

The digitalization of cultural experiences in physical and hybrid spaces prior to covid-19

La digitalización de experiencias culturales en espacios físicos e híbridos previo a la covid-19

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ABSTRACT

Between 2020 and 2021, different urban centers around the world restricted their activities after the waves of infections and the increase in deaths caused by covid-19, from essential activities to those that allow human development, such as social interaction, recreation, and culture. As a result of this measure, pre-pandemic projects are described that have already given new meaning to physical and virtual space and audiovisual design, while standing out as post-pandemic alternatives to be reinterpreted by artists or designers to diversify the user experience in more flexible, open, hybrid and even mobile environments.

Keywords

Digital culture; digital design; videomapping; virtual reality; hybrid experiences.

RESUMEN

Entre 2020 y 2021, diferentes centros urbanos alrededor del mundo restringieron sus actividades tras las olas de contagios y el aumento en los decesos provocados por la Covid-19, desde las actividades esenciales hasta aquellas que permiten el desarrollo humano, como la interacción social, el esparcimiento y la cultura. A razón de esa medida, se describen proyectos prepandemia que ya resignificaron el espacio físico, virtual y el diseño audiovisual, a la vez que se destacan como alternativas pospandemia para ser reinterpretadas por artistas o diseñadores con el fin de diversificar la experiencia de los usuarios en entornos más flexibles, abiertos, híbridos e incluso móviles.

Palabras clave

Cultura digital; diseño digital; videoproyección; realidad virtual; experiencias híbridadas.

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INTRODUCTION

Between 2020 and 2021, different urban centers around the world restricted their activities due to the health situation caused by Covid-19. In order to reduce the number of contagions, and prioritizing collective health, daily activities were restricted (mainly those carried out in closed spaces), from the indispensable ones, such as education, to those related to human development that allowed social interaction, leisure and access to culture.

The global disruption caused by the pandemic gave rise to reflection on the ways in which different spaces had operated up to that time: allowing the attendance of large numbers of people, prioritizing face-to-face activities and direct interactions. It also became necessary to rethink the reconfiguration of the individual in relation to space and content during the health crisis.

This paper discusses some of the alternatives that were implemented by artists and cultural institutions prior to the Covid-19 pandemic. These works, installations and services offered diversified experiences to users in art, culture and entertainment through more flexible, open, hybrid and even mobile environments. Therefore, the mechanics and processes of these examples are analyzed, inviting to continue with similar implementations or the reproduction of these for future projects in the face of the new panorama brought by the pandemic, along with the already experienced digital technologies.

During this pandemic period, museums, galleries, cinemas and theaters were temporarily closed; in addition, shows, concerts and exhibitions were suspended. On this, a report published in 2021 by the United Nations Educational, Scientific and Cultural Organization (UNESCO) confirmed the vulnerability of museums after a pandemic year; in 2020 they were closed an average of 155 days, which generated an average drop in attendance of 70% and a drop in revenues of between 40 and 60% compared to the previous year (Dickinson, 2021). In this report, UNESCO gave recommendations to museums to prioritize their digital development, measures that some institutions had to comply with in order to cope with the pandemic.

Since its opening in Mexico City, "Papalote Museo del Niño" was characterized by entirely playful and participatory educational activities through physical and mechanical interaction, which meant the almost total closure of its operations during the first two years of the pandemic, since it did not foresee alternatives outside its walls, in virtual environments or additional spaces that would extend its contents. Faced with the new normality, and after 18 months of temporary closure, the museum's director, Dolores Béistegui, together with her team thought about how they could continue to communicate with the public, after understanding

the need to reinvent their activities with the support of new technologies. That is how Papalote en Casa (PEC)¹ was born (Zamarrón, 2021).

PEC was an additional service within the museum's existing website, considered as an emerging strategy that provided audiovisual workshops, narrative classrooms, articles, audios and didactic material for children, parents and teachers; all in a virtual way through a subscription. This, during the period in which its physical facilities were closed due to governmental indications. Unfortunately, as of the date of this article, this web service has no more updates and will soon be restricted, as described in the notice on the website.

The director of the Soumaya Museum in Mexico City, Alfonso Miranda, understood that the virtual world complements the aesthetic experience, and adds: "what we will continue to do in a post-pandemic world is to reinforce and reoccupy museums and public space, but we will also have an offer where virtual and augmented reality exists" (Garduño, 2021).

Years ago, Giannini and Bowen (2018) already stated their position on the characteristics² that museums should consider for the digital future based on the following:

Digital change represents a great challenge for the museum of the future, this will depend on how they integrate into the digital ecosystem and use emerging technologies, while recognizing the power of digital culture to transform human identity, behavior, states of being, digital vision, art and aesthetics (p. 178).

Recent digital technologies continue to offer experiences of interaction between media, the individual and space. Within this trinomial, the variable of space has taken on greater relevance, being able to be physical, virtual, and even imaginable³, in all these cases the individual has the capacity to navigate along diverse planes making use of immersive resources; as referred to by the French minister of culture and writer, André Malraux, who proposed the idea of creating a museum⁴ without walls, without limitations, allowing each person to form his or her own museum.

¹ For more information, it is recommended to visit the Papalote en Casa website. Papalote en Casa (2022). Main page.

² These include: an open museum; diversifying languages; rescuing public conversations; storytelling; creating experiences; collaborating with other museums, artists, and all kinds of audiences; showing processes and raising questions; sharing the stage with other actors (Giannini and Bowen, 2018, p. 178).

³ Imagined space is understood by the urbanist Lynch (2008) as: "the quality of a physical object [...], it is that shape, that color, or that distribution of mental images of the environment that are vividly identified, powerfully structured, and highly useful. [...] when it is not only possible to see the objects, but when they are acutely presented to the senses [...] Imaginability does not necessarily denote something fixed, limited, precise, unified or regularly ordered" (pp. 19-21).

⁴ His "museum" is made from the subjectivity of the one who creates it and without limits of time or space. There is no other exhibition discourse than the one that guides the taste of the one who imagines the works of his ideal museum. [...] We can create our own museum according to our sensibility. [...] Malraux proposes that each person, in the manner of an album, create his or her own museum. This idea, nowadays, makes it possible to develop in a way unimaginable at the time for Malraux the imaginary museum thanks to the great technological advances (Maestre, 2022).

Highly narrative projects stimulate imaginary activities, as Krippendorff (2000) notes, "futures are being articulated by poets, science fiction writers and dreamers. Designers can be inspired by them, but, to succeed in realizing those futures, they need to learn to articulate possible futures through their own language."

Narrative creations can be as complex and systematic as the function of their very structure. We must point out that recent media are being an important factor in this rhizomatic development, they are the extension of the individual's thought and imaginary, which rises to another category; the cultural category of contemporary knowledge. Narrative in the last decades represents a new meaning, it appeals to the emotional connection, both individual and collective, since emotions move and identify. Let us think of integral narrative models, in which we rely on cognitive and technological resources to reach levels of satisfaction, through participation, interactivity and, finally, a hybrid system (Altamirano *et al.*, 2020a, p. 106, author's translation).

The articulation described above is due to the opening of narrative variability, which according to Altamirano *et al.* (2020a) "incorporates elements that bring more complex, dynamic, diversified and subjective results through the participation of users, as well as through mechanisms that allow them to interact and link with each other under communication systems and new media platforms".

The following is a description of pre-pandemic projects, which implemented alternatives for almost a decade, in which space, virtuality and audiovisual design were redefined using digital tools. These examples stood out for being unprecedented and original, others for their content and the level of interaction they achieved with their participants, as well as the connection between space-medium-individual; above all, they dispensed with physical contact and some developed their activities in open spaces.

Streaming and web sites

Before the pandemic, some of these institutions had already begun to diversify their services through digital media, through streaming or on-demand, charging a membership fee to their subscribers, or implementing the use of digital tools within their exhibitions and activities. In 2011 the *Metropolitan Museum of Art* began to change its policy, authorized the use of smartphones in its galleries, created applications and online catalogs that regularly published photos of the museum's works on Instagram (Martel, 2015).

The following year, the *New York Times* announced the Genome for the Art World project⁵, an extensive free repository of fine art images that also offered an online art appreciation guide (Ryzik, 2012). For its part, the *Chicago Symphony Orchestra* developed its website⁶, part of a media player and radio station, which makes available

⁵ Visit the Artsy website to learn more about the project. Artsy (2022). Home Page.

⁶ To learn more about the orchestra, it is recommended to consult the website. Chicago Symphony Orchestra (2022). Home page.

to the public resources such as Making Music, a music learning guide, Ingenuity Incorporated, an arts education platform for schools, and Artlook Map, an interactive map of Chicago's art venues (Martel, 2015 p. 260).

In that same sequence, Soundbox⁷ is one of the hybrid environments created by the above orchestra, described as a small backstage room. The space features a bar and video projections on the walls that form part of the stage and precede the show. The music vibrates with strong beats and chants coming from all corners, the concept recreates a cathedral and then a clandestine club.

During presentation of experimental projects at the Electronic Visualization and Art 2018, in London, one of the panelists established a dynamic among the participants of the event, questioning the use of new digital technologies based on mobile applications within the exhibition halls of museums, with the aim of strengthening the museum content. Following this line, we propose the feasibility of taking these same technologies to the streets, that is, to public spaces that enable immediate and free access to digitized art.

Virtual Reality

According to Altamirano *et al.* (2020b) taking the works to places beyond the walls (as muralism has already achieved) can be an alternative for urban revitalization, especially in metropolitan centers. These social, economic, cultural and security actions can bring enormous benefits in the medium and long term, such as increasing the added value of the intervened spaces, in addition to a strong identity charge.

An example of this took place in downtown São Paulo in 2019, where the artist Felipe Yung "Flip", painted his work on the facades of different buildings, creating an urban aquarium that exceeds 10,000 square meters. The initiative managed to attract people to this public space, offering them a complete sensory experience, given that the project was hybrid by creating a digital application that allowed users to visualize the work from a 3D immersion and virtual reality (Batschke, 2019).

Video Mapping

Multimedia projection is a tool capable of providing significant scopes in the generation of emotions and interaction with the audience. Altamirano (2015) states that:

The new digital technologies have opened the gap and the optimization of resources through video art, multimedia installations, digital photomontage, the web, virtual worlds, video games, interactive experiences, and in general all those that use a digital audiovisual support in their production process or in their exhibition (p. 150).

In this sense, video projection or video mapping as a new tool relies on "the use of projection technologies on objects, irregular or not, on which a virtuality, video,

⁷ The Soundbox space is available for consultation on the web. Sfsymphony (2022). Soundbox.

animation or image is projected; adding an extra dimension to the real object and generating a dynamic optical illusion on it" (Barber and Lafluf, 2015 p. 283). This projection is achieved with specialized software that "maps" two or three dimensions of the object, and then, making use of other tools, controls the projection in real time.

Video mapping can also be understood from the perspective of augmented reality, which allows the user to see the real world with superimposed or composite virtual objects, that is, virtual and real objects coexist in the same space, "which complements reality, rather than replacing it completely" (Azuma, 1997). In the same sense, Manovich (2008) considers this type of tools as a new hybrid language between culture and moving image, as a mixture not only of the contents of the different media, but also of their techniques, their working methods, their forms of representation and expression, all of them, "united by the common environment of software, cinema, animation, computer animation, special effects, graphic design and typographies" (p. 5).

In 2013, the International Festival of Design and Digital Arts *Proyecta Oaxaca*, Mexico, was the space for artists and designers to present their work through audiovisual installations in a natural environment of the Ethnobotanical Garden located in the center of the city. The night performances were projected on live organic pieces, on cacti and endemic vegetation of the state, so the curatorship of this proposal emphasized the freedom of the open space, without borders or built barriers.

Another example of the use of this digital resource was given in 2010, on the occasion of the celebration of the 10th Meeting of Revitalization of Historic Centers in Mexico, and thanks to the Endesa Foundation, the Spain Cultural Center in Mexico, and the National Institute of Anthropology and History of Mexico; the Santa María Cathedral Foundation was invited to contribute its experience in the projects carried out. *Lights and Shadows in Historic Centers* was the title of the series of conferences where projects were presented that took into account the physical, historical and social characteristics of each area, respecting the identity of the cities, monuments and historic sites to enhance the identity of citizens with these spaces considered cultural heritage. The congress discussed the use and effect of artificial lighting on natural and built heritage, as well as its use and abuse, the impact of electrical and lighting installations and the incorporation of projectors as a media strategy.

On behalf of the Santa María Cathedral Foundation⁸, the technician Óscar Muñoz described the activities of the project *El Pórtico de la Luz*, in which the polychromy of the building was digitally and architecturally restored using video projection as the main tool. Since its creation in 1999, "this foundation has been committed to the restoration of this monument, which was characterized by the application of new compatible technologies for heritage conservation with compatibility criteria" (Catedral Vitoria, 2009). Therefore, concepts related to three-dimensional visualization, representation and management were part of this project.

The *Portico de la Luz* used a 3D model using photogrammetry as a basis for further development and multidisciplinary studies (Koroso & Muñoz, 2009). Thus, all

⁸ Website. Santa María Cathedral Foundation (2022). Main page.

the compiled information was digitized and linked to a cartographic model along with the creation of a Geographic Information System on the Monument (GIS)⁹; subsequently, a series of applications based on 3D mesh models were developed, which were used during the restoration process and public dissemination.

The studies on this portico involved the use of photogrammetry to create a 3D model of the interior and exterior of the Cathedral, in such a way that an exact replica of the monument was obtained, allowing to visualize the spatial distribution of each stone and the distortion of the pieces of the construction.

The model of the Cathedral was not intended to be static and immutable, because during the restoration that was carried out, the model was updated and allowed to see the evolution of the Cathedral through time. The SIM organized the information gathered about the monument, and also allowed for the planning of future interventions. Based on this practice, the Foundation promoted the creation of different applications, including: real-time applications; 3D modeling of construction solutions; graphic reconstructions of the elements to be restored; and computer photorealism (Koroso & Muñoz, 2009).

By virtue of the graphic video reconstruction, it was possible to reproduce the portico in its different periods. In this way, say Koroso and Muñoz (2009): "The team of restorers achieved the chromatic integration through the projection of lights, which corresponded to the color of the pigments and the exact chromatography of all the analyzed samples obtained from the laboratory results, including the corresponding color code in CMYK" (p. 4).

Another project similar to the one described above took place at the Carmo Church and Archaeological Museum (MAC) in Lisbon, which implemented as part of its permanent audiovisual exhibition animations and video-projected graphics in the old sacristy of the building. In this, the historical chronology was reconstructed from its construction in 1389 as a medieval Gothic convent, to the present day, which is a living museum. "The goal is that at the end of the visit, if the visitor did not absorb all the history of the building we offer this video mapping so that any doubts they have are dispelled," notes Celina Pereira, curator of the MAC (Lusopress, 2020).

At the museum, those interested can learn about the architectural and artistic techniques of national pieces in which collections of pre- and proto-history, sculpture and epigraphy, medieval and modern sculpture, exotic collections, historical library and tilework stand out. Eventually this institution developed Lisbon Under Stars in 2018, an immersive show that went on to be awarded by the BEA World (Best Event Award) as best cultural event:

Lisbon Under Stars is an immersive show that aims to enhance the culture and heritage of Lisbon. The Carmo Ruins were the ideal stage and here is born a new

⁹ Website of the Universidad Veracruzana (2022). Geographic Portal INAH-CONACULTA. Observatory of Cultural Policies.

way to experience the history of the city. Created and produced by the OCUBO¹⁰ workshop, in institutional collaboration with the Carmo Archaeological Museum [...] it is a multidisciplinary experience that mixes multimedia projections, virtual dancers and visual effects to the sound of great names in Portuguese music (MAC, 2020).

It should be noted that the building does not have any type of roof, which is its main attraction. Therefore, the night show is conceived under the open sky, as specified in the title of the project. Years ago, the opening of Melissa, a shoe store and gallery with exclusive designs in which art, design and fashion are linked, took place in Manhattan, New York. This concept store, born in São Paulo in 2005, is characterized by the use of plastic in innovative footwear models, and proposes attractive window displays using different materials. The brand works on trends and events in the capitals of the fashion world, bringing together experts, architects, designers and digital artists to set up and decorate each of its stores.

For 2012 the Manhattan branch exhibited the work of Brazilian artist Eli Sudbrack, who projected a multicolored animated video installation from the ceiling to the sub-level of the room, as well as on the back wall, which followed the existing strokes of the wall textures, creating a kaleidoscopic effect with the overlapping of colorful, psychedelic and irregular dyes, very pop style; the graphics simulated brushstrokes and strokes synchronized with the music track that enlivened the space. It is worth noting that this Brazilian brand regularly redesigns in a creative and conceptual way the main entrance of its São Paulo branch, which proposes ephemeral pieces taking advantage of the appropriate location in a public and open space, with continuous traffic, in a commercial section of the city, with a variety of products of national and international design.

The Eyebeam Center for Art and Technology, founded in 1998, with offices and laboratory in Chelsea, New York, dedicated to the exhibition of new technologies and the arts, places these as an important resource in cultural production, as well as focusing on artists by providing them with the support to question and re-imagine what technology can mean and who it is for. In 2012, the Lumarca project was exhibited to the general public, a visual montage inside the gallery where 3D information artist Albert Hwang explored the relationship between cyberspace and the human body through open codes that generated dynamic three-dimensional projections.

Lumarca was a 360 volumetric video projection by Hwang and Matt Parker, which provided viewers with three-dimensional and moving images. The installation required only synthetic white thread, a projector, Java as a programming language processor, an Xbox Kinect and a computer; overall it was an affordable realization with amazing results. The surface on which it was projected was a cubic structure with rigid edges on the inside, on its faces were stretched from floor to ceiling a series of threads vertically to form a three-dimensional screen. The four faces of the cube showed the

¹⁰ A creative and highly qualified international studio that conceives corporate and artistic events using light and technology. For more information: OCUBO (2022). About. OCUBO.

movement of the light rays emitted by the projector placed at the top and in front of the installation.

This three-dimensional model could be walked around the cube and observed peripherally. The experience was interactive thanks to the Kinect motion sensor of the Xbox and the sound resource synchronized with the movements and tonalities of the projected lights.

Conclusion

Imagining future cultural scenarios forces both creative professionals and managers of institutions that preserve and disseminate knowledge, to reconfigure the mechanics and use tools that allow the transcendence of experiential, cognitive and even playful experiences; same that provoke the observer's participation, that is, that this is part of the complementary activities of the narrative and performative concept of the project.

Contemporary expressions are based on reinterpretations and experimental proposals that open up to imaginary, fantastic, narrative and hybrid worlds. Thus, recent technologies such as video projectors, augmented reality, virtual reality, motion detection programs, lasers, geolocation, social networks and video games are ideal tools to be incorporated into design processes. However, socio-cultural institutions can continue to resort to physical or live performances, such as concerts, plays, games, conferences or any activity that allows articulating the experience of the participant in relation to the spaces of cultural dissemination.

Finally, due to the health contingency, activities that had functioned on the basis of mutual contact will represent a new challenge for artists, designers, managers and groups in charge of creative and cultural development, since they will all have to implement hybrid strategies and more diversified activities that adapt to the recent post-pandemic criteria, digitizing some of their contents, as well as creating extensions of these in itinerant environments or via streaming.

REFERENCES

- Altamirano, O. (2015). Hombre Bestia en las calles rosarinas, en F. Irigaray y A. Lovato (eds.), *Producciones transmedia de no ficción. Análisis, experiencias y tecnologías* (142-158). Universidad Nacional de Rosario. https://www.academia.edu/22718076/Producciones_transmedia_de_no_ficci%C3%B3n_An%C3%A1lisis_experiencias_y_tecnolog%C3%ADas_2015
- Altamirano, O.; Montes, W. y Sumano Sánchez, E. (2020a). O hibridismo na construção narrativa contemporânea, en R. Longhi, A. Lovato y A. Gifreu (ed.), *Narrativas Complexas* (97-108). Ria. <https://indd.adobe.com/view/898a22c8-36db-4db0-8688-75cb107e940e>
- Altamirano, O.; Montes, W. y Sumano Sánchez, E. (2020b). Mediatización Urbana: Nuevas Dinámicas de Comportamiento entre Individuo, Medios y Territorio.

- Procesos Urbanos*, 2(7), 1-10. <https://revistas.cecar.edu.co/index.php/procesos-urbanos/article/view/494/580>
- Artsy (2022). Home. Artsy <https://www.artsy.net/>
- Azuma, R. (1997). A Survey of Augmented Reality. *Presence: Teleoperators and Virtual Environments*, 6(4). <https://www.cs.unc.edu/~azuma/ARpresence.pdf>
- Barber, G. y Lafluf, M. (2015). New Media Art; un abordaje al videomapping. *XIX Congresso da Sociedade iberoamericana de Gráfica Digital 2015*, 2(3). <http://pdf.blucher.com.br.s3-sa-east-1.amazonaws.com/designproceedings/sigradi2015/70184.pdf>
- Batschke, N. (26 de octubre de 2019). Un colorido “acuario urbano” irrumpe en la “jungla de cemento” brasileña. *Ultima hora*. <https://www.ultimahora.com/un-colorido-acuario-urbano-irrumpe-la-jungla-cemento-brasilena-n2851341.html>
- Catedral Vitoria. (2009). La Catedral de Santa María presenta en Italia la aplicación de las nuevas tecnologías en la restauración del templo. Fundación Catedral Santa María. <https://www.catedralvitoria.eus/es/actualidad/1536/la-catedral-de-santa-maria-presenta-en-italia-la-a>
- Chicago Symphony Orchestra (2022). Home. Chicago Symphony Orchestra <https://cso.org/>
- Dickinson, D. (20 de abril de 2021). La asistencia a los museos cayó un 70% debido al COVID-19, dejándolos en una frágil situación financiera. Noticias ONU. <https://news.un.org/es/story/2021/04/1490762>
- Dirección de Arte. (2 de febrero de 2013). La Historia de los Estudios Pixar [video]. Vimeo. <https://vimeo.com/58794418>
- Fundación Catedral Santa María (2022). Página principal. Catedralvitoria. <https://www.catedralvitoria.eus/>
- Garduño, M. (22 de febrero de 2021). Museos de CDMX se digitalizan ante pérdidas de hasta el 70% en ingresos. Forbes México. <https://www.forbes.com.mx/noticias-museos-cdmx-digitalizan-perdidas-70-ingresos/>
- Giannini, T. & Bowen, J. (2018). Of Museums and Digital Culture: A landscape view, en *Electronic Visualization and the Arts (EVA)*. BCS Learning and Development Ltd. <http://dx.doi.org/10.14236/ewic/EVA2018.34>
- Icomos (ed.). (1965). Carta internacional sobre la conservación y la restauración de monumentos y sitios: Carta de Venecia 1964. *II Congreso Internacional de Arquitectos y Técnicos de Monumentos Históricos*, Venecia 1964. https://www.icomos.org/images/DOCUMENTS/Charters/venice_sp.pdf

- Koroso, I. & Muñoz, O. (25 de febrero de 2009). Space Throughout Time, Application of 3D Virtual Reconstruction and Light Projection Techniques in the Analysis and Reconstruction of Cultural Heritage. *International Society for Photogrammetry and Remote Sensing*, XXXVIII(5), 4. https://www.isprs.org/proceedings/XXXVIII/5-W1/pdf/arriaga_lozano.pdf
- Krippendorff, K. (septiembre de 2000). Design centrado no ser humano: uma necessidade cultural. *Estudos em Design*, 8(3). https://repository.upenn.edu/cgi/viewcontent.cgi?article=1859&context=asc_papers
- Lusopress. (30 de septiembre de 2020). Museu Arqueológico do Carmo representa mais de 600 anos de história. [video]. YouTube. <https://www.youtube.com/watch?v=NDnhw8jxyCM>
- Lynch, K. (2008). The image of the city. Gustavo Gili. <https://tallerismcr.files.wordpress.com/2015/06/kevin-lynch-la-imagen-de-la-ciudad.pdf>
- Maestre, J. (24 de abril de 2022). El Museo Imaginario de André Malraux. *Actually Notes Magazine*. <https://www.actuallynotes.com/el-museo-imaginario-andre-malraux-html/>
- Manovich, L. (2008). Comprender los medios híbridos. Facultad de Arte, Universidad de la Plata. http://fba.unlp.edu.ar/lenguajemm/?wpfb_dl=63
- Martel, F. (2015). Smart. O que você não sabe sobre a Internet. Civilização Brasileira.
- Museo Arqueológico del Carmo (MAC). (2020). Lisbon Under Stars Espectáculo Interactivo. Museu Arqueológico do Carmo. https://www.museuarqueologicodocarmo.pt/agenda_cultural/2020/08/lus.html
- OCUBO (2022). About. OCUBO. <https://www.ocubo.com/about>
- Papalote en casa (2022). Página general. Papalote en casa. <https://papalote.org.mx/papalote-en-casa>
- Rivera, J. y Pérez, S. (2017). Carta de Cracovia 2000: principios para la conservación y restauración del patrimonio construido. Conferencia Internacional Cracovia 2000. https://www.ge-iic.com/wp-content/uploads/2006/07/Carta_de_Cracovia.pdf
- Ryzik, M. (8 de octubre de 2012). Art.sy Is Mapping the World of Art on the Web. The New York Times. <https://www.nytimes.com/2012/10/09/arts/design/artsy-is-mapping-the-world-of-art-on-the-web.html>
- Sfsymphony (2022). Soundbox. <https://www.sfsymphony.org/Discover-the-Music/SoundBox>

Universidad Veracruzana (2022). Portal Geográfico INAH-CONACULTA. Observatorio de Políticas Culturales. <https://www.uv.mx/opc/sitios-interes/portal-geografico-inah-conaculta/>

Zamarrón, I. (19 de octubre de 2021). Papalote: así sobrevivió a una herida de muerte provocada por la pandemia. Forbes México. <https://www.forbes.com.mx/papalote-asi-sobrevivio-a-una-herida-de-muerte-provocada-por-la-pandemia/>