









Personality Analysis of Social Media Influencers as a Tool for Cultural Institutions

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Abstract. Nowadays, more and more cultural venues tend to utilize social media as a main tool for marketing, spreading their messages, engaging public and raising public awareness towards culture. It comes to a point where the massive of content in social media makes it a tedious procedure to contact the appropriate audience, the people that would really be stimulated by cultural information. In this notion, we assume that establishing conversations of high impact can possibly guide the cultural venues to audiences that can benefit more. These conversations usually include the so called influencers, users whose opinion can affect many people on social media; the latter usually referred to as followers. In this research paper we examine the characteristics of the influencers that can affect the procedures of a cultural venue on social media. The research is done within the scope of “CrossCult” EU funded project.

Keywords: User modeling · Personality traits · Influencers
Cultural informatics · Social media

1 Introduction

The main goal of contemporary museums is to stimulate the senses and activate different cognitive and affective processes, like high order thinking and reflection, desire to know, emotional arousal and more [2–5]. In order to achieve it, they carefully plan exhibition themes and layouts and select objects so as to create a certain venue ambiance; all to ensure that visitors are engaged and appreciate the overall quality of the museum experience [1]. In parallel, it is a fact that nowadays the cultural institutions tend to widely use technology and its tools to attract people, spread their message and stimulate senses. This can lead to support to the visitor experience before, during and after the visit with different

technological solutions spanning from museum websites, to mobile devices and social media [1,6,7].

These applications not only provide easy access to different types of content, but they also allow the visitor to have active participation. In parallel, an increasing number of cultural venues support innovative procedures during the visits in order to offer an enhanced experience to their audience. What can really affect the way cultural institutions act is a further analysis of a procedure that can be initiated during the visit and continue as a post-visit interaction; the latter not necessarily including only visitors but a broader audience of people willing to interact with the venue. In other words, the cultural institution can benefit from visitors that can act as ambassadors of the stimulation of feelings and the sharing of the visit experience.

However, some people are more influential than others in spreading the museum message and affecting others' behavior. The personalities of different people and their influential role, like opinion leading, are studied in fields like marketing [12]. Recently, and due to the enormous dissemination of social media, people that are influential are also studied within the framework of social networks [13]. The sharing of experience in everyday life is widespread in a global online world through social media [8] and cultural experiences are no exception. This trend is such that people tend to seek information in the social media about events, things to do or interesting places to visit and a number of people seek advice from "experts" in the field or dominant individuals in order to maximize their experience [9]. By recognizing an expert in the field who can be transliterated as an influencer it is possible to understand the effect this person might have on others [10,11].

Influencers can affect others in multiple ways, from making a venue known to others and motivating others in visiting, to initiate discussions about cultural heritage, to create communities and keep people engaged, to even set trends. What influencers can or cannot do is of significant importance to cultural institutions, not only because they want to know what influencers might think and do, but also because they would themselves benefit from becoming influencers and key players in social life and social media. In addition, as the scope of an exhibition or generally a cultural institution is to spread a message, the uncontrollable situation of altering the message or spreading a different unwanted message on social media, is something that institutions should be aware of. Therefore, the present work aims at analyzing the personality of the visitors of cultural venues and the discussions that emerge around cultural heritage. We focus on establishing the personality of the influencers and their impact to other visitors, as well as identifying the characteristics of influential discussions. We particularly target the personalization procedure that can be based on the influencers (people and discussions) for each visitor in order to further activate and engage them. Our research is based on the pilot procedures of "CrossCult" EU Project through which we create ad-hoc social networks, where visitors can interact in real time either before, during the venue visit or even after visit. We examine the personality of the visitors that emerge as influencers, the characteristics of

posts that turned into important discussions and the way a cultural institution can benefit from this analysis. By performing the research and analysis on the procedures of fast and profitable message spreading through the social media, the cultural spaces have access to footprints they never used before. The role of this identification is crucial for cultural heritage as it can play an active role in the everyday life of people and thus raise the awareness, spread to the masses and engage larger audiences. The structure of the paper is as follows. The next section presents the related work that is done in the specific area, while Sect. 3 presents in detail our research methodology. Section 4 presents our experimental procedures and the next section presents a discussion on the founding. We conclude with future work and remarks.

2 Related Work

The term “influencer” is not novel, but has revived due to its extensive use in social media. In general the influencer is a person that can affect the opinion, the life stance, or the way of thinking and the attitudes of a number of people [20]. This can be done either on purpose, or due to the person’s position either in social life or the workplace, or just due to long time media exposure [13]. Common influencers among others could be people like athletes, rock stars, actors, models, politicians, mentors, etc., however, research shows that everyone could be an influencer under certain circumstances [13].

From a technical perspective, establishing the influencers is a procedure that is related to analysing quantitative parameters such the number of posts of a user, the number of likes and comments of other users, the times it is reposted and - if possible - the post reach. Past research has focused on different ways to identify social media influencers. For example, [21] applied a dynamic diffusion model to find influencers in specific discussions and to predict others from different topics, but within a specific time frame. Dedicated algorithms have been also used that measure different variables to spot influencers for a particular product [22]. In addition, it is equally important to recognize how influencer actions and traits are perceived by others. For this reason, a technique was developed to identify the perceived attributes of social media influencers and assist organizations to improve their social media presence [20].

To the authors’ best knowledge, there is very little research concerning social media influencers for cultural heritage. A 2012 study [24] revealed a gap in the use of technology and public outreach between high and popular culture. From their definitions, high culture is considered to be of great esteem by sophisticated or higher educated people, while popular culture is referred - as a term - to art that interests the general masses. As such, it seems that popular culture reaches social media users better, whereas high culture is behind in the use of new technologies. In this light, systematic use of technology and social media for high culture is still limited and as a result, the present work, wishes to be among the first to explore the field of influencers in culture and important cultural conversations in social media. Therefore, the current work focuses on identification of the type of personality of the Cultural Influencer.

Finally, the innovation and the importance of the present work lays in the empowerment of the cultural institution in playing an active role in influencing the cultural discussions and trends, identifying individuals and tendencies that can significantly affect and shift the focus of cultural attention, thus making them play a targeted active role in cultural technology and social networks.

3 Research Methodology

The experimental procedure is initiated after a visit in the Archaeological Museum of Tripolis (Greece); visitors were asked to participate in discussions on a Google document, in order to ensure collaboration, as well as Facebook discussions in order to retrieve influencer-related actions. Participants could choose between different discussion topics, all relevant to their museum visit including:

- “Nudity in antiquity and today”. During their museum experience, visitors had learnt about the symbolism of the naked body in antiquity.
- “Appearance as a comedy element in Classic Greek cinema”, a topic relevant to the museum information they had accessed about appearance of statues.
- “Comparing images”, where participants had to compare two images of women from Sicily. The first images showed young Romans wearing bikinis and playing a ball game. This was a mosaic from Villa Romana del Casale di Piazza Armerina (Sicily - 4c AD) [30]. The other image, showed contemporary nuns in Sicily. In another discussion about image comparison, images of ex votos were used from Christian contemporary churches (Catholic, Orthodox) and ancient ones from archaeological museums. The conversation is presented in Fig. 1.

The conversation presented in Fig. 1 is performed in Greek language and some of its “influencing parts” include the following conversation/facts:

- arguing about the assumption that the less science can help the more a superior power is activated and the fact that human beings rely on “transactions” with the superior power only when they are desperate
- conversation about game populous (the player had the role of god) and reactions of what it reminds
- long, engaging, and provocative conversation about existence of special body parts in the ex votos and what could be their meaning

The discussion topics were carefully selected with the help of humanities experts, in order to initiate conversations where the participant would have the ability to support totally different opinions on the same issue and find followers, supporters and people with different or opposed opinion. The issues are totally related to personal opinions and both the positive or negative opinions on the topics can find huge fans or enemies. This particularity enables more vivid conversations and enhances participation as they are intriguing. Participants were given one (1) week to complete their discussions; and after they completed their discussions, participants were asked to complete a personality test. While the

conversations on social media can last more or less “forever” we selected a period of time (seven days after the initialization of the conversation) in order to collect the information up to this time.



Fig. 1. Facebook conversations

3.1 Personality Test

In order to understand the characteristics of people, information about participants’ personalities was collected. The DiSC personality test was applied [25], which identifies 4 main personality dimensions:

- Dominance: How people handle situations and cope with problems
- Influence: Describes how people communicate, interact and relate to other people
- Steadiness: Includes aspects like perseverance, consideration for others and their problems, patience etc. that comprise one’s individual temperament
- Compliance: How people approach and arrange their activity, procedures and responsibility

DISC is used to improve work productivity [27], teamwork [29] and communication [26], since it shows how people relate to others and to tasks. In addition, past research has used DiSC in predicting the formation of ultimate groups, task performance and members’ satisfaction and positive emotions [28]. Therefore, it was also used in our experimental procedure in order to predict people’s personality characteristics, as these will emerge through cultural conversations. Each participant in the conversations was provided with an online form including the DiSC personality test in which each one had to answer a series of questions and

was kindly asked to submit the results of the tests. A sample result of the disc personality test is depicted in Fig. 2.

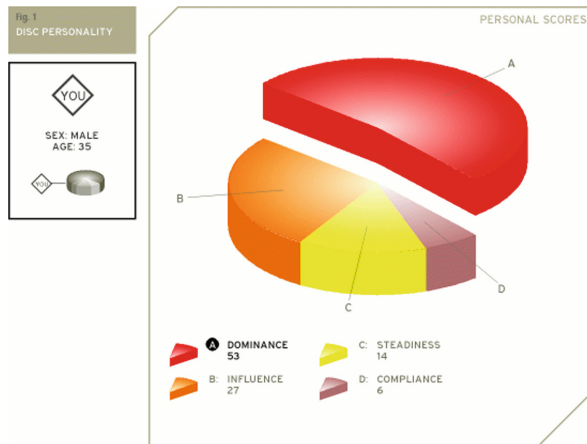


Fig. 2. DISC personality sample answer

As already mentioned the public conversations can provide us with important information about which user acts as an influencer but in the end what is really important is the actual personality of the user.

3.2 Reflection Analysis

Reflection analysis allowed the “in depth” qualitative viewing of the collected data. The number of times reflections occur, as well as types of the reflections are recorded and reported.

For the reflection analysis, the Soren [15] taxonomy of cognitive changes in dealing with cultural content, was used. Visitors described these changes in five ways:

- opportunity to have experiences with authentic objects
- unexpected experience and/or highly emotional experiences
- new attitudinal/cultural understanding
- motivation to become more proactive
- idea of infinity/lasting phenomena (how certain phenomena are relevant to people of different societies and times)

In addition, the Bloom taxonomy and its revised version was also used [16, 17]; [18], since reflection could be also treated as an upper level learning process [19]. In particular, the taxonomy describes 6 levels for high-level cognitive processes like memory, understanding/comprehension, application of knowledge, analysis, evaluation, and creativity. These processes are also hierarchically structured

from lower (memory) to higher (creativity). Thus, using the two taxonomies (i.e. Soren’s, Bloom’s), the collected data were qualitatively analysed to reveal their reflection potential.

4 Experimental Evaluation

The experimental procedure included a live visit at the Archaeological Museum of Tripolis, followed by online conversations on topics related to the visit and also a DISC personality test for each of the research participants. Furthermore, analysis on the conversations helped us obtain information about reflections generated throughout the text.

From the aforementioned procedure we collected data in order to study our main research question: the personality of the influencer.

4.1 Personality of the Influencer

In order to establish the users that act as influencers, we primarily identify the influencing discussions/comments. Discussing on social media, influencing comments are texts that have a significant number of (sub)comments, followed by large number of reactions, such as likes and emoticons (emojis). Furthermore, we collect information regarding the personality of the participants in order to study possible correlations between users’ personality and influencing texts. Table 1 presents the results of the DISC personality test for the participants that accepted to participate in the personality assessment.

Table 1. Personalities of participants

Dominant	Influencing	Steady	Compliant
5	10	7	2

In addition to locating influential discussions and identify participants’ personalities, the algorithm described in [14] was also applied, to find “bonds” between users. This would allow the recognition of influencing people among the participants in the conversation, even before the conversation analysis. According to [14], there is a tendency, in social network users, for higher responsiveness in recommendations made by the friends having the highest *tie strength* with them (or, recommendations that are based on those friends’ data, as long as this fact is communicated along with the recommendation). Tie strength is a directed measure and its calculation is based on the number of posts made on the social network within a time frame. More specifically, the tie strength between two users i and j is computed as:

$$W_{i,j} = \frac{C_{i,j}}{C_i} \quad (1)$$

where C_i represents the number of social media articles (either “original” ones or reactions/comments to other articles) posted by user i within a time period, and $C_{i,j}$ represents the number of posts made by user i within the same time period and are either aimed at user j (i.e. user j is explicitly mentioned in the recipient list of the post) or constitute reactions to posts made by user j .

According to the previous, we are able to find strong bonds between users and in that way recognize influencing persons between the participants. The outcomes of the process proved that it seems that some reactions in the conversations are related to strong bonds (a person always reacts - likes - the posts of another person).

Having the knowledge of the participants, their personality, the connection between them, the conversations and the reactions within each conversation we are, finally, able to locate influencing texts and make the interconnection with the corresponding personality. Figure 3 presents examples of typical texts that are considered to be influential.



Fig. 3. Influencing texts

We assume that the people that either initiated a conversation or a thread (a comment in a conversation) that included the characteristics described above (likes, comments, user reactions, reflections etc.) can be considered as influential individuals. We furthermore connected the influencing texts with the personality of the people that produced to the text. Results are present in the following table.

From the above analysis, it seems that it not only people with high Influence personality traits that produce interesting and influential discussions but is also people with mixed types that combine Influence and Dominance (Table 2).

Table 2. Number of interesting texts based on personality

Personality	# of interesting texts	# of people
Influencing only	3	2
Dominant only	2	2
Steady only	2	2
Influencing & dominant	12	4

5 Discussion

Performing the DiSC personality test on the participants we concluded that leading personalities high in Dominance or Influence are not by themselves adequate to influence cultural discussions. Our study revealed that the most influential individuals are the ones of a mixed type of leading traits that combine Dominance with Influence. However, the present work focused on the study of qualitative data and as such the sample size was limited. In addition, all data came from Greek participants and a cultural bias might be affecting the results. Nevertheless, the present work revealed the importance of the personality of the participant in cultural discussions in social media. The exact characteristics of the influencing personalities remain to be studied with a larger and international group. Future works should focus on more cultural discussions and collect data from various participants of different cultural backgrounds.

In addition, it was observed that in cultural discussions, background knowledge on the subject is very important. In this light, it is now only the personality characteristics of the person but also the knowledge on the subject that matter. It seems that an influencer combines both background knowledge and specific personality traits. The two combined seem necessary to produce interesting and influential discussions. At this point it is important to note that is the perceived background knowledge that seems important which might differ from actual knowledge. In other words, it is not what you know but what others think you know. Perceptions of background knowledge together with specific personality characteristics, in this case high Dominance and Influence, seem to create the necessary environment for an influential cultural discussion.

Furthermore, it is possible to relate conversations with strong reflections to influencing people, which, combined with the previous discussion leads to the fact that people that are able to generate emotions through their saying or writing can easily become influencers in cultural related conversations.

6 Conclusions and Future Work

Possible cultural biases might have affected our results as explained above, due to the nature of the work and the background of the participants. Our future work will analyse cultural discussions from people of different cultural backgrounds.

In addition, we will proceed with manipulation of the discussion team composition. In other words, we will ask people of only leader personalities (Dominance, Influence) or people of non-leader personalities (Steadiness, Compliance) to participate. Chatbots can be included in the formation of the teams, programmed in a way that mimics certain personality types, while in parallel researchers can possibly intervene in the conversations in order to provide evidence about manipulation of a cultural related conversation. This manipulation will allow us to study discussions of teams with different compositions of personalities. Once the personality traits that affect cultural discussions are clearly identified, cultural institutions can ask curators of certain personality traits to participate, or do it in an automated manner with the use of specially programmed chatbots. Moreover, we will proceed in the creation of specific guidelines to be followed by cultural institutions that wish to increase their impact on social media through reflection enhancement.

Finally, our future works includes application of the outcomes of our experimental procedures to real life organizations and more precisely cultural institutions. More specifically, a platform is implemented that can identify topics that are related to the cultural institution's context and are in parallel "hot" or "trending" topics. By establishing them we try to apply advertising principles by intervening texts with reflection within relevant conversations and we measure the affection on the discussion and the engagement of people. The latter can be of extreme importance for the public awareness towards cultural heritage related issues, as well as the increase of the engagement of more people to cultural spaces.

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