THE ROLE OF SOCIAL MEDIA ENGAGEMENT IN THE CASE OF EXHIBITIONS AROUND THE WORLD

[1]*Tünde Szabó*, [2]*László Csóka* ✉

[1]*Assistant professor, Babeş-Bolyai University, Faculty of Economics and Business Administration, Department of Business Administration, Sfântu Gheorghe, Romania; tunde.szabo@econ.ubbcluj.ro, ORCID: 0009-0004-4127-0987*
[2]*Assistant professor, University of Pécs, Faculty of Business and Economics, Department of Marketing and Tourism, Pécs, Hungary; csoka.laszlo@ktk.pte.hu, ORCID: 0009-0005-1255-198X*

ABSTRACT

Digital media has had a notable influence on museum practices. Museums can strengthen their online presence through social media platforms. Regarding the concept of social media engagement in museums, the study examines how museums and their visitors interact on social media platforms, more specifically on Facebook, seeking to answer the question of whether greater engagement with social media posts about exhibitions can influence exhibition attendance. The empirical research was based on the analysis of a sample of 70 exhibitions and to test our hypotheses, simple and multivariate linear regression models were applied. The engagement-related variables were the daily number of likes, comments, shares, and posts. Contrary to the mainstream approach, the results showed that higher engagement on social media in the museum sector does not in itself lead to higher visitor numbers to a certain exhibition. Our results rather show that a higher number of visitors to an exhibition results in a higher engagement indicator on Facebook.

Keywords: cultural tourism, engagement metrics, exhibitions, museum management, social media engagement

A KÖZÖSSÉGI MÉDIA SZEREPE A KIÁLLÍTÁSOK NEMZETKÖZI VILÁGÁBAN

[1]*Szabó Tünde, [2]Csóka László* ✉

[1]*Egyetemi adjunktus, Babeş-Bolyai Tudományegyetem, Közgazdaság- és Gazdálkodástudományi Kar, Sepsiszentgyörgyi Kihelyezett Tagozat; tunde.szabo@econ.ubbcluj.ro, ORCID: 0009-0004-4127-0987*
[2]*Egyetemi adjunktus, Pécsi Tudományegyetem, Közgazdaságtudományi Kar, Marketing és Turizmus Intézet; csoka.laszlo@ktk.pte.hu, ORCID: 0009-0005-1255-198X*

ABSZTRAKT

A digitális média jelentős befolyással bír a múzeumi gyakorlatra. A közösségimédia-platformokon keresztül a múzeumok erősíthetik online jelenlétüket. A múzeumokkal kapcsolatos közösségimédia-elköteleződés fogalma vonatkozásában a tanulmány azt vizsgálja, hogy a múzeumok és látogatóik hogyan lépnek interakcióba a közösségimédia-platformokon, pontosabban a Facebookon, választ keresve arra a kérdésre, vajon a kiállításokkal kapcsolatos közösségimédia-bejegyzések iránti nagyobb elköteleződés befolyásolhatja-e a kiállítások látogatottságát. Az empirikus kutatás 70 kiállításból álló minta elemzésén alapul, és hipotéziseink teszteléséhez egyszerű és többváltozós lineáris regressziós modelleket alkalmaztunk. Az elköteleződéssel kapcsolatos változók a lájkok, hozzászólások, megosztások és bejegyzések napi száma voltak. A mainstream megközelítéssel ellentétben az eredmények azt mutatták, hogy a múzeumi szektorban a közösségi média iránti nagyobb elköteleződés önmagában nem vezet egy adott kiállítás magasabb látogatószámához. Eredményeink inkább azt mutatják, hogy egy kiállítás magasabb látogatószáma nagyobb elköteleződést jelző mutatót eredményez a Facebookon.

Kulcsszavak: kulturális turizmus, elköteleződési mérőszámok, kiállítások, múzeummenedzsment, közösségimédia-aktivitás

1. Introduction

Visiting the museum is a dynamic and special experience in a unique place where visitors communicate and interact with exhibits in a given architectural space (Jeong & Lee, 2006; Simon, 2010). Consequently, museums are social spaces deeply rooted in their surrounding areas (Rivera, 2015), but these are no longer considered as being just exhibition places (Arnaboldi & Diaz Lema, 2021) therefore, they should become institutions whose mission is to link visitors and cultures to create a powerful relationship between the community and its history (Rivera, 2015; Csapó, 2012).

In this urge to build up this linkage, digitalization proved to be a great tool providing the opportunity to change the way organisations interact with their audiences (Fernandez-Lorez et al., 2022). Thus, nowadays museums are true spaces for dialogue, capable of integrating people, and 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 (Padilla-Meléndez & del Águila-Obra, 2013; Csapó & Schultz, 2024). On the basis that engagement with the cultural heritage is no longer just about the physical visit, but rather the entire visitor experience it can be stated that this experience starts online before the actual visit and ends after the visit has taken place (Walsh et al., 2020).

It is known that the application of digital technology may improve museum visitor engagement what's more, stimulates opinion-sharing and information exchange (Giannini & Bowen, 2022; Go & You, 2016). As internet gives the opportunity to reach millions of people (Saraff, 1999; Rivera, 2015) this enhanced the capability of museums to reach to a wider audience, respectively increased the chance to build up significant visitor engagement (Fernandez-Lorez et al., 2022). Hence, there is no question that the appropriate use of electronic resources and digital presence has become a key issue for museums, given that a large part of their success is based on the development of good communication strategies (Gonda, 2019).

Lately, museums are pressured to enlarge their cultural participation and to develop their audience, process, which is by no mean automatic, so there is a need to investigate deeper into new participatory practices (Arnaboldi & Diaz Lema, 2021). As the main goal of museums is to provide access to artifacts for as many visitors as possible (Carrozzino & Bergamasco, 2010; Raffay & Gonda, 2020) and at the same time, considering the economic benefits of the physical visits, we thought it would be worthwhile to address the concept of engagement and to examine it, related to the period before the pandemic. Furthermore, we considered to analyse data before the pandemic to get a more accurate picture for our research question.

It is known that social media contributes to raising the museum's visibility, as well as expanding its message and alongside advancing dialogue and engagement with visitor (Arnaboldi & Diaz Lema, 2021). Due to the advantages provided by social media, many authors are concerned with scrutinizing these online channel's content, their purpose for using it and the context in which these are utilized. We decided to have a more specific

scrutiny, namely we proposed to evaluate the reactions and engagement metrics (likes, comments, and shares) of Facebook posts for popular exhibitions. We assumed that if we choose popular museums with popular exhibitions, their Facebook activity will be more targeted and strategic, and this will be reflected in the number of reactions. Therefore, we can take the idea further and show that more engagement on a post lead to more visitors. Another reason for scrutinizing this relationship, is caused by the importance of using social media is not diminishing, even after the pandemic, perhaps it has a greater importance today, one could say an indispensable tool. Accordingly, we thought that it would be worth scrutinizing whether Facebook engagement metrics influences physical attendance to an exhibition, because once getting back to normality, visitors may want to visit museums not only through an online channel but also physically as well. Even more, as noted above, the digital presence is indispensable. Based on this, we formulated our first research question, respectively:

RQ1: How does engagement in social media influence attendance at exhibitions?

Furthermore, we could not ignore the noteworthiness of the co-creation process (Shahbaznezhad et al., 2021), another feature of the social media, obviously alongside communication function, thus we assumed a reverse mechanism between the analysed variables. With this in mind, we formulated our second question, respectively:

RQ2: To what extent is it possible that attendance has an impact on engagement in social media?

Hopefully, our results will provide important information for museums on what engagement metrics to consider. In this sense, perhaps the number of posts about a particular exhibition is worth looking at, or the number of likes is more important, or maybe visitors should be encouraged to comment or share an event if these institutions want to get more people to come to the exhibition.

2. Theoretical background

2.1. The role of social media in the museum industry

As with the growing significance of new media technologies, and in order to meet the costumers' needs (Cheng et al., 2020), tourism related organizations and also cultural ones are trying to use social media tools more strategically (Krátki et al., 2022). Given the diversity of social media applications and in order to ensure the success in applying these means, first and foremost, organizations need to consider the typology and functionalities of these. With regard to typology Go & You (2016) considering the degree of self-presentation and social presence, mentions the blogs, collaborative projects (e.g., Wikipedia), social networking sites (e.g., Facebook), content communities (e.g., YouTube), virtual social worlds (e.g., Second Life), and virtual game worlds (e.g., World of Warcraft) (Go & You, 2016; Rátz & Michalkó, 2023). In terms of functionalities Kietzmann et al. (2011), identifies seven main functionalities provided by social media, such as: identity,

conversation, sharing, presence, connections, reputation and groups (Kietzmann et al., 2011).

Concerning museums, both scholars and practitioners agree that to become relevant in today's world, it is essential to adopt new participatory practices (e.g., Saraff, 1999; Arnaboldi & Diaz Lema, 2022; Russo et al., 2008). The increased technological developments are aimed to offering support to the museum (Kamariotou et al., 2021; Chen & Ryan, 2020) capable of reaching broad audiences (Rivera, 2015) and encourage visitor participation with the support of modern channels, which can help not only to attract more visitors (Arnaboldi & Diaz Lema, 2021) but also to advance visitor's experience and engagement, learning and information (Kamariotou et al., 2021).

Of the many new media technologies (Go and You, 2016) in particular, social media has a great deal of interest (e.g., Rauschnabel et al., 2019; Hemphill et al., 2021; Colicev et al., 2016). Some professionals have anticipated that adopting digital innovations might help them strengthen their relationships with visitors and increase visitor numbers, whereas others have feared that this development would inevitably mean the loss of physical visits (Blasco-Lopez et al., 2019; Csapó et al., 2023). Intriguingly, Padilla-Meléndez & del Águila-Obra, (2013) in their research found that there is no conflict between the physical and the online presence; rather, there exists positive synergies for museums (Padilla-Meléndez & del Águila-Obra, 2013). Nevertheless, museums started to pay more attention to their websites' development (Fernandez-Lorez et al., 2022), moreover, it is expected that museum websites enable and promote learning, as well as to be functional, easily navigable, visually pleasing, and enjoyable (Kamariotou et al., 2021).

Formerly museum websites represented an alternative for people who may be interested in museum content but are unable or unwilling to visit the physical environment. This was the case of Web 1.0 (Rivera, 2015) so consequently, museums were under the pressure of redesigning their websites to emphasize the differentiation of their services (Garcia-Madariaga et al., 2019), and improve interaction with visitors. With the help of Web 2.0 platforms, which were basically designed to broaden experiences and knowledge (Ahuja & Medury, 2010; Drivas et al., 2022), cultural institutions are in a position to encourage participation while facilitating access to cultural objects (e.g., Giannini & Bowen, 2022; Capriotti et al., 2016; Proctor, 2010). Nonetheless, still there is a low presence of Web 2.0 tools and interactivity on websites and relatively few are taking full advantage of the potential of digital media (Villaespesa et al., 2015), moreover their communication with visitors is still relatively backward (Fernandez-Lorez et al., 2022). This can be interpreted to be an intriguing phenomenon because according to the results obtained by Padilla-Meléndez & del Águila-Obra, (2013) the combination of Web and social media usage can explain online value creation and different museum online strategies (Padilla-Meléndez & Águila-Obra, 2013).

The extant literature suggests that not all digital tools generate the same effects or with the same strength (Go and You 2016; Choi et al., 2016; Shahbaznezhad et al., 2021). Furthermore, with regard to social media and the possibilities they offer, in terms of

spreading mass information among online users, these certainly represent a prominent tool, but they do not automatically secure a higher level of online participation (Arnaboldi & Diaz Lima, 2022; Lazzeretti et al., 2015).

Given the importance of digitalization and with the shifted focus to online tools researchers have engaged in scrutinizing the link between Web and social media practices and museum performance (eg., Fernandez-Lores et al., 2022; Capriotti et al., 2016; Go and You, 2016). Once with the "experience economy", museums attitude towards consumers has changed (Johnson and Thomas, 1998) and lately they try to implicate them in the practices and processes of history "making" to engage, consult, collaborate and crucially listen. As a part of this endeavour, it is no surprise that museums have seen various forms of social media as a natural complement to the work they are doing on site (Kidd, 2011). It is also widely known that, not all museum visitors have strong cultural interest – in fact their behaviour as consumers of cultural attractions is part of their consumption of entertainment products – (Fernandez-Lores et al., 2022), so it is easy to understand why cultural institutions have taken a broader step around social media and in this urge to keep visitors engaged, museums have started to experiment with modern channels to encourage visitor participation (Arnaboldi & Diaz-Lema, 2021). In this sense, for instance, in their work Fernandez-Lores et al. (2022) analyses the combined impact of websites, social networks and virtual communities as traffic generators to museums and their results suggest that two of the three digital tools studied (social networks and virtual communities) can be important in driving visitor traffic to museums, whereas the website does not seem to play the same role and does not contribute to the generation of traffic (Fernandez-Lores et al., 2022). As a precursor to this, Capriotti et al. (2016) examined the resources or instruments that museums use to present information on their websites, furthermore they scrutinized what tools and resources are available on the websites for interaction, and of course the degree of interactivity implemented in the websites of major international art museums (Capriotti et al., 2016).

Undoubtedly, social media represents a prominent tool, but as they do not automatically ensure higher levels of interaction with the museum followers (Arnaboldi & Diaz-Lema, 2021) research questions are focusing on how to strategically combine social media platforms (ex. Fernandez-Lores et al., 2022; Capriotti et al., 2016; Russo, 2011). In this sense relevant it may be the research results of Go and You (2016) where they found that organizations use multiple social media applications in order to utilize diverse aspects of social media functionalities and choose to use social media applications that afford two-way interactive communication (Vassilakis et al., 2017) rather than applications that allow one-way communication (Go and You, 2016).

2.2. Engagement and social media

Engagement can be viewed as an individual's interaction with media (Lim & Rasul, 2022), furthermore this is a multidimensional concept that comprises not only behavioural (actions) but also cognitive (thoughts), and emotional (feelings) aspects (Khan, 2017).

Sajjad & Zaman (2020) in their work distinguish four types of engagement, respectively: innovative, functional, emotional and communal. Innovative engagement is described as a state when users are looking for distinctive and unique cutting-edge ideas on these sites. Functional engagement is seen as the users' active and real-time involvement in social media. In addition to this functional aspect, emotional engagement is based on feelings. As people have varied feelings, these exerts influence on the contents viewed on these sites. Additionally, it is not negligible the fact that users are motivated to be present on social networking sites to strengthen their communal engagement (CE), and in this sense CE allows users to cooperate or team up with people who are alike is terms of their liking or disliking behaviour (Sajjad & Zaman, 2020).

Conceivably the engagement mindset of modern businesses (Sajjad & Zaman, 2020) has been revolutionized by social media platforms and in this sense this notion is seen as a complex concept, in which many interconnected, difficult to assess components interact (Muñoz et al., 2022). The intricacy of this notion lies in the fact that these social media platforms altered the role of customers from passive observers of content, to active participants who, through their online interactions and behaviour, are co-producers and co-creators of content (Lim & Rasul, 2022; Shahbaznezhad et al., 2021; Uratnik, 2016). Concerning to this co-creation and co-construction activities, Gronemann et al. (2015) specifies three dimensions, namely co-construction of meaning (the communicative dimension), co-construction of participants (the social dimension) and co-construction of knowledge or action (the discursive dimension) (Gronemann et al., 2015). Apparently, in the social dimension, different levels of interaction can be identified, and as such, the extant literature classifies these levels into different groups, like simpler types of engagement, such as liking, and higher levels of a stronger engagement, like posting reviews (Shahbaznezhad et al., 2021; Ahuja and Medury, 2010). Understanding how to give meaning to visitors attending exhibitions can lead to a wealth of opportunities for curatorial decision or exhibition design (Eghbal-Azar et al., 2016) and more broadly, for engagement (Budge, 2017).

Actions/behaviours such as *liking, commenting* and *sharing* are used to measure consumer engagement with a post (Khan, 2017; Gkikas et al., 2022; Drivas et al., 2022). The subject of analysis in the extant literature is often driven by what generates and influences such attitudinal change and what factors make consumers more likely to comment, like or follow on different social networking sites. Research in the literature scrutinizes different aspects such as: *text analysis* (Gkikas et al., 2022; Eslami et al., 2022) *content with or without video or picture* (Shahbaznezhad et al., 2021; Drivas et al., 2022) *emoji/ hashtag in text* (Wang et al., 2022; McShane et al., 2021; Rauschnabel et al., 2019). As we wanted to take the scale of analysis further, and to the best of our knowledge these relationships haven't been yet addressed in this way, we formulated our research questions:

RQ1: How does engagement in social media influence attendance at exhibitions?

RQ2: To what extent is it possible that attendance has an impact on engagement in social media?

Given our research questions we have formulated, and the importance of engagement in the literature, we thought it would be worthwhile to discuss each engagement metric separately. Furthermore, the hypotheses were formulated on the assumption that a reverse phenomenon may also exist, whereby visitors only have a reaction to a post once they have visited the exhibition. In this case, the focus shifts from the quality of the postings to the quality of the exhibition, but of course this does not mean that social media should be neglected or that the quality of the posts and Facebook page is not worth paying attention to.

2.2.1. Related to liking behaviour

A first fundamental indicator of engagement is the number of likes of posts, since they express a positive attitude and help a message go viral, respectively (Muñoz et al., 2022). This is also reflected in the research topics as well, where this aspect is examined through various aspects. For instance, Gkikas et al. (2022) examines whether text characteristics (readability indices, text length, and number of hashtags) and branded Facebook image posts associate with consumer engagement and brand awareness (Gkikas et al., 2022). The results of the study pointed out that there is a significant link between text readability features and performance metrics. This emphasises the role of text construction and editing on consumer engagement and awareness. Furthermore, intriguingly the results showed that readable texts with more than 31 words and containing several hashtags tend to achieve higher engagement and awareness performance. This is reflected in higher values for the variables 'Lifetime post total reaches', 'Lifetime Post Total Impressions' and 'Lifetime post engaged users' (Gkikas et al., 2022). In their study Eslami et al. (2022) strive to conceptualize and validate the notion of consumer engagement with a social media post, proposing a research model which investigates the effect of popularity, discourse logic and argument frame on consumer engagement with a social media post. They found that customer engagement in social media is shaped by the number of *likes* and *shares* of a social media post (Eslami et al., 2022). Scrutinizing consumers' engagement McShane et al. (2021) found that consumers like and share tweets more when they contain emoji, and that this effect increases with the amount of emojis. What's more it has been proved that the liking action is not driven solely by features such as hashtags, user mentions, images or videos. This finding is thought-provoking because these functions are designed to increase attention and exposure to the message. Results showed that none of these features can exert as much influence on the liking behaviour than emoji does (McShane et al., 2021). Shahbaznezhad et al. (2021) having in their focus the active engagement behaviour, found that video format posts lead to active engagement of users by sharing their opinions and comments, however on the other hand photo formatted content encourages passive users' engagement. Furthermore, this passive engagement is more particular of Instagram as the number of likes is greater than the number of comments (Shahbaznezhad et al., 2021). In this sense, our established hypotheses in connection with the research questions are as follows:

H1: The number of likes per day on Facebook positively influences the number of visitors per day.

H2: The number of visitors per day positively influences the number likes per day on Facebook.

2.2.2. Related to commenting behaviour

While a click is enough for like, comment and share need additional actions that ask extra commitment or cognitive effort. When commenting on a post, the post appears on News Feed, but other posts push it out of News Feed before long (Kim & Yang, 2017). Posting and commenting on pictures, videos and status updates, sharing links is considered active engagement, but some argue that passive engagement may not involve the same level of social connection as actively engaging in activities (Akram et al., 2022).

Another gripping finding of Shahbaznezhad et al. (2021) is that while on Instagram users tend to like rather than comment, on Facebook commenting has been found to be the opposite, more popular engagement behaviour. Probably because this platform provides an environment that encourages users to engage – in active engagement behaviour – and post more comments than on Instagram (Shahbaznezhad et al., 2021; Mókusné Pálfi, 2024). This phenomenon is also supported by Eslami et al. (2022) where it was also found that the number of comments does not significantly contribute to forming the concept of customer engagement in social media, respectively Instagram (Eslami et al., 2022; Mókusné Pálfi, 2024; Grotte et al., 2023). Moreover, whether comments are positive or negative, Muñoz et al. (2022) concludes, that comments are made, and continues to indicate a user's capacity to generate a reaction in others and, therefore, must be kept in mind to measure their influence (Muñoz et al., 2022). Kim & Yang (2017) research results show that users were more likely to comment on messages that solicit responses and have logical information. In contrast, posts with photos were less likely to receive comments. In this sense we can establish the following hypothesis in connection with our research questions:

H3: The number of comments per day on Facebook positively influences the number of visitors per day.

H4: The number of visitors per day positively influences the number comments per day on Facebook.

2.2.3. Related to sharing behaviour

When sharing a post, the post not only appears on News Feed but also goes to user's profile page, suggesting that the shared post constitutes a part of user's self-presentation. In addition, technologically, Facebook allows users to add comments on the shared post, which also may mean that share needs more cognitive effort that comment does (Kim & Yang, 2017).

As noted by Shahbaznezhad et al. (2021) engagement behaviour can be of different types and intensities and focusing on active engagement behaviour found that video format posts are prone to generate active engagement in sense of users sharing opinions and comments. The liking behaviour is more common to photo formatted content. These types of media represent different levels of media richness, also commonly referred to as liveliness of online content. As Kim & Yang (2017) describes, a share weights approximately as much as 2 comments, each of which has roughly equal weight to 7 likes. This suggests that the strategic implication of each behaviour may differ from the other. Thus, it is imperative for public relations researchers and professionals to understand how each behaviour differs from the other (Kim & Yang, 2017). In this sense, in connection with the research questions we established the hypotheses as follows:

H5: The number of shares per day on Facebook positively influences the number of visitors per day.

H6: The number of visitors per day positively influences the number shares per day on Facebook.

3. Methodology

In order to test our hypotheses, we conducted empirical research on a sample of 70 exhibitions. As a first step to creating the sample, we used The Art Newspaper's list of the 500 most visited exhibitions of 2019 as a basis. The Arts Newspaper ranks the most successful exhibitions according to visitor number every year, thus its ranking system provided the opportunity for our research to identify the most visited exhibitions worldwide (The Arts Newspaper, 2019). It is important to emphasize that the year 2019 was chosen for our research in order to have data from the period of the normal operation of the exhibitions before the coronavirus. For this reason, our results are not distorted by the epidemiological measures introduced in different ways in individual countries after the outbreak of the epidemic.

In connection with all these exhibitions, we collected the social media platforms on which the organizing museums have a social media presence and then excluded those without a Facebook page. This selection criterion was chosen based on the work of Fernandez-Lores et al. (2022) as well as Arnaboldi & Diaz Lema (2021) who emphasized the dominant role of Facebook in the online presence of museums. For this reason, our research is focused specifically on Facebook presence of different exhibitions.

Since in the subsequent stage a very time-consuming and detailed data collection was carried out in connection with each exhibition, due to the limitations of our capacities, we had to narrow down the list of exhibitions that could be included in the sample. Thus, we randomly (to avoid distortions) selected 70 from the remained exhibitions on the list and built a database from the characteristics of their social media presence by checking the activity on the social media pages of the organizing museums. 70 as a final sample size can be considered adequate considering our goals and the planned methodology. It complies with the rule of thumb that in the case of linear regression, the number of observations

should be at least 10 times the number of variables included in the analysis and the number of observations should exceed the number of variables by at least 30 (Knapp & Campbell-Heider, 1989). In the current study, based on the hypotheses the maximum number of variables was 5, thus conducting linear regression based on the number of observations in the sample does not run into any problems. The 5 variables used, and their description are summarized in *Table 1.*

Table 1. Description of the variables included in the linear regressions

Variable	Description
Number of visitors per day	The total number of visitors divided by the number of open days of the exhibition.
Number of likes per day	The total number of Facebook likes on all the exhibition-related posts shared by the organizer divided by the number of open days of the exhibition.
Number of comments per day	The total number of Facebook comments wrote by individuals on all the exhibition related posts shared by the organizer divided by the number of open days of the exhibition.
Number of shares per day	The total number of individual shares of those Facebook posts originally shared by the organizer divided by the number of open days of the exhibition.
Number of posts per day	The number of Facebook posts shared by the organizer of the exhibition divided by the number of open days of the exhibition.

Source: own editing.

The main characteristics of the exhibitions included in the final sample along the variables analysed in linear regressions are summarized in *Table 2*. The exact list of exhibits included in the final sample can be found in *Appendix 1.*

Table 2. Descriptive statistics of the variables used

	No. of visitors per day	No. of likes per day	No. of comments per day	No. of shares per day	No. of posts per day
No. of cases	70	70	70	70	70
Mean	3451.46	145.00	15.872	29.127	0.181
Median	2766.50	38.83	1.867	7.405	0.153
Standard Deviation	2128.62	334.72	61.430	62.848	0.131
Minimum	1114.00	0.38	0.000	0.093	0.020
Maximum	11380.00	2065.19	486.382	335.175	0.506
Variance	4531034.37	112039.72	3773.612	3949.874	0.017
Range	10266.00	2064.81	486.382	335.082	0.486

Source: own editing.

To test our hypotheses, simple and multivariate linear regression models were applied. For every linear regression model, we tested whether the variables to be included in the analysis meet the assumptions of linear regression. During this process, according to Tranmer et al. (2020), the following five key assumptions were checked:

- continuous variables,
- a linear relationship between the dependent and independent variables,
- normal distribution of residuals,
- homoscedasticity,
- no multicollinearity between independent variables.

The present study only includes those linear regression models whose variables fully meet these assumptions. IBM SPSS 28 software was used to analyse the data, while Microsoft Excel 2021 software was applied to visualize the obtained results.

4. Results

As a first step in our analysis, the existence of linear relationships was tested between the three engagement-related variables (daily number of likes, comments, and shares) and the number of daily visitors by calculating Pearson correlation coefficients. The relationship between the number of Facebook posts posted by the organizer during an exhibition and the number of daily visitors was also tested as an addition to our main goal. Our results are summarized in *Table 3*, which shows that there is a statistically significant linear relationship between all the engagement-related variables and the number of visitors per day. From the engagement-related variables, the highest correlation could be found between the number of comments per day and the number of visitors (0.530), which is considered a moderate positive association. The correlation between the number of likes per day and the number of daily visitors (0.337) as well as the number of shares per day and the number of visitors per day (0.377) shows a weak positive association based on the Pearson correlation coefficients. While our non-engagement related variable the number of Facebook posts per day have also a moderate relationship with the number of visitors per day (0.284). At this stage, based on the values of the correlation coefficients as linear relationships exist between our variables, none of the examined hypotheses could be rejected. To explore the direction of these relationships and test our hypotheses, linear regression should be performed for all cases.

In the case of H1, H3, and H5 a multiple linear regression model (called model 1 in the following) was constructed, in which the dependent variable was the number of daily visitors, and the independent variables were the daily number of likes, comments, shares, and the number of Facebook posts per day. It means the examination of how engagement on Facebook posts generates visitors to exhibitions as well as the examination of how posts themselves generate visitors. To test the H2, H4 and H6 hypotheses construction of three different simple linear regression models was necessary. In these models, the independent variable was the same in all three cases, which was the number of daily visitors. It means the examination of how the visitor number could generate engagement-

related metrics like likes (model 2), comments (model 3), and shares (model 4). *Table 4* shows that all four of our conducted linear regression models exist as all the significance levels are below the 5% threshold (p<0,05).

Table 3. Correlations between the examined variable

Examined variables	Pearson Correlation	Sig. (2-tailed)
Number of visitors per day - number of likes per day	0.337	0.004
Number of visitors per day - number of comments per day	0.530	0.000
Number of visitors per day - number of shares per day	0.377	0.001
Number of visitors per day - number of Facebook posts per day	0.284	0.017

Source: own editing.

Table 4. Model summary of the conducted linear regressions

	R Square	Sum of Squares	df	Mean Square	F	Sig.
Model 1	0.304	94975951.03	4	23743987.76	7.090512	<0.001
Model 2	0.114	880075.2073	1	880075.2073	8.735664	0.004
Model 3	0.281	73232.24233	1	73232.24233	26.60899	<0.001
Model 4	0.142	38634.79357	1	38634.79357	11.23169	0.001

Source: own editing.

In model 1 the R square was 0.304, which shows that 30.4% of the variability observed in the dependent variable is explained by the regression model (*Table 5*). This value can be considered acceptable in social sciences. *Table 5* summarizes the significance levels and beta values of this linear regression model, which shows that only the number of comments has a significant impact on the number of daily visitors (p=0.001<0.05). Based on the beta value if the average number of comments per day is one more, this will result in 15 687 new daily visitors. In the case of the daily number of likes (p=0.707>0.05) and shares (p=0.978>0.05), a significant impact cannot be detected, which means, that a higher number of likes per day, as well as shares per day by itself, won't result in a higher number of visitors during an exhibition. Based on the results H3 should be accepted, while H1 and H5 should be rejected. In addition to the hypotheses, we also examined the impact of the number of Facebook posts per day on the number of daily visitors, where also no significant effect was found (p=0.434>0.05).

   Table 6 summarizes the coefficients and significance levels of models 1, 2, and 3. Based on the results of the linear regressions number of visitors per day have a significant positive impact on both the number of likes (p=0.004<0.05), comments (p=0.000<0.05), and shares (p=0.001<0.05). The beta values indicate that if the number of daily visitors increases by one that will generate 0.053 daily Facebook likes, 0.015 daily Facebook comments, and 0.011 daily Facebook shares. It means the existence of the phenomenon where a higher number of visitors will lead to a higher number of engagement-related metrics. These results show that H2, H4, and H6 should be accepted.

Table 5. Coefficients in model 1

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Beta	Std. Error	Beta		
(Constant)	2832.945	378.367		7.487	0.000
Number of likes per day	0.787	2.086	0.124	0.377	0.707
Number of comments per day	15.687	4.378	0.453	3,583	0.001
Number of shares per day	-0.324	11.828	-0.010	-0.027	0.978
Number of Facebook posts per day	1464.759	1860.720	0.090	0.787	0.434

Source: own editing.

Table 6. Coefficients in models 1, 2 and 3

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Beta	Std. Error	Beta		
Number of visitors per day on likes	0.053	0.018	0.337	2.956	0.004
Number of visitors per day on comments	0.015	0.003	0.530	5.158	0.000
Number of visitors per day on shares	0.011	0.003	0.377	3.351	0.001

Source: own editing.

5. Discussion

The present paper aims to measure engagement from another perspective in the case of exhibitions than it can be found in the literature (Gkikas et al., 2022; Shahbaznezhad et al., 2021; Wang et al., 2022; McShane et al., 2021). Research results of Drivas et al. (2022) showed that for each new post on the Facebook page of the examined institutions the number of total reactions, comments and shares were expected to increase and the highest engagement is observed for video posts (Drivas et al., 2022). Unlike their research objective, our scrutiny does not focus on finding out what element of a post generates reactions, but whether the reactions would show or predict how many people would go to the exhibition.

Contrary to Eslami et al. (2022), where it was found that the number of comments does not significantly contribute to forming the concept of customer engagement in social media (Eslami et al., 2022) our results showed that only the number of comments has a significant impact on the number of daily visitors. Therefore, based on the results, H3 should be accepted, while H1 and H5 should be rejected since in the case of the daily number of likes (H1) and shares (H5), a significant impact cannot be detected, which means, that a higher number of likes per day, as well as shares per day by itself, won't result in a higher number of visitors during an exhibition. Therefore, our answer to RQ1 (How

does engagement in social media influence attendance at exhibitions?) is, that currently in connection with the analysed exhibitions, engagement in social media does not generate attendance the way it should, based on the literature. Only comments have a slight impact on the number of visitors, which means that the current way of the social media presence of exhibitions is slightly questionable. A possible explanation for this is that there is a distinctive relationship between the three Facebook behaviour and reaction types. For instance, according to Kim & Yang (2017) research results showed that, posts created, with photos, and stimulating any of the five senses were more likely to encourage Facebook users to click the like. Furthermore, users were more likely to comment on messages that solicit responses and have logical information. In turn, if a user comments on the post this is viewed as a cognitive reaction, while like is an affective response. Accordingly, those who are truly engaged and considering going to an exhibition are more likely to have cognitive reaction, so this could be a possible explanation to our results. The practical implication of this is that, if the intention is to get the message across as widely as possible, professionals should use posts that appeal to any of the five senses or use photos. More people will click the like of the posts and, as a result, messages will spread into Facebook networks more quickly and more broadly. Nevertheless, if professionals intend to have more visitors, they must have posts soliciting responses or containing logical and in-depth information, because more people will comment on them.

In connection with our RQ2 (To what extent is it possible that attendance has an impact on engagement in social media?) we had a thought-provoking result, as we could accept H2, H4 and H6. Based on the results of the linear regressions number of visitors per day have a significant positive impact on both the number of likes, comments, and shares. This is a novel and intriguing finding that shows the existence of the phenomenon where a higher number of visitors will lead to a higher number of engagement-related metrics. This finding corroborates prior research regarding the importance of social media customer engagement and this reverse effect should be considered by the museum administrators, meaning that they should primarily focus on exhibitions features that make these successful because as mentioned by Arnaboldi & Diaz-Lema (2021) social media represents a prominent mean in terms of spreading mass information among online users, but they do not automatically ensure higher levels of interaction with the museum's online followers (Arnaboldi & Diaz-Lema, 2021).

Our research results also raise two research gaps. On one hand, because social media presence is of low quality and not adapted to the target audience, and on the other hand, in the cultural industry simply does not have the same effect. The low-quality presence of social media comprises that there is no high-quality content which is strategically adopted to the target audience, or the posting frequency is not consistent. It is also true that we examined this effect related to one exhibition and not to an entire Facebook page, so our understanding and suggestion is that if a cultural institution wants more people to attend a particular event, it is not worth posting the event repeatedly or monitoring all the reactions. Rather, it should focus on the content of the post which generates real

engagement, and on the quality of the Facebook page as whole. In addition, the success of the event, will positively affect the reactions on the social media page.

6. Conclusion

Both scholars and practitioners agree that to become relevant in today's world, it is essential to adopt new participatory practices (e.g., Saraf, 1999; Arnaboldi & Diaz Lema, 2022; Russo et al., 2008), since these channels can be useful in attracting more visitor and increase visitors' experience and engagement (Kamariotou et al., 2021). As Padilla-Meléndez & del Águila-Obra (2013) research results show, that there is no conflict between the physical and the online presence; rather, there exists positive synergies for museums (Padilla-Meléndez & del Águila-Obra, 2013), so it is completely reasonable that museums are trying to use these media tools more strategically, and moreover they started to pay more attention to their websites' development (Fernandez-Lores et al., 2022) and social media presence. An increasing number of research in literature indicates and addresses the impact that these tools can have on physical attendance on general scale and engagement. It should be noted that there is a more corporate approach to social media usage (e.g., Go and You, 2016; Gkikas et al., 2022; McShane et al., 2021; Sajjad & Zaman, 2020; Akram et al., 2022) but also a growing number of studies are appearing related to museums (Fernandez-Lores et al., 2022; Walsh et al., 2020; Drivas et al., 2022; Blasco-Lopez et al., 2019; Lazzeretti et al., 2015). In terms of the subject of study, the different social networking sites such as Facebook, Instagram, YouTube or Twitter are the most analyzed and mainly investigate engagement based on users' reactions. Text analysis of posts (Gkikas et al., 2022; Eslami et al., 2022), content analysis (Shahbaznezhad et al., 2021), presence of emoji or hashtag (Wang et al., 2022; McShane et al., 2021; Rauschnabel et al., 2019) are also used to measure the effects of the presence of each component.

While museums use different sets of metrics to evaluate their social media activities to better understand their online audiences (Rhee et al., 2022), very few examples investigate this in relation to a specific museum exhibition. The present study, primarily scrutinizes how social media, more precisely Facebook, can be an actual tool to evaluate engagement related to museum exhibition attendance. Measuring the interactions and engagement metrics conveyed by such platforms, we consider that this allows museums, to better understand their audiences and thus, to use more strategically these online digital tools. The current work contributes to the social media literature by identifying factors that can influence attendance to museum exhibitions. It also provides an initial empirical scrutiny of the phenomenon of engagement and what are the factors that influence a greater engagement and a greater attendance to exhibitions. Our study, to our knowledge, is the first to empirically test the proposed link between exhibition attendance and the level of engagement on such a large scale and in the case of numerous museums.

Overall, this study contributes to the extant literature concerning consumer behaviour and social media marketing, hopefully expanding the limits of previous studies and presenting new findings that will allow museums deeper understand the social media

mechanism. Being an exploratory study, this paper contributes to the literature on online value creation, particularly in the case of cultural organizations and museums, showing a reasonable theoretical framework with which to analyse the online strategies of museums. According to this, museums should be able to innovate and restructure their offer in order to better meet the needs of different consumer groups (Carrozzino & Bergamasco, 2010). For example, for average users should be offered an education path and for the professionals a more scientific tool. In a different approach Carrozzino & Bergamasco (2010) mention the new categories of audiences that museums should address, such as real, potential and remote internet users in order to make the most of their heritage. Regarding to the contribution of this paper to the museum management practice, we have found that to build relationships with visitors, museums should first and foremost concentrate on their service package and then communicate it strategically on their web and social media sites.

References

Ahuja, V. & Medury, Y. (2010). Corporate blogs as e-CRM tools – Building consumer engagement through content management. *Journal of Database Marketing & Customer Strategy Management, 17* (2): 91–105. DOI: 10.1057/dbm.2010.8

Akram, M. S., Malhotra, N., Goraya, A. Sh., Shareef, M. A., Malik, A. & Lal, B. (2022). User engagement on global social networks: Examining the roles of perceived brand globalness, identification and global identity. *Technological Forecasting & Social Change, 181*: 121771. DOI: 10.1016/j.techfore.2022.121771

Arnaboldi, M. & Diaz Lema, M. L. (2022). Shaping cultural participation through social media. *Financial Accountability & Management, 38* (2): 299–321. DOI: 10.1111/faam.12293

Arnaboldi, M. & Diaz Lema, M. L. (2021). The participatory turn in museums: The online facet. *Poetics, 89*: 101536. DOI: 10.1016/j.poetic.2021.101536

Blasco-Lopez, F., Recuero Virto, N., Aldas Manzano, J. A. & Cruz Delgado, D. (2019). Facebook's power: Factors influencing followers' visit intentions. *Spanish Journal of Marketing – ESIC, 23* (1): 95–117. DOI: 10.1108/SJME-06-2018-0032

Budge, K. (2017). Objects in focus: Museum visitors and Instagram. *Curator: The Museum Journal, 60* (1): 67–85. DOI: 10.1111/cura.12183

Capriotti, P., Carretón, C. & Castillo, A. (2016). Testing the level of interactivity of institutional websites: From museums 1.0 to museums 2.0. *International Journal of Information Management, 36* (1): 97–104. DOI: 10.1016/j.ijinfomgt.2015.10.003

Carrozzino, M. & Bergamasco, M. (2010). Beyond virtual museums: Experiencing immersive virtual reality in real museums. *Journal of Cultural Heritage, 11* (4): 452–458. DOI: 10.1016/j.culher.2010.04.001

Chen, H. & Ryan, C. (2020). Transforming the museum and meeting visitor requirements: The case of the Shaanxi History Museum. *Journal of Destination Marketing & Management, 18*: 100483. DOI: 10.1016/j.jdmm.2020.100483

Cheng, W. W. H., Lam, E. T. H. & Chiu, D. K. W. (2020). Social media as a platform in academic library marketing: A comparative study. *The Journal of Academic Librarianship, 46* (5): 102188. DOI: 10.1016/j.acalib.2020.102188

Choi, D., Matni, Z. & Shah, C. (2016). What social media data should I use in my research? A comparative analysis of Twitter, YouTube, Reddit, and the New York Times comments. *Proceedings of the Association for Information Science and Technology, 53* (1): 1–6. DOI: 10.1002/pra2.2016.14505301151

Colicev, A., O'Connor, P. & Vinzi, V. E. (2016). Is investing in social media really worth it? How brand actions and user actions influence brand value. *Service Science, 8* (2): 152–168. DOI: 10.1287/serv.2016.0143

Csapó, J. & Schultz, É. (2024). War heritage impact on museum dynamics in Budapest: A multidimensional analysis of visitor satisfaction through cultural, statistical, and netnographic modalities. *Museum Management and Curatorship,* 1–21. DOI: 10.1080/09647775.2024.2357075

Csapó, J., Csóka, L., Gonda, T. & Végi, S. (2023). A digitalizációhoz köthető recens hazai turisztikai fogyasztói szokások elemzése [Analysis of recent domestic tourism consumer habits related to digitalization]. *Marketing & Menedzsment, 57* (3): 68–78. DOI: 10.15170/MM.2023.57.03.07

Csapó, J. (2012). The role and importance of cultural tourism in modern tourism industry. In: Kasimoglu, M. ed. *Strategies for Tourism Industry – Micro and Macro Perspectives.* Rijeka: InTechOpen, pp. 201–232. DOI: 10.5772/38693

Drivas, I. C., Kouis, D., Kyriaki-Manessi, D. & Giannakopoulou, F. (2022). Social media analytics and metrics for improving users engagement. *Knowledge, 2* (2): 225–242. DOI: 10.3390/knowledge2020014

Eghbal-Azar, K., Merkt, M., Bahnmueller, J. & Schwan, S. (2016). Use of digital guides in museum galleries: Determinants of information selection. *Computers in Human Behavior, 57:* 133–142. DOI: 10.1016/j.chb.2015.12.035

Eslami, S. P., Ghasemaghaei, M. & Hassanein, K. (2022). Understanding consumer engagement in social media: The role of product lifecycle. *Decision Support Systems, 162:* 113707. DOI: 10.1016/j.dss.2021.113707

Fernandez-Lores, S., Crespo-Tejero, N. & Fernández-Hernández, R. (2022). Driving traffic to the museum: The role of the digital communication tools. *Technological Forecasting & Social Change, 174:* 121273. DOI: 10.1016/j.techfore.2021.121273

Garcia-Madariaga, J., Recuero Virto, N., Blasco Lopez, M. F. & Manzano, J. A. (2019). Optimizing website quality: The case of two superstar museum websites. *International Journal of Culture, Tourism and Hospitality Research, 13* (1): 16–36. DOI: 10.1108/IJCTHR-06-2018-0074

Giannini, T. & Bowen, J. P. (2022). Museums and digital culture: From reality to digitality in the age of COVID-19. *Heritage, 5* (1): 192–214. DOI: 10.3390/heritage5010011

Gkikas, D. C., Tzafilkou, K., Theodoridis, P. K., Garmpis, A. & Gkikas, M. C. (2022). How do text characteristics impact user engagement in social media posts: Modeling content readability, length, and hashtags number in Facebook. *International Journal of Information Management Data Insights, 2* (1): 100067. DOI: 10.1016/j.jjimei.2022.100067

Go, E. & You, K. H. (2016). But not all social media are the same: Analyzing organizations' social media usage patterns. *Telematics and Informatics, 33* (1): 176–186. DOI: 10.1016/j.tele.2015.06.016

Gonda, T. (2019). *A turisztikai termékfejlesztés elméleti alapjai* [Theoretical foundations of tourism product development]. Pécs: Pécsi Tudományegyetem.

Gronemann, S. T., Kristiansen, E. & Drotner, K. (2015). Mediated co-construction of museums and audiences on Facebook. *Museum Management and Curatorship, 30* (3): 174–190. DOI: 10.1080/09647775.2015.1042510

Grotte, J., Béres, I., Magyar, T. & Marczellné Szilágyi, E. (2023). A Z generáció digitális eszközhasználata szabadidős utazásaik során. *Turisztikai és Vidékfejlesztési Tanulmányok, 8* (3): 7–18. DOI: 10.15170/TVT.2023.08.03.01

Hemphill, L., Hedstrom, M. L. & Leonard, S. H. (2021). Saving social media data: Understanding data management practices among social media researchers and their implications for archives. *Journal of the Association for Information Science & Technology, 72* (1): 97–109. DOI: 10.1002/asi.24368

Jeong, J.-H. & Lee, K.-H. (2006). The physical environment in museums and its effects on visitors' satisfaction. *Building and Environment, 41* (7): 963–969.
DOI: 10.1016/j.buildenv.2005.04.004

Johnson, P. & Thomas, B. (1998). The economics of museums: A research perspective. *Journal of Cultural Economics, 22* (2): 75–85. DOI: 10.1023/A:1007537500352

Kamariotou, V., Kamariotou, M. & Kitsios, F. (2021). Strategic planning for virtual exhibitions and visitors' experience: A multidisciplinary approach for museums in the digital age. *Digital Applications in Archaeology and Cultural Heritage, 21*: e00183. DOI: 10.1016/j.daach.2021.e00183

Khan, M. L. (2017). Social media engagement: What motivates user participation and consumption on YouTube? *Computers in Human Behavior, 66*: 236–247. DOI: 10.1016/j.chb.2016.09.024

Kietzmann, J. H., Hermkens, K., McCarthy, I. P. & Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business Horizons, 54* (3): 241–251. DOI: 10.1016/j.bushor.2011.01.005

Kidd, J. (2011). Enacting engagement online: Framing social media use for the museum. *Information Technology & People, 24* (1): 64–77. DOI: 10.1108/09593841111109422

Kim, C. & Yang, S.-U. (2017). Like, comment, and share on Facebook: How each behavior differs from the other. *Public Relations Review, 43* (3): 441–449.
DOI: 10.1016/j.pubrev.2017.02.006

Knapp, T. R. & Campbell-Heider, N. (1989). Numbers of observations and variables in multivariate analyses. *Western Journal of Nursing Research, 11* (5): 634–641. DOI: 10.1177/019394598901100517

Krátki, D., Berki, T., Karancsi, Z. & Szabó, E. (2022). The impact of social media on attitudes towards tourism. *Turisztikai és Vidékfejlesztési Tanulmányok, 7* (3): 90–109. DOI: 10.15170/TVT.2022.07.03.07

Lazzeretti, L., Sartori, A. & Innocenti, N. (2015). Museums and social media: The case of the Museum of Natural History of Florence. *International Review on Public and Nonprofit Marketing, 12* (3): 267–283. DOI: 10.1007/s12208-015-0136-5

Lim, W. M. & Rasul, T. (2022). Customer engagement and social media: Revisiting the past to inform the future. *Journal of Business Research, 148*: 325–342.
DOI: 10.1016/j.jbusres.2022.04.068

McShane, L., Pancer, E., Poole, M. & Deng, Q. (2021). Emoji, playfulness, and brand engagement on Twitter. *Journal of Interactive Marketing, 53*: 96–110.
DOI: 10.1016/j.intmar.2020.06.002

Mókusné Pálfi, A. (2024). Utazom, tehát posztolok – magyar utazók az Instagramon. [I travel, therefore I post – Hungarian travelers on Instagram] *Turisztikai és Vidékfejlesztési Tanulmányok, 8* (4): 27–48. DOI: 10.15170/TVT.2023.08.04.02

Muñoz, M. M., Rojas-de-Gracia, M.-M. & Navas-Sarasola, C. (2022). Measuring engagement on Twitter using a composite index: An application to social media influencers. *Journal of Informetrics, 16* (4): 101323. DOI: 10.1016/j.joi.2022.101323

Padilla-Meléndez, A. & del Águila-Obra, A. R. (2013). Web and social media usage by museums: Online value creation. *International Journal of Information Management, 33* (5): 892–898. DOI: 10.1016/j.ijinfomgt.2013.07.004

Proctor, N. (2010). Digital: Museum as platform, curator as champion, in the age of social media. *Curator: The Museum Journal, 53* (1): 35–43.
DOI: 10.1111/j.2151-6952.2009.00006.x

Raffay, Z. & Gonda, T. (2020). Accessible tourism in some European countries – Results of an empirical survey. In: Schmidtchen, R. & Gonda, T. eds. *Opportunities and Challenges of Barrier-Free Tourism in Hungary.* Pécs: Peer-AcT, pp. 23–52.

Rátz, T. & Michalkó, G. (2023). A turisztikai blogok szerepe az Európa Kulturális Fővárosa címmel rendelkező desztinációk „jó hellyé" válásában. *Turisztikai és Vidékfejlesztési Tanulmányok, 8* (1): 57–76. DOI: 10.15170/TVT.2023.08.01.04

Rauschnabel, P. A., Sheldon, P. & Herzfeldt, E. (2019). What motivates users to hashtag on social media? Psychology & Marketing, 36 (5): 473–488. DOI: 10.1002/mar.21191

Rhee, B. A., Pianzola, F., Choi, J., Hyung, W. & Hwang, J. (2022). Visual content analysis of visitors' engagement with an instagrammable exhibition. *Museum Management and Curatorship, 37* (6): 583–597. DOI: 10.1080/09647775.2021.2023902

Rivera, L. W. (2015). The Museum 2.0 divide: Approaches to digitisation and new media. *Museum International, 257–260*: e1–e8. DOI: 10.1111/muse.12042

Russo, A., Watkins, J., Kelly, L. & Chan, S. (2008). Participatory communication with social media. *Curator: The Museum Journal, 51* (1): 21–31.
DOI: 10.1111/j.2151-6952.2008.tb00292.x

Russo, A. (2011). Transformations in cultural communication: Social media, cultural exchange, and creative connections. *Curator: The Museum Journal, 54* (3): 327–346.
DOI: 10.1111/j.2151-6952.2011.00095.x

Sajjad, M. & Zaman, U. (2020). Innovative perspective of marketing engagement: Enhancing users' loyalty in social media through blogging. *Journal of Open Innovation: Technology, Market, and Complexity, 6* (3): 93. DOI: 10.3390/joitmc6030093

Sarraf, S. (1999). A survey of museums on the Web: Who uses museum websites? *Curator: The Museum Journal, 42* (3): 231–243. DOI: 10.1111/j.2151-6952.1999.tb01143.x

Shahbaznezhad, H., Dolan, R. & Rashidirad, M. (2021). The role of social media content format and platform in users' engagement behavior. *Journal of Interactive Marketing, 53*: 47–65. DOI: 10.1016/j.intmar.2020.05.001

Simon, N. (2010). *The Participatory Museum*. Santa Cruz: Museum 2.0.

The Art Newspaper (2019). *Art's most popular – Exhibition and museum visitor figures 2019*. Special report. https://www.museus.gov.br/wp-content/uploads/2020/05/Arts-Most-Popular-visitor-figures-2019.pdf/

Tranmer, M., Murphy, J., Elliot, M. & Pampaka, M. (2020). *Multiple Linear Regression* (2nd ed.). Cathie Marsh Institute Working Paper 2020-01.
https://hummedia.manchester.ac.uk/institutes/cmist/archive-publications/working-papers/2020/multiple-linear-regression.pdf/

Uratnik, M. (2016). Interactional service innovation with social media users. *Service Science, 8* (3): 300–319. DOI: 10.1287/serv.2016.0149

Vassilakis, C., Antoniou, A., Lepouras, G., Poulopoulos, V., Wallace, M., Bampatzia, S. & Bourlakos, I. (2017). Stimulation of reflection and discussion in museum visits through the use of social media. *Social Network Analysis and Mining, 7*: 40. DOI: 10.1007/s13278-017-0460-3

Villaespesa, E., Tate, U. & Stack, J. (2015). *Finding the motivation behind a click: Definition and implementation of a website audience segmentation*. Museums and the Web 2015 (Proceedings).
https://mw2015.museumsandtheweb.com/paper/finding-the-motivation-behind-a-click-definition-and-implementation-of-a-website-audience-segmentation/

Walsh, D., Hall, M. M., Clough, P. & Foster, J. (2020). Characterizing online museum users: A study of the National Museums Liverpool museum website. *International Journal on Digital Libraries, 21*: 75–87. DOI: 10.1007/s00799-018-0248-8

Wang, X., Cheng, M., Li, S. & Jiang, R. (2022). The interaction effect of emoji and social media content on consumer engagement: A mixed approach on peer-to-peer accommodation brands. *Tourism Management, 96*: 104696.
DOI: 10.1016/j.tourman.2022.104696

Appendix 1. The exhibitions included in the analysis

Exhibition name	Exhibiting museum	Location
50 Years of Realism: Photorealism to VR	Centro Cultural Banco do	Rio de Janeiro
50 Years of Realism: Photorealism to VR	Centro Cultural Banco do	São Paulo
A Journey That Wasn't	The Broad	Los Angeles
Ai Weiwei: Resetting Memories	MUAC UNAM	Mexico City
Ai Weiwei: Root	Centro Cultural Banco do	Rio de Janeiro
Alexander Calder: Radical Inventor	Montreal Museum of Fine A	Montreal
All the Rembrandts	Rijksmuseum	Amsterdam
American Art and Vietnam War 1965-75	Smithsonian (SAAM)	Washington, DC
And Breathe Manchester Art Gallery	Manchester Art Gallery	Manchester
Apollo's Muse: Moon in Age of Photography	Metropolitan Museum of Ar	New York
Artemisia Gentileschi	Pushkin Museum	Moscow
Berthe Morisot, 1841-95	Musée d'Orsay	Paris
Between Worlds: Art of Bill Traylor	Smithsonian (SAAM)	Washington, DC
Bodys Isek Kingelez: City Dreams	Museum of Modern Art	New York
Boilly: Scenes of Parisian Life	National Gallery	London
Bulgari: Femininity, Roman Jewels	Moscow Kremlin Museums	Moscow
Camp: Notes on Fashion	Metropolitan Museum of Art	New York
Choi Jeong Hwa: Blooming Matrix	MMCA	Seoul
Christian Dior: Designer of Dreams	Victoria and Albert Museum	London
Claude Monet: Floating World	Albertina	Vienna
Courtauld Collection: Impressionism	Fondation Louis Vuitton	Paris
Cubism	Centre Pompidou	Paris
Da Vinci: Budapest Horse and Rider	Museum of Fine Arts	Budapest
Dalí, Raphael: Prolonged Reverie, Part Two	Teatre-Museu Dalí	Figueres
Don McCullin	Tate Britain	London
Dora Maar	Centre Pompidou	Paris
Dorothea Tanning	Tate Modern	London
Double Fantasy: John and Yoko	Museum of Liverpool	Liverpool
Dream of Italy: Marquis Campana Collection	Musée du Louvre	Paris
DreamWorks	Centro Cultural Banco do	Rio de Janeiro
DreamWorks	Centro Cultural Banco do	Belo Horizonte
Egon Schiele & Jean-Michel Basquiat	Fondation Louis Vuitton	Paris
French Advertising, 19th, 20th Century	Pushkin Museum	Moscow
Giorgio Morandi and the Old Masters	Guggenheim	Bilbao
Gogh and the Sunflowers	Van Gogh Museum	Amsterdam
Helen Levitt	Albertina	Vienna
Hockney, Van Gogh: Joy of Nature	Van Gogh Museum	Amsterdam
Impressionism: Monet, Pissarro and More	Art Gallery of Ontario	Toronto
Island Time	Mucem	Marseilles

Jean Dubuffet: a Barbarian in Europe	Mucem	Marseilles
Jenny Holzer: Thing Indescribable	Guggenheim	Bilbao
Joana Vasconcelos: I'm Your Mirror	Museu de Serralves	Porto
Kaleidoscope	Saatchi Gallery	London
Karl Marx Forever?	State Russian Museum	St Petersburg
Manga	British Museum	London
Michael Jackson: On the Wall	Galeries Nationales du GP	Paris
Munch	British Museum	London
Museo del Prado 1819-2019: Memory	Museo Nacional del Prado	Madrid
No Spectators: the Art of Burning Man	Renwick Gallery	Washington, DC
Nordic Craft and Design Manchester Art Gallery	Manchester Art Gallery	Manchester
Photographer's Gaze / Name of the Father	Museu Picasso	Barcelona
Pipilotti Rist: Open My Glade	Louisiana Museum of Modern Art	Humlebaek
Play it Loud: Instruments of Rock and Roll	Metropolitan Museum of Art	New York
Rembrandt, Vermeer, Dutch Golden Age	Louvre Abu Dhabi	Abu Dhabi
Rembrandt: Thinking on Paper	British Museum	London
Rules, Codes, Choreographies, 1965–2018	Whitney Museum	New York
Sabartés / Publishers Gustavo Gili	Museu Picasso	Barcelona
Sea Star: Sean Scully	National Gallery	London
Sean Scully: Landline	Hirshhorn Museum	Washington, DC
Shiota Chiharu: Soul Trembles, Aida Makoto, Yuan Goang-Ming, Zhou Tiehai, Takata Fuyuhiko	Mori Art Museum	Tokyo
The Moon	Galeries Nationales du GP	Paris
The Renaissance Nude	Getty Center	Los Angeles
Three Petersburg Collections	State Russian Museum	St Petersburg
Treasures: Flourishing China 18th Century	Moscow Kremlin Museums	Moscow
Trevor Paglen: Sites Unseen	Smithsonian (SAAM)	Washington, DC
Tutankhamun: Treasures of Golden Pharaoh	La Villette	Paris
Van Gogh and Britain	Tate Britain	London
Vasarely: Sharing Forms	Centre Pompidou	Paris
Velázquez, Rembrandt, Vermeer: Visions	Museo Nacional del Prado	Madrid
Whitney Biennial 2019	Whitney Museum	New York

Source: own editing.