Digital Museums: the Gen Z perspective

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Introduction

An empirical analysis about digital museums and their communication have been made within the European project "Cultural Heritage Active Innovation for Sustainable Society - CHANGES" project code n. PE00000020 - CUP: H53C22000860006 on the theme "Museums back to the future".

The analysis involved 30 students within the Museology course of the University of Bari (Italy) and became the base of specific interdisciplinary research about user experience and digital museums. The research started from the question: are museums understanding how young online audiences, such as students in Museology, approach their new digital ecosystem?

The last decade's trend is about platforms allowing a dialogical-conversational communication and an open and bi-directional interaction, which can lead to open participation and collaboration (Simon, 2010). However, while implementing types of contents and interaction, most of websites are developed for an informative and one-way model rather than a dialogic, participatory, and collaborative one (Orlandi et al., 2018; Kabassi, 2019; Bailey-Ross, 2021).

The survey focuses on the perception and user experience made by this specific audience, the Zoomers. Thanks to the digital reaction to the lockdown, and a stronger user-oriented approach, museums' digital transformation is slowly aiming at reducing the gap in communication, attractiveness, and interaction with potential visitors of this age group (Tranta, Alexandri and Kyprianos, 2021; Palumbo, 2022; Bonel, Capestro and Di Maria, 2023).

Museums are still considered unattractive for younger generations, to the point that these young people are generally considered non-visitors, because they do not express a demand for culture (Drotner, Knudsen and Mortenesen, 2017; Kluge-Pinsker and Stauffer, 2021; Cesário and Nisi, 2022; Bonel, Capestro and Di Maria, 2023). They would have good potential if museums developed adequate digital strategies, by offering engaging experiences of digital storytelling, gamification, interactivity, sociality, and virtual and augmented reality (Manna and Palumbo, 2018; Batat, 2020; Feitosa and Barbosa, 2020; Markopoulos et al., 2021; Bonacini, 2022; Lee, Park and Lee, 2022; Longo and Faraci, 2022; Khalil, Kallmuenzer and Kraus, 2023).

Previous analysis about the relationship between Gen-Z and museums concerned primary and secondary school students. So far, museums have not asked themselves what kind of motivations, expectations and perceptions more mature students have about their online presence.

The students experienced digital cultural communication during the lockdown, with an approach in line with online cultural consumption during the pandemic period (Ryder, Tingting and Hua, 2021). Starting from first-year matriculation, a basic moment of their training, they interacted with art in a completely new intense way, but almost exclusively virtual. This online cultural consumption allowed them to appreciate the variety and potential of digital communication and technologies; however, it generated great expectations, about the quality and offer of museums' communication.

At the end of a course focusing on the museums' digital ecosystem, the qualitative analysis was first conducted at home, by analytically answering a specific questionnaire.

Starting from the methods of empirical analysis, in particular of museums displaying their collections online, and from the evaluation criteria of museum websites known in the literature (Garzotto, Matera and Paolini, 1998; Harms and Schweibenz, 2001; Fotakis and Economides, 2008; Pallas and Economides, 2008; Theocharidis et al., 2014; Lopatovska, 2015; Chiang, Tsaih and Han, 2016; Kabassi, 2019), the research concerned the perception about the quality of 30 international and Italian museums' web strategies, a total of 13 international and 17 Italians museums websites[1]. Students' choices were generally motivated by a cognitive first approach to the collection or by a post-visit in-depth analysis.

Then websites' analysis was presented individually in classroom by each student to the others, browsing the chosen website, according to the *peer instruction flipped classroom* teaching method, in which students become tutors for their peers, further activated by the teacher as a mentor (Lage, Platt and Treglia, 2000; Strayer, 2012). A real collective and participatory brainstorming started from which a qualitative, collective and co-constructed evaluation derived for a specific number of 34 items[2]. No analytics or quantitative metrics relating to permanence on the site or amount of likes or views were taken into consideration. A reasoned score, from 0 to 10, was given to each criterion, to obtain a sort of qualitative ranking. The analyzed websites were defined according to the appearing predominant "vocation" in students' perception, depending on the degree of engagement and participation allowed to users: user oriented, collection oriented, collection oriented. Finally, final evaluations have been made homogeneous for a better ease of reading and comparison.

Digital museums: students' evaluation

The students challenged, first, with the ease and usability of the websites, with the characteristics of navigation and research, with virtual and interactive solutions, manipulation, aesthetics and design,

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[1] The international websites museums: British Museum and National Gallery in London; Metropolitan Museum, MoMA-Museum of Modern Art and Morgan Library & Museum in New York; Musée d'Orsay, Musée de L'Orangerie and Musée du Louvre in Paris; Russian State Museum in St. Petersburg; Egyptian Museum in Cairo; Museo Nacional del Prado and Museo Nacional Reina Sofia in Madrid; National Museum of Korea in Seoul. The Italian websites museums: Galleria Borghese, National Gallery of modern and contemporary art, MAXXI, Capitoline Museums and Vatican Museums in Rome; Uffizi Gallery and Galileo Museum in Florence; Egyptian Museum in Turin; MADRE Museum and MANN-National Archaeological Museum in Naples; Palazzo Ducale and Peggy Guggenheim in Venice; Ambrosiana and Brera Picture's galleries in Milan; Bologna's Picture gallery; Caserta Royal Palace; MArTa-National Archaeological Museum of Taranto.

[2] The 34 categories analyzed were: Usability, Physical accessibility, Digital accessibility inside the museum, Cognitive accessibility inside the museum, Digital accessibility to the website, Informations about the visit, Informations on exhibitions and events, Archive of exhibitions and events, Catalog of collections, Newsletter /mailing lists, Hyper textuality, Interactivity, 3D models, Google Arts&Culture, Multimedia, Application/audio guide, Podcast, Game, e-ticketing, e-shop, Card or membership, Educational activities, Activities for different target, Blog, YouTube, Facebook, Instagram, Twitter, Tik Tok, Pinterest, LinkedIn, Flickr, Foursquare, Strategic Plan.

accessibility of the pages, social content and, in general, with the quality of communication and valorization of online collections.

The analysis highlighted how a correct web strategy is not always applied, according to the 5 macro categories indicated by ICOM (Orlandi et al., 2018): information architecture, content strategy, user interface design, community building, creative (re)use of contents. Above all, collaborative aspects, bi-directional dialogue and creative use and reuse of contents, in most cases, seem not yet expressed in their potential and, therefore, reveal still lacking museum web strategies. A more promotional communication of activities and collections have been preferred. Therefore, there is a still too institutional tone of voice. Except for some cases, the general perception by the students highlighted a real "generational deficit" in the communication strategies of museums, a real perceived "distance" with their generation.

The students, on the contrary, appreciated all those institutions revealing a willingness to have a dialogue with users, to allow them to interact with contents, to let them able consulting their collections as interactively and transversally as possible, to speak a language more suited to a story than to a lesson, more friendly than authorial, without despising the scientific quality of the shared contents.

The aesthetic aspect of the design, the browsing menu, the architecture of the site were particularly appreciated, as was the presence of a sitemap helping in navigation.

The website of the Galileo Museum in Florence was the most appreciated for its character as an information hub, full of external links to websites, platforms, scientific portals of all kinds, virtual exhibitions and digital content available to users (collections, archives, documents, bibliography, photographs, etc.) with a real "digital prodigality".

Thanks to the almost full accessibility of the website in English, great was the consultation of the National Museum of Korea website, presenting numerous multimedia contents, even immersive and metaverse virtual experiences enjoyable from home, as well as the one of the Prado Museum in Madrid, providing various interactive online resources, including games for children, and inclusive resources that make the collections highly accessible.

In the museum panorama, BreraPlus+ appears as a novelty, a cross-media platform offering on-demand or streaming content for subscribers and BreraCard holders.

Focus on the online collections

The presence of easy-browsable collections, in which artworks descriptions are rich in information and insights, data on restorations and bibliography, good resolution and downloadable photos, interactivity and ease of interface navigation, as well as well-articulated solution in indexing or tagging, were considered a strong point of the online catalog of the British Museum, the Louvre, the Morgan Library & Museum, the Museo Nacional del Prado, the Musée d'Orsay and L'Orangerie, which have the same organization of the database and, finally, the Russian State Museum.

The richest in information and easily browsable Italian collections were those of the Egyptian Museum in Turin, the Galleria Borghese, the Pinacoteca Ambrosiana and the Pinacoteca di Brera.

Many collections have been critically valued due to the lack of a database searchable by periods, authors, keywords, techniques etc, such as the The Uffizi Gallery, which offers multimedia resources such as 3D models on Sketchfab, but it lacks filters or tags, for a more transversal browsing.

Although filterable by different keywords and themes, the online catalog of the Vatican Museums appeared distracting and unattractive, with technical sheets and no tags.

Really appreciated were those collections browsable through interactive timelines: only the MET and the Prado Museum offer timeline useful to "cross" time and geographical space or to "connect" events, historical figures, and artistic movements.

Even not only technical but narrative description of artworks were considered a strong point of some museums. The National Gallery provides two descriptive levels, one overview and one in-depth.

Disappointing, instead, are the Reina Sofia National Museum collection, the one from the Royal Palace of Caserta and the last one from the Archaeological Museum of Naples, with essential captions and external in-depth information sheets in .pdf, only for masterpieces, in which it is impossible to search by tag or keyword.

Many international museum websites offer in general a rich bibliography. Only the MET offer downloadable bibliographic resources, the MET Publications, while the Corpus is the Louvre's database of scientific research related to the collections.

The choice of discovering displayed artworks in the permanent exhibition was also considered an important resource: interactive maps with tags have been adopted by the Louvre, the MET, the National Gallery, while in Italy by the Capitoline Museums, the Borghese Gallery, the Galileo Museum and the Pinacoteca di Brera.

Printing, downloading in .pdf, sharing on social networks or via e-mail, as in the British Museum, or scanning by Qr Code, as in the National Museum of Korea, have been considered valuable solutions for allowing users saving research.

Zoomable or browsable high-resolution photos appear to be a further fundamental resource in the historical-artistic approach to the collections: artworks from the Prado, the National Gallery, the Pinacoteca di Brera, the Pinacoteca Ambrosiana open full screen.

Obviously, policies about images sharing and reuse were fully appreciated from the British to the Louvre, from the Prado to the MET and the National Museum of Korea. In Italy, only the Egyptian Museum of Turin and the Pinacoteca di Brera allow users to download and reuse of images.

Audio descriptions on the website are rare but it is a digital accessibility solution adopted by the British, the MET, the MoMA, the State Russian Museum and the Prado.

Focus on the virtual tours

While appreciating the degree of authenticity of the digital replica, none of the students considered the virtual tour as an alternative substitute to the physical experience at the museum, from an empathic, aesthetic, synesthetic and social point of view; the virtual tour has been appreciated not only as an initial approach tool, but also a post-visit tool, to appreciate spaces and artworks to the fullest.

On the contrary, the absence of a virtual tour, which let the students be aware of the spaces, displays and places, left them greatly disappointed. Students spent 15-20 minutes visiting online a museum when virtual tours were rich in interactive and multimedia content. In line with Resta et al., 2021, all

the virtual tours analyzed proved to be lacking in integrating storytelling elements (voiceover, characters, or interactive narratives), useful tools to make virtual experiences more engaging.

Among the interactive tours accessible from smartphones, desktops and in immersive mode, the MET 360° project stands out. Launched in collaboration with Google Cardboard, through 6 spherical videos, the visitor can immerse himself in a natural visit experience: since these are spherical shots, he can move together with other visitors.

The National Gallery offers engaging and interactive solutions: from the Google Arts & Culture's virtual tour to those on Matterport or other virtual spaces, the museum declares that these contents guarantee accessibility and digital use to anyone.

The Capitoline Museums virtual tour allow users to visit sections, by levels and interactive maps, as well as by unmissable works; a simple caption is equipped by audio narrations (in Italian and English) and evocative videos.

Interactive and immersive virtual tours of collections and exhibitions are offered by the State Russian Museum, which has a rich section of online content (even if almost only in Russian).

The three interactive, thematic, and curator-led tours created by the Prado Museum with Gigapixel Second Canvas technology can be used upon payment, while an immersive and gamified experience for children is free of charge.

The Egyptian Museum of Turin created an interactive tour designed for two different audiences: a first, for adults, a second for children, in which, maintaining the same interactive map and virtual walk, content (video, audio descriptions) and language change, with learning verification quizzes at the end.

For many museums, Google Arts & Culture and the Street View solution are a great alternative (Resta et al., 2021). Highlighting the link to the virtual tour on the homepage or indicating the link between the media resources was considered a positive element. In some cases, browsing proved to be so chaotic and confusing that it was impossible to understand the consistency of the collections (how many works and by which authors) that students preferred consulting the profile on Google Arts & Culture: this happened in the case of the MADRE of Naples.

Considering Google Arts & Culture "an encyclopedia museum of museums" (Zhang, 2020, p. 2), as well as the largest online virtual exhibitions platform (Lee, Park and Lee, 2022), students badly rated the lack of direct links to Google Arts & Culture for the MET and the Uffizi Gallery, or the total absence from the platform, as in the case of the Louvre, the Prado Museum, the Pinacoteca di Brera and the Vatican Museums.

Focus on social media communication and storytelling

The analysis disappointed students' expectations, whose perception was that the lockdown ferment (Ryder, Tingting and Hua, 2021) was not followed in the tone of voice, in interaction and content, highlighting some critical issues:

- lack of online interrelation between museums and users (comments are often not answered or interacted and, in too many cases, followers' questions are answered by other followers).

- low inclination to find forms of engagement;

- using social networks as simple bulletins of activities;

- lack in storytelling about the collections;

- lack of targeted communication strategies both at the type of social platform and at different audiences;

- failure to "update" new generation social networks or to use a correct tone of voice suited to the target;

- abandonment of profiles and channels.

The students expected a greater quality of communication, a greater attention to the public and a much less formal tone of voice, more oriented towards storytelling. The lack of interrelationship with social media followers was considered very badly, to the point that, in evaluating the presence of the MET on social media, thus a student expressed herself: "I perceived the Museum as a divine entity, not descending to the level of its faithful, but remains elevated and unreachable". Despite activating many contests on Instagram and Tik Tok, the MET has one-way communication. For this Z generation, used to an increasingly digital sociality, this "distance" was inexplicable and unjustified.

Some museums, such as the British, spread same posts across different social networks: this was judged as a disappointing automatism. Apart of the well-organized YouTube channel with 64 million visualizations and an active Community section to interact with users (through trivia, quizzes, surveys), the British does not seem interested in enhancing users' engagement on the other social networks, while, instead, the storytelling and the tone of voice used are praiseworthy.

Publishing the same contents on Facebook, Twitter and Instagram is usual for the MoMA, the Reina Sofia Museum, the Peggy Guggenheim, and the Pinacoteca Ambrosiana.

The students were struck by this way of communication: the failure to distinguish between social media, targets and content has been considered as a lack of roles distinction within a communication department or as a disqualifying lack of interest towards audiences of different ages and languages.

While the MET, the National Gallery and the MoMA diversify a Facebook post from a tweet or an Instagram post, their Tik Tok profile appears a little "jarring" with respect to the target in terms of content, tone of voice and engagement strategies, since they mostly replicate what is published elsewhere.

The performance of the YouTube channels of the Uffizi Galleries and the Vatican Museums is disappointing, if we compare them to the British Museum's channel followers and views with its 600.000 followers and 64 million views.

The Vatican Museums is the least social of all the analyzed museums: they recently open an Instagram profile which appears to be their only social "voice".

The impression from the analysis of Facebook, Twitter and Instagram profiles of the Galileo Museum was positive, revealing a real interacting museum, thanks to distinction of contents, headings, tone of voice, irony, rhetorical questions, riddles, trivia, invitations to interact, feedback to followers' questions. The use of emoticons was greatly appreciated as an informal social approach, a more captivating if not even playful visual-verbal form of communication (Lazzeretti, 2023).

The Uffizi Gallery was instead positively judged on Instagram, Twitter and especially on TikTok: they search for differentiated content, language, and new forms of connection with the artworks. Lexicon, irony, use of effects, filters, memes and, above all, attention to social trends are the keys of a Z

Generation style in communication. The Uffizi and the Archaeological Museum in Taranto have been able to create their own communication ironic style to the point of being even irreverent, by following the popular trends on social media.

Focus on engagement, participation and collaboration

Museum websites revealed a low propensity for users' engagement, participatory and collaborative solutions. Although their communication is often more user oriented than in the past, they do not pay attention to community engagement solutions on the website or on social media.

Therefore, engagement, collaboration and participation solutions that were positively reported by the students deserve to be remembered.

Through the #MOMAPhotoClub contest on Facebook and Instagram, followers are invited to follow some challenges according to specific themes. Their contents, photos, and videos are re-shared on the MoMA's profiles and are on display in the city's subway.

Through #MyMarta and #GensMArTA selfie contests on Facebook and Instagram, followers are invited to send their selfies inside the museum. Their photos are then collected and shared in a special section on the Instagram's feed or Facebook albums.

Talking about users' engagement with collections, the British and the French museums of Orsay and de l'Orangerie open the doors to a bottom-up revision process, allowing registered users to provide feedback on the cataloged objects (corrections, updates, bibliographical references, etc.).

Even the Pinacoteca di Brera, with yourBrera contests (open to users' participation and creation of content), asked followers to give voice to the captions or tell their favorite artwork.

In terms of creative and participatory writing, the MET's Teen Blog stands out, entrusted almost entirely to an editorial team of teenagers, the Teen Advisory Group, where young people can express their relationship with art.

Finally, forms of creative engagement were also created through games and applications.

A form of creative musical engagement is the interactive game *Resonancias. El Oído* launched by the Prado Museum, which allows young users to create melodies, by digitally "playing" the musical instruments painted by Bruegel the Elder and Rubens.

With the multiplayer video game project on the Roblox platform, entitled *Keeper Council*, the National Gallery has gone further, with the game's codesign and cocreation: after launching the first AR app *The Keeper of Paintings and the Palette of Perception*, Keeper Council was created thanks to the

suggestions of eighty children with their families, involved in the testing phases together with professional figures from the gaming and education sectors.

A participatory and co-creative process, launched by MANN together with City Open Source, concerns the extraMANN project, with a free application through which is possible to map one's experiences of places, map new places and trace new routes in Naples, to encourage forms of geolocalized collaborative storytelling.

Conclusions

Beyond any evaluation through the students' experiences, as direct users of digital cultural content, we want to provide a general indication about overthrowing the mindset, to fill the gap between perception, reality and desire for digital museums, and their communication, attractiveness, and interaction with young potential visitors, who are actual digitally educated students, current consumers of culture onsite and online, and future consumers as scholars or as individuals and families.

This investigation confirms what highlighted by other research (Goldman and Schaller, 2004; Lopatovska, 2015; Artese, Ciocca and Gagliardi 2017), aimed at considering online museum spaces as attractive spaces where the enthusiasm of discovery is possible thanks to an "extended" museum experience (Biedermann, 2021).

This work therefore aims to contribute helping institutions in changing strategies about their online digital cultural offer and their languages, by building cultural proposals able in involving (perhaps even exciting), rather than thinking that online digital valorization must pass through static, formal, and emotionally sterile forms.

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