

**HOW ARE ICT IMPLEMENTED IN ETHNOLOGICAL MUSEUMS?  
THE MUSEL, JELLY FISH AND DOLPHIN MUSEUMS OR AN AP-  
PROACH THROUGH A MUSEUM CATEGORIZATION**

***LOS MUSEOS ETNOGRÁFICOS ANTE LA IMPLEMENTACIÓN DE TICS: LOS  
MUSEOS MEJILLÓN, MEDUSA Y DELFÍN, UN ESTUDIO EXPLORATORIO  
PARA UNA TIPOLOGÍA MUSEÍSTICA***

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**Abstract**

Nowadays digital content and multimedia guides are present in many museums. We have inquired into the attitudes, fears, expectations and demands toward digitalization of museum contents among ethnological museum workers and managers and introduction of ICT in Galician ethnological museums, in order to discover the key reasons for not adopting such technological tools. Thus ethnological museums can be classified in three different groups according to their management attitude to the introduction and use of digital technologies: proactive (dolphin museum type); opportunist (jellyfish museum type); opportunist (mussel museum type). The lack of knowledge about the implementation and management of multimedia digital guides; fear of high costs; and a lack of confidence in the benefits for the transmission of information to the visitors, are some of the main reasons given.

**Key words:** Museum. Innovation. Exhibition. Technological gap. Technophilia. Heritage.

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## Resumen

En la actualidad los contenidos digitales y las guías multimedia están en muchos museos. Se han analizado de forma exploratoria las actitudes, miedos, expectativas y reticencias asociadas a la digitalización de museos etnográficos en base a entrevistas a trabajadores/as y directores/as de museos y disponibilidad de TICs en los museos etnográficos gallegos, que llevan a la no introducción de las tecnologías de la información y la comunicación (TICs). En consecuencia se propone la categorización de los museos en tres grupos de acuerdo a su actitud ante la introducción y manejo de las tecnologías digitales: proactivo (museo tipo delfín); reactivo (mejillón); oportunista (medusa). Los principales asuntos giran en torno a la falta de conocimiento sobre la implementación y gestión de la información multimedia, el miedo a costes elevados, y desconfianza sobre los beneficios reales del acceso del público a la información.

**Palabras clave:** Museo. Innovación. Exposición. Brecha digital. Tecnofilia. Patrimonio.

## INTRODUCTION. ETHNOLOGICAL MUSEUMS AS A CATEGORY

Ethnological, Heimat or folk museums are, primarily, exhibition institutions for local folklore, traditional culture and human communities understood as groups defined by specific cultural characteristics and activities. Their aim is to preserve in some way the culturally specific diversity of local communities (with the exception of the big museums committed to human cultures and diversity on the world, like the Tropen Museum in Amsterdam, or the Musée du Quai Branly in Paris). In this sense ethnological museums are strongly linked to tradition and conservation, the past as a resource to be preserved and that should be valued in the present, their aim is to build up connections between past and present. Ethnological museums play a significant role in the construction of an identity for these communities, but beyond this connection to the past, the mission of these museums is more than to preserve tradition but also to offer the possibility to learn from the past, building communities (generating ethnical, national, cultural identities) and putting traditional culture in value (Silveman, 2003). Thus ethnological museums belong to a category of educational institutions targeted to a young public (students or school groups): these future citizens and future community members become the prior public for their activities and educational goals.

Ethnological museums are mostly small institutions with low budgets and limited facilities and personnel. This study is intended to focus on this kind of ethnological museum as, under their conditions, the introduction and use of digital technologies for exhibition and interpretation purposes is problematic. We know that these circumstances are not unique to ethnological museums: art, science, history and many other museums are affected by similar circumstances. In this study ethnological museums could be considered as a sample of these small museums with limited space, staff and budgets. The present pool is centered on ethnological museums in Galicia (a region in north west Spain). Because of the self government of this region, cultural institutions (including ethnological museums) are generally ruled by similar principles and regulations. This setting offers a homogenous group with diverse adaptations and projects.

Culture heritage (Jokilehto, 2005) in both its forms (material and intangible), is an appropriate field for the implementation of digital technologies, not only for showing objects (tools, artifacts, musical instruments...), but also for displaying oral traditions and expressions,

performing arts, social practices, rituals and festive events, knowledge and practices concerning nature and the universe and traditional craftsmanship (UNESCO, 2003). Nowadays digital content and multimedia guides are present in many museums. The benefits of adopting digital technologies are undeniable, but not all museums are at the same practical level of interest or familiarity with the use of digital technologies for exhibition, interpretation purposes or other uses (management, self-promotion...). Due to the variety of displayed contents in ethnological museums and the complexity of the material and intangible cultural products, multimedia technologies seem to be a particularly suitable instrument which should be promoted. Furthermore, if low cost technological solutions could be offered to the museums, the chances of wide implementation may only depend on the perception and acceptance of multimedia and digital technologies by the management of the museums.

### **ACTUAL USE OF ICT TARGETED TO VISITOR**

For the present study the 17 ethnological museums and public ethnological collections in Galicia were considered. In every museum, the head and at least one worker were interviewed regarding the use of ICT. Also an inquiry on the TIC facilities of the museums were made. In general terms there is a positive acceptance of the work with ICT, in some cases active and in others restricted by circumstances. However, none of the museum workers had specific education or training in ICT, their knowledge is limited to the instruction for using some specific management software and to the use of common user software (text edition, e-mailing, internet browsing...). The use of other kinds of software or hardware is exclusively autodidactic and, when implemented for the museum activities (f.e. blogging, social networks or document sharing), is solely because these services are free of charge. An interest in ICT, and efforts to use them, are the norm. Museum staff, or more accurately, individual motivated workers operate as ICT handymen. None of the museums have adopted advanced ICT (augmented reality, geolocated infos, app for smartphones, touch-tables, collaborative tools...) either for exhibitions or for other activities with the public. Under advanced ICT we consider not merely the latest technologies, but any technology that allows a better and more pleasurable learning experience, defined as a process that should be easy (uncomplicated and intuitive) to achieve, should also attain more information acquisition, should be more substantial (durable and consistent) and finally should be applicable.

In this respect, few innovations have been carried out. Ethnological museums in Galicia have been founded from the beginning of the XX Century to our days, many have closed their doors, the ones active at the present moment have been founded from 1969 to our days, and have been transformed and adapted to new demands. These changes have been made in two main areas: space (new buildings or remodeling of old vernacular constructions) and computerization of museum management (under the programs Muga, Ceres and Domus). The architectural undertakings provide basic facilities for the passive display of objects (the main activity of these museums), computer-based undertakings are currently targeted at object inventory and day-to-day management tasks. As a consequence of the internet connection requirement to run the management program and basic communication needs (e-mail) most of the museums in question (13 of 17) have developed internet sites. This sites are mainly intended to promote the museum and to provide information (with some exception only general information on the museum is given). In all the cases the implementation of ICT for exhibition and interpretation purposes is restricted to audio listening gadgets like mp3-, CD-players, or DVD-players for image (photo and video) reproduction on screens; in short, we have observed a lack of advanced TIC applications for exhibition and interpretation purposes (see table 1).

Name	Location founded in	Web	Micro- /Blogs	Social Networks	Web Syndication	Materials to download	Virtual visit	Digitalized funds	Video/ audio
Museo etnográfico do Cebreiro	Pedrafita do Cebreiro 1970	<a href="http://www.xunta.es/conselle/cultura/cultura/muse_cebreira.htm">http://www.xunta.es/conselle/cultura/cultura/muse_cebreira.htm</a>	No	No	No	No	No	No	No
Museo etnográfico e da historia de San Paio de Narla	Friol 1983	<a href="http://www.museolugo.org">http://www.museolugo.org</a>	Twitter	Facebook	RSS	Videos	No	No	Yes
Museo municipal de Monterroso	Monterroso 1990	No	No	No	No	No	No	No	No
Museo provincial do mar	Cervo 1969	<a href="http://museodomar.blogspot.com/">http://museodomar.blogspot.com/</a> (Blog)	Blog, Twitter	Facebook	RSS	Podcast, videos, Slideshare	No	No	No

Palloza Casa do Sesto	Cervantes 2007	<a href="http://www.palozamuseo.casadosesto.com">http://www.palozamuseo.casadosesto.com</a>	No	No	No	Pdf	No	No	No
Museo comarcal da Fonsagrada	A Fonsagrada 1984	<a href="http://www.fonsagrada.org/content/museo-etnografico">http://www.fonsagrada.org/content/museo-etnografico</a>	No	No	No	No	No	No	No
Museo etnográfico Sotelo Blanco	Santiago de Compostela 1995	<a href="http://www.soteloblancodicondicion.com/fundacion/museo.htm">http://www.soteloblancodicondicion.com/fundacion/museo.htm</a>	No	No	No	No	No	No	No
Museo etnográfico da Capela	A Capela 2001	<a href="http://www.museodacapela.org">http://www.museodacapela.org</a> (Blog)	Blog	No	RSS	No	No	No	No
Museo do Pobo Galego	Santiago de Compostela 1977	<a href="http://www.museodopobo.es">http://www.museodopobo.es</a>	No	Tripadvisor	No	Pdf	360° View	Audio	Yes
Museo da Terra de Melide	Melide 1978	<a href="http://www.mtmelide.es/">http://www.mtmelide.es/</a>	No	No	No	No	360° View	No	No
Museo etnográfico 'Olimpio Liste'	Cea 1972	<a href="http://www.museodopobo.es/cgm/liste.html">http://www.museodopobo.es/cgm/liste.html</a> (no active)	No	No	No	No	No	No	No
Museo etnográfico da Limia	Vilar de Santos 1991	<a href="http://www.museodalimia.com">http://www.museodalimia.com</a>	No	No	No	No	No	No	No
Museo etnolóxico de Ribadavia	Ribadavia 1993	<a href="http://museoetnoloxico.ribadavia-blog.xunta.es/">http://museoetnoloxico.ribadavia-blog.xunta.es/</a> (Blog)	2 Blogs	Facebook	RSS	Pdf	No	No	Yes
Parque etnográfico do Río Arnoia	Allariz 1995	No	No	No	No	No	No	No	No
Casa do patrón	Doade 1996	<a href="http://www.museocasado patron.com">http://www.museocasado patron.com</a>	Blog	Facebook	No	No	360° View	No	No
Museo etnográfico e do viño	Cambados 2001	No	No	No	No	No	No	No	Yes
Museo Liste	Vigo 1999	<a href="http://www.museoliste.org/">http://www.museoliste.org/</a>	No	No	No	Pdf	No	No	No

Table 1. Use of ICT in ethnological museums. State in January, 2013

The application of ICT is irregular but of a similar nature. Thus the internet sites vary from reduced presentation sites with general information on the museum (presentation, location and opening times – e.g. Museo etnográfico do Cebreiro), to more elaborate and informative sites (with virtual visit, audio archive – e.g. Museo do Pobo Galego) and even more active sites (e.g. Museo Etnográfico 'Olimpio Liste'), but all of them offer conventional information to a general user. They only allow a passive consumption, no interactive, gaming or collaborative experiences are provided, nor are there any specific feed-back tools (with the exception of the four Facebook profiles) and e-mails.

Other services included within the web presence are: blogs and micro-blogging, social networks, syndicated content, materials to download, virtual visit and digitalized resources. Blogs: websites of two museums are conceived as blogs (Museo provincial do mar and Museo etnográfico de Ribadavia –this with two different blogs, one for the museum itself and another for the activities of the museum's library), in addition one museum (Casa do patrón) has a website and a blog, which also communicates via micro-blogging (Twitter). Social Networks: five museums take advantage of social networking to activate closer communication to visitors and interested people (four in Facebook and one through Tripadvisor offering recommendations from visitor to visitor). Web syndication is offered in four cases via RSS. Six museums offer the possibility to download related materials like podcasts, videos, presentations in Slideshare or texts as pdf files; in all cases these materials are not directly linked to an actual exhibition as complementary info or digitalized resources. This resource works as a repository of information with ethnological interest. In the same way, three museums announce virtual visits, in all cases these are visual presentations giving 360° views of the spaces of the museums without any further exploratory feature. Digitalized resources are only included on one website (Museum do Pobo Galego), the material presented is a catalogue of oral, percussion and instrumental audio records as part of the intangible cultural heritage. Four of them offer some kind of video or/and audio support at the exhibitions.

Looking at the digital information available from the museums and the considerations revealed in the interviews, the use of ICT online is intended to serve to promotional goals of the museums as a visiting card. A presentation card targeted to visitors but without a clear, active

strategy to gain visitors. Indeed, no systematic studies of the impact of websites, blogs, downloads or social networking are being undertaken by any of the museums. The logic seems to be to maximize the availability of information without a master plan, assuming that sharing information generates knowledge itself or/and that new visitors and an interested public can be gained this way. The possibility that ICT offer to digitalized and publish information is considered by museum workers as its largest advantage. A virtual presence is a consolation, an illusion or an attempt to achieve a wider public when the number of physical visits to museums is, in fact, shrinking. Among many of the museums heads, it is considered that a virtual presence is a way of showing the existence of the institution, or even better of achieving international visibility. What is unclear is the aim of this wish to simply put the museum in the world. As a consequence of this assumption, at a recent meeting of the ethnological museums, the experts demanded the creation of a virtual ethnological museum in Galicia in order to gain more external projection (MMM, 2011). Promotion is needed, but it is for a different purpose than learning. None of the interviewed people could give a definition of ICT or state their benefits, other than that they are good for communication and that they are a must. These museums are not optimizing ICT to achieve a more advanced learning experience. Related to this state of things, the use and implementation of ICT in the museums is barely linked to the availability of free charge services such as social networking, document sharing facilities, etc. Because of the limited economic resources of the institutions and the willingness to capitalize on the advantages of ICT, the free on-line services are being used more or less profitably. The only cost is the extra working hours spent on it by particular workers.

Despite museums' wishes and projects for the future, there is currently no implementation of ICT to attract new visitors, to activate regular visits and to offer a more advanced, more pleasant and deeper learning experience to the public. Part of the problem is that these museums are supported by public funds and led under the concept that a museum should be a container/storage room for objects rather than an educational institution for the general public. Many of them have been opened without a viability plan. As a consequence, visitors are obviously welcomed and desired (they have something to communicate), but the museum's survival and the level of staffing does not depend on the number of visitors or success of exhibitions (at least at the moment), also staffs are stable. Taking in consideration the museums' lack of specialized ICT or web maintenance workers, any project in this direction is

based on voluntarism and the availability of staff members. New projects are only started when some extra funding is obtained (mostly via public subsidies). However, these projects are usually undertaken by external sub-contractors for a limited period and consequently, when the project is over nobody at the museum goes on developing or maintaining it, as in many other museums (Hornecker & Bartie, 2006). The objectives of these projects are not defined by the museums themselves. But the use of ICT in these museums is valuable and welcome, no fears or reservations are shown, but the lack of a master plan and of expert workers or systematic coaching lead to a limited, short-term view of the use of ICT. Low budgets are obviously a determining but not unique explanation of the situation.

### **HOW ETHNOLOGICAL MUSEUMS DEAL WITH TICS: MUSEL, JELLY FISH, AND DOLPHIN MUSEUMS**

As shown in the analysis of museums, ICT are being used in a limited way, but there are still wide differences between museums, not only in the ICT<sup>3</sup> implementations but also in how ICT are appraised by museums' staff members and, more significantly, by museum heads. On a fuzzy scale any museum could be situated between a passive and a proactive attitude towards ICT. Curiously, future strategies for the museums are declared to involve some kind of use of ICT targeted at visitors, none of the museums in question is reluctant to use ICT for exhibition and interpretation purposes. Thus, it is agreed the benefits brought by adopting digital technologies, but not all museums are at the same practical level of interest or familiarity with the use of digital technologies for exhibition and interpretation purposes or other uses. At the same time, the interviewed staff members have no clear idea of what ICT are.

In this context museums could be classified in three different groups according to their attitude to the introduction and use of digital technologies:

– Mussel museums (reactive): these are reactive museums without or with only poor digital presence limited to general museum information accessible via the web. In terms of web usability these sites are poor, and the information given is reduced, non systematic and not up-to-date. The main interest is to keep the museum anchored to its rock. This means to have a minimum, but constant number of visitors. The people in charge believe and expect that the

museum's collection itself is enough to attract visitors and that the displayed objects themselves are 'so attractive' that anybody may want to visit them, if they don't visit the museum is because the visitors don't appreciate the real value of the collection. ICT may be only introduced as a consequence of the *Zeitgeist* or if the museum gets involved in some project concerning ICT that is provided or perhaps compulsory; e.g. if the Galician government promotes, and pays for, some ICT program, or if the introduction of some technological innovation is a requirement to get a subsidy. The digital goal for the mussel museums represents a first step into the digital world of museums. What is needed? A project of digital education to show what ICT can do for an exhibition and for the future of the museums, and to place their museums in comparison with other similar ones. The chances of the introduction of multimedia tools in exhibitions is extremely low.

– Jelly fish museums (opportunist): Museums adopting some restricted use of digital technologies, mostly only for online self presentation and unstructured content about their collections. The presence of ICT in the exhibitions is always used to reproduce static and dynamic images (photo, maps... and video) and audio tracks. The gadgets employed can be more or less sophisticated (overhead-projection on different surfaces, computer screens, TV monitors and CD- and mp3- music players) allowing only a passive viewing, offering no possibility for interaction. Their *modus operandi* is to swim in the flow, they are active at a very basic level. Like the mussel museums the jelly fish museums depends on governmental initiatives for the introduction of ICT for management and exhibitions, but they try to find new applications for the existing facilities such as social networking, blogging (in some cases the internet sites are published as blogs –an open question is if a blog is the best tool for their goals and for the users for this kind of museums), or public online document sharing (via download or viewing only). The objects, as such, become their meanings in the exhibition context, they are not isolated items, in contrast to the mussel museums the items are part of a narrative, a story to be told to the visitors: the premise “we are objects from the traditional popular culture, thus we have value” changes to “we have value because we are part of a story of the past we can tell you”. The goal for the jelly fish museums represents a second step into the digital world: a process of self development with the aim of discovering what they want from the ICT, in other words, the design of a visitor master plan involving ICT. Mainly due to

the positive inclination to ICT, the opportunist attitude could easily become more proactive if the factors are favorable (more on this point in the conclusion).

– Dolphin museums (proactive): institutions working to bring the information to a digital presentation on several levels and working with specifically designed contents for digital access (the smallest section of our sample). They use ICT in a proactive way in the context of a low budget and no IT-expertise qualification. It is perceived that the survival of the museum is directly linked to the implementation of ICT, in this sense the museums work actively to introduce innovations at management and exhibition levels. Also working on and searching for projects involving ICT with other museums and institutions belongs to their agenda. The dolphin museums represent the third step: they know what ICT can bring, they have developed or could develop a master plan for visitors and ICT, but they need the right tools, and these tools must fulfill three requirements they must be: (i) inexpensive for the museum due to the low budgets of these museums, (ii) technically affordable, the lack of specialized staff members trained ICT requires that the technological facilities must be easy to use and to maintain, with a good usability level in the case of software, and (iii) advanced in terms of knowledge acquisition, these museums are willing to offer a learning experience with a strong didactic component targeted to young public, they present themselves as institutions with a social mission: to bring the past into the present, and to understand the present from the past. In this case, it is not the objects or the exhibition that is the focus of the museum, but the visitor. The museal narrative and didactic strength is developed to fulfill the curiosity of the visitors. Bringing multimedia digital life into these museums depends only on the adequate implementation of ICT (more on this point in the conclusion).

Museum type	Mussel	Jelly fish	Dolphin
Profile	reactive	opportunist	proactive
Core	objects	exhibition	visitor
Goal	Introduction to ICT	ICT Master Plan	Advanced ICT
Multimedia chance	low	high	high

Table 2. The Museums' typology

As above showed, the three types of ethnological museums in response to their attitude to ICT as exhibition and interpretation tool and as an aid to improve the communication/knowledge

transmission to visitors. From the opportunist mussel, through the opportunist jelly fish to the proactive dolphin museums not only the use of ICT are dissimilar, also the goals of the museums and their mission are different. With the introduction of ICT the visitors obtain a mayor presence and importance in the museum goals. This is not a random reliance: the logic of ICT implementation in museums is to achieve a higher level of communication and knowledge transmission, by considering the visitor as a more passive or active part of the communicational process the ICT are considered a less or more important assistant in this task. And multimedia digital facilities make sense only if they allow a more intensive communication and deeper knowledge, leading us to the idea of a more advanced learning.

## CONCLUSIONS

All the ethnological museums analyzed present different levels of introduction of ICT, poor, for exhibitions purposes and, mainly, for on-line presence (in this study no use for management was relevant). The attitudes of the staff thought ICT are more receptive and positive than their implementation in the practice. The fact of being institutions with a secure economical support (not depending of the number of visitors, neither the success of the exhibitions), but also with low budgets and no workers with specialized training in the use of ICT in the staffs limit the implementation of ICT. In these circumstances the use of ICT is a question of given opportunity, voluntarism and technological curiosity of single workers. This state is not exclusive of the Galician ethnological museums, but they offer us an optima sample of similar institutions. The lack of implementation of ICT is directly related with the main characteristics of each museum type: for some is compulsory an introduction to the benefits of ICT (mussel museums), for other (jelly fish museums), already using ICT, a master plan would help them to orientate their undertakings through clear goals, the most advanced (the dolphin museums) just need to get the right TIC tools.

How ought to be here 'right' defined? The basic mission of the museums is to provide primary knowledge, and secondly an interesting and pleasure experience to visitors. In this sense the introduction of multimedia digital solutions may be optimal, like any other museums taking advantage of ICT (Bearman & Trant, 2010). The benefits of multimedia implementations are widely documented (Filippini-Fantoni & Bowen, 2008), not only by promoting a more

intensive experience at the museum, but also by working as an extra museum attraction, with its aid more visitors can be pulled to the exhibitions. On the other side, we need to consider the state of these ethnological museums, which is determined by low budgets and the technological unexpertise of the workers, but openness to technological innovations (not fear of lost working places is shown).

In addition, the fact of ethnological museums transmitting cultural heritage (material and intangible) makes the use of multimedia, digital technologies a high appropriate solution. Objects (tools, artifacts, musical instruments...) and over all the no material –oral traditions and expressions, performing arts, social practices, rituals and festive events, knowledge and practices concerning nature and the universe and traditional craftsmanship– may take advantage of multimedia presentation. Indeed m-learning technologies (defined by permanency, accessibility immediacy of the information for the learners and context-awareness) (Yahua, & Abd Jajil, 2010) are adequate for the situations in which the museum spaces are not enough: open air celebrations (f.e. traditional carnival), outlying points of interest (f.e. vernacular architecture samples), or at-the-field performances (f.e. craftsmen at work). Self-researching (Marsick & Watkins, 2001) is the gate that connects the nuclear qualities of m-, and e-learning as well as learning strategies based upon social, constructivist and collaborative principles. An advanced active learning experience may be based upon extendable and durable contents (possibility of acceding to the contents after or previous to the visit, links to further information, eventually storage for off-line use), personalization (preferences based user's profile, information adapted to the user's profile), collaborative work (connection between gadgets for cooperative learning) and social networking (users' valuations and reviews, file share features, micro-blogging).

The actual data on ethnological museums and ICT support the introduction on multimedia digital solutions for mobile, personalized and collaborative/shared learning and pleasure experiences. But the data also reveal two main limitations at museums: low budgets and lack of training in ICT. As solution and alternative for the implementation of any multimedia facility we could think on low-tech solutions and the development of a free platform for showing information at computers, smartphones and tablets in which all parameters of kind of information, text length, static/dynamic image format, audio file type, layout format, intend of

use (previous, during or after the exhibition, as web content...) may be established in advance, as well as the information input should be tutored. This platform may be a data-base under the same user usability as we know it from popular services for web site self-editing. A platform, like the proposed, may be possible to create even museums without buildings or to bring the exhibitions to out-doors locations (Galani et al., 2011), with such platform micro museums ad hoc, natural spaces (Naismith et al. 2005), open air museums or points of interest or a guided tour outdoors (Cheverst et al., 2000) could be created anywhere without infrastructure at the place.

For a further analysis of the demands, limits and fears of museums' workers a wider sample is compulsory: more ethnological museums in Spain, outside the Galician jurisdiction, and responding to other museums policies and other found rising culture –this leads to a greater pressure for winning more visitors and for offering a better experience at the museum. In the next research step the data sample with interviews will be complemented with a quantitative study based on queries. An item to be included is the interest on a platform under the above exposed terms. Furthermore, a second research line on the museums' visitors will complement this study, based on the point of view of the visitors on the implementation of ICT in museums (expectations, frustrations, demands and general opinions). We consider fundamental to take into account the visitors in order to target the innovations in museums, to put the visitor in the middle-point, granting a broader visitor participation in the museums (Simon, 2011: 235-237) without upsetting the final goals of each institution.

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