



MUSEUMS IN THE DIGITAL AGE

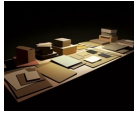
Using new technologies **BEFORE, DURING** and **AFTER**
visiting a museum, cultural institution or art gallery

RESEARCH
CONDUCTED BY

dosdoce.com

PRESENTED AT THE 2013 EDITION OF

**MUSEUM
NEXT**



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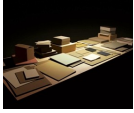
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INTRODUCTION

1 Although we may all more or less agree that the Internet has radically changed the way in which people look for and find all kinds of cultural and leisure contents, do we really believe that museums, cultural institutions and art galleries can offer the same experience on visiting an exhibition or collection in the 21st century without embracing any kind of change?

Museums, cultural institutions and art galleries **can't afford to remain aloof to this change, which is directly affecting the consumption of cultural products** and is consequently influencing our access to art and culture from any perspective. Neither can

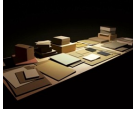
they deny spectators' demands for interactive experiences, which are not always met in practice through the use of games.

The main purpose of this study is to analyze how museums, cultural institutions and art galleries may benefit from the latest technology on the Web and on the market, as well as that offered by recently created technology companies, better known as startups, with a view to improving their services within gallery spaces, with virtual material and content, with a view to enriching the visitor experience.

The impact of third generation technology in the cultural sector -such as

facial recognition systems, smart sensors, real satisfaction recommender systems, interactive applications for mobile devices, among other novelties- offer cultural institutions an **amazing choice of opportunities to enhance the visitor experience** at an exhibition, among other experiences that may be offered by a museum, cultural centre or art gallery.

HOW CAN ART INSTITUTIONS BENEFIT MOST FROM TECHNOLOGY WITHIN THEIR REACH?



INTRODUCTION

BEFORE, DURING AND AFTER

1.1

Contrary to [previous studies](#)¹ by Dosdoce.com, where we analyzed whether or not a given cultural institution was present on a social network and subsequently provided a series of recommendations to improve its presence on those networks, this time we preferred to analyze the degree to which all kinds of technologies are used during the three stages in which a citizen may experience direct contact with a cultural institution:

- **Before the visit** (discovery stage)
- **During the visit** (direct experience stage)
- **After the visit** (stage at which the experience / satisfaction is shared)

The results of this last study have revealed a **highly intensive use of technology during the discovery stage** (mainly focused on promotional activities in social networks and the

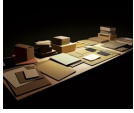
development of applications for smart devices); a **diminished use of tools during the visit to the physical installations** of the corresponding institutions (mainly focused on the use of certain technologies for the purpose of enriching the visit); and lastly, a **low use of technologies to encourage the exchange** of experiences after the visit.

Cultural institutions and technology companies in the digital age need to work together more closely with a view to benefiting from the opportunities offered by tools such as mobile

RECENT ATTENDANCE RECORDS SHOULD NOT BE USED AS AN EXCUSE TO POSTPONE THE USE OF TECHNOLOGY TO ENHANCE THE VISITOR EXPERIENCE

applications, QR codes, gamification, touch-screens, sensory technology, geolocation or augmented reality, among others, to develop new services for the purpose of enriching discovery processes at museums as well as promoting a connection among visitors.

Although museums have reached record levels of visitors during the last few years (3 million annual visits to the Prado Museum; 1 million visits to the Bilbao Guggenheim Museum in 2012; almost 400,000 visits to the Picasso Museum in Málaga, etc.), one of the most significant challenges these institutions will have to face in the next few years is the addition within their gallery spaces of a broad range of technology in order to enrich the visual experience for visitors and **really meet the needs of 21st century clients**.



INTRODUCTION

'BLIND' IN THE DIGITAL AGE

1.2

Museums and cultural institutions are *blind* in this digital society because they are unaware of most of their visitors' profiles and cultural preferences. They don't know whether their visitors are dealers, Fine Art students, tourists or town residents visiting a museum for the first time. This is due to the superficiality of statistics controlling the number of visitors at museum entrances and to the failure to analyze specific studies that institutions of these characteristics should conduct.

How can a museum recommend an exhibition or the contemplation of a particular painting to potential visitors if it is unaware of their cultural tastes? **The real additional value provided by the Internet is the direct knowledge of its visitors and their behaviour during the process of discovery or consumption** of any cultural content. New cultural content recommendation systems based on real satisfaction during previous visits will allow cultural managers to recom-

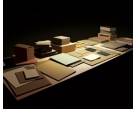
mend visits in a highly personalized way since they will be familiar with their clients' real preferences as well as their degree of satisfaction. This information regarding visitors' behaviour and their true level of satisfaction, which are impossible to secure in the analog world, will become the **active ingredient and competitive advantage for museums** in the new digital age.

VIEWING AND DISCOVERING AN EXHIBITION SHOULD NOT BE A SOLITARY ANALOG PROCESS; IT SHOULD BE SHARED WITH TECHNOLOGY

The way an exhibition is discovered and viewed in the digital age will no longer be a solitary analog activity and will turn into a process shared with technology. Visitors in the 21st century need to be offered an online experience in order to stimulate every one

of their senses.

One of the main conclusions of this study is that **museums, cultural institutions and art galleries are destined to get along with recently created technology companies** in order to benefit from the opportunities offered by the Internet. 90% of the companies participating in the survey revealed that they were truly interested in new technologies and considered it highly advisable to implement them in their institutions to enrich the visiting experience before, during and after visits. However, the study also revealed that only 30% of the institutions participating in the survey claimed to have held one or two meetings with technology companies in the previous year. If museums, cultural institutions and art galleries fail to accept the challenge of **thoroughly modernizing the discovery and visiting processes of their collections and exhibitions**, they will scarcely remain as relevant cultural options for citizens of the 21st century.



USING NEW TECHNOLOGIES BEFORE, DURING AND AFTER VISITING A MUSEUM, CULTURAL INSTITUTION OR ART GALLERY

2

In this study we have sought to analyze the extent to which all kinds of technologies are used in three main stages during which a citizen has direct contact with a cultural institution:

- **Before the visit** (discovery stage)
- **During the visit** (direct experience stage)
- **After the visit** (stage at which the experience / satisfaction is shared)

The results of this last study revealed a

highly intensive use of technology during the discovery stage (mainly focused on promotional activities in social networks and the development of applications for smart devices); a **diminished use of tools during the visit to the physical facilities** of the corresponding institutions (mainly focused on the use of certain technologies for the purpose of enriching the visit); and lastly, a **low use of technologies with a view to encouraging the exchange** of experiences after the visit.

As has occurred in relation to other activities in the cultural and creative industries, such as screen reading or music and film consumption by streaming, the **change in cultural visits will be much more radical than we suspect**.

Offering visitors a broad range of exhibitions and activities is not enough, they must be engaged by new, unique experiences using the support of users' mobile devices either during the visit to the gallery spaces or on visiting the museum website.

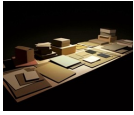
GOOD PRACTICE EXAMPLES BEFORE THE VISIT

2.1

The discovery and subsequent visit to an exhibition in the digital age will no longer be a solitary analog activity but will become a process shared with technology. Visitors in the 21st century must be offered an online experience to add to their physical visit to stimulate each and every one of their senses.

VISITORS IN THE 20TH CENTURY SHOULD BE OFFERED ONLINE EXPERIENCES TO STIMULATE ALL THEIR SENSES

To understand all the implications of this change, **we have chosen a broad range of examples of uses of all kinds of technologies** by cultural institutions throughout the world for the purpose of enriching the visitor experience *before, during and after* the visit.



GOOD PRACTICE EXAMPLES — BEFORE THE VISIT

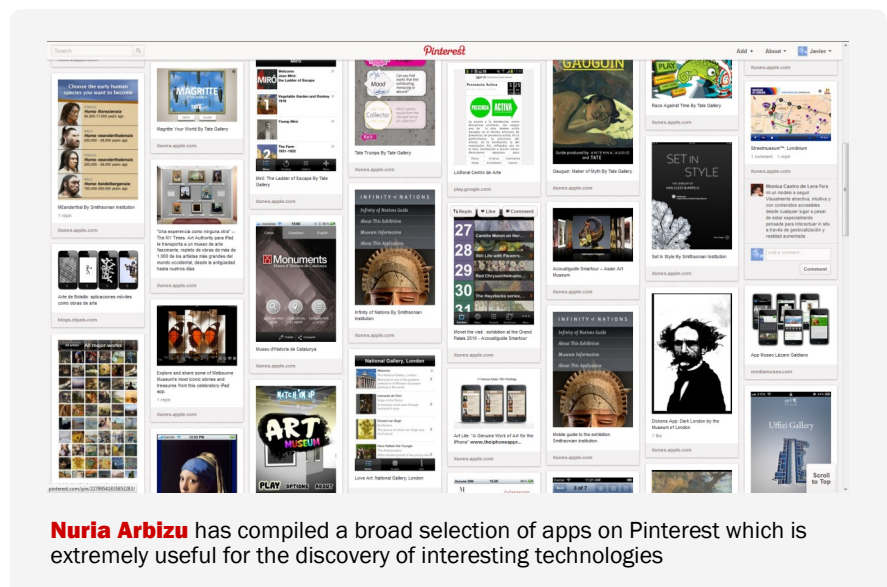
APPLICATIONS FOR DISCOVERING EXHIBITIONS, CULTURAL ACTIVITIES, ETC.

2.1.1

[Our attention was particularly drawn to an app² used in New York City](#)

Subway, which provides comprehensive details via a mobile application on a wide variety of artwork installed throughout the subway and rail system in New York. Several contemporary works of art are displayed at select stations to accompany travellers. It is almost impossible to know where each of these works or art is exhibited. However, the Meridian app provides background information about each piece of art and its creator. Apart from being a free app, works within the app are organized by subway or railroad line and artist. Browsing on the application from Kennedy International Airport allows you to check out flights, restaurants, bars, stores... and a lot more. For example, at the Lan Su Chinese Garden, you can use Meridian to tour the whole garden and learn about the fantastic world of plants and at the Fernbank Museum of Natural History in Atlanta, you can use the app to learn everything you need to know about dinosaurs (among many other things) through various games and challenges.

Along these same lines, the **Mapfre Foundation** [has created an application³](#) to share all the activities offered



Nuria Arbizu has compiled a broad selection of apps on Pinterest which is extremely useful for the discovery of interesting technologies

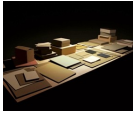
by its Institute of Culture and keep the public informed of exhibitions, conferences and publications as well as cultural initiatives in Spain, Latin America and Europe.

The **Musée du Louvre** has created an app which allows users to browse through 100 artworks in the museum, discover the secret behind the Mona Lisa's enigmatic smile and explore Napoleon's apartments.

The **State Hermitage Museum in Saint Petersburg** also [has its own](#)

[app⁴](#) offering a magnificent virtual tour of the museum with 100 amazing 3D panoramas as well as descriptions of individual artworks.

Considering the endless list of apps for museums, cultural institutions and art galleries, we recommend that readers visit Nuria Arbizu's wall display on Pinterest, where she [has chosen a broad range of apps⁵](#). We would like to take this opportunity to thank her for this initiative, as it is an extremely useful wall in discovering and narrowing down all kinds of applications.



GOOD PRACTICE EXAMPLES — BEFORE THE VISIT

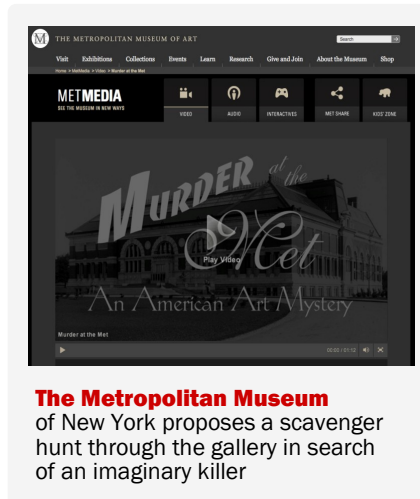
EXPERIENCES RELATED TO GAMIFICATION

2.1.2

Using technologies derived from the gaming industry, such as challenges and prizes, to transform everyday chores into fun activities can be extremely useful in attracting audiences' attention to activities offered by museums, cultural institutions and art galleries.

The **Metropolitan Museum of New York** is a good example of how to apply gamification (defined by some as the application of game theory concepts and techniques with a view to involving users) to increase interest in the world of art. The MET, for example, has created [the game Murder at the Met](#)⁶, whereby a player must find the killer of Madame X, the woman immortalized in John Singer Sargent's painting by that name (at the MET collection), allowing users to explore statues, paintings and objects with a view to finding the evidence directly leading to the murderer and witnesses.

The PradoMedia section at the **Prado Museum in Madrid** [offers a broad range of games](#)⁷ inviting visitors to discover its works in detail through conceived entertaining techniques to develop their visual memory, among other things. Along the same lines, the Education Department of the



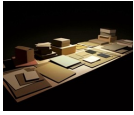
HOW DOES GAMIFICATION WORK? IT USES GAME MECHANICS TO GET USERS INVOLVED

Thyssen-Bornemisza Museum (Educathyssen) offers a [range of video adventures](#)⁸ based on the gamification concept, where art is discovered through storytelling.

The **Carlos de Amberes Foundation** (Madrid) created a [game on Facebook](#)⁹, on a low budget and in a short space of time, allowing it to share the temporary exhibition *Beatlemania, 50 years later* which increased the number of followers and visitors to the exhibition by 85%.

Similarly, the **Museum of the City of New York** includes a [post every Friday on its Facebook page](#)¹⁰ of a mystery image. Followers are challenged to identify its location and must validate their responses.

Some museums are creating challenging competitions based on their exhibitions using [SCVNGR](#)¹¹, a social, location-based, gaming platform for mobile phones. We found an example of the use of this platform at the **Smithsonian**, which organized an interactive game called The goSmithsonian Trek, a scavenger hunt in which museum visitors had to decode clues in nine of its museums to solve the mystery.



GOOD PRACTICE EXAMPLES — BEFORE THE VISIT

ELECTRONIC RESOURCES ON WEBSITES OF CULTURAL INSTITUTIONS

2.1.3

Many are the museums, cultural institutions and art galleries, which allow us to discover their collections and activities on their websites, by the click of a mouse, without having to move from our computer or tablet screens.

The **Bilbao Fine Arts Museum** offers [multiple itineraries](#)¹² on its collection, including comprehensive information and audio-guides; it has also designed a multimedia section on its website with videos of exhibitions and activities where more than 145 of its artworks are already part of the Google Art Project.

The **American Museum of Natural History** offers its future visitors an [interactive map on its website](#)¹³ to help plan their visit.

The aforesaid PradoMedia section at the **Prado Museum** in Madrid allows visitors the opportunity to visit the museum in a dynamic and attractive way with contents of interest to every age group. The electronic resources of

Plan Your Visit

- Admissions & Ticketing
- Visitor Information
- Accessibility
- Public Tours
- Plan a School Group or Camp Group Visit
 - Getting Started
 - Preparing for Your Day

Interactive Floorplan

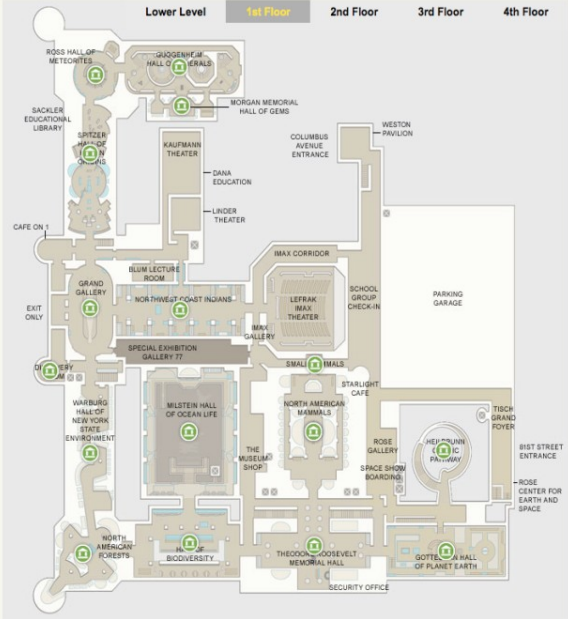
Download Museum Map

Information/Información /重要信息

- AMNH Sleepovers
- One Step Beyond

Interactive Floorplan

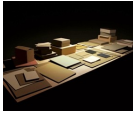
Below is an interactive map to help you find your way...



The American Museum of Natural History offers its future visitors an interactive map on its website to help plan their visit

this particular section of the web are classified into five large areas: Exhibitions, Collection, Education, Investigation and Games. Another, important point to bear in mind is the

creation of a channel on YouTube where the museum offers users more than 100 videos on current, past and future exhibitions.



GOOD PRACTICE EXAMPLES — BEFORE THE VISIT

GUIDED TOURS ON TWITTER

2.1.4

The **Tate Gallery** in London has, once again, demonstrated its ability for innovation through the use of social networks to broadcast its exhibitions and activities. It recently gave a guided tweet and image based tour on Twitter of the pop artist Roy Lichtenstein's exhibition on display at the Gallery.

We have seen other initiatives before with a view to promoting certain exhibitions or encouraging visits to museums via Twitter, with the consequent hashtag (#). However, this was the first time a guided tour was actually given on Twitter.

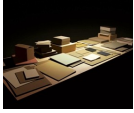
The tour lasted half an hour and was

hosted by a museum guide who discussed and provided some of the keys to the artist's work. There was also a question and answer session with one of the curators in charge of the virtual tour. Photographs of the artworks being discussed accompanied the tweets.

In this case, interaction and museum activity were extremely well combined to provide a virtual service to potential visitors and consequently attract visitors to the museum. It is also a great opportunity for anyone wishing to receive real-time, significant information on a given exhibition, wherever in the world they may be.



The Tate Gallery recently hosted the first guided tweet and image based tour on Twitter



GOOD PRACTICE EXAMPLES — BEFORE THE VISIT

NEED TO **REDESIGN** **WEBSITES** OF CULTURAL INSTITUTIONS

2.1.5

The arrival of smart phones is causing more changes in habits and on the Internet than we are capable of understanding. This new mobile support, in combination with tablets of various sizes, is prompting a radical change in the way in which we discover all kinds of cultural contents (books, music, art, etc.) and is also having an impact on our decisions as

to whether to visit a certain exhibition. It is even influencing how we enjoy the experience of consuming these cultural contents.

ADAPTING WEBSITES TO BE EASILY READ ON MOBILE DEVICES IS ESSENTIAL FOR IMAGE AND SERVICE

Unfortunately, there are many cultural institutions that have still not adapted their websites to be easily read on these new devices. It is of the utmost importance to redesign the websites of cultural institutions for their adaptation to all kinds of mobile devices if there is an intention to project a good image and provide a better service to visitors.

GOOD PRACTICE EXAMPLES — BEFORE THE VISIT

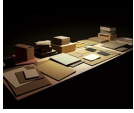
ENRICHING THE NAVIGATING **EXPERIENCE**

2.1.6

Apart from redesigning websites for their adaptation to all kinds of mobile devices, cultural institutions should focus towards **a more semantic approach on their websites to enhance the navigating experience**. At this particular stage in the evolution of websites, all their contents should be interconnected via supplementary informa-

tion published by users, which would **assist in saving information as well as enriching it**. New websites along those lines will allow users to share, process and transfer information in a simple fashion, consequently obtaining better results in the search for information on the Web. Enriching the navigating experience for its users will be crucial to museums: a combina-

tion of key words will offer us **connections, for example, to pieces in a collection, exhibition or related activity**. The example of Cultural Surface, which we will describe in the next section, will help the readers of this study to understand the evolution in the design of cultural websites.



GOOD PRACTICE EXAMPLES **DURING THE VISIT**

2.2

The use of audio guides in gallery spaces was initially a source of criticism for various cultural managers. However, practically every museum currently offers them and approves of the services they provide for visitors. Similarly, we will soon witness the arrival of all kinds of third generation technologies in gallery spaces owned by museums, cultural institutions and art galleries as a way of enhancing the visitor's visual experience and really meet the needs of 21st century clients.

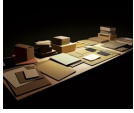
Enriching a visit means interacting or getting deeply involved in what we are discovering. Using these technologies in museums will

allow visitors to watch video interviews with their favourite creators, search for artworks, delve into details, view related images or texts, scan QR codes on a screen to obtain more information on a given work or purchase the digital version of the exhibition catalogue, etc.

As we indicated in the introduction of the study, we detected a minor use of technologies during the visiting stage to the physical installations of museums, cultural institutions and art galleries. Most of the tools used by the institutions participating in our study revolve around the **development of applications for smart devices**. We were surprised by the fact that

JUST AS AUDIO GUIDES ARE NOW USED DESPITE INITIAL CRITICISM, WE WILL SOON SEE THIRD GENERATION TECHNOLOGY IN GALLERY AREAS

most apps developed by cultural institutions are focused on individual use, whereas we usually visit a museum or cultural institution in the company of others. Since we live in an era of collective participation, cultural institutions **should develop applications that may allow a collective use**, with a view to assimilating analog experiences along with virtual ones.



GOOD PRACTICE EXAMPLES — DURING THE VISIT

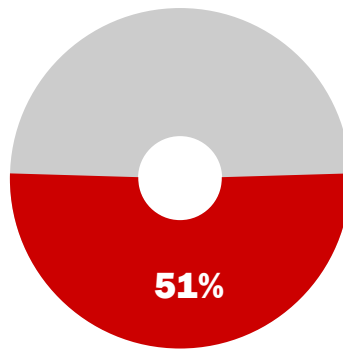
SEMANTIC TOUCH-SCREEN DEVICES

2.2.1

51.1% of the institutions surveyed indicated that they were contemplating the use of interactive touch-screens within their exhibition spaces to enhance and enrich visitor experience.

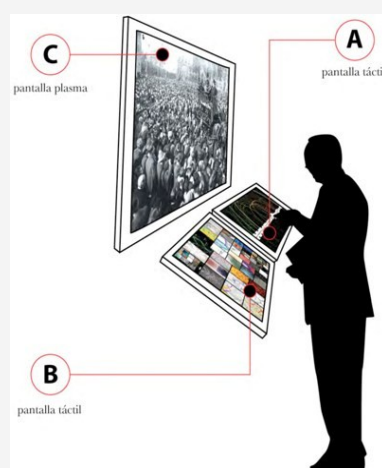
Some examples of the use of these screens in cultural institutions are provided below.

The **Espacio Fundación Telefónica** (a cultural space or surface located in Telefónica's historic headquarters in the heart of Madrid) [offers the tool Cultural Surface](#)¹⁴, which enables users to experience the sensory and semantic browsing of its vast number of works. Following the intense task of cataloguing and labelling more than 1,000 artworks comprising the collection, visitors can gain access, in a remarkable way, to the digitized collections of the works constituting Telefónica's artistic, historical and technological heritage. Using various touch-screens, users can filter their searches by establishing different relationships between works to be able to visualize the chosen works on another screen.



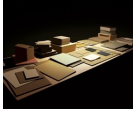
51% of the institutions participating in this study claimed that they were contemplating the use of interactive touch-screens in their gallery spaces

The museum offers interactive games through which to explore figurative sculpture via sensors, or to browse through its collection of portraits via face recognition software, allowing visitors to link their faces to the painting that most closely represents their facial expression, as you will see by clicking on the corresponding link below. Another app invites visitors to navigate and find a digital interpretation of their favourite artworks based on proximity. These are only some of the examples of the initiatives of this museum whose **objectives are learning and interpretation and the building of new audiences with a view to garnering interest in art.**

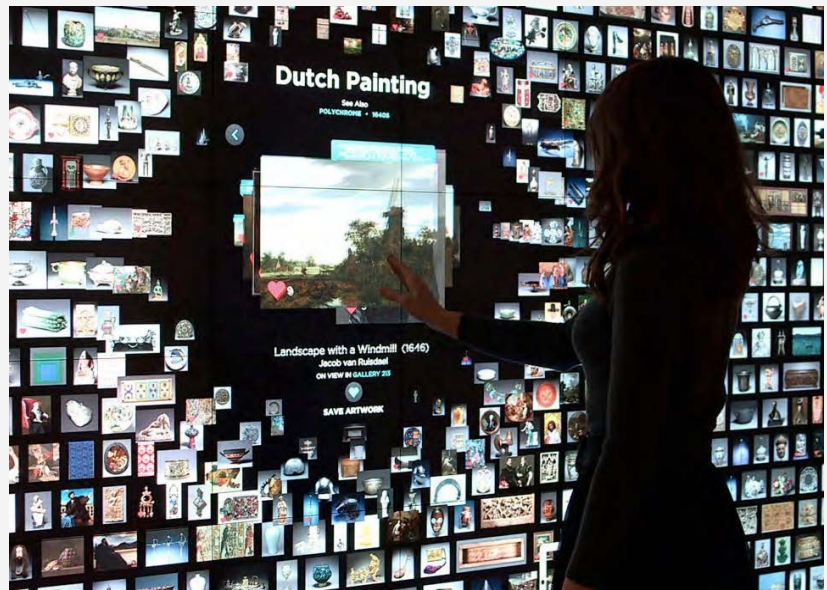


The Espacio Fundación Telefónica in Madrid offers a tool to navigate through its vast collection using sensory and semantic technology

The **Guggenheim Museum in Bilbao** offers its visitors [the multimedia orientation room, Zero Espazio](#)¹⁵. It is a dynamic and interactive space whose aim is to act as a meeting point between the museum and its visitors, providing them with the necessary tools to live a unique experience at the Museum and get the most out of their visit: printable maps, activity guide, audio-visual material on the Guggenheim building and project, multimedia games, digital catalogues, etc. ►►



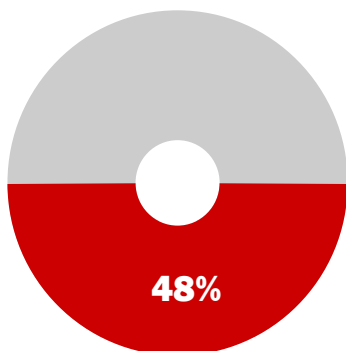
►► The **Cleveland Museum of Art's Gallery One** [is one of the best examples](#)¹⁶ of enriching the visitor experience in museums, fully benefiting from the opportunities offered by technology. Gallery One's proposal is to invite visitors to participate actively during their visits through exploration and creativity. Their different initiatives are focused towards every age where the combination of art and technology achieve a greater understanding of the artworks and artists on display. For example, it is possible to discover different artistic objects in detail through touch screen technology **encouraging visitors to browse and allowing a deep interpretation of the artworks.**



The Cleveland Museum of Art's Gallery One allows visitors an extensive use of multi-touch screen devices as a way of enriching the visitor experience

GOOD PRACTICE EXAMPLES — DURING THE VISIT

USING QR CODES IN EXHIBITION HALLS



48% of the participants indicated that they use QR codes to enhance visitor experience

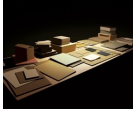
2.2.2

48.2% of the institutions surveyed indicated that they used QR codes to enhance the visitor experience.

Since their invention in 1994 by a company belonging to the Japanese Toyota group, QR codes have speeded up management processes in sectors such as the automobile and mass consumption sectors. Their recent appearance in the cultural sector will cause a real revolution as to the way in which cultural contents are discovered as well as having a huge impact on them since it will enrich the visitor experience at museums, cultural institutions or art galleries.

We will gradually grow accustomed to these small square shapes everywhere: in newspapers, on restaurant menus, household goods, etc. Soon these grids incorporating black and white shapes will revolutionize the way in which we visit an exhibition.

[An example of such use](#) may be found at the exhibition *Los espejos del alma* (The mirrors of the soul) at the **Museum of Romanticism** in Madrid. The exhibition includes QR codes that allow visitors to access a playlist on Spotify of German pieces of music from the relevant period as a tool to enhance the visitor experience beyond the artworks on display.



GOOD PRACTICE EXAMPLES — DURING THE VISIT

LIVE-STREAMING OF THE VISITOR EXPERIENCE

2.2.3 New technologies based on real time streaming also allow the audio and/or video live streaming of the visitor experience at any cultural institution.

The Polemic Tweet project, developed thanks to the collaboration of **IRI - Institut de Recherche et d'Innovation du Centre Pompidou** (The Pompidou Centre's Institute for Research and Innovation), indexes audiovisual contents being streamed live, registers their scope on Twitter and transforms them into a series of images appearing on the video timeline.

GOOD PRACTICE EXAMPLES — DURING THE VISIT

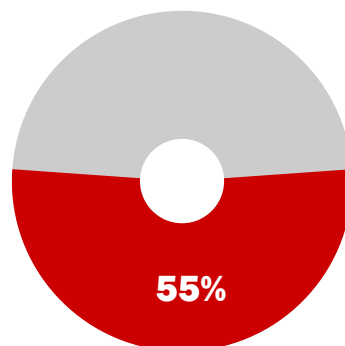
USING APPLICATIONS TO ENRICH THE VISITOR EXPERIENCE

2.2.4 55.6% of the institutions participating in this study expressed their extreme interest in enhancing the visitor experience through the use of [mobile applications](#)¹⁸.

Throughout the last few years, a large number of institutions have developed apps enabling visitors to enrich their physical experience with the aid of technology.

We will comment on various applications with different focuses so that they may serve as a reference to cultural managers who may be thinking of incorporating all kinds of technologies to their gallery spaces with a view to enhancing their visitors' experiences.

The app used by the **New York**

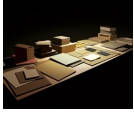


55% of the participants expressed a keen interest in implementing the use of mobile apps during visits

Museum of Modern Art is the ideal tool for obtaining more information on the artwork being viewed at a given time and it also allows visitors to take a virtual tour of the museum, secure comprehensive information on exhibitions and listen to curators' comments.

The **Art Museum** app goes a step further and assumes that we are already familiar with the exhibition but want to intensify our knowledge on a given work or artist. In other words, Art Museum seeks to be our private Art teacher, for example, by showing us the differences between Renoir and Rembrandt. The app uses gamification techniques to help us become acquainted with art history.

Likewise, **Art Authority** offers ►►



►► comprehensive information on the great works of over 1,000 artists, from the Renaissance to Romanticism. You can dive into the depths of an image to view every last detail or simply allow the app to walk you through the artwork.

Another essential application for learning more on artworks being viewed in a museum or art gallery is

ArtFinder, which includes artists from the present and the past. If you have a particular interest in a specific work you can hold it in your hands (or rather, your device), download it and use it, for example, as your wallpaper.

[The Maurizio Cattelan app](#)¹⁹, developed by the **Guggenheim Museum in New York**, allows visitors to access a video featuring the exhibition curator, Nancy Spector, who examines Cattelan's oeuvre, and over 20 more videos on the artist including interviews with his friends, partners... As well as reflections by the artist himself.

The **Prado Museum** has recently launched a new application for mobile devices rich in imagery, with great attention to detail and excellent interaction design. The app allows visitors to explore the museum through five thematic groupings. A total of 400



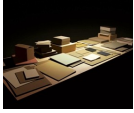
An app created by the **Fine Arts Museum in Budapest** features videos in various international sign languages

works are available for viewing and are classified by nationality and the period in which they were created. The app clearly focuses on interaction since the top right hand corner includes a button to enable users to share files on Facebook and Twitter.

The **Tate Gallery** can boast of no fewer than 16 applications. Most of them are free and cover topics from art glossaries to [leisure related apps such as Muybridgizer](#)²⁰, which features the creation of animated shots, Eadweard Muybridge style, simply using the iPhone camera. Although most of these apps are only available for iPhones, Android users will soon also have access to them.

The **Fine Arts Museum in Budapest** also offers a rather unique application. The Museum recently [launched its SzépMu SL \(sign language\) app](#)²¹ for visitors with hearing problems. It features videos in various international sign languages and about 150 paintings from the collection, in conjunction with an interactive map.

The **Andy Warhol Museum in Pittsburgh**, the artist's native city, [features an application](#)²² that allows visitors to create screen prints of themselves, Andy Warhol style, and share them on the Internet via social networks.



GOOD PRACTICE EXAMPLES — DURING THE VISIT

SENSORY TECHNOLOGIES

2.2.5

Museums will soon incorporate all kinds of third generation technologies in their gallery spaces such as facial recognition, smart sensors, real satisfaction recommender systems, among other novelties, offering them a huge range of opportunities to enhance visitor experience at exhibitions.

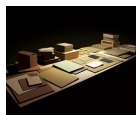
Various cultural institutions are investigating the advantages of the **use of sensorial technologies to provide a unique experience at a museum**. Although some cultural managers might consider them science-fiction contraptions, we can assure you that they will be very commonly used much sooner than expected. Recently, **everyone has been talking about potential applications and projects such as Google Glass** in

relation to all kinds of activities (city walks, car trips, going to bars, etc.). We will soon see their application to all kinds of cultural activities (plays, concerts, visits to book stores, exhibitions, etc.). We recommend that the readers of this study pay close attention to the [preliminary conclusions of the Museum Guide 2.0](#)²³ due to the large number of clues offered on the benefits of using technologies of this kind in cultural institutions.

Museum Guide 2.0 is a sophisticated, automatic guide system for a visitor to a museum. It analyzes the visitor's eye movements and recognizes the objects to which most attention is paid. When visitors view a specific object for a certain length of time, this sensory technology supplies information about the object in several

different forms, which is subsequently displayed on a smartphone. This system combines a mobile eye tracker (SMI Eye tracking Glasses) with an object recognition engine. An algorithm for distinguishing attentive gaze from non-attentive gaze has been implemented to detect the viewer's interest in a given object. Due to recent advances in sensory technology, future eye trackers will be much smaller and easier to manage.

**FACIAL RECOGNITION,
SMART SENSORS, REAL
SATISFACTION
RECOMMENDATION SYSTEMS ... SCIENCE FICTION?
NO, THIS IS WHAT
FUTURE HOLDS FOR US**



GOOD PRACTICE EXAMPLES — DURING THE VISIT

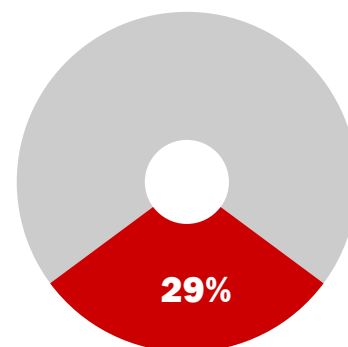
GEOLOCATION TECHNOLOGY

2.2.6 Although 29.4% of the institutions participating in the study alleged that they used geolocation technologies, we have experienced difficulties in finding relevant examples to share in this study.

[Areago, un paseo sonoro por Igartubeiti](#)²⁴, (Areago, an audio stroll through Igartubeiti), is an innovative heritage project which integrates the use of new technologies related to geolocation and heritage resources from the **Caserío Museo Igartubeiti** (Igartubeiti Estate Museum). This project proposes an audio guide via

the use of smartphones equipped with GPS technology that offer the possibility of exploring open spaces with sound, using stories specifically created by and in the Igartubeiti Estate Museum.

We believe that the reason for the limited use of technologies of this kind is that cultural institutions are unaware of their advantages. In order to understand their potential, these institutions need to reflect on how technology can help to provide a better service to clients and enhance users' experiences.



29% of the institutions alleged that they used geolocation technology

GOOD PRACTICE EXAMPLES — DURING THE VISIT

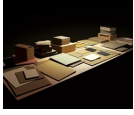
RADIOS, AUDIO FILES, PODCASTS, ETC.

2.2.7 Various institutions offer their visitors the possibility of downloading audio files (podcasts) to enrich the visitor experience with supplementary information on exhibitions and activities. We would like to specifically mention the [RWM](#)²⁵ of the **MACBA** (Barcelona Museum of Contemporary Art radio web), a radio project which explores the possibilities offered by the Internet

and the radio as potential spaces of synthesis and exhibition. The RWM programmes are available on demand

**DOWNLOADING PODCASTS
ENHANCES THE VISIT TO THE
MUSEUM WITH ADDITIONAL
INFORMATION ON
EXHIBITIONS AND
ACTIVITIES**

and by podcast subscription. The RRS (**Radio Reina Sofía Museum Radio**) project also has an [extremely interesting approach](#)²⁶ since the sounds that can be heard on the radio not only aspire to be an acoustic version of the museum experience, they are also designed to become new contents that can broadcast the ideas of collection, exhibition and debate to new territories.



GOOD PRACTICE EXAMPLES AFTER THE VISIT

2.3

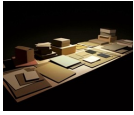
As we mentioned in our introduction to this study, we detected little to no use by cultural institutions of technologies that may encourage users to exchange their visitor experience once it has concluded. Users undoubtedly publish all kinds of **comments, photos and videos on social networks such as Facebook and Twitter as a way of sharing their experiences** after a visit to an exhibition but do so without any kind of encouragement by the galleries. There is no proactive policy towards encouraging visitors to share their experiences or rewarding them for doing so.

This indicates a lack of feedback between digital strategies and the more “traditional” communication activities in the good sense of the word. Most cultural institutions are already well represented on social networks. However, **day-to-day and virtual museum activities are not fully interconnected.**

We will now go on to discuss **some initiatives and ideas to be put into practice to encourage a greater interaction** among users after a visit to a museum, cultural institution or art gallery, with a view to providing feedback to digital actions via analog activities. Since there are very few examples

of good practice, in most cases we will simply mention the idea itself so that it may serve as a topic for reflection by cultural institutions:

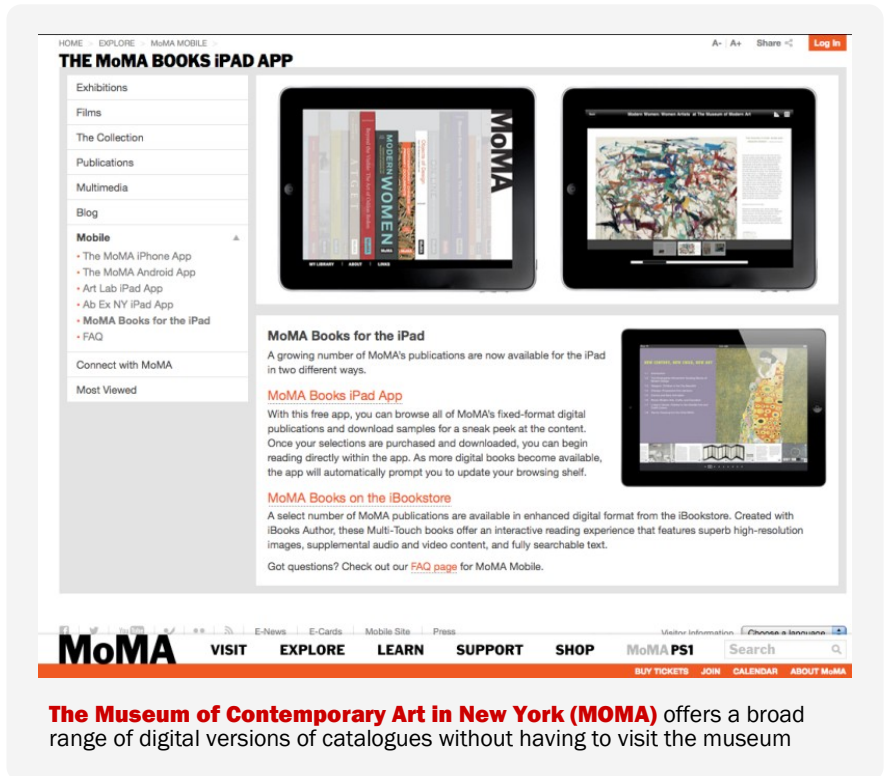
- **Offering free Wi-Fi** throughout their entire installations so that visitors may share their experiences, sensations, opinions etc. This may be considered another crucial service at the “during” stage since it is required for most of the apps mentioned in this study: geolocation, QR codes, etc.).
- **We have not detected** any signs in gallery spaces at most of the museums mentioned in this study inviting visitors to leave their rooms to share their experience on social networks.
- In this regard, we would like to encourage all cultural institutions to **incorporate their logos and URLs relating to their presence on social networks** such as Facebook, Pinterest or Twitter on all their information materials (catalogues, brochures, cafeteria, store, etc.) and at exhibition entrances and exits. Some cultural managers will consider it a horrifying suggestion to include these logos in their physical spaces, but then, why have virtual presence?
- **A high percentage** of visitors to cultural institutions and museums **are foreign** and it would therefore be highly recommendable that the galleries use different languages to communicate on social networks apart from the official language of the country of residence.
- Some museums publish information **on the same profile of a social network in various languages.** This is not recommendable as it confuses followers. It is best to open separate profiles, each in a different language. This is common practice in other sectors such as sports, entertainment, etc. A report drawn up by Dosdoce.com [on the presence of 2.0 technology in the football](#)²⁷ sector revealed that many of the big clubs and the most popular players (Ronaldo, Messi, Forlán, Iniesta) managed various profiles on social networks, each in a different language (Spanish, Catalan, English, Arabic, etc).
- We recommend **offering visitors a choice of reading material** associated with their exhibitions or recommendations to visit exhibitions in other art galleries in the same city related to the one they have just visited. ►►



- Why not include a **QR code in the entrance ticket** that is purchased before visiting the exhibition with the possibility of downloading the digital version of the catalogue?
- Why not offer the possibility of **downloading the digital version of the catalogue** on leaving the exhibition without having to visit the bookstore?
- We are already aware that the reading experience is not the same on screen but **the digital version offers a certain dynamism and interaction** which is really appropriate for artistic contents. The digitalization of contents is also a way of enhancing the value of an institution by placing its assets at the public's disposal. Many institutions already offer their contents in eBook format or as apps for tablets. **The Museum of Contemporary Art in New York (MOMA)** offers a [broad range of digital versions](#)²⁸ to visitors and all the contents at **Medialab Prado** are [online and downloadable](#)²⁹ free of charge.

- Museums and cultural institutions should **encourage the participation and contribution of contents by their users** much more than they do now since they are crucial elements in the web 2.0. For example, why not allow users to choose exhibitions or activities they would like to see in art galleries? In this context, the **CA2M (Centro de Arte Dos de Mayo or 2nd of May Art Centre - Madrid)** team [conducted a survey among their visitors last December on Facebook](#)³⁰, asking them to vote for their favourite exhibition of the year. These kinds of initiatives are excellent with a view to obtaining more information on the public's interests which may also be used when programming future events.

- This **doesn't mean that we should leave the programming of events** of a cultural institution in the hands of users since that is the responsibility of the institution's



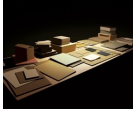
The Museum of Contemporary Art in New York (MOMA) offers a broad range of digital versions of catalogues without having to visit the museum



The CA2M centre in Madrid asked their visitors to vote for their favourite exhibition of the year on Facebook

professional team. We simply wish to draw attention to the fact that due to the age of participation we now live in, institutions cannot

afford to remain aloof from their audiences. Taking their opinions into consideration can only enrich the relationship between them. ►►

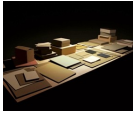


- When **a user creates contents for a cultural institution** (by sending a photo or video, participating in a survey, giving an opinion on a topic, criticizing certain activities, etc.), it establishes a close identification between the user and the institution. Every cultural institution should recognize the areas where their users may contribute to enriching its management.
- The facebook profile of the **Centro Cultural de la Ciudad de Barcelona** (CCCB - Barcelona Cultural Centre) posted a **link to the Storify platform** where a [collection of](#)

[material had been submitted by visitors](#)³¹ to an exhibition on *Paral·lel, el mítico barrio barcelonés* (the legendary Barcelona neighbourhood, Paral·lel), via different social networks (Twitter, Instagram, Facebook...). The use of this tool by the management team to supplement the exhibition was a great success since visitors were able to submit all kinds of content (anecdotes, material and experiences) due to the proximity of the topic.

- Digital strategies **predispose organizations to communicate with users**. In this context therefore, the following question should be asked: Are cultural institutions

ready to converse, exchange ideas and suggestions and include them in their programming? A close relationship with users should be one of the keys to digital presence in cultural institutions. Visitors should feel free to converse and exchange experiences in both the analog and virtual environments of any institution. The entire digital content of a cultural institution should be predisposed to being shared by its audiences. Museums are no longer places to simply visit: physical, geographic and time concepts fade away. Museums may be found in a tablet, a mobile application or a social network.



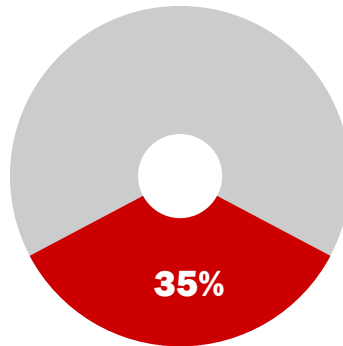
MAIN CONCLUSIONS OF THE STUDY

POOR INTERACTION BETWEEN MUSEUMS AND TECHNOLOGY COMPANIES

3.1

Unfortunately, the results of this study revealed that most museums, cultural institutions and art galleries **have failed to build any collaborative bridges with 21st century tech companies**. Although over 90% of the institutions claimed to have a great interest in incorporating more technology into cultural management, less than 35% of the institutions surveyed stated that they had held from one to five meetings with a tech company throughout the previous year. This information implies that **cultural managers are predisposed** to incorporating more technology in their galleries but the fact of the matter is that these **intentions have not yet fully materialized**.

The underlying causes and interpretations of these low results in the survey are numerous. We have learned from our experience in this line of work that many cultural managers believe that a close collaboration with tech

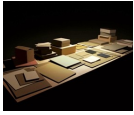


Less than 35% of the participants stated that they had held from one to five meetings with a tech company throughout the previous year

companies is not necessary since they consider the content of a museum more than sufficient to attract visitors' attention. Other managers arrange meetings with tech companies to get information out of them or any other details on their technologies and potential benefits without really intending to work with them. The most arrogant

believe that their extensive knowledge of the sector, coupled with certain internal resources, are more than enough to meet any digital challenge.

Museums, cultural institutions and art galleries **will soon incorporate all kinds of third generation technologies to their physical installations**. As we have seen throughout the study, third generation technologies allow users to *touch* the contents of a work. **Touching in the digital age means interacting or delving deeper into what we are discovering**. Incorporating these technologies in cultural institutions will allow visitors to exchange opinions in real time with other visitors, obtain personalized recommendations, see video interviews of their favourite creators, dive into works of art to discover more details, see other, related images or texts, scan QR codes to purchase the digital version of the exhibition catalogue, share the experience with other visitors, etc.



MAIN CONCLUSIONS OF THE STUDY

BEYOND SOCIAL NETWORKS: DIFFERENT MARKET PRIORITIES

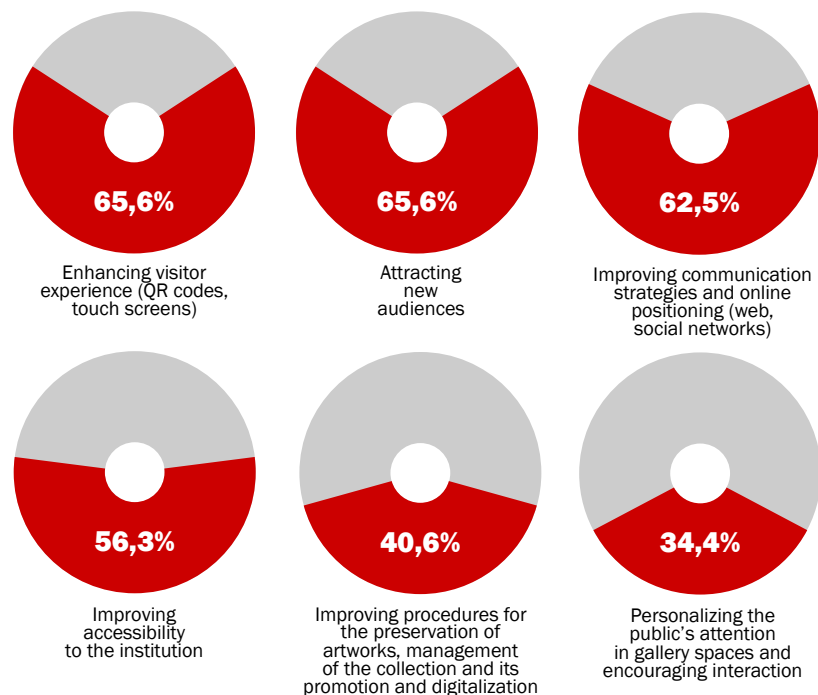
3.2

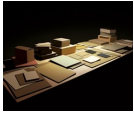
English speaking cultural institutions have different priorities from Spanish speaking ones. The different comparative analyses we have conducted among Spanish and English speaking cultural institutions, following the results of the study, indicate that **the process of incorporating technologies in the cultural sector is happening at different speeds.**

While 65% of Spanish speaking institutions have mainly met up with companies specializing in web design and social network positioning, most English speaking cultural institutions have met up with tech companies with a view to enriching visitor experience (65.6%) and attracting new audiences via digital initiatives (65.6%). In other words, English speaking cultural institutions are already incorporating all kinds of technologies to enrich cultural experience, beyond social networks.

What were the main objectives of meetings with tech companies?

English speaking segment – More than one response may be marked





MAIN CONCLUSIONS OF THE STUDY

NEED FOR FEEDBACK IN ANALOG AND DIGITAL ACTIONS

3.3

The results of this study revealed a highly intensive use of technology during the discovery stage (mainly focused on promotional activities in social networks and the development of applications for smart devices); a diminished use of tools during the visit to the physical installations of the corresponding institutions (mainly focused on the use of certain technologies for the purpose of enriching the visit); and lastly, a low use of technologies with a view to encouraging the exchange of experiences after the visit.

This **lack of feedback between**

analog and digital actions prevents the broader development of new services to enhance the discovery process at exhibitions and museum activities as well as obstructing a greater interconnection between visitors.

65.6% of English speaking institutions claim that their main priority is to attract new audiences to their centres via new technologies. To achieve this objective, **the digital strategy of the organization must go hand in hand with its global strategy** to extend, like the arms of an octopus as it were, to every department: from the education department to the promo-

tional department, not failing to miss the conservation department.

Virtual and analog experiences do not exclude each other. In fact, they mutually support each other. **Let's benefit from every experience lived by users in the physical environment to stimulate virtual visits and vice versa.** Besides excellence in contents, both from analog and virtual standpoints, users should be provided with unique experiences according to expectations of the digital age. Let's find ways to personalize both real and virtual experiences. Museums should consider each user as being unique.

MAIN CONCLUSIONS OF THE STUDY

REDEFINITION OF DIGITAL STRATEGY AND ORGANIZATION

3.4

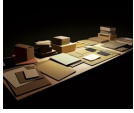
During the process of development of this study, we realized **how difficult it was to identify the person responsible for digital strategy** in most cultural institutions. In some institutions, the responsibility was focused on one person but in most cases there wasn't even a Department or person considered responsible for the global definition of digital strategy.

Although most cultural institutions employ a person responsible for contact with the media, the education department or institutional contacts,

we found it surprising that most of the institutions surveyed could not claim to have an employee responsible for digital strategy. These tasks are currently **distributed among several departments such as press, marketing, web maintenance, press contacts**, etc., without anyone specific to define, co-ordinate and supervise the global strategy of the cultural institution across all the departments of the organization.

In an exercise of admirable transparency, The London **Tate Gallery** has recently published its [digital strategy](#)

[plan for the next two years](#)³² on its website. Its vision may be summarized in one resounding statement, *Digital as a dimension of everything*, which may be interpreted as the **incorporation of new technologies in all the activities of the institution and the development of online skills throughout the whole organization.** We recommend that the readers of this study read the document in detail since it will provide the keys as to how to redefine their digital strategy and its impact on the reorganization of cultural institutions.



MAIN CONCLUSIONS OF THE STUDY

WORKING TOWARDS IMPROVED COLLABORATION IN CULTURAL MANAGEMENT

3.5

In the age of participation, every cultural institution –regardless of its size and specialization– should **establish strategic alliances with various tech partners to be able to confront challenges of the digital age**. Considering that the State's contribution to the cultural sector diminishes year after year –due to continuous cutbacks in budgets– the role of technology and the contribution of citizens will keep on increasing.

Advances in technology during the last few years have prompted such a change in society that its impact in the organization and management of cultural institutions and the way in which these institutions interact with their public is

irreversible. In this period of increasing change with no turning back, we will witness the birth of

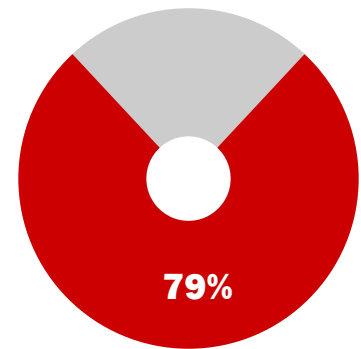
THE ROLE OF TECHNOLOGY AND THE CONTRIBUTION OF CITIZENS WILL KEEP ON INCREASING

new models of creation, production and cultural management, whose aim will be to involve the highest number of cultural institutions and tech companies with a view to an increased sharing of culture. In this regard, we would like to highlight the initiative of the Reina

Sofia Museum, which [has chosen the idea of an open Museum](#)³³, a web Museum, for its future development, contrary to the short-sighted and centripetal notion of the traditional museum. This institution enjoys a close relationship with various international institutions such as the **MoMA**, **Tate Modern**, the **Pompidou Centre**, the **Serralves Foundation** in Oporto, the **Moderna Galería** in Lubiana, the **Van Abbemuseum** in Eindhoven, the **Cisneros Foundation** and the **MUAC** in México City, among others, all of which are pioneers in experimenting and redefining the philosophy and purpose of a museum in the 21st century.

Cultural institutions should reflect on the internal and external processes that may be more closely handled in conjunction with tech companies and users. The possibilities are endless: from involving users in defining the programming of activities, to financial contributions via collective financing (crowdfunding).

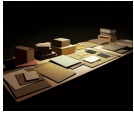
Marketing and digital communication strategies are no longer sufficient; technology companies and users will have to be included in every creation, participation and promotional project where the management team believes they may make a valuable contribution. **Cultural managers in the 21st century should accept that they will not be able to, and should**



79% of the institutions claimed a low budget as the main obstacle to incorporating more technology

not, control every process of the institution they represent.

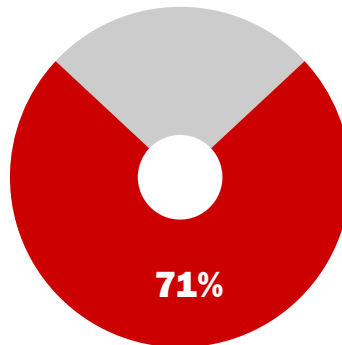
A more active association with different startups would allow cultural managers access to more innovative ideas and would above all provide the keys to the reorganization of their institutions to be able to thrive in the 21st century. **Recently created technology companies usually handle digital challenges with a different outlook.** These young entrepreneurs always try to find a new way of resolving a problem or meeting users' specific needs. Collaborating with them will allow cultural managers to obtain a deeper understanding of new and dynamic behaviours in the ►►



►► digital age and of opportunities arising in this world on a daily.

79% of the institutions surveyed indicated a low budget as the main obstacle for incorporating more technologies. If this is the case, **why not share financial resources and experiences among museums and cultural institutions?** Why should every museum have its own app? As a response to these questions, **11 museums in Denmark** have collaborated in the development of an [application to access their collections](#)³⁴. Collaboration agreements between cultural institutions and startups could be unlimited. For example, **various museums or cultural institutions could share the cost of developing apps** for mobile devices or could negotiate jointly with tech companies to share investigations and results.

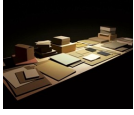
If 71% of the institutions participating in the survey claimed that they did not have enough qualified personnel to



71% of the respondents claimed not having sufficiently qualified employees to incorporate more technology

incorporate more technology to their centres, wouldn't it stand to reason to share financial and human resources with other institutions for any technology project? In this context of collaboration, the **New York Times** has decided to [share its offices with various startups](#)³⁵ to work together to identify solutions to common challenges. The honesty and simplicity on contemplating this collaboration agreement is worthy of mention: "The New York Times, and the press in general, are in the midst of an unprecedented change. Our main objective continues to be to improve society through the creation, collection and distribution of high quality news and information. We want to find the best way of doing this and believe that this collaboration may be part of the process."

OPEN QUESTION FOR FURTHER THOUGHT:
How many museums or cultural centres are prepared to share their offices with startups specializing in the cultural sector with a view to jointly developing solutions to common problems?



STUDY PROCEDURE

4

This study was entirely conducted between the months of January and May 2013, following the steps briefly referred to below:

- 1. Designing** of a questionnaire made up of 13 questions with multiple answers (January 2013).
- 2. Internal** testing of each questionnaire's suitability by experts on the subject (February 2013).
- 3. Translation** into English of both questionnaires for increased international participation.
- 4. Publication** of the questionnaires on the Survey-Monkeys platform (March 2013).
- 5. Opening** of preliminary participation stage by invitation. Personal e-mails were sent to a list of museum, cultural institution and art gallery professionals, inviting them to participate in the survey. The results were added following the deadline and a prior assessment was conducted.
- 6. A second round** of participation was launched in specialized social media. Following an assessment of the results and a verification of no significant diversions between both groups, the results of both rounds were added to obtain a broader sampling.
- 7.** All the answers were treated **confidentially**. Any records of respondents' identity were deleted.
- 8. Compilation** and analysis of the responses to the 136 questionnaires that were filled out (April 2013): 103 replied in Spanish (75.7%), 33 replied in English (24.3%).
- 9. Interpretation** of the results and preparation of report with the main conclusions of the study (April 2013).
- 10. Publication** of the report (May 2013) on the occasion of Dosdoce.com's participation in MuseumNext.



AUTHORSHIP



Museums in the digital age

May 2013

This study was conducted by Iñaki Saldaña and Javier Celaya of Dosdoce.com, in collaboration with Clara Merín and Cristina González, of Endecomunicación. We would also like to thank the contributions made by Araceli Corbo, Gabriel Portell and José Antonio Vázquez who have enriched the process of development of this study. The study and questionnaires were translated into English by [Annabelle Pratt-McKiernan](#) and the design and layout were handled by Ibai Cereijo of [Woo Media](#). The image on the cover belongs to the artist [Fernando Martín Godoy](#).

Dosdoce.com was launched in March 2004 for the purpose of analyzing the use of new technologies in the cultural sector. Throughout the years we have compiled over 20 studies and reports on the use of new technologies in different areas of the cultural sector. In November 2005 our first study was published: "[El papel de la comunicación en la promoción del libro](#)" (The role of communication in book promotion). In 2006 two new studies were published: "[El uso de las tecnologías Web 2.0 en entidades culturales](#)" (The use of Web 2.0 technologies on cultural entities) and "[Los retos de las editoriales independientes](#)" (The challenges faced by independent publishers). In October 2007 the following study was published, "[Tendencias Web 2.0 en el sector editorial](#)" (Web 2.0 trends in the publishing sector). In October 2008 the following study was published in conjunction with the social network Edición: "[La digitalización del libro en España](#)" (Book digitalization trends in Spain). We published the following study in March 2009 "[Visibilidad de las ciudades en la Web 2.0](#)" (City visibility in the Web 2.0); in October 2009, the second edition of the study "[La digitali-](#)



[zación del libro en España](#)" (Book digitalization in Spain) was published; in November 2009, "[La visibilidad de los museos en la Web 2.0](#)" (The visibility of museums on the Web 2.0). In 2010 we published the study "[La visibilidad de las galerías de arte en Facebook](#)" (The visibility of art galleries on the Web 2.0) and "[Chuleta de las redes sociales](#)" (Social networks cheat sheet). We began 2011 with the publication of the second edition of the study "[Las galerías de arte en la web 2.0](#)" (Art galleries on the Web 2.0) and published the study "[Fútbol 2.0](#)" (Football 2.0) which analyzes how football clubs are incorporating 2.0 technologies to their communication strategies and their team, player, event promotions etc. We concluded 2011 with the publication in September of the study "[Industria editorial 2.0](#)" (Publishing industry 2.0) and the following study in November "[Conexiones entre museos](#)

[en las redes sociales](#)" (Museum connections on social networks), the infographic "[Derechos de los usuarios en la nube](#)" (Users' rights in the cloud) and versions in Catalan, English and Portuguese of "The Social Networks Cheat Sheet". We began 2012 with the publication of "[Cronología de la edición digital \(1912-2012\)](#)" (Digital publishing. A chronology (1912 – 2012), and the Catalan and Basque versions of the infographic "Users' rights in the cloud". We recently shared the results of the survey "[Anatomía del perfil del editor digital](#)" (Anatomical profile of the digital publisher). In September 2012 we published the study "[El directivo y las redes sociales](#)" (Social media and management) in partnership with the CEDE Foundation and the BPMO Group. In February 2013, Dosdoce.com's study "[Cómo colaborar con startups](#)" (Collaborating with startups) was published.

For further information:

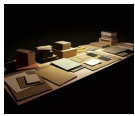
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All of the above reports have been drawn up for information purposes and are particularly focused towards communication officers who may be unfamiliar with these new tools but have a real interest in learning the benefits of using them in their companies. As we indicated previously, all these studies are published under a Creative Commons Attribution-NonCommercial-NoDerivative license; they may be copied and distributed by any other means provided that their authorship (Dosdoce.com) is credited, they are not used for commercial purposes and are not amended in any way. The full license may be viewed at: <http://creativecommons.org/>



LINKS REGARDING **EXAMPLES** **OF GOOD PRACTICE**

- (1) Section relating to Studies conducted by Dosdoce.com
<http://www.dosdoce.com/archivo/estudios/>
- (2) Applications for discovering contents
<http://www.comunicacion-cultural.com/2013/02/14/museos-bajo-tierra/>
- (3) Fundación Mapfre app
http://www.fundacionmapfre.org/fundacion/es_es/apps/default.jsp
- (4) Hermitage app with 3D images
http://www.hermitageapp.com/e_press.html
- (5) Apps on Pinterest
<http://pinterest.com/arbizon/museums-apps/>
- (6) Murder at the MET
<http://www.metmuseum.org/metmedia/video/news/murder-at-the-met>
- (7) PradoMedia by Madrid Prado Museum
<http://www.museodelprado.es/pradomedia/>
- (8) Gamification at the Thyssen Museum
<http://www.educathyssen.org/juegos>
- (9) Gamification at the Amberes Foundation, Madrid
https://www.facebook.com/fundacioncarlosdeamberes/app_454196767974669
- (10) Gamification at the Museum of the City of New York
<https://www.facebook.com/MuseumofCityofNY>
- (11) Gamification platform used by various museums
<http://www.gosmithsonian.com/scvngr/>
- (12) Bilbao Fine Arts Museum
http://www.museobilbao.com/virtual_bilbao/virtual_tour.php
- (13) Museum of Natural History
<http://www.amnh.org/plan-your-visit/interactive-floorplan>
- (14) Cultural Surface of Telefónica
<http://espacio.fundaciontelefonica.com/cultural-surface-una-nueva-forma-de-consultar-el-patrimonio-de-fundacion-telefonica/>
- (15) Multi-media orientation room
<http://www.guggenheim-bilbao.es/recursos/>
- (16) Multi-touch screens at the Cleveland Museum of Art's Gallery One
<http://www.clevelandart.org/gallery-one>
- (17) QR Codes at the Museum of Romanticism, Madrid
<http://museoromanticismo.mcu.es/actividades/exposicionesTemporales/actuales.html>
- (18) Apps for enhancing museum experiences
<http://www.comunicacion-cultural.com/2013/04/25/7-apps-para-enriquecer-el-arte/>
- (19) Cattelan app at New York Guggenheim Museum
<http://www.guggenheim.org/new-york/press-room/releases/press-release-archive/media-releases-2011/4313-mauriziocattelanapp>
- (20) Tate Gallery apps
<http://www.tate.org.uk/context-comment/apps/muybridgizer>
- (21) App with sign language
<https://www.gov.uk/government/world-location-news/british-embassy-budapest-supports-launch-of-new-sign-language-app>
- (22) DIY app, Andy Warhol Museum
<http://www.warhol.org/connect/mobile/>
- (23) Sensory technologies
<http://museum20.dfki.de/>
- (24) Geolocation technologies
<http://www.igartubeitibaserria.net/>
- (25) Use of podcasts
<http://rwm.macba.cat/es/sobre>
- (26) Reina Sofía RRS
<http://radio.museoreinasofia.es/informacion>
- (27) Study on the use of different languages on social networks
<http://www.dosdoce.com/articulo/estudios/3653/futbol-2-0/>
- (28) Offer of digital contents at the MOMA
<http://www.moma.org/explore/mobile/momabooks>
- (29) Online downloading of contents
<http://medialab-prado.es/archive>
- (30) Participation by users in the programming of a cultural institution
<http://www.facebook.com/CA2MMadrid>
- (31) Users' contributions to exhibitions
<http://storify.com/cececebe/paral-lel>
- (32) Digital strategy definition by Tate Gallery
<http://www.tate.org.uk/research/publications/tate-papers/tate-digital-strategy-2013-15-digital-dimension-everything>
- (33) Reina Sofía Museum Web Project
<http://www.museoreinasofia.es/redes/presentacion.html>
- (34) Collaboration agreements between museums
<http://youtu.be/Sle3uQEdeNA>
- (35) Examples of collaboration with tech companies beyond the use of their technology
<http://www.comunicacion-cultural.com/2013/02/27/el-new-york-times-comparte-sus-instalaciones-con-startups/>

