Leonardo 500 Years: Digital Experiences in Milan, Rio de Janeiro and São Paulo

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The object of this study is the impact of technology in four exhibitions held to celebrate the 500 years of the death of Leonardo da Vinci on 2019. Two exhibitions took place in Milan, Italy, one took place in Rio de Janeiro, Brazil and the last one took place in São Paulo, also in Brazil. This study aims to explore the empirical evidences found during the field research in three of the four exhibitions object of this study (one of the exhibitions could not be observed to the museum being closed as a result of the pandemic caused by the coronavirus). This study is based on references and recent secondary researches that analyzed the aspects of quantity and quality in exhibitions sites, and also on other data available on websites and in the media. This study aims to question the importance of the original work in digital exhibitions and a possibly a further extension on the word “experience” not specifically through technological immersion. Lastly, these subjects are revisited once we look at the museums amid the world pandemic.

Keywords: Ephemeris Leonardo da Vinci 500, Immersive exhibitions, aura of the original, Digital experiences after the pandemic

Introduction

The Vitruvian Man made by Leonardo da Vinci, c. 1492, shows a human body in two with his arms and legs apart and inscribed in a superimposed circle and a square. This picture perfectly depicts the idea of the man as the center of the world, representing its unity and balance with the universe. The philosophy of the Humanism along with a number of classical inspirations begins in the early stage of the Renaissance (Florentine Trecento) which marks the transition from the Middle Age to the Modern Age, when the gothic architectural style was replaced along with the paintings of the two-dimensional art. It was during this time that culture, art and erudition flourished. The university originated in the Christian tradition, from St. Andrews in Scotland to Coimbra in Portugal, from Uppsala, Sweden to the Jagiellonian University in Kraków, Poland, then multiplying across France and Italy. Some political, economic and cultural forces asserted with city-states of the Italian peninsula and market towns within the Hanseatic League (die Hanse) from Flanders to Poland, and from Scandinavia to Bavaria. Notwithstanding the epidemic of the plague, the population continues to grow and production becomes diverse with new techniques such as the press, metallurgy, sericulture, glass working and naval construction, as

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well as the tools of the first stage of capitalism, namely the bill of exchange, insurance and the specificities of accounting (Le Goff, 1992, p. 16).

Leonardo Da Vinci (1452-1519) became one of High Renaissance (the culmination of the Renaissance which occurred during 1450-1527) most important names and although he is best known for his work as a painter, specially his portrait Mona Lisa, and a sculptor, he set himself apart from other contemporary artists for his different scientific inclinations, also being an inventor, an engineer, a mathematician, astronomer, anatomist, architect, botanist and writer. Da Vinci also projected diversions for Tuscany and crosswalks in the city of Milan among his many curious works. According to the interpretation of his journals, he also invented the napkins, on 1491, when he was working for the Duke of Milan, Ludovico Sforzo. It is worth noticing, however, that the piece of cloth that was supposed to be used to wipe the hands during feasts was not interpreted correctly, since at that time the cutlery was not of use, to his disappointment, and the tablecloths were still used in that regard (Cioccarelli, 2015).

The term “Humanism” refers to the stance that emphasizes the value of the human faculties as a whole, whether it is the artistic, rational, scientific or the technologic side, although it also largely associated with the development of many field that led to the creation of the “Humanities”, which refers to creative production and subjects (such as Philosophy, History, Anthropology, Law etc.). Recently the term that was originally used in “Digital Humanities”, which comes from “Computing Humanities” refers to the field of technology that not only operates in favor of the fields of humanities but it should also be studied.

It could be argued that by the end of 2019 (the year on which this study occurred) the digital technologies have become a part of even the most trivial actions of everyday life in the contemporary time. For example, when choosing a movie, buying groceries or speaking with friends and family, technology has become a mediator of our relations. On 2020, however, there was no such thing as trivial actions but a way of survival, and technology has been used as a mediator a whole lot more.

In the last decades the digital technologies were responsible for significant changes in education, healthcare, culture and entertainment as well as museological language which is the object of study of this paper. Once we consider that main change brought by the use of technology on the twenty-first century is arguably the subjectivity of our perception of the world, it is relevant to reflect on the importance of traditional art and other objects, generally rare and/or antiques, found on immersive digital exhibitions. In the digital age, when the representation is more important than the object itself, is the original’s “aura”, specially its original art, lost in the transition? And considering the new scenario created by the pandemic of COVID-19 in which museums across the globe were closed and, in their physical stead, virtual collections took place, what is the value of the physical object?

This paper aims to study the use of digital technologies in a number of exhibitions related with the milestone reached on 2019 which contemplates the 500 years of the death of Leonardo da Vinci. Two exhibitions that took place in Milan, Italy, were studied for this paper. Leonardo da Vinci in 3D, at the cultural center Fabbrica del Vapore, and Leonardo maivisto (Leonardo never seen), at one of the city’s most popular museum, Castelo Sforzesco. In addition to these, it was also object of the study the exhibitions Alma do Mundo—Leonardo 500 anos (Soul of the word—Leonardo 500 years), at the National Library in Rio de Janeiro, Brazil, and Leonardo da
In order to translate the empirical remarks of visiting the exhibitions aforementioned, two researches regarding the audience in museums and expositions were used as a secondary source of data. The first research concerns the visitation of museums in Brazil with focus on quantity (a total of 600 participants) and quality (a total of 36 participants). The second research (with ten voluntary participants) concerns the quality of the exhibition *Modigliani Art Experience*, in Milan. Both researches were made on 2018 and had their results published on 2019.

**Technology and a New Meaning to Museums and Art Exhibitions**

Discussions on the matter of new practices regarding museums emerged after the end of World War II and became more relevant during the 1960s among movements of political and cultural democratization. It was during this period that museums began to grow beyond their main sites and towards the development of activities in the communities (Suano, 1986).

The discussions on the educational role of exhibitions and the role of museum within the spaces related to art started long before, maybe due to the need to help the public understand avant-garde in the concept of art rather than just showing it to the same public. Examples are the Museum of Modern Art in New York (1939), the Institute of Contemporary Arts in London (1947), which was inspired by the Leed Arts Club (1903), and the Centre Georges Pompidou, in Paris (1974), these which integrated both functions of a museum and a cultural center. All of these added to the debate on the role of the museum in service of the public and also its effect of restoring the urban space, a phenomenon known as “Bilbao effect”.

In the end of the 1970s, when taking into consideration social movements such as the Black Power movement, the feminist movement and the hippie movement, Huegues Varine-Bohan (French intellectual and director of the International Council of Museums from 1965 to 1974) stated that starting in the Nineteenth Century, the development of museums became primarily a colonialist phenomenon in which the European countries imposed their own views to the rest of the world and forced outsiders to view their own cultures through European lens (Chagas & Gouveia, 2014), therefore making it necessary for these people to reflect on themselves. By the end of the Twentieth Century, new fields of knowledge emerged and interdisciplinary studies became more common.

Also in the same period of time technology became more accessible and more helpful to museums in crucial matters related to cataloging and putting their collection into digital format, increasing the array of possibilities for interaction of museum practices. However, these new technological means employed in exhibitions and the role of the museum in the social sphere of the community added to the need to solve the economic issue, since the survival and sustainability of the institutions have become more difficult in face of a global crisis (Cândido, 2013).

Benhamou (2007) stated that public financing has been decreasing around the world and that private companies are less generous, choosing to invest in social programs. When taking into consideration art museums specifically, “by introducing the commercialization of related products in order to create profit, it also led to a conflict” although those were an increasing source of income (Benhamou, 2007, p. 91). A large number of
museums started to put away their less valuable or secondary works of art in relation to their main interests with the goal of making money, as well as renting collections and paintings, “which contradicts the mission of museum of lending for free” (Benhamou, 2007, p. 93). In addition to it, the demand for qualified services has increased, consequently increasing the costs for a museum to remain open when the price of the visitation ticket, which are already considered to be high, does not cover the overall costs. Therefore, it is now crucial to apply the museum equipment to new use.

Specifically, but not exclusively, in Brazil, the museums’ collections are perceived as “dead files” and museum are not visited twice since “nothing changes there” or “I already know what I’m going to find there”, as seen in the answer given in the document Museus: narrativas para o futuro (Oi Futuro & Consumoteca, 2019, p. 108). In this research fifty per cent of the participants stated that a museum is the type of place where you visit once, especially when you look at the most known. “Visit it more than once seems pointless” (Oi Futuro & Consumoteca, 2019, pp. 111-112).

In order to appeal to the public and remain relevant, it is customary for museums to open for temporary exhibitions as well as for concerts and other activities (most of these aiming for entertainment rather than the cultural value), and along with the other services provided, shops, restaurants, food courts, movie theaters etc., use such to promote and generate profit. These ephemeral exhibitions, which tend to move from place to place, usually uses digital and technological resources in order to create and immersive experience to the public. According to the research abovementioned, fifty-six per cent of the participants agree that technological tools are fit for museums1 (Oi Futuro & Consumoteca, 2019, p. 29). It is worth noting the use of virtual/digital technology have become common, including when the exhibition presents the work of a well-established painter, cases in which his/her work is valued according to the original art although the “aura of the unique work of art” have been demystified in the iconic paper A obra de artena era de suareprodutibilidadetécnica, written by Walter Benjamin in the nineteen-thirties.

Amid the industrial production, art has been heavily dominated by the general media, and artists started to use this same media for both creating and presenting their work to the general public. This phenomenon is becoming increasingly more common nowadays due to the constant changes of mass media and the brand new technologies that increase the gap between these and the artists (Santaella, 2005).

The triad art/media/technology have been used not only to expand the artistic language in the works of art and as a mean of diffusion but also to create immersive experience that separate themselves in art exhibitions, specifically those that make use of high resolution technology to present works of art made by renowned artists which can be found across the globe in different museums and find itself surrounded by hi-tech security. Meaning, these collections are both difficult to be gathered and even more difficult to move.

Among the firsts and most famous experimental art exhibitions was Van Gogh Alive, which was designed to be placed in a specific location: Arles, a small city in the Provence region in France, where the painter lived and worked, which set an emotional bond with his image. Every surface in that space was used for his work to be seen, music and smells made the experience of immersion complete, and since its debut on 2011 it became the event of biggest audience in the genre, with over eight million visitors in approximately 100 cities around the world,

1 Considering the study was composed of 600 participants and answers 4 and 5 on a 1 to 5 base.
placed in museums, cultural centers, churches or warehouses built specifically for the purpose of the exhibition, all of those produced by the same company that designed the first exhibition in Arles. Following the same path, other exhibitions such as Klint Experience, Monet Experience e Modigliani Art Experience, among others, have been displayed in many European cities.

In order to understand the impact of technology used for the immersion of visitors and subjectivity of these visitors in a digital exhibition, Carù, Carbonare and Ostilio (2019) carried out a field research at the MUDEC, Museo delle Culture di Milano, in Milan during the Modigliani Art Experience on 2018. The research was made with volunteers that have already attended another traditional exhibition of the same artist. The participants were encouraged to write a report detailing the emotions, feeling and thoughts they have experienced during the experience. The main value categories attributed to the immersive experience by the volunteers were: learning value, emotional value, socialization value and introspective reflection.

On the learning value, it was observed that the knowledge concerning the artist, his life and the historical context presented with the help of technology were appreciated by the volunteers and perceived as something of importance in order to better understand the work of the artist, and there were mentions that the more traditional exhibitions should consider using digital technologies to further the learning experience of the visitor. Images, music and other stimuli served in favor of the experience and created emotions according to the value which resulted from analysis of the research. However, some of these emotions were negative. Smells and noise and the lack of distinction from one physical space to the other forced the volunteers to move faster to the next rooms.

The socialization value seemed to be less present in this immersive exhibition, observed in the lack of interpersonal interactions and connections due to the sense of escapism that the immersion provided. Although it should be noted that the volunteers reported they felt influenced by the people that was present in the exhibit and repeated their behaviors, adding also that this would serve as an opportunity to share the experience with friends.

On the introspective reflection, the researchers observed that this type of exhibition provides a positive scenario for the visitors to relate their own life experience with the history of the artist. The digital technologies were a medium to access memories and connect events which created emotions that furthered the immersion experience, and yet, the abundance of stimuli led to a form of introspection entirely unrelated to the exhibition. At this point, the researchers found contradictory results. The immersive technologies were appreciated for its emotional and ludic value since it allowed the visitors to stimulate their senses and emotions, make them curious, engaged and rewarding. However, these technologies were believed to inhibit the immersion, limit its appreciation and change the focus of the exhibition. They found the following negative aspects of the experience. Socialization, since the immersion made visitors unaware of the presence of the others around them, which contradicts the most traditional feature of the cultural experience, the ability to further social interactions and relations, and the limitations caused by the immersion on the aspect of freedom of movement. On the other hand, the more traditional forms of cultural experience seemed to take more time for the visitors to feel immersed, and as a result technology was seen as a facilitator for this process. In spite of the negative aspects identified in this experiment, researchers believe that the traditional exhibitions should seek to combine the physical and digital tools to reach the goals of the institution.

According to Bruno David, president of the National Museum of Natural History in Paris, France:
The public goes to the museum to see real objects because they are emotional. If you visit *L’Orangerie*, you do because you want to see the original Water Lilies paintings made by Monet, not a copy. If not, you can find much better pictures in a computer in comparison with the real ones (Oi Futuro & Consumoteca, 2019, p. 64.)

The research *Museus: narrativas para o futuro* (Museums, a narrative for the future) shows that among the trends related to expectations of the museum audience are: the “real object”, the “participative subject”, the “surprise factor” and the “club museum” and in this sense “the public believes that interaction with the object is more important than the object itself” (Oi Futuro & Consumoteca, 2019, p. 77), and agrees with the premises of the post-modern consumer evidenced in Carù, Carbonare and Ostillio (2019) that the possibility for experiences is the motivation for people to go out.

But the so called “experience” could be the direct contact with the real object? The original work of art?

A growing trend in the present is that of the museum as a stage which celebrates the ephemeral, the shell, almost as if the museum becomes a celebration of the silver screen. The point is, the direct contact with the object should not be lost. (…) To look straight to a work of art, a collection. (Oi Futuro & Consumoteca, 2019, p. 88)

Alfredo Tolmasquim, content director of *Museu do Amanhã* in Rio de Janeiro, Brazil (the most paradigmatic of an example for a museum in Brazil concerning interaction) states that the new digital experiences “that facilitates the expansion of knowledge” do not undermine the emotional experience of seeing an original manuscript from 500 years ago (said on 2/28/2019), such as the manuscripts written by Da Vinci.

**500 Years of Da Vinci’s Legacy**

The celebration of the 500 years of death of Leonardo da Vinci on May, 2019 started on the year before that, with a series of thematic event, most of them in the cities of Italy, where the artist was born and spent most of his life, and France, where he died. But they also took place in different locations around the world that Da Vinci have never set foot but nonetheless were influenced by his genius and his legacy in many fields of knowledge until the present days.

During his years of instruction that took place in Florence on 1470, Da Vinci was already creating works of art which were the result of an intellectual mind that would reach beyond the walls of his home, later to not only adorn the likes of courts in Milan, Rome, Venice and all of the Po Valley but also to be known across Europe, such as in Germany and Hungary (Pedretti, 1992, p. 242). The city and its surrounding helped in promoting a number of cultural activities to celebrate this special occasion, among which stands out the exhibition *L’acquamicroscopiodellanatura: ilCodice Leicester di Leonardo da Vinci* (Water as a microscope of nature: Leonardo da Vinci’s codex Leicester) that presents the Codex Leicester (currently possessed by Bill Gates) a collection of writings by Da Vinci regarding water and his observations on the Arno River (called Leicester). It is believed that “the true Leonardo is in his codices” (Galluzzi, 2018), which consists of observation about nature and its inventions, codices that are scattered across the world now in libraries and collector’s stands. In the exhibition mentioned before, visitors could experiment the immersion by touching a digital screen that would recreate the original writing but inverted then its transcription in either Italian or English.

At the age of thirty, Leonardo travels to Milan where he worked for the next seventeen years, granted by mailing from his Maecenas (patrons), Lorenzo de’ Medici, and Ludovico Sforza, Duke of Milan (Pedretti, 1992). In Milan, Da Vinci obtained most of the empirical evidence to his research, especially at Castello Sforzesco.
Digital technology was fundamental in making it all come to fruition and celebrate the legacy of Leonardo, gathering and distributing his vast work in many countries, continents and to different audiences. In this regard, technology played a role beyond allowing an immersive and interactive experience to the public. Eike Schmidt, director of Galleria degli Uffizi, a museum that possesses four works of art from Da Vinci, claims that is not only impossible but also wrong to hold a major exhibition with borrowed works of art from Leonardo’s collection, since that would mean to expose his material to risk, instead, said material which should be preserved to the next generations (Schmidt apud Cardoso, 2018)

A Digital Ephemeris

The empirical data contained in this research began in a field observation during an exhibition in Milan on July, 2019. The first one is an interactive exhibition named Leonardo da Vinci in 3D, placed in a cultural center known as Fabbrica del Vapore (located outside the tourism zone of the city). The second one named Leonardo maivisto (Leonardo never seen), took place during a temporary reopening of a room containing restored frescoes made by the artist using a technique called trompe l’oeil (optical illusion), which had been concealed for centuries in one of the main cultural-historical monuments in the city, the Sforza Castle, known among tourists.

Leonardo da Vinci in 3D was presented as a “family-friendly multisensory experience” (Leonardo da Vinci 3D, s/d: s/p). The exhibition consisted of eight rooms that covered over 1,500 m² and had 3D presentations, holographs and augmented reality, in addition to over 100 minutes of moving images. The first room, with dim lights, showed digital images of the most famous among the works of art from Da Vinci in high resolution and organic lights, which allows the pictures to stand out and a video showing his history. Following this the exhibition is separated in rooms according to the theme, each room using an immersive digital tool. In one room, a holographic image of Da Vinci speaks with the audience. Another room shows the schematics of his machines in different perspectives, volume and motion. Other room in the exhibition shows the Cenacle (where the Last Supper took place) is projected in life-size and shows its details in a larger scale. Projections are shown in every surface of another room, from the floor to the ceiling. There is also a huge interactive book which translates to augmented reality, virtual reality headsets, among other tools used for informing and entertaining.

Although the event’s website stated that the amount of people was over 25,000 on the first month (May, 2019) during the day of the research field, there were not many visitors and it was easy to move from one room to the other and it was not necessary to wait in line to use the multimedia equipment. The researcher even reported to find herself alone in a few of the rooms. It was observed that the adults were accompanying children and the souvenir store at the end of the exhibition was targeted at the children. The language of the exhibition (audio and text) was simplistic, although not downgraded neither aimed for those of naive mind and the material kept the interest of both adults and children. It is believed that the date when the research was carried out did not encompassed the period of school visitation, since it was during the vacation months in Europe and it also occurred during the weekday when families often do not attend exhibitions. It is worth noticing that during the day of the research, there was not any visitors from other countries.

The second exhibition which was object of the research was one of the most important events of the time Leonardo maivisto (Leonardo never seen) which last eight months and took place in the Sala delleAsse which
contained an unknown and unfinished work from Da Vinci, a structure in the shape of a pergola on the ceiling and the superior area of the walls.

The castle was originally designed to serve as a fortress during the year of 1300 and it was reconstructed on the following century by Francesco Sforza (who later was nominated the Duke of Milan). In order to turn this fortress into a more pleasant scenario, some of the best architects and artists of the Renaissance were employed, including Leonardo da Vinci. Years later, following the extinction of the duchy territory, the fief sustained several attacks and was claimed by outside forces, causing the castle, and the Sala delleAsse to undergo several changes for different uses, consequently burying Leonardo’s painting under the many reconstructions. However, documents indicated that Da Vinci had previously worked in that chamber on 1498 (Milano Castello Sforzesco, s/d: s/p.)

During the many interventions, first the decor on the ceiling was revealed (although with no evidence of by whom) and it was only on 1950 when a schematic drawn by using charcoal was discovered that suggested it could be the sketch of the project for the ceiling and clearly compatible with Leonardo’s style (Sforzesco, 2019a).

Leonardo’s work turned a square room of big dimensions into a great illusionistic pergola which references with the images seen in fairy tales, represented by the arrangement of branches, tree trunks and strings at the top of the ceiling with the coat of arms of Sforza and projecting a landscape from the horizon. In addition, traces of a schematics which was also restored can be seen in one of the walls of the room “with roots that creep along the walls, a naturalistic detail consisted of great power that efficiently depicts Leonardo’s passion for the natural” (Sforzesco, 2019a).

Even after its restoration, the fresco remains worn and not visible. As a result, to prepare the room for the exhibition, a scenic presentation entitled Sotto l’ombra del moro (Under the shadow of the Moor) was shown through projections accompanied by audio narrations, depicting the virtual restoration of the fresco, alongside the remaining paintings, making the colors more vivid and capturing the details with more visible quality in order to “define a magnificent project that covers every inch of the room (…), turning it into a huge trompe l’oeil” (Art.it. s/d: s/p.). Before and after this presentation which allows the public to see the fresco on the ceiling. There is another projection on a different wall that shows the silhouettes of Leonardo and Ludovico discussing the project.

The visitation in this room was divided in limited groups of people and did not require any special ticket or reservation for the multimedia presentations. On the day the research occurred, there was a huge number of people around the castle and considerably large group of visitors inside, but not as many visited the Sala delleAsse.

From this point in the exhibition and on, other temporary smalls exhibit (or display) were presented, related with this ephemeris. One of them presented a small set of original drawings by the artist and others with holograms of Leonardo speaking with the public, sometimes speaking directly with holograms of other figures. It was noted that the public was moved by some of the original drawings but not as many took interest in the holographic figures.

During the second half of 2019, two of the main cities in Brazil held exhibitions related with the event of the 500 years of death of Leonardo da Vinci. In Rio de Janeiro, the National Library had the exhibition Alma do Mundo—Leonardo 500 anos (World Soul—Leonardo 500 years) which revisits the thoughts, and the soul, of Leonardo in two manners: with books, pictures and rare drawings from the Library’s collection and by reading
through contemporary lens the legacy of the work of the artist in different field of knowledge such as mathematics, astronomy, science and arts.

Among the works of art of the Library’s collection, one of the most important is *Divina Proportione*, by Luca Pacioli, milestone in the field of geometry during the Renaissance, which contains sixty pictures from Da Vinci of the Platonic solids (polyhedrons with the same number of faces meeting at each vertex, such as pyramids, cubes, octahedrons, dodecahedrons and icosahedrons). It was when teaching mathematics at the court of the duke Ludovico Sforza that Pacioli met Da Vinci, who was working on the fresco mentioned before. The exhibition also included works of art that are believed to be part of Leonardo’s instruction and others about the artists also considered to be rarities, such as *Le vite de piu eccelenipiitori, scultori e aschitettori*, from Giorgio Vasari, Florence, 1568.

These alone would be suffice to pick the interest in general to this exhibition, but it is believed that contemporary exhibitions should include some form of digital tool in order to distant themselves from the old-fashioned type. As a result, right at the entrance of the exhibition there are luminous panels projecting augmented digital replicas of Leonardo’s work. And not only that, but Leonardo’s vast legacy has been reproduced through many contemporary visual means, provided by different national entities.

In the field of Mathematics, IMPA (Institute for Pure and Applied Mathematics in Brazil) presented a video of Mona Lisa moving its face through motions based on mathematical principles, which would turn the figure in the painting in other forms, such as the figure of a frog. The Fractarte Institute in São Paulo presented different videos that depict fractal explosions, result of over a ten trillion signs that correlate with the end of the world as imagined by Leonardo. The Museum of Life and Science in Rio provided plastinated anatomic pieces that refer to Da Vinci’s pioneer studies. In addition, the exhibition also gathered works of art from contemporary artists that are related, each on its way, to the work and thinking of Da Vinci.

In São Paulo, the exhibition *Leonardo da Vinci—500 anos de um gênio* (Leonardo da Vinci—500 years of a genius) was held by the end of 2019 at the new Experience are of the *Museu da Imagem e Som* (Museum of Image and Sound) designed as a gallery of projections and digital interactive exhibits. This exhibition was created by the Australian company Grande Exhibitions, the same company behind Van Gogh Alive, which is still being presented across the world. A number of exhibitions to celebrate the ephemeris of Leonardo da Vinci such as *Da Vinci—The Genius, Leonardo da Vinci—500 Years of a Genius, Da Vinci Inventions* and *The Secreto of Mona Lisa*, could be found on the website of the company on 2019, including the estimated time for the first exhibition that would take place in São Paulo among other cities. On May of 2020, the website showed that the exhibition was being held in over fifty cities across the world.

Divided in eighteen themes that encompasses the work and history of Leonardo da Vinci, the exhibition that contains some of the top-notch technology for such, is completely immersive and multisensory, with digital animations in high resolution that are projected all over the public accompanied by audio narrations. It also shows machine copies designed by Leonardo, touchscreens of his codices and an analysis of the world’s most famous painting entitled “The secrets of Mona Lisa”, made by the Louvre.

In contrast with the exhibitions mentioned before, the one held in São Paulo was a success, requiring visitors to purchase tickets days in advance for specific times and dates. On March, 2020, due to the pandemic of coronavirus, this exhibition was closed.
Final Considerations

The aim of this research was to study the advantages and/or relevance of digital technologies in exhibitions as a tool for creating a bridge between the material and the targeted audience through the analysis of four specific exhibitions, in which three of them were analyzed through field research. Although the exhibitions studied were focused on Leonardo da Vinci, each one had major differences when compared to one another, and had different target audiences.

It is not questioned that the digital technologies help in connecting the material and its many forms to different parts of the world in a more accessible and economically viable way, preserving the priceless originals from the risks of transportation which may sometimes be extremely complex, as evidenced by the works of art of Leonardo da Vinci, scattered across the world as stated by Eike Schmidt of Galleria degli Uffizi. However, it is also not questioned the immense value that the original holds. While different places in the world were exhibiting Da Vinci’s Cenacle simultaneously, including in an exhibition in the city of Milan, in the very city the original was part of an exhibition that had its tickets sold out months prior to the date. In contrast, however, with the original Mona Lisa which became just a travel checkpoint, a moment simply to be captured and posted on social media, such as Instagram.

The technological resources present in Leonardo da Vinci in 3D, in Milan, were well used and in some of the rooms served to facilitate the interpretation of the intended message, as evidenced in the room dedicated to showing the Cenacle, in which the multimedia presentation that consisted of a simple technology helped capturing and explaining each detail of the fresco. Yet a great part of this exhibition could be interpreted subjectively since it brings to life, through augmented reality, digital animation and virtual reality, objects which had never been materialized beyond a sketch. As entertainment, it could be seen as interesting but it brings the questions of how much of the genius in Leonardo’s work is accurately translated to the youngsters and also, if by distancing these works of art from their historical aspect and inserting contemporary language, they lose exactly the value of their history. It is believed that these technologies could be used as a teaching resource for supervised school visitations.

In the exhibition Leonardo maivisto, also in Milan, the multimedia tool of the Sala delleAsse served to present the material in a blunt form, but it helped to create emotions through it. However, it is believed that even without the digital tools, these emotions would come to the audience regardless of the manner, since they would be exposed to the works of Leonardo da Vinci that existed for over 500 years and remained concealed, and unknown, for all these years. It is worth noting the other original works by Leonardo, although in smaller dimensions, were exhibited in glass cases in the Intornoalla Sala delleAsse, Leonardo tra Natura, Arte e Scienza (Around the Sala delleAsse, Leonardo between Nature, Art and Science), in the room next to the Sala delleAsse, which generated a lot more emotion to the audience in compared to big digital reproductions in high resolutions of the works of art present in Leonardo da Vinci in 3D, that could be seen very closely in all its details and original texture.

On the subject of the same exhibition that was held at Castello Sforzesco, the holograms of the historical figures that created the illusion that they were talking to each other did not seem to pick the interest the public. To an extent, they seemed silly when juxtaposed with the traditional art already present in the museum in their glass.
When pertaining the exhibition that was held at the National Library in Rio de Janeiro, Brazil, the most impacting moment, at least to a specific audience, was the presentation of the original and rare works of art and their connections with the life and history of Leonardo da Vinci. In fact, it should be the goal of the library to exhibit its valuable collection. Although the digital material was interesting and relevant, it did not serve to facilitate the interpretation of the message behind the works of art that were presented, even if they had a language of their own. Also the digital technology did not seem significant to engage the target audience with the content of the exhibition.

The fourth exhibition mentioned in this study that was held in the Experience area of the Museu da Imagem e do Som in São Paulo, in contrast with the others, was a huge success among visitors and sold out its tickets, requiring the visitors to purchase the tickets in advance, tickets which were expensive (more expensive than a ticket for the movie theaters of Kinoplex during the weekend. It is worth noting that the technologies employed in this exhibition had been largely promoted in the media, as well as the references to the international exhibitions that the company responsible for it had been doing. The advertisement in the urban spaces of São Paulo seemed bigger in comparison with the advertisement for Leonardo da Vinci in 3D in Milan. These factors help promote a product which is, for all intents and purposes, good. But the question is if the immersive exhibitions, specifically those dedicated to art, are becoming more and more of spectacles and that they all look alike and the formula follows the same path. When asked about the immersion of Van Gogh in the *Atelier des Lumières* in Paris, Martijn Pronk, director of Van Gogh Museum responded “it’s a great show, but it has nothing to do with the work and the life of Van Gogh”, even though Martijn states that contemporary museums should focus on the digital information (Pronk, 2019). This question brings us to Carù, Carbonare and Ostillio (2019), who we can all agree that the more traditional exhibitions should combine both the physical objects with digital technology in order to facilitate the interpretation of the content.

Considering the data of this study, it is believed that museum practices could and should have technology as mediator, but not rely entirely on it. The words “experience” and “interaction” should not be limited to the digital aspect. The “participative subject” must be part of the emotional side of the interaction.

At last, it should be noted that this paper was written during a worldwide pandemic and the consequent collapse of the economy as never seen before. Museums are currently closed and a huge part of their collections are available in social media. As for the company Grande Exhibitions, on the other hand, until this moment there has been no indication of a free experience aimed to personal devices in relation to the exhibitions that have been all across the world. Considering that on the last decades, the cultural sphere as a whole have seen its budget from public bodies decreased and the digital services becoming more expensive, it brings the question of how can museum survive in the years to come.

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