

Web and social media usage by museums: Online value creation



Antonio Padilla-Meléndez*, Ana Rosa del Águila-Obra

Department of Management, Faculty of Social and Work Studies, University of Málaga, Campus Teatinos (ampliación), Málaga, Andalucía 29071, Spain

ARTICLE INFO

Article history:

Available online 10 September 2013

Keywords:

Web usage
Social media usage
Online strategies
Museums

ABSTRACT

This paper contributes to the understanding of online strategies in the context of museums as examples of cultural organisations, an underrepresented sector in the information management literature. It presents a theoretical framework for understanding the online strategies of museums' use of Web and social media, their sources of online value (efficiency, novelty, lock-in, complementarities) and some measurements of Internet performance, such as the Alexa Internet ranking and the number of followers of museums in social media. This type of analysis has not been conducted before and the findings will help museum curators and managers of other cultural institutions to appreciate the impact of these technologies and to make better informed decisions regarding online strategies and resource allocation. In addition, the results of this research are applicable to similar organisations, such as archives and cultural exhibitions, as well as to other service organisations related to information, education and entertainment activities.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

The technological environment of cultural organisations has changed significantly in recent years, prompting these institutions to state their objectives more clearly to reach their social and economic outcomes and to consider new strategies (business models) (Bakhshi & Throsby, 2010). By analysing the use of Web and social media in the context of the online value creation framework of Amit and Zott (2001) and the strategy typology of Miles and Snow (1978), this paper contributes to the understanding of online strategies in the context of museums as examples of cultural organisations, an underrepresented sector in the information management, Information Technology (IT) and services literature.

The integration of IT, and particularly the Internet, into the consumption of cultural products has been identified as one of the most important trends in the cultural sector (Pulh, Marteaux, & Mencarelli, 2008). In the case of museums, as information resources become more technically complex and the users of those resources become more information-literate, the needs and expectations of museum visitors become increasingly sophisticated (Marty, 2008) and the use of the Internet plays a crucial role in meeting these expectations. The relevance of this online presence in museums (having a website on the Internet) for communicating and preserving cultural heritage was already recognised by the UNESCO Charter on the Preservation of Digital Heritage back in 2003 (UNESCO, 2003). However, despite the seemingly omnipresent

nature of the Internet in contemporary society, its adoption and reflection within heritage and museological methodologies remain partial and limited (Waterton, 2010).

Despite recognition of the relevance of this approach, little research has explored the possibilities arising from the use of the Internet (Web and social media), particularly in the case of museums. Indeed, the role of technology and technological innovation in value creation has been studied outside the cultural sphere (Amit & Zott, 2001; Del Águila-Obra, Padilla-Meléndez, & Serarols-Tarrés, 2007; Lee, 2001). However, research into online value creation in the not-for-profit (or non-profit) sector remains meagre, and there is an absence of any established methodology for analysing technological innovation processes in the cultural sector (Camarero & Garrido, 2008). The introduction of multimedia information systems, based on Web and social media use, enables museums to redesign traditional products and promote new cultural experiences by involving a worldwide network of potential visitors, who now take part in the production of the cultural service. Consequently, a proper understanding of how museum visitors use these digital museum resources in their daily lives is critical for the success of museums in the information age (Marty, 2008). In addition, the use-value of social media by museums (for both the museums and the users) remains questionable, and more debate is needed (Kidd, 2011). Accordingly, this paper addresses four relevant research questions (RQs): (RQ1) Does Web usage among museums explain different museum online strategies? (RQ2) Does social media usage among museums explain different museum online strategies? (RQ3) Does the combination of Web usage and social media usage among museums explain online value creation? and (RQ4) Can the museums' online strategies be categorised into three types, namely defender, analyser and prospector?.

* Corresponding author. Tel.: +34 951952084.

E-mail addresses: apm@uma.es (A. Padilla-Meléndez), anarosa@uma.es (A.R. del Águila-Obra).

The theoretical framework of this paper combines the value creation framework (Amit & Zott, 2001) with the strategy typology of Miles and Snow (1978). The use of this strategic theoretical framework to characterise electronic commerce strategies is not new (see Apigian, Ragu-Nathan, & Ragu-Nathan, 2006). In light of this precedent, the main contribution of this paper is to present a theoretical framework for understanding the online strategies of museums. This framework will be constructed by analysing museums' use of Web and social media, their sources of online value (efficiency, novelty, lock-in and complementarities) and some measurements of Internet performance, such as the Alexa Internet ranking and the number of followers of museums in social media. To the authors' best knowledge, this type of analysis has not been conducted before. The findings may help museum curators and managers of other cultural institutions to address these technologies and to make better informed decisions regarding online strategies and resource allocation. In addition, the results of this research are applicable to similar organisations, such as archives and cultural exhibitions, as well as to other service organisations related to information, education and entertainment activities.

The rest of the paper is organised as follows. Following a literature review, we explain the research framework, methodology and main results. We close the paper with conclusions, limitations and further lines of research.

2. Literature review

2.1. Web usage

Some studies on the impact of the Internet on policy development in museums have shown that the use of the Internet is still in its infancy (Morse, 1999). Furthermore, three strategies for the use of Internet have been proposed (Lagrosen, 2003): avoidance strategy, content strategy and technological strategy. Apart from this proposal, previous research (Marty, 2007, 2008) draws attention to the need for museum professionals to think critically about their websites and the information they provide from the perspective of museum visitors both before and after museum visits (Marty, 2007). Online and in-house museum visitors are not separate entities, and it is important for museum professionals to understand how the needs of museum visitors change over time and to develop and strengthen a complementary and supportive relationship between museums and museum websites (Marty, 2008). In addition, virtual museums enrich the museum experience by allowing an intuitive interaction with virtual museum artefacts, and the comparison between real and virtual museums indicates that there remain important issues for virtual museums to solve (Styliani, Fotis, Kostas, & Petros, 2009). Moreover, museums are increasingly using their websites to communicate with their audiences (Lehman & Roach, 2011). Finally, researchers have found that the experience gained by visits to museum websites significantly influences participants' intentions to revisit websites for personal and professional purposes and ultimately to visit the museums themselves (Pavlou, 2012).

2.2. Social media usage

Social media is defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, which allows the creation and exchange of user-generated content" (Kaplan & Haenlein, 2010). Social media sites have been used since the early 2000s to give museums a recognisable face as an extension of their branding activity (Kidd, 2011) and is one manifestation of the so-called "Museum 2.0" (Srinivasan, Boast, Furner, & Becvar, 2009).

Previous literature has stressed how Web 2.0 tools encourage participation while facilitating access to cultural objects, but catalogues themselves must undergo a much deeper change than merely the addition of Web 2.0 functions on top of their existing structure, format and vocabulary (Srinivasan et al., 2009). Overall, there is a low presence of Web 2.0 tools on museum websites and that there are significant differences in the use of Web 2.0 tools among countries and categories (López, Margapoti, Maragliano, & Bove, 2010). The use of social media by museums has been categorised into three organisational frames (Kidd, 2011): marketing (which promotes the face of an institution), inclusivity (which develops a real and online community) and collaborative (which goes beyond communication and promotes collaboration with the audience). In fact, social media support and facilitate viral marketing, which helps to stimulate word-of-mouth among customers (Hausmann, 2012a). For example, a recommendation in Facebook may reach an unlimited number of people. Therefore, an updated profile of the museum in social media and a regular stimulation of interactions among users are needed (Hausmann, 2012b).

2.3. Online value creation

The Internet allows organisations to develop new or complementary business models based on value creation throughout information use (Porter, 2001). Digital technologies create new possibilities for museums to exploit their cultural assets and create more value, allowing them to deliver and assess customer value in new ways; for example, by digitising their collections and archives or providing new services to existing customers, they are able to expand audience reach (Bakhshi & Throsby, 2010).

In the case of the museums, through the Web, the museum 'breaks' the traditional value chain (Minghetti, Moretti, & Micelli, 2002). Therefore, in these organisations, value creation has two different forms of value (social and economic) (Zott, Amit, & Massa, 2010). In museums, the business model has been defined as "the mechanism by which a museum intends to manage its costs and generate its outcomes—in the case of for-profits, the outcomes are primarily revenues earned, and in the case of nonprofits, the outcome is primarily the public good created" (Falk & Sheppard, 2006). Consequently, museums create economic value and social value (Camarero & Garrido, 2008; Camarero, Garrido-Samaniego, & Vicente, 2012). Thus, researchers have proposed a museum value chain that includes the main activities in which competitive advantage resides (Porter, 2006).

Value creation has been studied previously in e-businesses, and four main drivers of online value creation have been identified: efficiency, complementarity, lock-in and novelty (Amit & Zott, 2001). Efficiency refers to the fact that transaction efficiency increases when the costs per transaction decrease. Complementarity is when having a bundle of goods together provides more value than the total value of having each of the goods separately. Lock-in is a condition where companies make it difficult for customers and partners to migrate to competitors. Novelty is related to the innovations of e-businesses in the structure of transactions. Museums are organisations that partially develop their operations over the Internet and that create economic and social value. Consequently, exploring the mentioned four drivers would include analysing Web and social media usage by museums and would help us understand how these organisations create online value.

2.4. Museums online strategy

Miles and Snow's approach to categorise strategy (Miles & Snow, 1978) has been widely used and applied to different industries because of its strong theoretical orientation and generalisability. Three strategic organisation types have been defined (Miles &

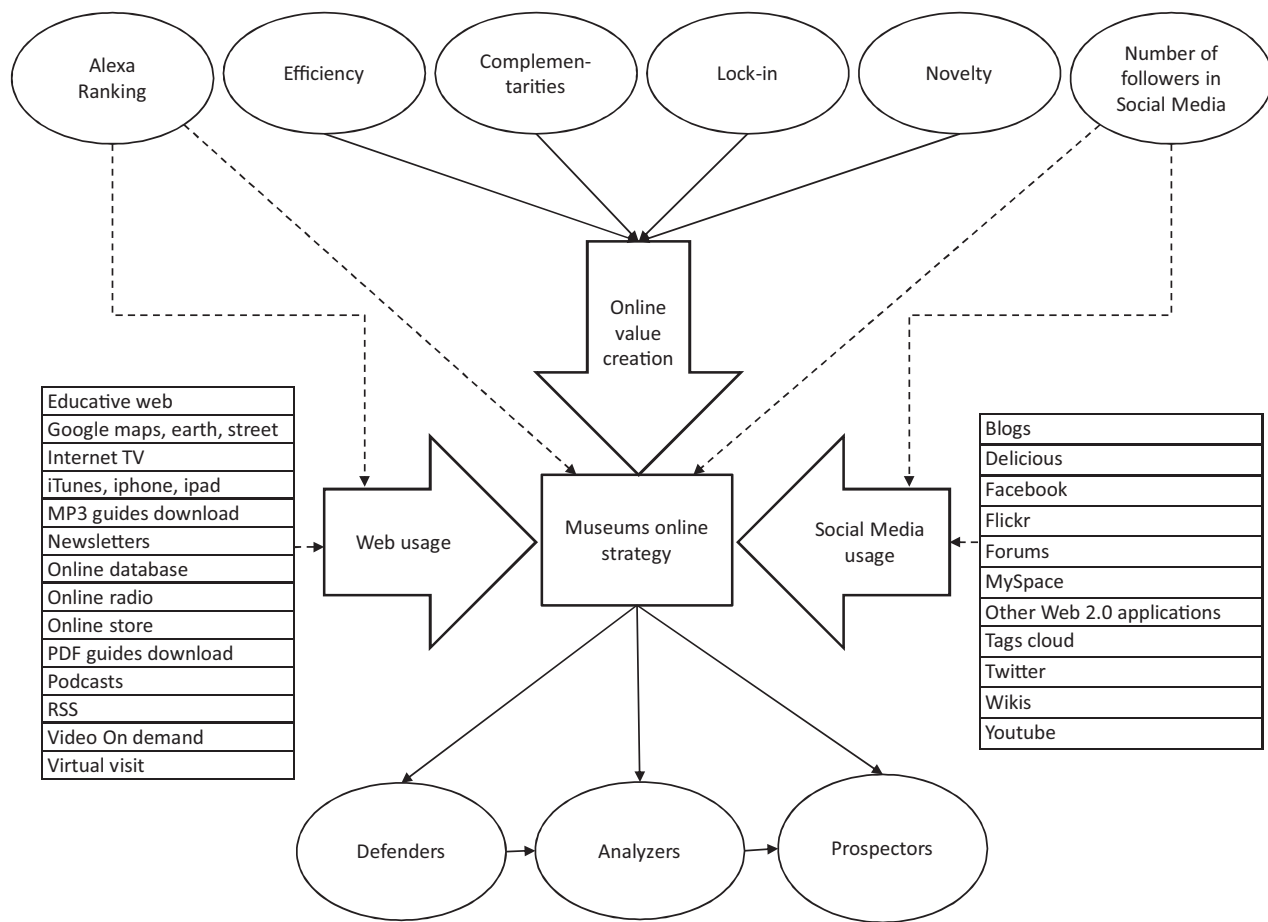


Fig. 1. Research model.

Snow, 1978; Miles, Snow, Meyer, & Coleman, 1978): defenders, analysers and prospectors. Each type has a different configuration of technology, structure and process in response to the environment. These authors also consider the reactor strategy, referring to an organisation with inconsistencies, and cannot be categorised in the same way as the other three.

In this paper, we will consider the three previously mentioned strategies, which are similar to previous studies related to strategic profiles and the Internet (i.e., Apigian et al., 2006).

2.5. Research model

As research model (see Fig. 1), we took sources of value creation in the Internet from the literature review as the basis for analysing the strategies that museums were following using the Internet. These strategies may be categorised by the museums' Web and social media usage, together with some output measures that will be explained later, such as the museums' Alexa ranking and the number of the museums' followers in social media. These online strategies were categorised as defenders, analysers and prospectors.

2.6. Research methods

To examine and categorise the online strategy of museums, we adopted a qualitative and quantitative approach, which included a literature review and data collection (expert interview, website content analysis and public data available on the Internet regarding Alexa ranking and followers of social media). We analysed data using different techniques: descriptive statistics, multiple

correspondence, cluster, and discriminant analysis. First, we reviewed the literature to identify elements of Web usage, social media and online value creation in the case of museums, which allowed us to conceptualise the research model already described.

Regarding data collection, there were different empirical inputs: interviews, web content analysis, Alexa ranking data, and the number of followers in social media.

First, we conducted one in-depth interview with a museum manager with previous experience in three international museums. Doing so allowed us to design the research and gain insight into museums in real life as well as into the relevance of Web usage and social media in this context. Second, we chose the world's most-visited museums (The Art Newspaper, 2010) as the primary area of study and conducted an observation study based on a review, Web content analysis and classification by three observers of the Web from those museums (see Table 1).

Second, a Web content analysis of those museums websites was conducted. Similar to Cormany and Baloglu (2011), for each website visited, evaluation was made on content of the website and the services offered by the museums and no judgement was made as to the website's design or functionality. A list of items, informed by previous research (i.e., Shang, Li, Wu, & Hou, 2011; Del Águila-Obra et al., 2007) was used. Items (see Table 2) were measured on a nominal "present/not present" scale, eliminating the variability of qualitative assessments (Cormany & Baloglu, 2011, 711). This type of methodology is being increasingly used as a research technique by many researchers (i.e., Liu, Arnett, Capella, & Beatty, 1997; Huizingh, 2000). For example, Del Águila-Obra et al. (2007) applied a Web content analysis to aggregator websites when studying value-chain changes and new business models in the news

Table 1
Analysed museums.

Most-visited museums	Country	2009 ranking (millions of on-site visitors)	Alexa ranking (July 16, 2010)	Number of followers in social media (July 16, 2010)
Louvre	France	8.50	51,650	112,822
British Museum	UK	5.57	56,242	55,708
Metropolitan Museum of Art	USA	4.89	20,863	307,474
National Gallery	UK	4.78	117,830	18,483
Tate Modern	UK	4.75	26,740	199,853
National Gallery of Art	USA	4.61	74,655	11,064
Centre Pompidou	France	3.53	90,974	46,255
Musée d'Orsay	France	3.02	151,762	11,607
Museo Nacional del Prado	Spain	2.76	134,243	136,471
National Museum of Korea	Korea	2.73	117,965	0
Museum of Modern Art (MOMA)	USA	2.67	18,779	650,402
Taiwan Palace Museum	Taiwan	2.57	166,455	0
State Hermitage Museum	Russia	2.43	128,550	0
Tokyo National Museum	Japan	2.27	133,345	0
Victoria and Albert Museum	UK	2.27	41,594	62,721
Reina Sofia	Spain	2.09	364,286	39,221
National Portrait Gallery (UK)	UK	1.96	105,792	6784
Art Institute of Chicago	USA	1.85	92,867	52,650
De Young Museum	USA	1.84	N.A.	0
Moscow Kremlin Museum	Russia	1.57	425,254	0
Galleria degli Uffizi	Italy	1.53	N.A.	0
National Museum of Western Art	Japan	1.51	252,614	0
Tate Britain	UK	1.50	26,740	201,895
Mori Art Museum	Japan	1.50	N.A.	0
Musée Quai Branly	France	1.50	339,363	5028
Van Gogh Museum	The Netherlands	1.45	284,652	12,805
Kelvingrove Art Gallery	UK	1.37	N.A.	272
Art Gallery of New South Wales	Australia	1.31	N.A.	6782
Children's Museum	USA	1.30	297,681	18,422
State Tretyakov Gallery	Russia	1.28	220,030	0
Museum of Fine Arts	USA	1.27	507,539	11,172
Royal Academy of Arts	UK	1.27	218,976	14,306
Guggenheim Museum	USA	1.26	91,971	219,839
Saatchi Gallery	UK	1.26	23,377	27,040
Palazzo Ducale	Italy	1.22	N.A.	430
National Portrait Gallery (USA)	USA	1.19	105,493	8051
Getty Museum (Getty Centre)	USA	1.15	N.A.	0
Kunsthistorisches Museum	Austria	1.14	300,704	2001
Galleria dell'Accademia	Italy	1.13	N.A.	0
Pergamonmuseum	Germany	1.09	N.A.	0

Source: [Alexa Internet \(2011\)](#), [The Art Newspaper \(2010\)](#) and own work.

Note: N.A., not available.

industry. In addition, [Shang et al. \(2011\)](#) applied Web content analysis to categorise social media services. To ensure the validity of the results, we cross-checked between multiple coders and used a formal coding scheme ([Neuendorf, 2002](#); [Thelwall, 2009](#)). Three researchers visited the websites, thus enhancing the validity of the data. The validity was further improved by our use of other sources of information (extensive online research and interview with one museum manager) as a means of triangulation ([Patton, 1990](#)). In

addition, we ensured that the content analysis was valid by thoroughly understanding the research objectives, previously reading a sub-set of relevant content ('immersion in the message pool' according to [Neuendorf \(2002\)](#)), and carefully selecting the content sample (in this case the museums' webpages) to be analysed ([Thelwall, 2009](#)). Regarding reliability, Cronbach's alpha coefficient for all items was estimated as 0.827, far higher than the minimum acceptable value of 0.7 ([Hair, Anderson, Tatham, & Black, 1998](#)).

Table 2
Items.

Web usage	Presence in the analysed museums (%)	Social media usage	Presence in the analysed museums (%)
Educative Web	87.5	Blogs	27.5
Google maps, earth, street	20	Delicious	12.5
Internet TV	12.5	Facebook	67.5
iTunes	20	Flickr	40
Downloadable MP3 guides	12.5	Forums	10
Newsletters	60	MySpace	5
Online database	87.5	Other social media applications ^a	17.5
Online radio	2.5	Tags cloud	2.5
Online store	72.5	Twitter	55
Downloadable PDF guides	42.5	Wikis	0
Podcasts	37.5	YouTube	42.5
RSS	32.5		
Video on demand	32.5		

^a Vimeo, Issuu, Yelp, Upcoming.org, blip.tv, friendfeed, digg, hyves.

Third, as additional sources of data, two measurements were used: the Alexa ranking and the number of followers in social media. The Alexa Internet ranking is an inverse indicator; thus, a lower gauge number indicates that the website is better positioned. We visited the website www.alexa.com on July 16, 2010, between 12:00 and 14:00 to collect the ranking of the 40 museums. A site's ranking is based on a combined measure of reach (unique users in a giving day) and page views (total visits), being the site with the highest combination of both indicators ranked #1 (Alexa Internet, 2011). In addition, we calculated the number of social media followers for each museum by adding the number of followers on Facebook and Twitter (if any) of the museums surveyed. To obtain the number of followers, we searched for an official group in the two social networking services on the same day (July 16, 2010).

We analysed the data obtained with the help of descriptive statistics, multiple correspondence, cluster and discriminant analysis, using the software IBM SPSS Statistics 19. Because of the nature of the data about Web and social media usage (categorical data showing the presence or absence of the different features), multiple correspondence analysis was considered appropriate for reducing the number of dimensions with categorical data.

The 24 mentioned items were used in the analysis and two factors were obtained. Once we had the scores, the Alexa ranking and the number of followers in social media for each museum, we computed a *k*-means cluster analysis. After obtaining three clusters, we used discriminant analysis to build a predictive model for group (strategy type) membership. The two factors obtained in the correspondence analysis, the Alexa ranking and the number of followers were then used as predictor variables. The dependent variable was the cluster in which each museum was classified.

3. Results

3.1. Descriptive results

From the analysis of the information obtained (see Table 2), Web usage is mainly based on making the database of its collections available and using the web for educational purposes (educational website, that seeks to bring the museum to the public by offering entertainment services, games and so forth). As new formats, museums offer content throughout video on demand, iTunes and Internet TV. Regarding social media usage, museums are creating their profiles on social networking services such as Facebook and Twitter. Instances of Web 2.0 are less widespread, with the most prominent examples being the availability of content on YouTube or Flickr.

3.2. Statistical analysis

We used multiple correspondence analysis (Hair et al., 1998). Cronbach's alpha coefficients of the dimensions were not sufficiently high to include more than two dimensions. According to the discrimination measures per variable and per dimension, dimension 1 was interpreted as showing the use of social media features. Meanwhile, dimension 2 was interpreted as showing other Web features uses more related to content. To determine whether there were different strategies on the Internet, we used cluster analysis. Considering the theory and previous tests, and after analysing several graphs charting museum classification, we examined three groups in the *k*-means clustering technique. The cases were classified into three groups that include one, 16 and 23 museums, respectively.

To test the reliability of the clustering, we ran discriminant analysis, taking the three considered variables (punctuations in dimensions, number of followers, and Alexa Internet Ranking) as

Table 3
Statistical analysis.

Discriminant analysis. Tests of equality of group means						
	Wilks' Lambda	F	df1	df2	Sig.	
Museums' scores in Dimension 1	0.787	5.003	2	37	0.012	
Museums' scores in Dimension 2	0.944	1.090	2	37	0.347	
Followers in social media	0.305	42.189	2	37	0.000	
Alexa ranking	0.164	94.153	2	37	0.000	
Box's test results						
Box's M	67.911					
F	Approx.				5.949	
	df1				10	
	df2				4870.079	
	Sig.				0.000	
Classification results						
	Cluster	Predicted group membership			Total number of cases	
		1	2	3		
Count	1	1	0	0	1	
	2	0	16	0	16	
	3	0	0	23	23	
100.0% of original grouped cases correctly classified.						

independent variables for each of the cases and the cluster where each museum is included as a dependent variable (see Table 3). The discriminant analysis was conducted using Fisher's discriminant function with the stepwise method and the minimum Wilks's Lambda as variable-selection criterion. The Bartlett-Box test (Box's *M* test) was also applied, on the determinants of the matrix of covariances between groups—and in this case, the statistic was found to be significant. Three of the independent factors that we considered were significant (i.e., they were discriminating variables, as they were significant in the Wilks's lambda and *F* tests). Scores in dimension 2 were not significant. The confusion matrix was used to represent the general level of accuracy achieved by the discriminant functions. In this case, 100.0 per cent of the original cases were correctly classified. This finding demonstrates the adequacy of the classification obtained in the cluster analysis using the proposed factors. We thus are able to confirm that the function performed better than the chance level. This analysis will be the basis for the discussion.

4. Discussion

The main contribution of this paper is to show how the 40 most physically visited museums in the world create value on the Internet using Web and social media. Using the Alexa ranking and the number of followers in social media as outcome measures, we found different strategies related to the success of the museums' actions on the Internet. Contrary to what might be thought, the museum with the best practice ranked third place in terms of the number of on-site visitors. Consequently, there is no conflict between the physical and the online presence; rather, there exist positive synergies for museums.

Web usage is well developed across all the museums under analysis, although most of this is for "traditional" features (such as PDF guides) rather than for "innovative" features (such as Internet TV). Regarding social media, there is a clear sign of museum websites becoming more "socialised", with more than fifty per cent of those museums on our list already using social media to promote their services and products. According to the results obtained, the combination of Web and social media usage explains online value creation and different museum online strategies. This combined usage will

be discussed in the context of the online value creation framework, using the four drivers.

First, the actions of the museums in the efficiency area are shown in the use of the Web as an online brochure. Museums are now accessible online to potential visitors, providing them with useful online information to prepare their physical visit in advance. Second, museums are continually introducing complementarities by selling complementary products and services and by setting up online stores, marketing podcasts and educational Web development. Third, in terms of lock-in, the potential value creation derived from how museums use Web and social media may depend largely on the ability to motivate visitors to make repeat visits. The aim is to develop loyalty through new relationships beyond the museum visit. Fourth, regarding novelty, museums have largely used their Internet presence for product innovation through the development of online services such as radio, video on demand or Internet TV.

Regarding strategy, previous research has identified three strategies of Web usage by museums (avoidance, content and technology) (Lagrosen, 2003). Similarly, but from another perspective, we have found three strategy types: defender, analyser and prospector. The *defender* group of museums develops an informational/complementary strategy that considers the website of the museum to be a complement to the physical museum. These museums are mostly located outside the US, and have both a low Alexa ranking (444,444) and a very low number of followers in social media. This strategy is employed by those museums that use social media either to a minimal extent or not at all (using only blogs or newsletters) and thus have a low number of followers in social networking services.

The *analyser* group of museums follows an interactivity/expansion strategy. These museums have medium/high levels of value creation online and a medium number of followers in social networking services. Most museums in this group are from the UK and USA (13 out of 23), a good ranking Alexa average of 106,000, and a considerable number of followers in social media. We would like to highlight within this group the cases of the Tate Modern and the National Gallery. The Tate Modern has community members and offers them the chance to personalise Web content, download audio to iPhone/iPad, send e-cards and use interactive calendars. It also provides them with a wide variety of multimedia content, including Internet TV channels. The National Gallery (London) uses innovative tools such as the possibility of downloading podcasts with images, which are renewed every month. Visitors may use the Google Street View to find the locations that inspired certain artworks, and the organisation has an application for the iPhone called Love Art, offering not only a selection of paintings with images and comments but also the possibility of exploring and learning about the stories that inspired these works. Similarly to previous studies (López et al., 2010), our research shows that actively used social media are generally found on websites belonging to museums located in English-speaking countries, namely, England and the USA. Other countries are also included but are less represented. Additionally, and similarly to Camarero and Garrido (2008), we found that instead of breakthrough innovations, in most museums, the most common innovations are continuous or incremental when using the Internet.

The *prospector* group is made up of just one museum following an online leadership strategy, which consists of showing a medium/high level of online value creation. This museum is the MOMA (Museum of Modern Art, New York), which has the highest number of followers in social networking services and may be considered to have the best practices in using Social media, reaching 650,402 followers on Facebook and Twitter. It was observed that, similarly to the findings of Bakhshi and Throsby (2010), the use of digital technologies is fundamentally reshaping the nature of the relationship between museums, in this case the MOMA, and the

public. The MOMA offers visitors the possibility to download mp3 guides and to design their own personal webpage of the museum so that it displays information that is of interest to them (My Met Museum). It also has a strong presence in all the social networking services analysed.

5. Conclusion

In conclusion, Web and social media usage explains online value creation by museums, and their online strategy may be categorised as defender, analyser and prospector. Being an exploratory study, this paper contributes to the literature on online value creation, particularly in the case of cultural organisations, showing a valid theoretical framework with which to analyse the online strategies of museums. In addition, we have included Web and social media usage, sources of online value (efficiency, novelty, lock-in and complementarities) and some Internet performance measures such as the Alexa Internet ranking and the number of followers of museums in social media. The results of this research are applicable to similar organisations such as archives and cultural exhibitions as well as to other service organisations related to information, education and entertainment.

Regarding the contribution of this paper to the information management practice in museums, we have found that to meet their social and economic outcomes, museums must decide strategically how best to use the Internet and social networking services. This study may help museum curators and managers of other cultural institutions to engage these technologies and to make better-informed decisions regarding online strategies and the allocation of technological resources. It may be fashionable to use social media, but without a proper strategy, it could have more negative than positive consequences. Several positive outcomes may be obtained with an adequate mix of different sources of value creation. As Codina, Cristobal and Thorsson (2004) stressed, marketing managers of museums should adopt a professional attitude and find new marketing strategies and forms to motivate the public and encourage sporadic visitors to return. In addition, previous research has stressed the need for museum professionals to think critically about their websites and the information that they provide from the perspective of museum visitors before and after museum visits (Marty, 2007). This study helps managers to understand the relevance and implications of Web and social media usage in the way museums create online value and thus helps them to implement their online strategy effectively.

As limitations of the study, first, this study is based on information available on the Web. Although we did conduct an in-depth interview with the director of a museum, more interviews are necessary to corroborate the findings and thus achieve better triangulation of data. Moreover, the number of museums analysed was limited, and although they are the most visited in the world, it is still a rather small sample. Second, the use of cross-sectional data prevented us from examining the evolution of the different ways in which Web and social media are used. Third, they are limits to statistics based on the data available from websites with low visitation (Alexa Internet, 2011).

References

- Alexa Internet. (2011). FAQ. How are Alexa's traffic rankings determined?? Retrieved from <http://www.alexa.com/faqs/?p=134>
- Amit, R., & Zott, C. (2001). Value creation in e-business. *Strategic Management Journal*, 22, 493–520.
- Apigian, C. H., Ragu-Nathan, B. S., & Ragu-Nathan, T. S. (2006). Strategic profiles and Internet Performance: An empirical investigation into the development of a strategic Internet system. *Information and Management*, 43(4), 455–468.
- Bakhshi, H., & Throsby, D. (2010). Culture of innovation: An economic analysis of innovation in arts and cultural organizations. Research report: June 2010. NESTA.

- Camarero, M. C., & Garrido, M. J. (2008). The role of technological and organizational innovation in the relation between market orientation and performance in cultural organizations. *European Journal of Innovation Management*, 11(3), 413–434.
- Camarero, C., Garrido-Samaniego, M. J., & Vicente, E. (2012). Determinants of brand equity in cultural organizations: The case of an art exhibition. *The Service Industries Journal*, 32(9), 1527–1549.
- Codina, J., Cristobal, E., & Thorsson, A. (2004). Marketing management in cultural organizations: A case study of Catalan museums. *International Journal of Arts Management*, 6(2), 11–22.
- Cormany, D., & Baloglu, S. (2011). Medical travel facilitator websites: An exploratory study of web page contents and services offered to the prospective medical tourist. *Tourism Management*, 32, 709–716.
- Del Águila-Obra, A. R., Padilla-Meléndez, A., & Serarols-Tarrés, C. (2007). Value creation and new intermediaries on Internet: An exploratory analysis of the online news industry and the web content aggregators. *International Journal of Information Management*, 27(3), 187–199.
- Falk, J. H., & Sheppard, B. K. (2006). *Thriving in the knowledge age: New business models for museums and other cultural institutions*. Oxford: Altamira Press.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis with readings*. Englewood Cliffs, NJ: Prentice Hall.
- Hausmann, A. (2012a). Creating 'buzz': Opportunities and limitations of social media for arts institutions and their viral marketing. *International Journal of Nonprofit and Voluntary Sector Marketing*, <http://dx.doi.org/10.1002/nvsm.1420> (article first published online 18.04.12)
- Hausmann, A. (2012b). The importance of word of mouth for museums: An analytical framework. *International Journal of Arts Management*, 14(3), 32–69.
- Huizingh, E. (2000). The content and design of web sites: An empirical study. *Information and Management*, 37, 123–134.
- Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons*, 53(1), 59–68.
- Kidd, J. (2011). Enacting engagement online: Framing social media use for the museum. *Information Technology and People*, 24(1), 64–77.
- Lagrosen, S. (2003). Online services marketing and delivery: The case of Swedish museums. *Information Technology and People*, 16(2), 132–156.
- Lee, C. S. (2001). Modeling the business value of information technology. *Information and Management*, 39(3), 191–210.
- Lehman, K., & Roach, G. (2011). The strategic role of electronic marketing in the Australian museum sector. *Museum Management and Curatorship*, 26(3), 291–306.
- Liu, C., Arnett, K. P., Capella, L. M., & Beatty, R. C. (1997). Web sites of the Fortune 500 companies: Facing customers through home pages. *Information and Management*, 31, 335–345.
- López, X., Margapoti, I., Maragliano, R., & Bove, G. (2010). The presence of Web 2.0 tools on museum websites: A comparative study between England, France, Spain, Italy, and the USA. *Museum Management and Curatorship*, 25(2), 235–249.
- Marty, P. F. (2007). Museum websites and museum visitors: Before and after the museum visit. *Museum Management and Curatorship*, 22(4), 337–360.
- Marty, P. F. (2008). Museum websites and museum visitors: Digital museum resources and their use. *Museum Management and Curatorship*, 23(1), 81–99.
- Miles, R. E., & Snow, C. C. (1978). *Organizational strategy, structure and processes*. New York: McGraw-Hill.
- Miles, R. E., Snow, C. C., Meyer, A. D., & Coleman, H. J. (1978). Organizational strategy, structure, and process. *Academy of Management Review*, 3(3), 546–562.
- Minghetti, V., Moretti, A., & Micelli, S. (2002). Reengineering the museum's role in the tourism value chain: Towards an IT business model. *Information Technology and Tourism*, 4, 131–143.
- Morse, V. (1999). Untangling the Web: Comparing the impact of the Internet on the National Archives, the National Library and the Museum of New Zealand Te Papa Tongarewa. *Archives and Museum Informatics*, 13, 1–21.
- Neuendorf, K. (2002). *The content analysis guidebook*. Thousand Oaks, CA: Sage Publications.
- Patton, M. Q. (1990). *Qualitative evaluation methods* (2nd ed.). Newbury Park, CA: Sage Publications.
- Pavlou, V. (2012). The educational potential of museum websites: Building an instrument for assessing pre-service teachers' views. *Museum Management and Curatorship*, 27(3), 291–309.
- Porter, M. (2001). Strategy and the Internet. *Harvard Business Review*, 63–78.
- Porter, M. (2006). *Strategy for museums*. Retrieved from http://www.isc.hbs.edu/pdf/Strategy_for_Museums.20060427.pdf
- Pulh, M., Marteaux, S., & Mencarelli, R. (2008). Positioning strategies of cultural institutions: A Renewal of the offer in the face of shifting consumer trends. *International Journal of Arts Management*, 10(3), 4–20.
- Shang, S. S. C., Li, E. Y., Wu, Y. L., & Hou, O. C. L. (2011). Understanding Web 2.0 service models: A knowledge-creating perspective. *Information and Management*, 48(4/5), 178–184.
- Srinivasan, R., Boast, R., Furner, J., & Becvar, K. M. (2009). Digital museums and diverse cultural knowledges: Moving past the traditional catalog. *The Information Society*, 25(4), 265–278.
- Styliani, S., Fotis, L., Kostas, K., & Petros, P. (2009). Virtual museums, a survey and some issues for consideration. *Journal of Cultural Heritage*, 10, 520–528.
- The Art Newspaper. (2010). Exhibition and museum attendance figures 2009. *The Art Newspaper*, 212, 23–30.
- Thelwall, M. (2009). Introduction to webometrics: Quantitative web research for the social sciences. In G. Marchionini (Ed.), *Synthesis lectures on information concepts, retrieval, and services*. San Francisco: Morgan & Claypool Publishers.
- UNESCO. (2003). *Charter on the preservation of digital heritage*. Paris: UNESCO.
- Waterton, E. (2010). The advent of digital technologies and the idea of community. *Museum Management and Curatorship*, 25(1), 5–11.
- Zott, C., Amit, R., & Massa, L. (2010). *The business model: Theoretical roots, recent developments, and future research*. WP-862. IESE.

Antonio Padilla-Meléndez is an Associate Professor of Management at the University of Málaga. His research focuses on innovation involving SMEs and academic entrepreneurship. This includes technological innovations such as e-business adoption and the role of knowledge transfer exchanges and networks in academic entrepreneurship. He is also a partner of a university spin-off and works as a consultant for national and international organisations.

Ana Rosa del Águila-Obra is an Associate Professor of Management and Dean of the Social Studies and Work Faculty, University of Málaga. Her research focuses on e-commerce, innovation in SMEs and academic entrepreneurship. This includes electronic service quality in e-commerce, technology adoption and the role of knowledge transfer exchanges in academic entrepreneurship. She is also a partner of a university spin-off.