location privacy and public metadata in social media platforms: attitudes, behaviors and opinions. *Multimedia Tools and Applications*, 74(21):9795–9825, 2015.
11. A. Giachanou and F. Crestani. Like it or not: A survey of twitter sentiment analysis methods. *ACM Comput. Surv.*, 49(2):28:1–28:41, June 2016.
12. H. Hamdan, F. Béchet, and P. Bellot. Experiments with dbpedia, wordnet and sentiwordnet as resources for sentiment analysis in micro-blogging. In *Proc. of the 7th International Workshop on Semantic Evaluation, SemEval@NAACL-HLT*, pages 455–459, 2013.
13. X. Hu, J. Tang, H. Gao, and H. Liu. Unsupervised sentiment analysis with emotional signals. In *Proc. of the 22nd WWW*, pages 607–618, 2013.
14. B. Jensen. Instagram as cultural heritage: User participation, historical documentation, and curating in museums and archives through social media. In *2013 Digital Heritage International Congress (DigitalHeritage)*, volume 2, pages 311–314, 2013.
15. P. Johnson. Museums. In R. Towse, editor, *A Handbook of Cultural Economics*, pages 315–320. Edward Elgar, 2003.
16. Y.-L. Lin, X. Bai, Y. Ye, and W. Real. Constructing narratives using fast feedback. In *Proceedings of the 2012 iConference*, pages 486–487, 2012.
17. M. Montangero and M. Furini. Trank: Ranking twitter users according to specific topics. In *Consumer Communications and Networking Conference (CCNC), 2015 12th Annual IEEE*, pages 767–772, Jan 2015.
18. K. Ravi and V. Ravi. A survey on opinion mining and sentiment analysis: Tasks, approaches and applications. *Knowledge-Based Systems*, 89:14 – 46, 2015.
19. D. M. Romero, B. Meeder, and J. Kleinberg. Differences in the mechanics of information diffusion across topics: Idioms, political hashtags, and complex contagion on twitter. In *Proc. of the 20th WWW*, pages 695–704, 2011.
20. X. Wang, F. Wei, X. Liu, M. Zhou, and M. Zhang. Topic sentiment analysis in twitter: A graph-based hashtag sentiment classification approach. In *Proc. of the 20th ACM CIKM*, pages 1031–1040, 2011.
21. J. Yang and J. Leskovec. Modeling information diffusion in implicit networks. In *Proc. of the 10th IEEE ICDM*, pages 599–608, 2010.
22. S. Yardi and D. Boyd. Tweeting from the town square: Measuring geographic local networks. In *Proc. of the 4th International Conference on Weblogs and Social Media, ICWSM*, 2010.