Top European Museums on Twitter

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Abstract Recently, museums worldwide started to use social media and have developed initiatives to provide widespread access to museum information resource, engage audiences and attract more visitors. Twitter, the most popular microblogging platform, allows museums to spread small time-sensitive amounts of information and transform audiences from passive observers into active participators. However, little research effort has been devoted at investigating the use of Twitter by museums. The paper aims to fill this gap and records the top-60 European museums and their Twitter accounts. Eleven Twitter performance indexes are used to describe the activity and performance of these accounts. Descriptive statistics, Principal Components Analysis and correlational analysis reveal that there is a significant differentiation among museums regarding Twitter performance. Performance of the accounts is described using three principal components: networking, tweeting activity, time that the account is active and involvement. A group of the more active museums on Twitter is constructed. Partially, Twitter performance is in accordance with museums popularity and ranking, while there are a significant proportion of museums which do not use Twitter. Implications and suggestions are provided for the museums to use Twitter as a marketing and promotion channel, especially for the museums which are placed lower within the ranking list.

Keywords European museums • Twitter • Performance • Activity • Popularity

JEL Classification M15

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1 Introduction

Museums are important heritage destinations and generators of income (Silberberg, 1994). In many destinations they are primary tourist attraction for foreign and local tourists (Jansen-Verbeke & Rekom, 1996). Deffner, Metaxas, Syrakoulis, and Papatheohari (2009, pp. 58–59) claimed that museums act as 'the instruments' for cities in the development process. It is interesting that 3 out of 10 tourists that visited London visited the city for its museums (Corbos & Popescu, 2011). Museums in order to be profitable, are marketing themselves as heritage destinations and tourist attraction (Kirshenblatt-Gimblett, 1998). Nowadays, challenging economic times and reduction of museums budgets has put increasing pressure on museums to widen their appeal and to attract more visitors (Chan, 2009; Goulding, 2000). Thus, museums explore new ways to increase attendance levels and self-generated revenues (Silberberg, 1994).

Alpers (1991) described the museum as a 'way of seeing', where objects are isolated from their world and displayed for attentive and interpretive seeing. Still, museums are places of collecting and seeing. However, as museums are becoming more visitor-oriented they try to facilitate experiences that satisfy their visitors and to incorporate 'aspects of mediatized, embodied, and communal gazing in visitor's experiences' (Chan, 2009; Larsen & Svabo, 2014 p. 2) and have adopted a wide range of digital and mobile technologies for creation of awareness of the organization, promotion of events and exhibits, provision of customized experiences, engagement with stakeholders and cultural production (Chen, 2015; Thomson, Purcell, & Rainie, 2013). Digital technologies and new social media are determining factors in museum's self-identification and are changing societal roles (Holdgaard & Klastrup, 2014). Simon (2010, p. 2) defined the museum as a cultural institution 'where visitors can create, share, and connect with each other around content'.

Social media adoption is a global trend that has the potential to change social lives both on interpersonal and community level (Ellison, Lampe, & Steinfield, 2009). Social media such as Twitter, Facebook, YouTube and Flickr are a two-way communication channels (Huvila, 2013) offering organizations tools for engaging in dialogue with their public and the opportunity to become more social and participatory. Social media provide museums with flexibility, personalization, interactivity and an opportunity for collaboration between museums and their public (Capriotti & Kuklinski, 2012). Thus, museums and other organizations are trying to keep up with this changing environment and to implement social media to their benefit (Effing, van Hillegersberg, & Huibers, 2011). For museums social media is an instrument for outreach to the public, promotion of exhibitions, organization of participatory projects, conversations and debates with potential visitors and capture a global audience's attention for their collections (Villaespesa, 2013). Moreover, social media have the potential to transform visitors from passive observers into active participators and content creators (Holdgaard & Klastrup,

2014) as they post photos taken during their visit, express their opinions and experiences and share content about the museum (Villaespesa, 2013).

Twitter, the fastest growing social network by active users (Vincezini, 2013), is a microblogging service that allows users to share information via short messages with a maximum of 140 characters in length and to answer the question: 'What's happening' (Chu, Gianvecchio, Wang, & Jajodia, 2010; Naveed, Gottron, Kunegis, & Che Alhadi, 2011). Museums attracted by a potentially large audience of Twitter and the easy-to-use platform started join Twitter. By the start of 2010, over 1000 institutions in 34 countries had joined Twitter (Museum Marketing 2014) and this number grows exponentially. It is interesting to understand the use of Twitter by museums, as they appeal to present, future and potential museum visitors (Lossing, 2009), however research is very limited. Thus, the paper aims to fill this gap and records the top-60 European museum's Twitter accounts. It aims at describing the activity and performance of these accounts and it associates their Twitter performance to their general popularity and impact. Differentiations among museums regarding Twitter performance are reported.

2 Twitter

Twitter microblogging platform was officially launched in October 2006 (Krishnamurthy, Gill, & Arlitt, 2008). Microblogging platforms provide an easy form of communication and enable users to broadcast and share information about their opinions, activities, and status (Java, Song, Finin, & Tseng, 2007). Today, Twitter is one of the most popular sites worldwide as it has a global Alexa rank of 8 (Alexa, 2015). Total number of Twitter registered users are about a billion (DMR, 2015) while 288 millions of them are monthly active users (Twitter, 2015). Users post about 500 million tweets per day (DMR, 2015).

Registered users may post short messages, less than 140 characters, republish another's tweet (RTretweet), write mentions—tweets addressing a specific user- or tweet directed at a certain user via @reply. They may follow hashtags, metadata tags that group tweets by topic ('#' followed by a word), create lists of accounts to follow, search through the Twitter chatter and participate in trending topics (Hargittai & Litt, 2012; Kwak, Lee, Park, & Moon, 2010; Sousa, Sarmento, & Rodrigues, 2010).

A Twitter user 'A' may follow another user 'B'. That means that the user 'A' is subscribing to the 'B' user's Tweets as a follower. His/her updates will appear in 'A' user's Home tab. That person 'B' is able to send the user 'A' Direct Messages. The vast majority of Twitter accounts are public, in the vein that can be viewed by anyone of the Twitter users who subscribes to view the tweets (Marwick & boyd, 2010). The relationship of 'following' is not mutual as a user can follow any other user, and the user being followed need not follow back (Hargittai & Litt, 2012; Kwak et al., 2010). Thus, some users follow a few, while others follow thousands. Some follow only users that they know personally, while others follow celebrities

and anyone that they find interesting (boyd et al., 2010). This highly skewed distribution has also been recorded at followers. Some Twitter accounts exist that attract enormous number of followers while the majority has only a few followers (Bakshy, Hofman, Mason, & Watts, 2011; Huberman, Romero, & Wu, 2009; Kwak et al., 2010).

In the world of Twitter, social networks are being created via followers' relationships, retweets, @replies and #hashtags, (Sousa et al., 2010).

3 Museums and Social Media

Nowadays, social media are gaining more and more popularity among museums and other cultural organizations as they are a natural complement to the work they are doing on site and platforms that enable performing educational, marketing and engagement-focused practices (Kidd, 2011; Langa, 2014). Museums use social media in order to get more audiences and visitors, to engage the existing ones, to communicate their activities and exhibitions, to grow institution's reach between and around individuals and communities, to build and sustain communities of interest around the museum and to increase public engagement (Kidd, 2011; Spiliopoulou, Mahony, Routsis, & Kamposiori, 2014; Tuğbay, 2012). Their flexibility, ease of use and speed of content publishing has resulted in public's active participation and creation of user generated content (Agichtein, Castillo, & Donato, 2012; Fletcher & Lee, 2012). Social media offer the possibility to museums' visitors to express their experiences, and upload their own photos and videos taken during their visit. In this vein, use of social media transforms visitors from passive observers into active participators, creators and museum's ambassadors (Holdgaard & Klastrup, 2014; Kidd, 2011; Villaespesa, 2013).

For the moment little research effort has been devoted at investigating adoption and use of social media by museums and especially on Twitter. Alexander et al. (2008) investigated how museums build and maintain web video channels on You Tube. Participating institutions completed a survey outlining background information on their projects and statistical data from YouTube about the channel and their videos. Findings reveal that posting video content on YouTube benefits the institution. However, museum videos generate a small number of comments and dialogue comes from a small number of active community members. Most visitors to YouTube are interested in specific topics and looking for contents around those topics and are not searching for the term 'museum'. Russo and Peacock (2009) suggested that social media should be viewed as living systems. Thus, it is a challenge for museums to support the health of the ecology of the systems by maintaining the right level of contribution, understanding and nurturing their dynamics and carefully examine interests, motivations and rewards that drive others to the systems. Later on, Lopez, Margapoti, Maragliano, and Bove (2010) examined the extent to which museums have adopted Web 2.0 tools on their websites. Two hundred and forty museum (arts, natural sciences, social sciences,

and specialized) websites in Italy, France, Spain, England, and the USA were analyzed. A low overall presence of Web 2.0 tools on museum websites was recorded. Significant differences in the use of Web 2.0 tools were also recorded among countries and different museum categories. Kidd (2011) highlighted the increased use of social media in the museums sector in the UK and investigated the frames within which social media activity is being experienced. From her findings it is evident that a gap exists between the possibilities offered by social media and their use by museums. She proposed that it is crucial for museums to better understand the frames within which such activity is being encouraged and experienced. Bocatius (2011) focused on the question 'What kind of Web 2.0 elements are already being used for Museum Education Services on-line'. She took into consideration the Jewish Museum in Berlin, the Städel Museum in Frankfurt and the Brooklyn Museum in New York. The findings from the case studies indicate that adoption of Web 2.0 by museums is still at an early stage but museums are getting more and more aware of it.

Fletcher and Lee's (2012) purpose of study was to investigate how American museums are using social media. They collected 315 online surveys among American museums, and conducted nine in-depth interviews with professionals working with social media. Results indicate that involvement with social media is considered important. However, American museums use Facebook and Twitter mostly as one-way communication channels. Their social media strategies are focusing on event listing, reminders, and reaching larger or newer audiences by increasing the number of fans and promotional messaging. Pett (2012) demonstrated how social media can be used for museums' marketing, for fostering multi-vocal dialogue, and creating a strong online brand. He claimed that when social media are correctly used, the results are extremely beneficial to a museum engagement with a wider audience. Social media use, in order to be successful, demands a clear strategy, commitment, resources and personnel, directorate buy-in, marketing nous, a unique selling point and a fan base to cultivate. Capriotti and Kuklinski (2012) assessed the level of dialogic communication developed on the Internet by 120 museums in Spain. They analyzed the use of web platforms and social web applications as tools for dialogic communication. Their findings showed that museums are not using all the advantages that the Internet offers for interactive, multidirectional and symmetrical communication. Museums make a very limited use of social media. They use social media mostly for one-way communication and share passive information. Chung et al. (2014) explored the use of social networking services by art museums and their effectiveness as marketing tools. Twelve museum staff participants in the Midwestern United States were interviewed. Three distinct marketing applications were identified for which social networking services were being used: building awareness, engaging with the community, and networking. They claimed that Twitter is 'suitable for spreading small amounts of information that may be time-sensitive, such as events of the day, exclusive offers from the museum store, or a special tour of the exhibition', while Facebook is suitable for longer, richer, and more conversational information.

Regarding Twitter Osterman, Thirunarayanan, Ferris, Pabon, and Paul (2012) explored the different ways that the Smithsonian's Hirshhorn Museum and Sculpture Garden use Twitter to engage audiences. They collected and analyzed tweets over a 6 months period of time. Their findings suggest that the two museums use Twitter in a consistent manner, focusing on: sharing links and resources, publishing upcoming activities and announcements and museum staff commentary or criticism. Moreover, they are trying to form active two-way communication and to engage creatively the public to utilize new social media tools. Villaespesa (2013) investigated the significant role that Twitter played during the festival 'Art in Action' at 'The Tanks', Tate Modern's new space dedicated to live art. She analyzed the tweets that mentioned 'The Tanks' during that period and covered the process of collecting, coding and analyzing the data following three different lines: Twitter as a communication tool, as a conversation tool to engage with the visitors and as an audience research tool. In a more recent study Langa (2014) tried to understand more about the relationship building that museums are engaging in using Twitter. She employed quantitative counting and categorization of content tweeted by a purposeful sample of 50 museums. In order to investigate level of engagement she used six dimensions: count, reliability, content, find ability, frequency and engagement. Half of museums in the sample had a higher number of followers than the institution followed. A large number of museums in the sample focused on original content in their Twitter feed and the highest portion of them was cross-referencing social media platforms in their Twitter postings, like Instagram photos and Facebook posts. The majority of the sample was tweeting several times a day, however remarkable differences were recorded in frequency across disciplinary type of museum. Regarding engagement two types of activities were observed: participation such as museum replies to users who had already posted to the museum account and dialogic activity between a museum and a user.

4 Methodology

According to http://www.europe.org the ranked list of the top European museums was searched. The recording was done during 2–5 March 2015. Sixty top European Museums, according to the popularity and the famous works of art they have in their possessions, were recorded. For economy the top-20 museums are described here: The National Gallery, Musee du Louvre, Galleria degli Uffizi, The Hermitage Museum, Rijksmuseum, Museo del Prado, Vatican Museums, British Museum, Alte Pinakothek, Gallerie dell' Accademia, Tate Britain, Schloesserland Sachsen, Van Gogh Museum, Galleria Borghese, Melngalvju nams, National Archaeological Museum, Bodemuseum, Guggenheim Bilbao, CentrePompidou and Musee d' Orsay.

For each museum its Twitter account (if one exists) was recorded, and several Twitter activity indexes were recorded as well: top content 8 tweets, Topsy score, number of followers, number of followers the accounts talked with, number of

accounts following, tweets per day, number of tweets, photos and videos tweeted by the accounts, number of favorites, number of lists an account belongs to, and time since the accounts are active. Also, the rank of each museum was recorded. Number of followers of an account, number of other accounts an account follows (following), and number of tweets, are recorded since it is supported by the literature that they are indicators of Twitter performance (Anger & Kittl, 2011; Bakshy et al., 2011; Bayram & Arici, 2013; Crump, 2011; Rossi & Magnani, 2012; Sevin, 2013). Topsy score is a complex index provided by Topsy.com social search and analytics site, which takes into account the retweets and mentions than matter for a particular Twitter account, as a measure of users community involvement for this account. Top content 8 tweets is the total number of replies that these tweets get. It is a measure of effective reach that an account has to its followers. Number of followers the accounts talked with is the number of conversation they had on social media. The indexes are provided by Twtrland.com, Topsy.com and by using NodeXL for Windows.

The findings include the presentation of the descriptive statistics of the abovementioned indexes. Next, a Principal Components Analysis with Varimax rotation is used to produce components of the indexes in order to better describe and understand the activity of the Twitter accounts. According to the produced factor scores, a group of the most active, on Twitter, accounts is located. This group consists of the accounts that have at least one factor score (out of the three calculated), over unity, since it is known that factor scores are standardized having means equal to zero and standard deviations equal to one. Factor scores over unity are considered to indicate high factor scores and consequently large values of the activity indexes associated with the factor scores. This group is described in detail. Finally, correlation coefficients are calculated among factor scores of the accounts and the relative ranks of the museums that the accounts belong to (within the list of sixty museums). Conclusions are drawn from these correlations.

5 Findings

Fifteen out of the 60 museums (25 %) do not have a Twitter account. Four out of the top-20 museums do not have a Twitter account. Table 1 presents the descriptive statistics of the recorded indexes. The older account was created on April 2007 (Tate) while the most recent account is that of Galleria degli Uffizi, February 2013.

Regarding the distributions of the Twitter performance indexes, Skewnness ranges from 1.4 (tweets per day) to 5.8 (numbers of accounts following). The medium positive values of Skewnness imply that there is a tendency for some museums to have high values of the indexes while most museums have low values.

Standard deviations are higher than the means especially for number of following and followers and Topsy score. There is a great differentiation regarding the indexes among the museums' Twitter accounts. This can be considered to be in accordance with Skewnness.

Table 1 Descriptive statistics for the Twitter performance indexes

	Median	Mean	Std. deviation	Skewnness
Following	442	1965	6625	5.8
Followers	3089	93,215	230,527	4.3
Photos and videos	192	532	812	3.2
Favorites	2945	1306	2328	2.9
Topsy score	145	2703	6014	2.6
Top content (8 tweets)	95	839	1576	2.3
Tweets	2046	4294	5620	2.1
Lists	0.5	2.52	3.9	2
Talked with	29	247	442	1.9
Tweets per day	1.4	2.4	2.5	1.4

Table 2 Principal components analysis of the Twitter performance indexes

	PC 1: networking	PC 2: tweeting activity	PC 3: time active and involvement
Top content (8 tweets)	0.891	0.314	0.027
Topsy score	0.864	0.378	0.111
Followers	0.792	0.202	0.282
Talked with	0.789	0.523	0.145
Following	0.709	0.057	–0.094
Tweets per day	0.204	0.896	0.290
Tweets	0.261	0.875	0.348
Photos and videos	0.410	0.824	–0.037
Favorites	0.163	0.785	0.001
Lists	–0.106	0.102	0.882
On Twitter since	–0.429	–0.192	–0.641
Total variance explained	56 %	14 %	10 %

On average a museum tweets 2.4 times a day, which could be considered a fairly high value for such an organization. Half of the museums have less than 3000 followers and low Topsy scores. On the other hand, the average followers value is 93,215 and the average Topsy score is 2703. Differentiation among the museums is obvious for all the indexes, but it especially apparent for number of followers, Topsy score, number of tweets and number of accounts the museum account talked with. In this sense, Twitter activity is hardly uniform.

A Principal Components Analysis with Varimax rotation using the eleven indexes produces a three factor solution. The total explained variance is 80 % (Table 2). The first PC is correlated with top content, Topsy score, number of Followers and number of Following, number of account talked with. It summarizes the networking ability of the museums accounts. The second PC summarizes the tweets per day, total number of tweets and number of photos and videos. It is the tweeting activity that the second PC is presenting. The third PC summarizes the age

Table 3 Correlations between museums ranks and Twitter activity factor scores

	Museum rank
PC 1: networking	–0.437*
PC 2: tweeting activity	–0.219
PC 3: time active and involvement	0.133

*$p < 0.01$

of the account and the number of list that the account belongs to. Time that the account is active (age) and involvement could be the name of this PC.

These three Principal Components are used for two purposes: first, it is interesting to use them to explore whether there is an association between Twitter performance and general popularity of the museums as it is described by the museums rankings within the top-60 museums list, and second to use them to locate the most the active museum Twitter accounts.

To explore if there is an association between factor scores and original rankings, correlation coefficients are calculated between factor scores and museum rankings (Table 3). A medium but statistically significant correlation coefficient is calculated for PC1 (networking), −0.437. The more popular a museum is the most active and connected its Twitter account is. This tendency describes a context where popularity for the museums is nearly universal, popular museums tend to be also popular on Twitter. Twitting activity and Twitter involvement of the accounts are not associated to popularity of the museums.

To locate the most active Twitter accounts we apply a simple procedure that takes account of the PCA factor scores. Since the factor scores are standardized, values over unity are considered big. So the museums that have factor scores over one are performing well on the relative principal component and on the original indexes associated with that principal component. We can construct a group of the most active accounts if we consider the accounts which have at least one factor score, out of three, which is over one. That is a Twitter account belongs to the group if it performs well at least in one PC. There are eight museums accounts which satisfy this criterion. The museums and the indexes of their Twitter accounts are presented in Table 4. The museums are Museo del Prado (high values in PC2), British Museum (high values in PC1), Tate Britain (high values in PC1, PC3), Neanderthal Museum (high values in PC3), Centre Pompidou (high values in PC2, PC3), Museo Reina Sofia (high values in PC2), CCCB (high values in PC2, PC3), Mercedes-Benz Museum (high values in PC3). Regarding each principal component, the British Museum and Tate are performing better in networking, Centre Pompidou, Museo Reina Sofia, and CCCB are performing better that the others in tweeting activity. The Tate Britain, the Neanderthal Museum, Centre Pompidou, CCCB and Mercedes-Benz Museum are performing better regarding involvement and time they have been active.

Table 4 Top museums according to general Twitter performance (at least one factor score over 1)

Museums	Tweets	Following	Followers	Favorites	Lists	On twitter since	Photos and videos	Topsy score	Talked with	Top content (8 tweets)	Tweets per day
1. Museo del Prado	25,700	887	361,000	7987	2	Oct-2008	4508	16,280	1180	2581	11
2. British Museum	10,500	42,400	476,000	4362	0	Jan-2009	2371	24,481	1713	6693	4.7
3. Tate Britain	10,000	1142	1,350,000	577	4	Apr-2007	1230	22,851	1408	5427	3.5
4. Neanderthal Museum	2634	2226	3387	858	17	Nov-2009	188	58	67	73	1.4
5. Centre Pompidou	16,600	484	246,000	1224	12	Aug-2008	1170	3343	805	907	6.9
6. Museo Reina Sofia	10,600	1120	197,000	11,700	2	Feb-2009	841	4978	431	1111	4.8
7. CCCB	18,700	1741	81,500	1533	11	May-2009	1016	2290	341	271	8.8
8. Mercedes-Benz Museum	1237	10,600	30,000	424	11	Jan-2009	177	1289	35	876	0.6

6 Conclusions

The paper described the Twitter appearance and activity of the top-60 European museums. It recorded the museums accounts, in the cases that these accounts exist. Eleven Twitter performance indexes were recorded for each account. There is a significant proportion (25 %) of the European museums which do not use Twitter. For those which use Twitter, there is a significant differentiation regarding usage and activity. Partially, Twitter activity is in accordance with the museums popularity and ranking. This association is evident especially for the networking indexes and indexes regarding number of people that the accounts are connected to. Popularity of the museums tends to be transferred also on Twitter. However, this tendency does not constitute an association in an absolute manner. There are museums which perform well on Twitter but they are not listed high in the museums ranking list, as it is evident from the group of the best performing museums on Twitter.

A museum can be a destination in and of itself. Tourism and destination management could take advantage of the promotion and visibility of museums to attract visitors. Besides the established original reputation of the museums, presence and visibility in the social media might be used as a marketing tool to attract more visitors and tourists especially for the museums having low popularity rankings.

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