



HAL
open science

Expanding Museums : new tools and concepts for mediation and virtualization

Laurent Lescop

► **To cite this version:**

Laurent Lescop. Expanding Museums : new tools and concepts for mediation and virtualization. Move international Conference : Museums environments : challenges and opportunities (MECO), Faculty of Engineering, Ain Shams University, Dec 2021, Cairo, Egypt. hal-03523024

HAL Id: hal-03523024

<https://hal.science/hal-03523024v1>

Submitted on 12 Jan 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial - NoDerivatives 4.0 International License

Expanding Museums: new tools and concepts for mediation and virtualization

Laurent Lescop, laurent.lescop@nantes.archi.fr

Ensa Nantes, CRENAU AAU-UMR CNRS 1563, France

Abstract: Museums have always had a strong territorial identity: the name of a museum may often be used to identify the city in which it is located, as well as the objects kept there. Museums, on the other hand, have been attempting to "export" themselves for some time, either physically or online. This tendency, which is being exacerbated by the Covid epidemic, generates a slew of new problems, which will be addressed in this article. This evolution is occurring in the context of the emergence of new museum forms that are unrelated to the conservation, study, and mediation of collections. The production of facsimiles is encouraged by the conservation of vulnerable locations; museums without artifacts encourage sensitive encounters; more playful versions resemble amusement parks; and ultimately, the potential provided by virtualisation of collections and settings enable distant visits. As a result, new technologies are frequently at the centre of these suggestions, and they appear to alleviate a variety of problems. However, one must be cautious and nuanced, and each answer must be tailored to each scenario. To attempt to tackle this broad subject, we will examine content virtualisation approaches by tracing the concepts' history, then examining the disparities in stakes across sites and objects, and finally questioning the cultural determinisms that the new technologies bear. To sum up, we will offer a dual idea, heritage and emergence, which allows us to explore the real world in relation to its digital clone.

Keywords: Museum, Ambiances, Virtualization, Mediation, Virtual Visits, Tourism.

1 Introduction

On September 8, 1940, the mechanic Marcel Ravidat discovered Lascaux in the neighborhood of Montignac, France, when he uncovered a twenty-centimetre aperture that appeared to conceal an extremely deep well. He returned four days later with three young guys, expanded the passage with a knife made from a car spring blade, and slipped in with his three accomplices. The little group discovered the first figures in the axial diverticulum after a risky descent lighted only by a Pigeon lamp. The little team returned the next day and the day after that to continue their exploration, delving deeper and deeper. They informed former teacher Léon Laval on September 16th. The discovery was a stunning success as soon as word of the discovery spread, and spectators flocked in droves, with 1,500 visitors in a week before visitation were halted. Léon Laval and Henri Breuil were the first to take a scientific approach to the cave, and it was rapidly protected and maintained. The impact of this discovery cannot be disconnected to the socio-political background at that time, the war, the collapsing of the French state, the loss of national pride (POTIN 2017).

The cave's success necessitated the arrangement of the entrance and the closing of a door. Indeed, the improvements removed a significant amount of sediment, which was to become archaeological data that would be lost. The visits, followed by the removal of the thermal buffer that had previously protected the site, will leave it vulnerable, resulting in climatic disturbances that are hazardous to the paintings. André Malraux closed the cave in 1963 to protect it. As an alternative, a replica of the cave was made available to the public in 1970. Lascaux 2 is only 200 meters away, and it will be the sole replica visible to the public for the next thirty years. A new traveling replica will be unveiled to the public across the world in 2012. The worldwide exhibition, Lascaux, was a big success. In 2016, a new facsimile was created allowing a visit even closer to the real model, in an interpretation center near the village of Montignac at the bottom

of the hill. Virtual tours and entertaining supports for the contextualization of the cave figures enrich the visit to the facsimile. Lascaux is a paradigmatic case that encapsulates all of the issues that will characterize many similar sites in the future: an unintentional discovery that feeds a mythological narrative, an exceptional graphic corpus that re-examines current knowledge, an awareness of a site's fragility in relation to its public success, a closure that reinforces the aura of exception, and finally, a mediation that takes different forms according to the evolution of techniques, fashions and the public's supposed or real expectations. All of these topics are intertwined, and several actors are involved in more than one. It is still necessary to go over them in depth and disassemble the study, preservation, and mediation processes.



Fig. 1. Lascaux 4, Snøhetta Architects, photo L.Lescop.

2 Problem: Protect and preserve

Before the virus spreads across the globe starting in 2020, widespread tourism has begun to pose a clear threat to the environment, particularly important cultural sites. In Europe, residents in Venice and Barcelona have protested against the influx of tourists, while Dubrovnik has regulated entry to the old city as a result of the success of the Game of Thrones series, which was filmed there. Everyone in Egypt recalls the shocking vandalism committed by a Chinese visitor. These iconic monuments generate international headlines, but other, less well-known locations are also under threat. As a result of this stress, tourism agencies are proposing new regions under the guise of "responsible tourism" or a return to nature. Along with widespread tourism, conflicts and natural disasters have resulted in the loss of precious cultural assets. One can recall the fire that destroyed the Rio Museum in Brazil on September 2, 2018, as well as the destruction in Syria and Afghanistan. The loss of the Institute of Egypt in Cairo in 2011 serves as a reminder of the need of paying attention to places, buildings, and collections. It's easy to understand why scientists, with the help of governments, want to keep what's most delicate or least accessible at a distance by digitalizing it and creating digital, virtual, or real facsimiles that may be offered to the benefit of everyone. The advantages are numerous: digitalization allows for an initial recording, an initial archiving that will be valuable in obtaining a testimony at a specific moment of conservation, digitisation allows for innovative studies to be developed and solidifies restitution hypotheses, and digitisation facilitates for convincing alternatives to be offered to the public and fulfills the mediation mission. Even though digitisation appears to fully meet the requirements for heritage site and object protection, improved knowledge, and mediation,

it is still vital to identify what we are talking about and to assess the long-term trajectory of these solutions. In previous articles, we have discussed the challenges of digitisation, through the evolution of techniques and the interpretation and conservation of data. (LESCOP 2018). We have stated, among other things, that digital recording can enable us to capture information that our current technologies are unable to perceive or interpret, referring to the DNA that is now being used on objects discovered before the procedure was established. The mission of mediation and issues of cultural transmission will be the focus of this paper.

2.1 From real to real scale replicas

If the preservation of sites seems to go hand in hand with a form of sanctuary and then sometimes restoration, other forms of protection have been proposed. In the 19th century, the John Ruskin (RUSKIN 1849) advocated not touching the ruins and ensuring the preservation of the sites by leaving them in the ignorance of the greatest number. He was opposed to Violet le Duc who, in contrast, imagined study, restoration and enhancement in a broad movement that will animate the heritage ideal until now. As a result, we are familiar with the conceptual construction that necessitates recognizing an object or a site as heritage and thus assigning it a value (RIEGL 1903-1984), as well as how one extracts an element from one's daily life to make it an emblematic element. Of course, there is ideological convergence in Europe between the construction of the concept of Nation (THIESSE 1999) and the identification of natural and historical sites that anchor this concept in space and time. At this time, traditional dress, folk dances, and ancestral stories are created or coded, uniting peoples around emblems that must be preserved.

As we saw in the introduction, the discovery of Lascaux and its subsequent closure can be viewed as a framework for what might happen next. The heritage site can operate independently of its home territory. The seemingly indestructible link allows for the creation of replicas accepted as having heritage value, as well as virtual experiences that are faithful transcriptions of real experiences. The high quality of the replica at Lascaux has attracted a huge number of people who are not disappointed that they will not be able to view the original. The visit is undertaken with the knowledge that an exceptional manifestation of human creation has been discovered, and that its fragility has been maintained by hiding it. With Lascaux 3, a traveling copy of the cave that has been shown all over the world, Lascaux continues to innovate and export the cave. Lascaux 4 opened in 2018, and visitors can see two replicas: an analogue replica from the 3D survey and a digital replica in virtual reality. The discovery of the Grotte Chauvet Pont d'Arc in 1994 provoked a protective measure, a site closure, a comprehensive digital survey for scientific investigations, and the use of this survey to produce an analogue replica and a digital replica for virtual exploration, following the example of Lascaux. A comparable method is currently being developed for the Cosquer cave, and it is possible that more sites will follow the lead.

2.2 Governance issues

The NCATC (European Network on Cultural Management and Policy), a UNESCO partner organization that helps with the training and management of cultural actors, has identified six categories of actors in the mediation process:

1. Owners care about the economic and cultural capital that their heritage provides.
2. National heritage is used by governments to gain respect and legitimacy.
3. Visitors follow the logic of "Edutainment," a term that encompasses two motivations: heritage as a learning (Education) and leisure (Entertainment) (Entertainment).
4. Academics develop a cognitive and expert approach to heritage with the goal of controlling the scientific outputs.
5. The media is fascinated by heritage's long-term and spectacular aspects.
6. Insiders (local actors) are becoming more interested in heritage as a reflection of the community's identity and secrets.

Each of these entities operates in their own time frame. We can use Stewart Brand's proposal in the research on the **Clock of the Long Now project** to visualize the temporality of each actor's functioning (BRAND 1999). The Long Now Clock is a statement for being conscious of the temporalities we encounter as humans and that we must be aware of as architects or designers or curators. Imagine rotating concentric circles, with the top layer moving faster than the bottom layer, and so on.

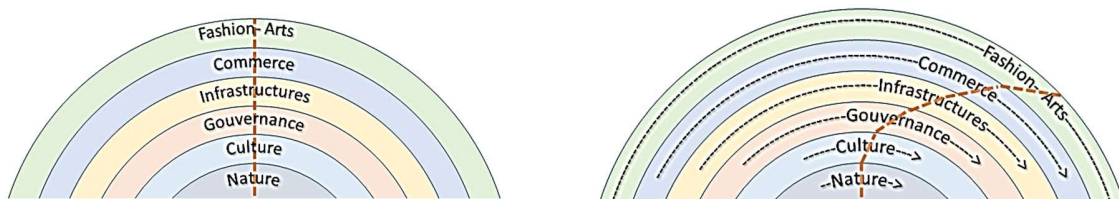


Fig. 2. Temporalities: synchronization / desynchronization, Illus. L.Lescop after Brand.

Each layer will have a temporal actor attached to it: the fastest layer is fashion and the media, followed by commerce, infrastructures, governance, culture, and nature. The time it takes to make a decision is longer than the time it takes to set up the infrastructures that will host the sites where knowledge will be economically disseminated, which takes even longer. It's easy to observe how a subject that could be considered transversal will progressively endure distortions and phase shifts by putting the model in motion. How can we build a project and make it cohesive by taking into consideration the interest it arouses at any given time, inscribing it in infrastructures, providing governance, and connecting it to its cultural roots? Temporality and patrimonialization, opens up the question of symbolic functioning (DAVALLON 2006) that we've got to keep in mind.

In practical terms, this means that, due to temporal variances, what appears to be the most latest in the state of the art at a specific time will be utterly out of date on the day of its installation. This is the most common stumbling block in museography and most mediation endeavours. Consider interactive terminals that have been widely used in museography but are now being phased out in favour of tablets and, of course, virtual headgear.

3 Problem: heritage preserved, heritage created

Intuitively, we might sense that a museum that has been in the area for years does not have the same stakes as a newly established institution to accompany a significant discovery. What can we do to formalize this? How does it impact on mediation and furthermore the use of new technologies?

3.1 Visible / revealed sites.

To gain a better grasp of the topic, it's necessary to distinguish between two categories of archaeological or heritage sites. The first category includes sites that are clearly visible in the landscape, such as Carnac in Brittany, Egypt's pyramids, and medieval castles. The list goes on and on... Understanding the importance of their maintenance and care, they become knowledge repositories and, most importantly, permanent emblems of identity. As a result, we place a high importance on the transmission of this tradition and the expertise that comes with it. Heritage preservation and conservation go hand in hand; it is an act that confers a sacred character on a site for the entire community. It is a political and frequently ideological process in and of itself. It is part of a linear and cumulative temporality in France and Western Europe. It is, above all, a transmission that serves to maintain and defend a legitimacy that can only be obtained via mastering of codes and peer acceptance. One could even argue that academic institutions, training, and

knowledge validation are all part of the effort to create a universal register. In order to create a social allegiance to scientific authority, symbols and rites that the public will recognize are created. Of course, this is where concerns like heritage, museum construction, preservation, digitalization, and protection are defined.

In contrast to the first category, the site is revealed and this revelation functions as a creation. The second category of site is dedicated to extraordinary findings with impacts and implications comparable to those of a creation. The term "inventor" refers to the person who discovers an object or a location. The act of creation brings into being a subject or a location that was previously unknown. There occurs a break in an existing continuum, and a new reference point is established. However, there is a yearning to be connected to existing reference points, which translates into a search for a holistic, or all-encompassing, experience. This work creation symbolizes the entire and should be honoured as such. It receives immediate support from the entire society as well as from each person. This work creation needs to be viewed as a cultural phenomenon.

3.2 Legacy / emergence

To understand the challenges of heritage mediation, we can design a typology proposing two types of narratives. The first typology contains what we will call the *narrative of legacy*. The narrative of legacy is conceived as a protocol of transmission and content with a teleological aim that is to say with an objective, a purpose, which is that of the preservation, the maintenance of rules and rites with the highest possible qualitative requirement. So there is a transcendental goal. This account of legacy is what constitutes the framework of the secular university, but we can also recognize it in what preceded it, in the centres of study and interpretation of sacred texts, religion working of course on the narrative of legacy. The transmission is done by the establishment of symbols and rituals that will be recognized socially as the affirmation of a moral and scientific authority and as a reservoir of references. The transmission of the narrative of legacy takes place from close to close in a series of interdependent periods. If in the scientific world, the content of the narrative evolves, often by exhaustion of paradigms, the paths of its evolution are controlled by the teleological aim, namely the production of new knowledge validated by peers.

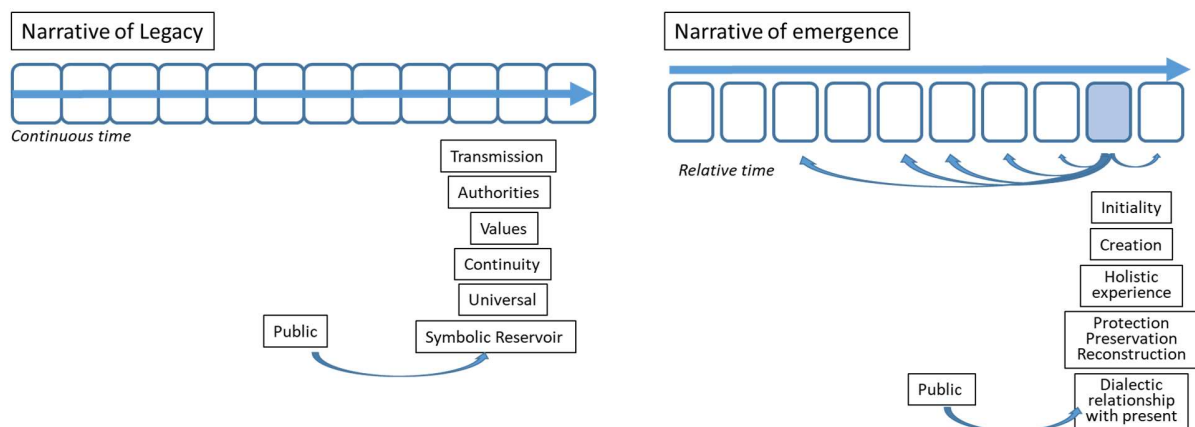


Fig. 3. Concepts of Legacy / Emergence, Illus. L.Lescop.

For museums housing archaeological or historical collections, the challenge is to succeed in transmitting its essence or its past use while it is cut off from the world and visitors by the museum system. As the Italian philosopher Emanuele Coccia writes: "*Once it is placed in a museum, an object is condemned to exist in a sort of acosmic interval in which, separated from its use and from its existence, it neither lives nor dies. It is as if the object were reified and materialized in the experience of display and contemplation*"

(COCCIA 2018). This cut-off of the object from the living world places it in the reservoir of knowledge that the narrative of legacy will exploit. However, it can be an obstacle for the public to understand its uses or simply to have a form of empathetic relationship with him.



Fig. 4. Dialectic between past and present in Lascaux4, Photo. L.Lescop

The narrative of emergence refers to a second typology in which a discovery made cannot be brought back or identified within the narrative of inheritance. This is typically the case of the discovery of Lascaux which, by its exceptional content, surpasses and displaces everything that the scientific and social world could know or imagine of prehistory. The narrative of emergence can be likened to the narrative of a creation. What will characterize this story is a holistic experience, that is to say creating multiple interactions with many areas. The narrative of the emergence will thus weave correspondences with different points of history and above all will question our contemporary in many areas. It is a historical emergence that shakes the present. The museography housing the artifacts, sometimes just the copy like Lascaux or Chauvet, must make strong correspondences with our present and what animates the visitors. The UNESCO classification principles, with identification of universality on the one hand and exceptionality on the other, cannot be expressed any other way.

4 Research: Toward new Museums

As a result, the issue of mediation for museums is inextricably linked to the issue of representation. Representation is the backbone of an idea, a discourse, and is thus inextricably related to the technic, the substructure, and the ideology that underpins it. The infusion of digital technology into the field of culture and heritage opens up enormous possibilities for the collection of information, its processing, the preservation of sources, and public mediation, and after a period of resistance, a surge of interest in making information available to everyone at all times can be observed. The inclusion of the triptych Study - Preservation - Mediation thus initiates an initial reflection on what should now be called the sustainability of digital data. The term durability is understood as that used in construction. What is durable is what allows it to resist temporal regimes, to endure and to be transmitted. At present, the sustainability of data is not yet achieved simply to go from preservation to mediation. Many factors could explain this fact, perhaps the simplest is that it is partially admitted the fragile state of the media.

That, however, is not the core of the problem. The question of narrative is at the centre of the mediation and transmission project. We know that a device can make a visitor feel emotions that are similar to those he might have had in the physical location. This equipment might be digital or analogue. In both cases, as Lascaux's examples demonstrate, these devices may be exported outside the immediate vicinity of the site they depict to embark curious and enthusiastic visitors with an experience of a site they could not even approach. This also highlights the issue of a site's interaction with its surroundings, but it would be too much to cover here.

As previously said, this narrative of the visit is incorporated into another narrative, which can be legacy, or emergence. Pyramids in Egypt are unmistakably part of a legacy story, while Lascaux is certainly part of an emergence story. However, there are three parts to these stories that we often get mixed up about.

- The inscription, the search for traces, the recording, the survey, and the use of archives are all part of the initial step. This is the archaeologist's sole domain of knowledge.
- The representation or re-presentation phase is the next step. This is the point at which the interpretation begins.
- The third step is the period of memory, change, and reception in order to provide the supports for conservation and mediation. And herein lies the essence of our problem.

The *telos* and the *mythos*, two forms of narratives, will conflict. The scientists' telos is the knowledge derived from the item investigated, while the teleological project, or one with a finality inscribed in its genesis, is the knowledge derived from the object researched. By incorporating components outside of the original scientific endeavour, popular culture perceives, transforms, and accepts the mythology. The most common example is popular stories and their inclusion or exclusion from the scholarly corpus. Given this, the creation of mythos in the telos is fascinating to see. The mythos is profoundly etched in the collective memory of open and permanent places such as the Pyramids or Egyptian temples, and it is conveyed in a variety of ways. Science, in its teleological purpose, cannot prevent the production of mythos that will either deliver knowledge to the public, or confront existing mythos, which may be abandoned or utterly erroneous scientific ideas. The Egyptian heritage is full of fanciful myths...The telos/mythos dialectic can also be found in UNESCO categorization criterion VI: "*to be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria)*" (<https://whc.unesco.org/en/criteria/>).

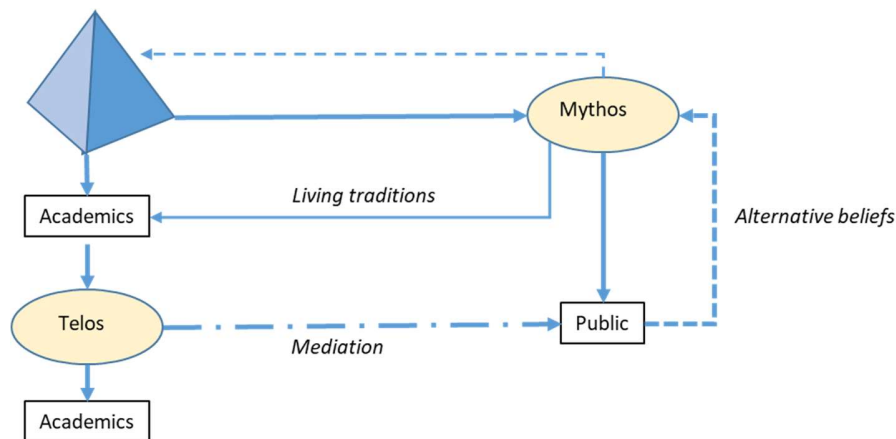


Fig. 5. Telos / Mythos dialectic. Academics produce Telos from heritage that Telos is transferred to the public in a Mediation process for education and for academics for scientific use. Mythos is known as living traditions that public knows and can be eventually used and protected by academics. The lack of strong Telos, favours the creations of new Mythos as alternative beliefs which can cloud scientific studies. Illus. L.Lescop.

4.1 Analog double

The plundering of archaeological antiquities found all over the world is also a part of the digital double conundrum. While it is fascinating to be immersed in Babylon or Pergamon, in the real remains of these cities, we can wonder if the real location of these items is not in their place of origin while we are in Berlin. We know that this removal could have been done for safety reasons (but certainly not only for that), but the question remains unanswered. What is at stake when a replica is created?



Fig. 6. Real Artefacts in Berlin, Photo. L.Lescop

Digitalisation allows for the creation of highly accurate copies. The 3D data is transformed into geometric coordinates, which are used to create castings or structures that accurately reproduce all of the site's characteristics. The creation of a replica still activates Viollet le Duc's question on authenticity, on choosing a certain configuration for the restitution.

As Jean-Michel states regarding Chauvet Pont d'Arc cave : *“The replica's timeliness was also rapidly debated: would we portray the cave as it was discovered in 1994 or as it was known by prehistoric man? It was decided to return it to its previous state. The scientific committee, chaired by Jean Clottes and made up of fifteen international experts, endorsed all of these decisions. This committee was involved in the regular monitoring of the ornamental panels' development, their underground envelope, and palaeontological remnants, as well as the Aurignacian Gallery's museographic content and the 10 visiting stations along the route.”* (GENESTE 2017). The Caverne du Pont-d'Arc, which opened in 2015 and was conceived by architects Vincent Speller and Xavier Fabre, allows visitors to experience the cave's realistic interior on a scale of one to one, but folded up, densified, and filled with narrative ellipses that enforce the visit's rhythm. The narrative sequences chosen by the research team's archaeologists were selected and prepared by them; they defined these ellipses so that the final rhythm would be identical to that of the original cave. Which can be argued.

The Lascaux's replica offers a full real scale restitution. Visitors don't have a compressed space like in Pont d'Arc, but a full immersive experience. As a matter of fact, Lascaux is smaller than Chauvet and is easier to embed into a large building.



Fig. 7. Real scale replica in Lascaux4, Photo. L.Lescop

Immersion in a remote location is not a new concept. It should not be assumed that digital technologies have resulted in the creation of new products or, even more importantly, new questions. Before appraising the achievements of digital virtualization, it's essential to take a step back. Indeed, if the technology appears revolutionary and spectacular today, it is the heir to a long line of devices whose purpose was nearly two centuries ago:

- to show an elsewhere with strong heritage potential,
- to have the sensation of being projected into this elsewhere,
- to live a spectacular and memorable experience, and, finally,
- to be nourished by new knowledge.

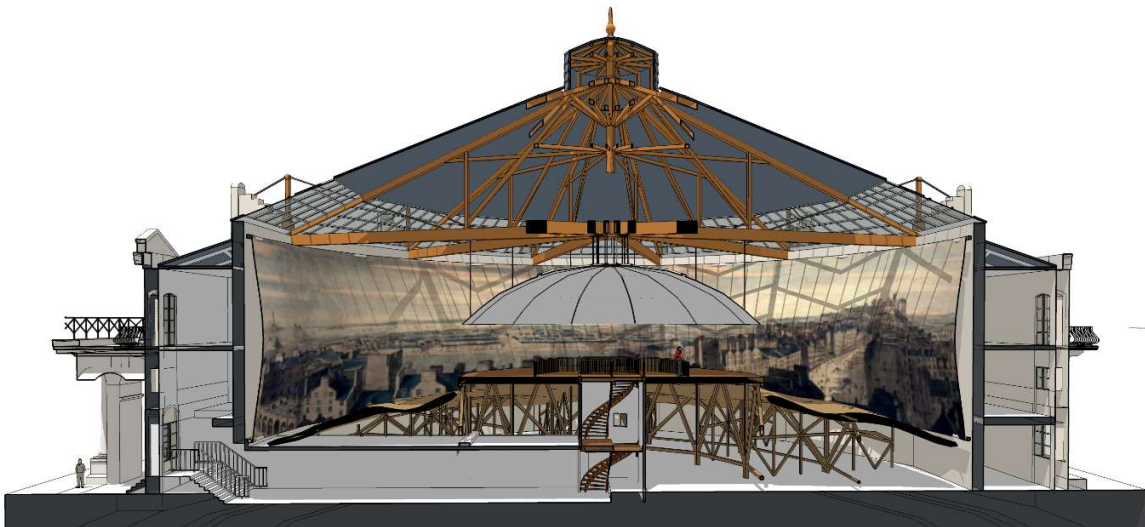


Fig. 8. Section of a generic XIXth century panorama. Ill.. L.Lescop

The earliest immersive device can be traced back to the end of the eighteenth century. It's Barker's panorama, which he created in 1787. The device is presented as a large painted canvas developed inside a cylinder with a public platform in the centre. Other devices, such as ornate caverns, may have been conceived earlier, but panoramas are the subject of patents, such as Fulton's of 1799, which clearly define the principle and effects sought. (BAPST 1891). These are illusion machines that produce a sense of astonishment when the landscape is discovered in 360° through the effects of light and movement. Panoramas were immensely popular attractions in the nineteenth century, encompassing a wide range of subjects from landscape exploration to historical frescoes. What's amazing is that new technologies were added as they were found, whether it was photography, sound transmission, or the ability to create

movements that mimicked a boat at sea. Three remarkable immersive devices were presented to the public at the 1900 Universal Exhibition: the Maréorama, which created the illusion of a real boat trip, the Cinéorama, which allowed spectators to experience a virtual balloon ride, and finally the Trans-Siberian Railway, which was an immersive journey through Europe proposed by architect Georges Chedanne. (LESCOP 2017). All these devices offered a collective immersive experience. At the same time, devices were developed that strongly resembled the immersive headsets of today. The Kinetoscope, a vertical box in which the observer looks, was invented by Thomas Edison in 1889. The Mutoscope, a sort of immersive binocular, was conceived by W.K.L. Dickson and Herman Casler in 1894. In practice, the film is a carousel of images fixed in a hub that the user moves quickly, while the Lumière brothers unveiled the Kinora, a device that is practically identical. None of these developments were able to compete with the cinema's collective experience. Individual systems and collective devices are involved in the same issues.

4.2 Digital duplicates

Digital duplicates can be seen in a variety of ways around the world, including traditional projection, immersive projection with some interactivity, and immersive experience using a virtual headset. The immersion's effectiveness will be determined by a number of criteria, including the size of the projection, the audience's envelopment, sensory saturation, and possibly the inclusion of heat or olfactory effects. The use of the above-mentioned panoramas as an example is critical in this regard, as it provides both solutions and inspiration. The most crucial aspect of virtual immersive proposals is to consider them in a physical space. Immersion works because there is a space of preparation, a place of experience (or experimentation) that must be perfectly defined and protected, and a space of exit that allows you to return to reality. Here again, the lesson of panoramas is valuable. Access to the immersive image of a panorama always takes place after a journey in the dark that makes the transition between the world from which we come and the world towards which we are going. This transition is the guarantee of the success of the experience. To fully operate, the virtual experience must work on the same principle, which can be a scenographic challenge for museums.



Fig. 9. Inside Naexus and Erodor, two innovative immersive devices, Photos. L.Lescop

We presented a mobile immersive device for museums a few years ago. The Naexus, for particular, had a 220° encircling image 15m long and 2m high, as well as a 3D audio system. (2016, LESCOP et al.) The device has been demonstrated multiple times and fits like a large piece of museum furniture, allowing for easy integration. Following that, we designed another device, the Erodor, whose main role is to serve as a metaphor for a railway voyage. It allows visitors to journey around the cave world's most iconic locations in an immersive virtual experience. These two devices, Naexus and Erodor, provide a shared experience, allowing visitors to share their sensations and share them with others.

The next goal is to be able to provide virtual reality headset experiences and to 'export' the museum or a portion of the exhibits to a remote audience. There are a variety of reasons for this, including maintaining museum accessibility even when it is closed, giving access to a distant audience, and increasing the value of reserves that are not visible to the public. It also allows the museum to open up its treasures to different categories of visitors and to develop custom-made themes for each category of visitor. It also allows for a different interaction with the artifacts by reintroducing them to their original context, gestures, and environments.

5 Findings and Discussion: Multisupport online platforms

The Covid crisis, which began in 2020 and persists to this day, has propelled the development of online platforms for the construction of virtual communities. Each of these platforms has a distinct focus, such as education for Engage (engagevr.io), co-working for Immersed (immersed.com/), or entertainment for AltSpace (altvr.com), albeit the latter platform's goals are considerably broader. The number of simultaneous guests that may be welcomed, the variety of interfaces for taking virtual tours, the ability to create one's own content, and, of course, the price of the subscription or access will set them apart. Apart from AltSpace, two platforms should be followed with interest in this choice. The first is Hubs Mozilla (hubs.mozilla.com), which is open source and free, and the second is Spatial (spatial.io), which is versatile. Both platforms allow for environment customization and, as a result, the creation of unique experiences.



Fig. 10. Examples of online virtual exhibitions with open access. Visitors are visible as realistic avatars . Ill.. L.Lescop

With Spatial, visitors can use a phone, a tablet, a computer, and, most importantly, a virtual headset to access virtual worlds. This means that anyone, with any type of device, can join a group of visitors and share an experience, exchange information, and converse. You can also handle things and watch movies and slide shows. The ability to entirely reimagine museography is maybe the most intriguing aspect. From the scale of the environment to the scale of small artifacts, the same object can be seen at several scales, allowing for a better grasp of the issues at hand. It is now possible to digitally visit sites and gain a better understanding of them on a smaller size. This solves the difficult question of sensitive experience supplemented by a contribution of knowledge.

6 Conclusions and Further Research

In this article, we have repositioned museographic issues in terms of a relation to space or time. What we've labeled legacy maintains a spatial relationship of continuity, while what we've labeled emergence evolves into a dialectical temporal relationship. Because of the differences between the two, distinct mediation methods and immersive experiences are proposed. The difficulty is to preserve a collective experience with the immersion technologies that are enforced as an alternative to visiting sites to protect them. This is made feasible by online platforms, which provide amazing chances to update the museum approach. The museum is no longer envisioned as a built object, but rather as a hyper device with multiple dimensions.

References

- Bapst, G., (1891). *Essai sur l'histoire des panoramas et des dioramas*, 1891, BNF
- Brend, S., (1999). *The Clock Of The Long Now: Time And Responsibility*, Basic Books
- Coccia E., (2018). *The Eternal and the Ephemeral*, in *The Transitory Museum*, Coccia E., Grau D., Polity Press
- Davallon, J., (2006). *Le don du patrimoine: Une approche communicationnelle de la patrimonialisation*, Hermes Science Publications
- Geneste, J.M., Delannoy J.J., Tosello, G., (2017). *De la grotte à la caverne et de l'archéologie au public*, *Les nouvelles de l'archéologie*, 147 | 2017, 39-44.
- Lescop, L., Cassen, S., Grimaud V., Naexus : dispositif immersif mobile pour la valorisation du patrimoine. In Ausonius Eds, editor, *Virtual retrospect*, volume 6 of *Tiré-à-part des Actes du colloque Virtual Retrospect 2013*, pages 12–17. May 2016.
- Lescop, L., (2017). *360 vision, from panoramas to VR*. In Tom Maver, editor, *Envisioning Architecture: Space / Time / Meaning*, Volume 1 Of *Envisioning Architecture: Space / Time / Meaning*, Pages 226–232, Glasgow, United Kingdom, September 2017d. Tom Maver, Paul Chapman, Christopher Platt, Victor Portela And David Eaton , Published By The Mackintosh School Of Architecture And The School Of Simulation And Visualization At The Glasgow School Of Art.
- Potin, Y., (2017). *1940 : Lascaux, l'art mondial révélé par la défaite*, in *Histoire Mondiale de la France*, dir P.Boucheron, Points Histoire.
- Riegl, A., (1903-1984), *Le culte moderne des monuments. Son essence et sa genèse*. Éditions du Seuil
- Ruskin, J., (1849). *The Seven Lamps of Architecture* Smith, Elder & Co., 1849
- Thiesse A.M., (1999). *La création des identités nationales*, Éditions du Seuil

http://www.encatc.org/pages/fileadmin/user_upload/supervisors/FONTEVRAUD_REPORT_FINAL_FR.pdf, p.11

Spatial online examples are at the following adress :

<https://app.spatial.io/rooms/60e180626c51d54380946a1b?share=3623940114162470034>