Smart museums: enjoying culture virtually Case of Virtual Museum of the National Museums Foundation. Rabat - Morocco

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Abstract

Before, the city was a space dedicated to offering a range of services to all the inhabitants who lived there, such as public transportation, education, housing.... However, things have undergone a certain change with the introduction of the Internet and ICTs. To this end, we have today began to hear about -Smart City-this new emerging concept leaves no major metropolis untouched.

The digital and modern age has affected almost every sector, even those who imagined they were frozen in time, thanks to the cities have experienced the technologies were throughout the early 21st century. Here, we cite for example: the world of banks, telecommunications, service companies ... even the public sector such as: education, culture, administration.

Future museums may also contribute to human culture in a society witnessing rapid changes via smart museum technology that encourages constructive participation with the public.

Digital technologies did not emerge overnight in museums and started by replacing conventional analog broadcasting media without altering the experience of visitors. What is really new is the appearance, which includes screens near the works giving more information.

The term "virtual museum" has been defined as follows: "... a collection of digitized objects logically articulated and composed of various supports which, due to its connectivity and character multi-access, allow you to transcend traditional modes of communication and interaction with the visitor... " [2].

Our study case will also reach the Virtual Museum of the National Museums Foundation Rabat Morocco. Here, we will discover the exhibits the Virtual Museum in partnership with Virtuelli, a virtual imaging agency which is a platform, open to the general public and art lovers that hosts virtual tours of art exhibitions organized by the National Foundation of Museums under its supervision.

Keywords: smart cities, virtual museum, new technologies, smart museums, virtual exhibition.

1. Introduction

This race for modernity, originality, and excellence encourages museums to provide the latest equipment, and museums have become an impressive testing ground for digital innovation [17] In addition to personal aids for visitors, it also provides 3D and 4D representations, geographical location, virtual reality, a gestural interaction experience with a 3D stereoscopic interface [12], a Web 2.0 collaboration experience, intelligent glasses capable of recognizing works and providing annotations to guide the eyes.

As a result, the digitization did not suddenly enter the museum. It began by replacing traditional analog media without fundamentally altering the visitor experience.

The virtual museum is in no way a rival or a threat to the traditional museum because its digital nature prohibits it from presenting real objects to visitors, unlike the traditional museum [25]. But it can also extend the ideas and concepts of collections in cyberspace, and in so doing, reveal the quintessence of the museum. At the same time, the virtual museum touches visitors who may never have the opportunity to physically visit a particular one.

The Virtual Museum of the Rabat Morocco National Museum Foundation will also obtain our study event. Here in collaboration with Virtuelli, a virtual imaging agency that is a forum available to the general public and art lovers that host virtual tours of art exhibitions arranged by the National Foundation of Museums under its supervision, we will discover the exhibits of the Virtual Museum.

1.1 Beginning of the digitalization

Over the last two decades, auxiliary digital equipment for websites, multimedia terminals, PDAs 'Personal Digital Assistant', and touch screens have been used in permanent and temporary exhibitions. To this end, they have contributed to a profound and lasting change in the behavior of museums and visitors [29]. Note that in the new practice, interaction (often emphasized) is not limited to numbers. Long before the computer age, old institutions such as the Science Museum in London (1852) or the German Museum in Munich, or more recently the Discovery Museum in San Francisco provided interactive devices to visitors. These devices include the following: the computer, operation, tactile copy, games ... The digital technology entering the museum is used first to computerize the collection and then for the visit [13]. It is on the basis of these collections that it is planned to offer visitors access to the computer collections (image libraries and documents from the computer heritage) at the end of the 1980s [1].

1.2. The video screen, a rarity in the exhibition

The instrumental diffusion of scientific contents in the museum space was assured by audio guides on analogical cassettes [7]. The physical movement of the tape determines the speed of access, not the accompaniment. At the same time, videos with simulated toys are distributed in a dedicated space. For technical and ideological reasons, the museum wishes to distinguish the world of works from the world of technology and keep the video screen-free exhibition [27]. Among these exhibitions, let us mention the exhibition Cités-Cinés in 1987 or the exhibition Memories of Egypt in 1990. These exhibitions are dedicated to the first experience of museology, which we define today as immersive and innovative. The science of the scene integrates a large screen, the image is transmitted by the hybrid analog-digital Laserdisc system and the sound is transmitted separately via headphones with an infrared reception function [1]. This technology allows visitors to hear the sounds in the reception area and discover the story behind the exhibition.

The visitor is captive and to escape the comments, you have to remove your headphones or change space. However, many managers want voluntary access, triggered at the visitor's request. It is this concern that guides the first devices broadcasting sound from Flash memories (non-volatile memory): to have immediate access to the message one chooses to listen to. In their original form, we find the Influx® ramp developed in 1995 by the Créamuse and RSF companies for the Neanderthal Museum in Mettman. Installed in the permanent exhibition, this device contains all the sound mediation. The visitor connects to it with the plug of a headset and this gesture triggers access to the commentaries and the soundtrack of the films [1]. This use of digital technology is seen as a technological innovation that compensates for the linear playback of videotapes, while allowing the use of several sound channels for multilingual broadcasting and offering autonomy and

freedom of access to visitors. The first digital audio-guides in 1997 were based on the miniaturized and mobile principle.

1.3. The touch screen, a guest that imposes itself

In the mid-1990s, IT was still not very present in homes and the multimedia terminal was a real curiosity [15]. At the same time, the screen that has become a touch screen is all the more easily imposed as it lightens the interactive device and even makes it attractive through its modernity [3]. Museums look kindly on these buttons which can offer large amounts of information. Equipping a museum with "multimedia kiosks" is becoming a fashionable phenomenon, and the success of consultations far exceeds expectations [5]. It is thought that visitors are available to access the information and that is a new cognitive and physical approach to communication. To tell the truth, the multimedia kiosk was first of all the place of novelty where many contents were stored that could not be placed otherwise, but that it was good to store somewhere for the visitors [18]. Plenty of content was there, present in the knowledge kiosk, even if in the end it became laborious, not to say impossible to consult it, so much so that touch the technology was in its infancy and navigation was an obstacle course [8].

Augmented reality is a growing process in museums, which consists of offering additional information to the works on display [28]. It is a technique allowing to insert in real-time a 2D or 3D element in a real image [6]. This additional information is disseminated through tools such as smartphones, laptops, and now tablets tactile. These comments can focus on digitized works and be in this case available online on a website or an application [9].

Digital programs on the tablet can even foster autonomy, attention, satisfaction, and the experience of establishing new relationships with children's museums based on the segmentation of young audiences and design from the user's point of view [4].

1.4 The advantage of digitalization

With the implementation of a database dedicated to the management and administration of collections, IT technology, and digital policies have entered the museum. Traditionally, collections are recorded in inventory books and linked to all documents and management elements by numbers. Since computer databases operate on the same principle (a digitally linked file itself contains fields related to the same subject), it becomes an ideal tool for managing collections [16]. The first step is called the computerization or digitalization of the collection, which will have an impact on the production and format of the content related to the artifacts [12].

With the advent of personal computers, museums are designing and selling multimedia CD-ROMs. At the end of the visit, visitors can buy it as a museum or showroom catalog and continue to find it at home. The content is selected, digitalized and edited by the museum with an editorial logic. [18] and [21] said that with the help of the Internet, museum professionals are discovering the possibility of attracting visitors and providing information about the collection in this way.

Virtual museums are based on websites that bring together digital works (sometimes videos). CD-ROMs that bring together images from the collections of the world's largest museums also appeared in the early days of the Internet. Since the mid-1990s, the Hermitage in St. Petersburg and the Louvre in Paris have been publishing this medium. These CD-ROMs present virtual interactions with publicly accessible digital works, which in some cases the public has never entered the museum, but have been discovered by new managers. Although the launch of these CD-ROMs may have been a commercial ambition, these early applications laid the foundation for virtual tours, but they did not provide the highly realistic efficiency, precision, or love that we find today. In the late 1990s and early 2000s, advances in the Internet and online multimedia applications gradually replaced the CD-ROM.

The museum's website can be pre-prepared for visits (schedules, location), explore the collections by accessing the database, let your mouse or avatars wander in the simulated exhibition space [4]. Internet is then considered as a new way of presenting objects means [19]. In addition to the multiple presentations of content that museums can offer in this way, the strongest idea that comes from the combination of computerized collection listings and the Internet is that this content is accessible from anywhere in the world.

The collections of the Louvre Museum, the Altes Museum in Berlin, the Metropolitan Museum in New York, etc. are easily accessible without removing the chair. Because of this fundamental step, the digitalization of the collection, it seems that the relationship between the museum and the public can be redrawn in the time before and after the visit [27]. Then, by coupling the content of these digital museums to the network, it can become many public access points linked to spaces that are not limited to traditional museum spaces (museums, exhibition halls, documentation centers, conservation areas, offices). Places, some of which are not visitors to the physics museum.

Technical tools can hold, restore, and archive large amounts of data in multiple formats, providing rich, personalized content for each visitor. Several different strategies can achieve this personalized goal [23].. First, multimedia tools (whether they are voice guides, PDAs, or converted to PDAs or multimedia terminals) can be considered as extended devices that would provide many functions.

Moreover, there is relative freedom in the choice of navigation (or listening) and their use. With the advent of portable tools such as PDAs, the content of multimedia terminals and audio guides can be combined to increase the benefits of mobility. We have noticed changes related to mediation time: after visiting museums, this change can continue. At Seattle's Museum Planning Music Experience Hall, visitors can use PDAs to record interesting objects they encounter during their visit [29].

They can then log on to the museum's website from their personal computer and download further information about the previously selected object. The Cité des sciences et de l'industrie is also implementing similar initiatives. This is the Visite + project, launched in 2000 [1]. Professionals see these tools as opportunities for in-depth research visits, but

more importantly, they can explore the content according to their personal interests and speed.

The interaction is ultimately seen as beneficial for the visitors: "The objective of strengthening the relationship with visitors for the cultural, educational, and scientific mission of the museum; other possible areas of development in trade, fundraising, and communication are subordinate to this, the main objective". This example remains an exception and Visite + was cited above, illustrating the possibility for a museum to establish a close and personalized relationship with visitors around the exhibition [30].

The functions of Visit + include: providing "Support for the city's offer (personalized exhibition itinerary, proposing new interactive methods), "making resources available" (collecting visitor profiles and expectations, positioning, and monitoring actions), memorizing the experience of the visit, evaluation, and advertising, marketing and visitor loyalty), "museology" (access to content adapted to each visitor). Recording the traces of usage induced by digital technology and its use is a method that offers considerable opportunities to understand visitors and provide them with a relationship that is increasingly adapted to their expectations [1]

Building a visitor's gallery, commenting, and sharing content are processes that allow online users to own the content that the museum provides them via digital and/or online technology. In addition to the consumer devices authorized by ArtsConnected [12]; [24] we can also note the Opales plan. The program allows external experts to comment on digital recordings and share these comments with other researchers. Here we enter a loop, from access to online content, to create appropriations and reuse.

The virtual museum is about the possibility to visit the collections of all the museums of the world of origin, or use the mouse or touch screen to visit the exhibition at the location copied on the screen, which means that the exhibition space of the collection is no longer limited to the museum and to consult the catalog. With the development of digital technology and the Internet, the interaction between visitors and museums has become increasingly easy, and mobile technology has also improved access to the Internet and its data. The first cell phones or programs designed by the museum offer possibilities of continuous visits and/or enrichment and adaptation during and/or after the visit [2]. In addition to the first two options, in a nested environment where the resources of the exhibition are part, first among visitors to the same museum, between visitors and institutions (or their representatives), and then between visitors and family members.

2. Virtual visit and exhibition

Since the communication tools can be searched for anywhere in the world, the purpose of providing digital works and virtual tours is to encourage a remote audience to actually visit this museum. Therefore, it is a kind of tourist exchange, from an educational point of view, it is a new objective that has been difficult to achieve so far.

The development of museum-related virtual tourism began with the rise of the Internet in the 1990s.

Emphasizing the irreplaceable character of the visits themselves, the objectives of these first virtual systems are focused on the diffusion of digital works to experts and the public. At the same time, the emphasis is placed on education, science, and tourism, especially for the remote public. Although the degree of uniqueness in the real world is so far very high, the latest virtual tours (such as the Google Art Project) have not changed the use of virtual tours that were determined when they appeared. However, in addition to spreading the media and future technological advances via the Internet, all these processes, which are still perfect, offer important opportunities for development.

The mid-1990s and the first ten years of the 2000s were marked by the development of the Internet and virtual reality applications.

These studies focus on the role of websites in cultural institutions or on the impact of the digitalization of heritage and works of art.

New media, in particular, new applications to appreciate works of art, historical or archaeological sites, and to understand the past are constantly developing. Eternal updates follow that mark the new technologies.

The Google Art Project is a project created in February 2011. The project is based on the digitalization of 17 museums, recognized worldwide for their collections. Thanks to its StreetView technology, originally created to visualize the streets of the city, anyone with an Internet-connected device (computer, tablet, smartphone) can walk through the galleries of some of the most beautiful museums on the planet. Internet users can also stop in front of the stars and zoom in to better meditate. While many major museums offered virtual tours on their websites long before the Google Art Project, it is clear that the marketing ergonomics of Palo Alto proposed by the Google Art Project can provide new ideas for virtual museums' perspective. There are other programs related to virtual tours, but they are not visible like Google Art Project.

The usefulness and purpose identified from the first experience of virtual visits. The main work we have identified on virtual museums dates back to the late 1990s and early 2000s when the Internet was experiencing a real boom in industrialized countries. It was at this time that the paradigm of the virtual museum emerged. Some researchers were quick to question the ability of the latter to replace traditional museums.

Most museums are hoping to successfully develop these emerging technologies, while at the same time pointing out the limitations of these operations. This development outside the physical structure of the museum is the responsibility of the curator. However, the hypothesis that the virtual cannot replace reality has been confirmed many times in the discussion at the time and has therefore been reiterated since the development of the virtual in the museological field.

MUVA, the Virtual Art Museum, was created in Uruguay by the newspaper ‘El Païs’ in 1997. It was one of the first examples of virtual museums created at that time, offering the possibility of this concept. The lack of art facilities in the country proves the rationality of

its creation. The virtual museum is seen as a way to promote the development of Uruguayan art centers and museums. This method is based on the premise that virtual museums can help people appreciate art, and therefore can raise awareness of museums or real institutions devoted to art. The project is based on the use of the internal quality of the Internet, i.e. continuous interactive access to images and data, which are physically inaccessible to Internet users over a wide area. This original experience precedes the current virtual visit.

The museum no longer needs to be set up between four walls, it is no longer just a database: it is also an online source of information, forums, research tools and knowledge diversification - and the benefits of the museum. The virtual is interactive: anyone, anywhere, and at any time can visit any art form.

Because of the information, interaction and simultaneity that can be presented in the virtual universe, the virtual screen is complementary.

The theory of distinction or complementarity rejects the similar use between traditional museums and virtual museums conceived in the 19th century, which seems to develop slowly and proposes a distinction between uses.

3. Case of virtual museum: National Museums Foundation Rabat Morocco.

The smart museum is a space that helps to democratize access to art and culture by allowing visitors to discover the masterpieces exhibited in museums from home, from a computer or a mobile device, through self-guided tours.

The virtual museum of the National Museums Foundation Morocco allows a completely virtual immersion of the general public into the museum and the artistic universe. This experience is complemented by guided tour cycles of LIVE streaming and educational animations on social networks for all ages, such as educational games and interactive quizzes.

The Mohammed VI Museum of Modern and Contemporary Art highlights for the first time, three women artists, with three paths, via the exhibition "Chaïbia Talal, Fatima Hassan El Farrouj, Radia Bent Lhoucine: “A journey to the sources of art".

Linked by the same sense of identity, the three artists, originally from the rural area got inspired by oral traditions. Holder of this innate language of the sign linked to crafts and popular expressions such as henna, tattooing, weaving, embroidery, they are confronted almost by chance to the artistic practice through their relatives.

Accessing artistic training in a discontinuous and empirical way, they complete their initiation to color and matter in contact with artists passionate about the new art paths of the 60s and 70s. Without complexity, they have overcome the obstacle of self-taught to give birth to a "spontaneous art". They offer, in the joy of their colors and the audacity of their expressions, a truly free painting, able to transcribe on the canvas the force of morality and the fantasy of their imaginations. Moreover, all of them exercise a certain form of struggle for the emancipation of women through art.

These women artists go beyond narration towards a transmutation, a characterization of the real. If all three had a multitude of points in common, the fact remains that each of them embodied a particular sensibility and was characterized by a singular pictorial treatment. Through a hanging that confronts their views on the different themes of their repertoire of representation, three luminous paths emerge three founding imprints of Moroccan art of the second half of the twentieth century, three pioneering voices.

"Journey to the sources of art": Virtual exhibition

The exhibition is under the name of: "A journey to the sources of art", was organized from October 23, 2018, to January 23, 2019, highlighting three women artists: Chaibia Talal, Fatima Hassan El Farrouj, Radia Bent Lhoucine.

In the virtual platform, we find the multiples components:
There is an introduction to the exhibition and a biography of the three artists in question, here: Chaibia Talal, Fatima Hassan El Farrouj, Radia Bent Lhoucine, in the second, which represents more information on the pictorial space, practiced by these three women artists, then the gender scene where a description of the society, festivals, and animals in which they lived is highlighted through the colors, shapes, symbols through the canvases, and all the information likely to give more information on the paintings, among others, portrait, landscape.

The "Journey to the Sources of art" is an exhibition that pays tribute to the Moroccan female artistic expression in Morocco in the 60s and 70s through an exhibition dedicated to three Moroccan women artists from rural areas and who are considered self-taught artists, who make spontaneous expressions.

An introduction to the exhibition and a biography of the three artists in question can be found here. In other words, we find biographies, the pictorial space, gender scenes, party scenes, the bestiaries, ornament, landscape and vegetation and the portrait.1

It is about Chaibia Talal, Fatima Hassan El Farrouj, Radia Bent Lhoucine, is an exhibition that brings together almost 80 works that is divided into several themes: the first theme deals with the subject of the artistic space in these women artists, the genre scenes, the portrait and finally the landscape.

The three artists are women coming from rural world of self-taught training, they meet in the early 60s in modern Morocco in Casablanca and Rabat in particular, and will be confronted with the reality and modernity.2 The main question was: how will these women react to this modernity?

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[1] https://femmes.visite360.ma/
https://fnm.visite360.ma/exposition/voyage-aux-sources-de-lart/?lang=en

2 https://leconomiste.com/diaporama/le-mmvi-accueille-l-exposition-chaibia-talal-fatima-hassan-el-farrouj-radia-bent-lhoucine

These artists have a particular way of treating their space: Radia Bent Lhoucine, who had the idea of weaving before starting to paint at the age of 50, will treat her painting in a vertical way. It will give the impression of being behind the weaving, so the discovery is done vertically.

Fatima Hassan El Farrouj will treat her space differently with the contribution of backgrounds emanating from the scenes of the genre that will exceed the colors of polychrome paintings to become singular and monochrome scenes dyed in black and white.

Chaïbia Talal realizes in her turn a work that revolves around the individual portrait and the collective portrait, where the artist has direct contact with her canvas since she paints with her fingers to paint her scenes.

Color is the element that will characterize the totality of these women: at Radia's, we discover colors ranging from shades of pink to yellowish.

At Fatima Hassan in particular and Chaibia, we find the return of signs and symbols of her past through her culture and her life experience.

The signs in the work of Fatima Hassan El Farrouj is very present since she is a woman who comes from the Rif 'northern region of Morocco' and therefore she will present her background with the Rif culture and we will have the impression to see ceramic forms that are present in the work which is characterized by the female ceramic production of the Rif: narrative scene of her life and customs.

In Radia's work, we rather have a dominance of hunting scenes, proof of what this artist has heard since her youth, how she imagined it and all the stories she has stored inside her, thanks to what she has been told.

Chaïbia stands out mainly through her work on individual and collective portraits.

4. Conclusion

Digitization is a great challenge for museums, because in 20 years, digitization has become the visible site of the best digital technological innovation, which is contrary to the image of the traditional museum. For museum institutions, it is a key method of digital technology that forces you to serve your own discourse, narrative, and point of view without affecting the construction of meaning. It also means opposing the misconception of naturalizing culture through data and algorithms.

For museums, digital mediation refers to the virtual exhibition that seems to be fashion. A model of the exhibition with new technologies. In the digital world, we see that pages of text have been displayed in the form of scrolls or labels since the beginning of history.

Although digitization of collections has not started, visibility and centralization of collections on multiple digital devices (websites, applications) remains the main method.

From this state of the art, we note that the trend towards the personalization of content to the diversity of audiences is built as soon as the computerized databases of collections appear and are used.

Smart museums are more connected. With the arrival of the web, access to content from almost anywhere, towards the pursuit of the adaptability of devices for the appropriation of content has become feasible and achievable. In a recent article, Paul F. Marty highlights the need to give the public "(...) access to more content with as few obstacles as possible and all for free".

The computer tool is more the medium for transmitting and receiving information, thanks mainly to the use of databases. Although new modes of interaction between the museum and its public are being explored from the participatory web, they do not seem to replace or substitute for this relationship of interaction that takes place within the exhibition medium between the museum and its public.

With smart museums and conducting an analysis of the digital devices that act on this interaction relationship that can take place between the visitors themselves and between the museum and the visitors, leads us to question situations of interaction.

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