Towards a Virtual Museum of Ephemeral Architecture: Methods, Techniques and Semantic Models for a Post-digital Metaverse

Maurizio Unali, Giovanni Caffio, and Fabio Zollo

1 Introduction

The essay summarises the latest results of an experiment, between research and didactics, on the general theme of the Virtual Museum (VM) in architecture and design (Fig. 1), explaining the workflow used and the semantic models elaborated for the realisation of a prototype (called *VM5*), conceived as a thematic metaverse of ephemeral architecture. In order to summarise the main outcomes of the carried out research, the contribution has been articulated with respect to three main thematic areas addressed in the study, each treated individually by one author. The first theme—Sect. 2. The State of the Art Survey: Conceptual Map, Timeline—was elaborated by Giovanni Caffio, and summarises the project and the contents of the conceptual map and timeline realised, where the most significant works were classified, also attempting to highlight the different types of application and use of the VM. In the third part of the experimentation.

The second topic—Sect. 3. The VM Project of Ephemeral Architecture, Between Research and Teaching—was elaborated by Maurizio Unali, and introduces some of the foundational aspects inherent to the structure of the entire research, summarising the design contents that nourished the realisation of the VM5 prototype, both in compositional terms and with respect to the type of fruition experience. The main results achieved are also analysed and some possible developments are highlighted—Sect. 4. The Processing of the Workflow to Realise the VM5 Prototype, here written

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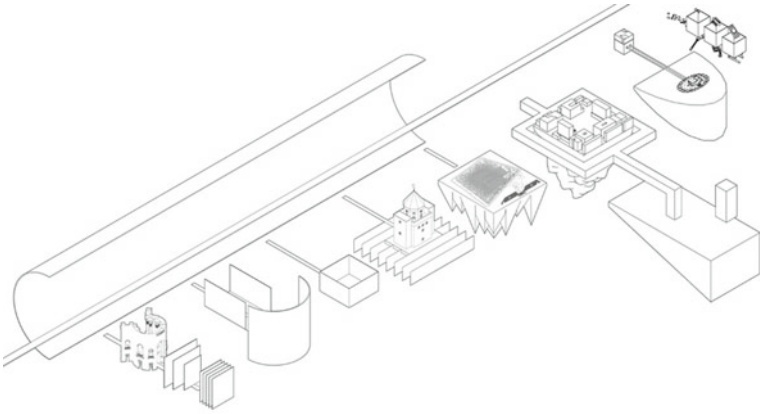

Fig. 1 Project sketch of the Virtual Museum of Ephemeral Architecture, adopted as the general composition scheme—red carpet; information videowall; exhibition pavilions—of the research carried out within the five-year degree thesis workshop in Architecture, coordinated by Professors G. Caffio and M. Unali, the Department of Architecture of the University G. d'Annunzio of Chieti-Pescara

by Fabio Zollo, the methods and techniques (workflow) used to realise the VM5 project were defined, a graduation theme of the same author, elaborated within the five-year degree thesis workshop in Architecture (a. a. 2021/22), coordinated by Professors G. Caffio and M. Unali, of the Department of Architecture of the University G. d'Annunzio of Chieti-Pescara (Figs. 2, 3, 4, 5, 6, and 7).

2 The State of the Art Survey: Conceptual Map, Timeline

The Virtual Museum is a subject of debate and research that encompasses the preservation and dissemination of knowledge and culture through digital networks. Since the late 1980s, techno-culture has been introducing developments that cross various disciplinary fields, and the Virtual Museum, as a composite and experimental digital artifact, is an ideal field of investigation. It encompasses aspects of historical culture on the one hand, and the conformative and representative dimensions of virtual living [1] and the new forms of human-digital interaction through an increasing number of technological devices.

We have collected many examples in the form of interactive timelines that can be navigated online [2]. This sequence has unfolded over the years and includes well-known authorial projects, such as the Virtual Museum commissioned by the Guggenheim Foundation in 1999 to the Asymptote Architecture studio (Rashid and Lise Anne Couture), as well as more eclectic experiences that are no less interesting or useful in projecting forward a new model of art consumption. We also cover the

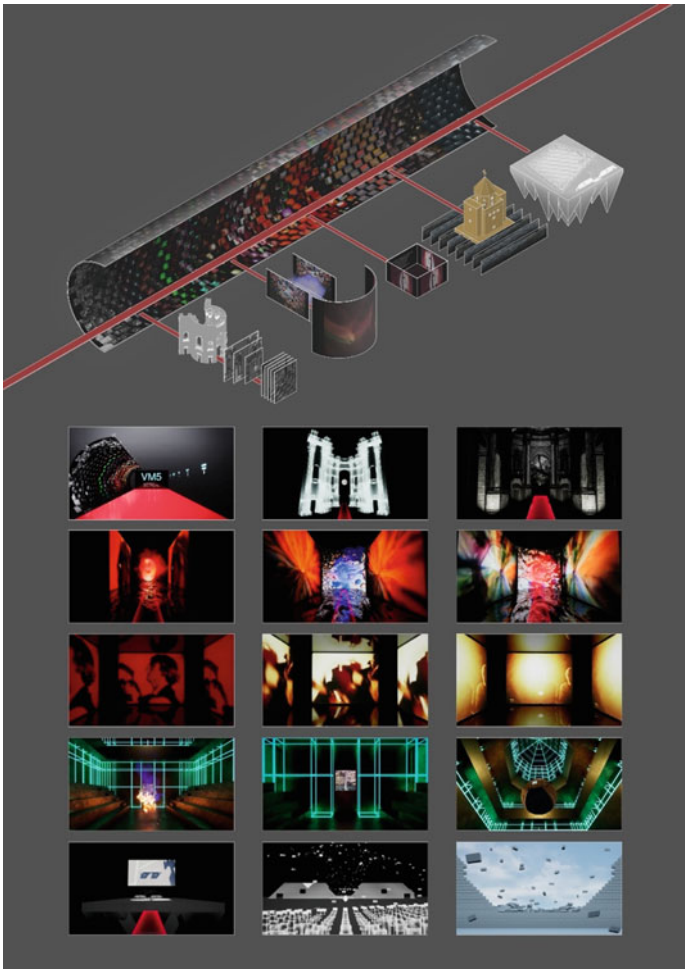

Fig. 2 Overview of the overall structure of *VM5* and views of the five exhibition halls. Five-year degree thesis workshop in Architecture: graduating student F. Zollo; relator Prof. M. Unali, co-relator G. Caffio, Department of Architecture, University "G. d'Annunzio" of Chieti-Pescara

most recent developments linked to the birth of NFTs, new systems capable of generating value through multiple series of graphic or three-dimensional digital works. The conceptual map organizes events temporally, revealing affiliations and kinship between fragmentary projects. It brings out a hidden red line within a succession of apparently fleeting and disconnected elaborations. When put in sequence, these elaborations reveal an adventure of ideas [3] that is fascinating and a harbinger of future developments.

What unfolds before our eyes is a process of transforming an idea that has always been ingrained in culture. This idea fruitfully intersects with the vicissitudes of

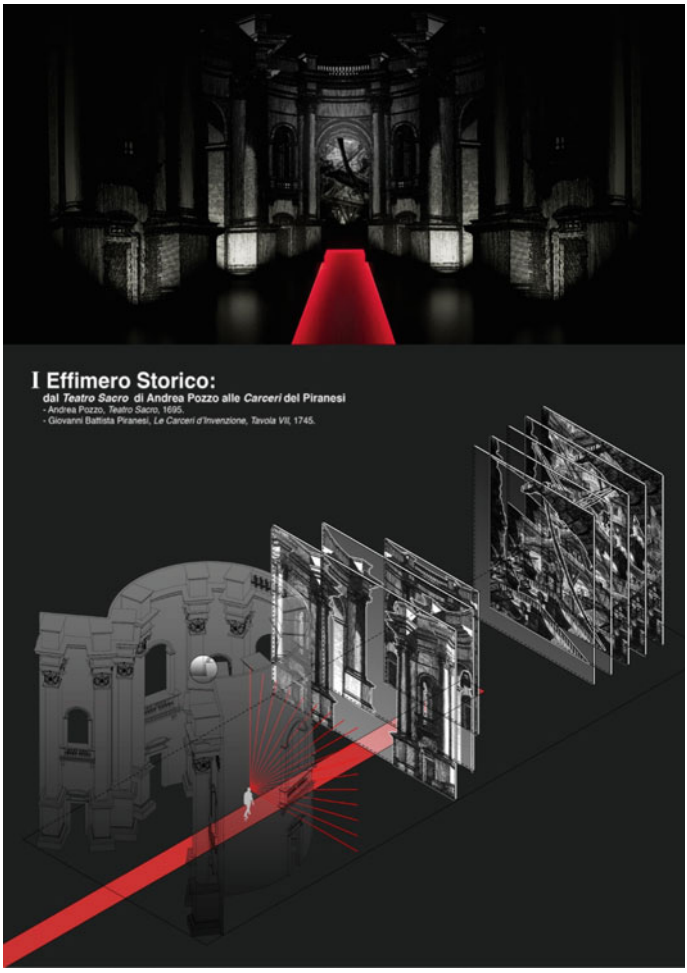

Fig. 3 Room I of VM5, Historical Ephemera: from Andrea Pozzo's Teatro Sacro (1695) to Giovanni Battista Piranesi's Carceri d'Invenzione (Table VII, 1745). Five-year degree thesis workshop in Architecture: graduating student F. Zollo; thesis supervisor Prof. M. Unali, co-supervisor G. Caffio, Department of Architecture, University "G. d'Annunzio" of Chieti-Pescara

architectural representation and constitutes a fertile terrain for freely experimenting with methods, techniques, and processes of simulation and interactive visualization. These methods allow for the creation of potential spaces in which to move and travel in the form of virtual personae and imaginative avatars.

The Virtual Museum (VM) is an ideal platform to explore the various forms of architectural and urban ephemera. It is a hub for utopian and radical projects that exist in the continuous immaterial flux of the web. The map presented here is a work in progress, useful for classifying and organizing the various manifestations of the Virtual Museum that have emerged in different years and in different technological

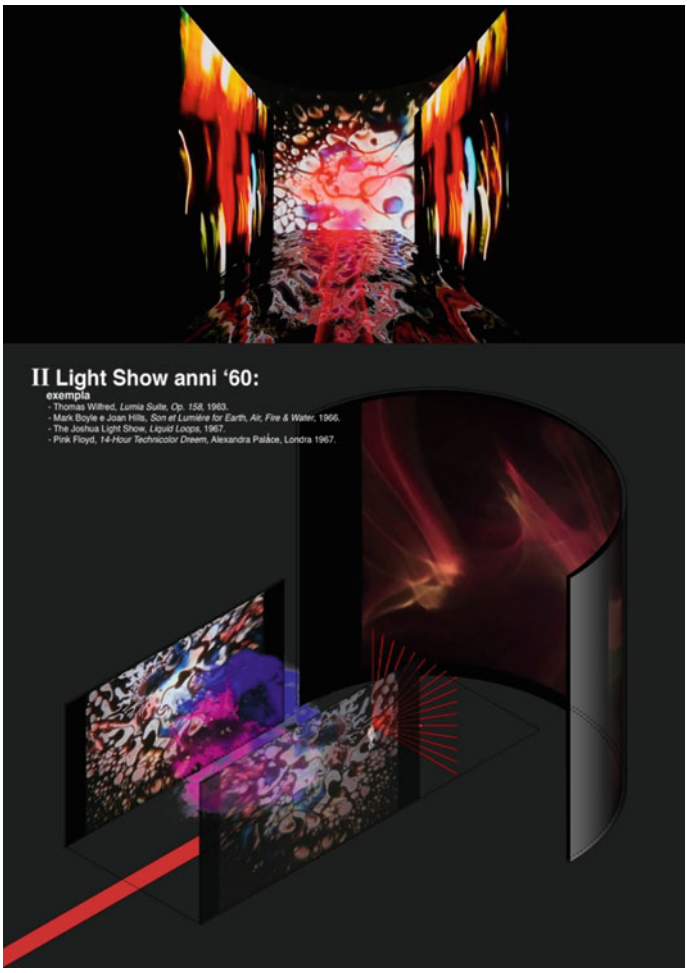

Fig. 4 Room II of the VM5, 60 s Light Show: Thomas Wilfred, Lumia Suite, Op. 158, 1963; Mark Boyle and Joan Hills, Son et Lumière for Earth, Air, Fire and Water, 1966; The Joshua Light Show, Liquid Loops, 1967; Pink Floyd, 14-h Technicolor Dream, Alexandra Palace, London 1967. Five-year degree thesis workshop in Architecture: graduating student F. Zollo; thesis supervisor Prof. M. Unali, co-supervisor G. Caffio, Department of Architecture, University "G. d'Annunzio" of Chieti-Pescara

cultures. It is a partial and incomplete selection of the most emblematic cases, based on a precise typological distinction. This typological differentiation is based on an analysis of the most frequently found cases in digital networks, resulting in a tripartite simplification: (A) digital archive; (B) virtual tour; (C) metaverse.

(A) The VM is designed as a replica or reproduction of the existing museum in the form of a website. We are dealing with a web transposition of the museum's catalogue, a sort of digital version that exploits the telematic archives and

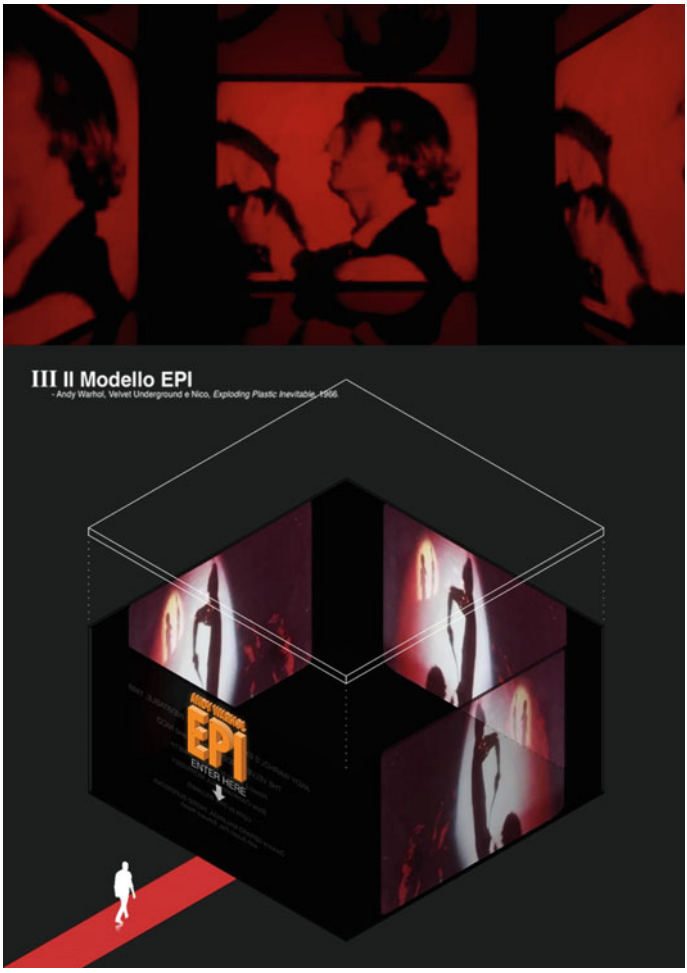

Fig. 5 Room III of VM5, Il Modello EPI: Andy Warhol, Velvet Underground and Nico, Exploding Plastic Inevitable, 1966. Five-year degree thesis workshop in Architecture: graduating student F. Zollo; relator Prof. M. Unali, co-relator G. Caffio, Department of Architecture, University "G. d'Annunzio" of Chieti-Pescara

multimedia of the new platforms to make the different contents housed in the halls and archives of the analogue museum usable. These are the first forms in which the VM also begins to appear in the most widespread publicity and thus receives its own recognisability and popularised functionality. Examples of this type are the websites of major museums such as the Vatican Museums [4] and the Metropolitan Museum of Art in New York [5].

(B) The virtual museum (VM) is a networked representation, a kind of virtual tour or digital clone of real museum spaces. The first model of the VM (website and digital archive) is extended by other possibilities for interactive exploration,

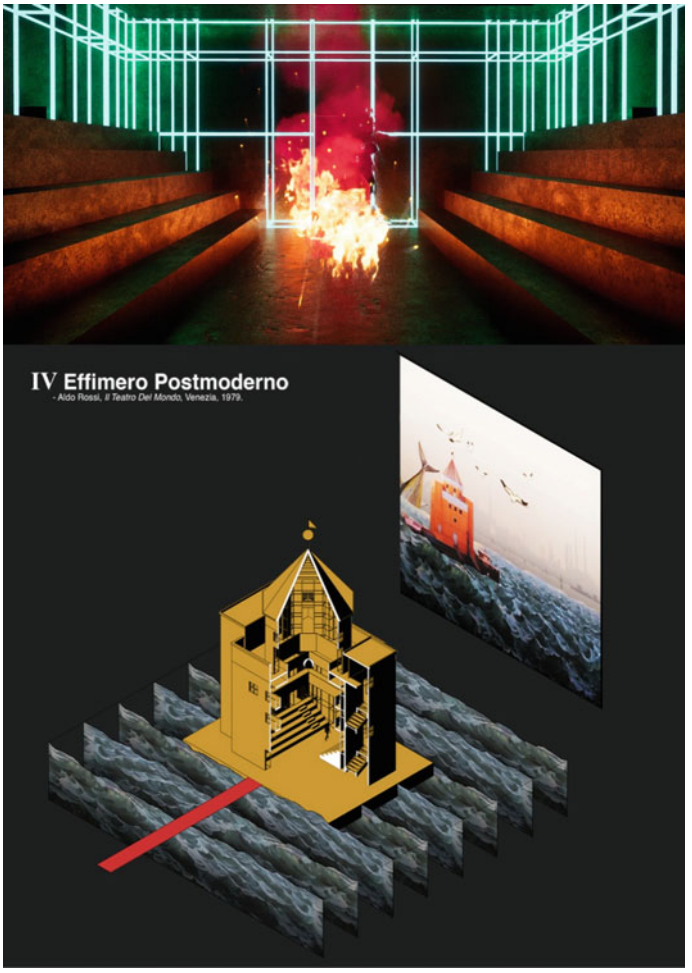

Fig. 6 Room IV of VM5, Postmodern Ephemeral: Aldo Rossi, Il Teatro Del Mondo, Venice 1979. Five-year degree thesis workshop in Architecture: graduating student F. Zollo; relator Prof. M. Unali, co-relator G. Caffio, Department of Architecture, University "G. d'Annunzio" of Chieti-Pescara

in which the museum rooms themselves become an opportunity to browse the collections. The museum is mainly rendered through the use of 360° panoramic photos or navigable photos, with systems borrowed from other fields such as the well-known Google Street View. As a result, the visitor moves between corridors and rooms, experiencing a substitute experience in which the visual dimension is prevalent. Unlike a real visit, the visitor is not sharing space and views with other users, and can see the work down to the smallest details, thanks to the high definition of the digital photos. This experience is similar to the real one, and has become increasingly popular due to the pandemic and the

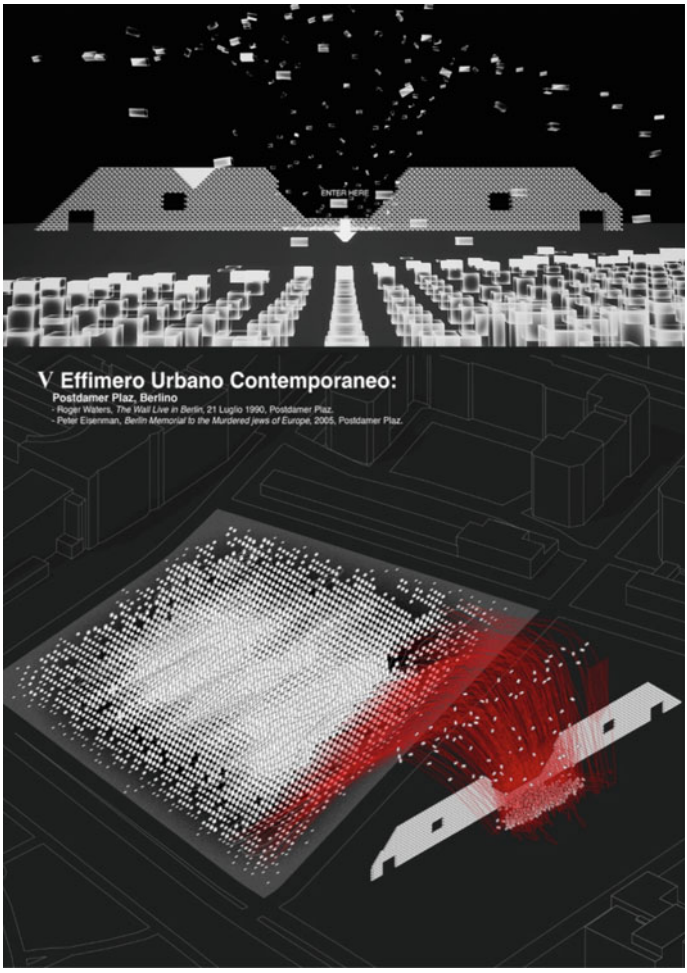

Fig. 7 Room V of VM5, Contemporary Urban Ephemeral, Postdammer Plaz, Berlin, 1990–2005: Roger Waters, The Wall Live in Berlin, 21 July 1990, Postdamer Plaz; Peter Eisenman, Berlin Memorial to the Murdered Jews of Europe, Postdamer Plaz, 2005. Five-year degree thesis workshop in Architecture: graduating student F. Zollo; thesis supervisor Prof. M. Unali, co-supervisor G. Caffio, Department of Architecture, University "G. d'Annunzio" of Chieti-Pescara

inability of people to travel to places of artistic preservation and dissemination. An interesting example of this type of VM can be found on the website of the Dalí Theatre-Museum [6], which features an interactive 3D visualization of its rooms on the Matterport platform.

(C) The last case, which is perhaps the most interesting due to the direct and synergistic relationship created between digital artworks and their hosting medium, is represented by the VM as a virtual space in its own right. This is an autonomous but virtual architectural organism that has no concrete counterpart that can be

experienced physically. These are all the experiments that arise within the digital space of shared networks, immersive environments that exploit the narrative and experiential potential of multi-user virtual worlds to host and enjoy works born and conceived to be immaterial and made by sequences of bits. An interesting example of this type of VM can be the Metaverse Arts Museum created on The Sandbox platform [7].

Given the vastness, diversity, and complexity of the Virtual Museum's potential history—with its numerous semantic, disciplinary, and techno-cultural references to the broader evolution of the concept of virtual living—we can only highlight two projects in this particular context. Though they represent only a small fraction of the metaverse's history, these works have contributed significantly to the Virtual Museum's development as a digital exhibition space through their technological, semantic, and representational innovations.

The *Virtual Guggenheim Museum* is an appropriate starting point for our study. The Guggenheim Museum Foundation commissioned this project from Asymptote Architecture, a New York studio led by Lisa Anne Couture and Hani Rashid [8]. In 1997, the Guggenheim Museum launched a major initiative funded by the Bohen Foundation [9] to commission, acquire, and exhibit works of emerging digital art. Net-art, a new and interesting branch of art designed to be exclusively digital at the time [10], stimulated major institutions in the art world to question themselves on how to exhibit and enjoy new works and how to be present and recognizable in the increasingly crowded web space. The *Virtual Guggenheim* was the first project of a major US museum in the direction of virtual space. It was intended to complement the Guggenheim's other museum spaces, including Frank Lloyd Wright's iconic building in New York, the Bilbao construction designed by Frank Gehry, as well as the Berlin and Venice venues.

The Virtual Museum directly confronts architectural venues that represent landmarks of modern and contemporary architecture. As an established presence within a world-class museum offering, it aimed to expand its scope by experimenting with new digital frontiers. The stated ambition was to create the first fully functional virtual museum dedicated to the exhibition and presentation of Net-Art and to provide an online digital archive for all other forms of new media art. The two commissioned designers imagined a fluid, three-dimensional virtual space whose characteristic spiral shape seems to be inspired by Wright's architecture. The large vortex that rises upwards to form an enveloping and dynamic hollow space seems to become a malleable band, a Moebius strip that stretches to connect bloblike and transparent semantic spaces, each specialized to house digital artworks. The thematic areas are named Artscape, Azone, Mediasphere, Virtual Architecture, and GVM Archive. Rendered through luminescent colored ribbons and isocurves, like those describing NURBS surfaces in three-dimensional modeling, they characterize the sections that are to house the unprecedented works. In other images presented as renderings, the museum's galleries appear as the result of the interweaving of meandering forms, opaque flexuous structures that intertwine with transparent fluid

blobs within which, like synthetic amniotic sacs, float spheres that allude to interactive works and performances, visitors, and artists' avatars. The entrance space to the virtual museum consists of a ramp that starts from a white podium and wraps around itself, leaving a central void (perhaps reminiscent of the wraparound atrium of the New York building), while a red mesh forms the backdrop. According to Hani Rashid, We set out to design a fully interactive computer-generated environment that would enable new ways of disseminating and providing access to complex, data-rich environments [11]. This project, though it remained in the embryonic form of a prototype, represented a fundamental moment in the culture of digital architecture. It had the ability to foreshadow forms, functions, and technologies that were not yet as widespread at the time as they are today, such as Virtual and Augmented Reality systems, parametric design, and the use of Artificial Intelligence. It also served as a bridge between the new possibilities offered by digital networks and the tradition of utopian and radical architecture.

Looking ahead 20 years, we see the Asymptote vision of digital space [12, 13] taking on various forms in today's metaverse. Mark Zuckerberg defines the metaverse as a virtual world in which the lines between the real and virtual blend together [14]. The metaverse requires a complex system of technologies: a connected network, extended reality (XR), and financial systems based on cryptocurrencies and NFTs. The emergence of cryptocurrency and NFTs is crucial for the metaverse's future because they support a transparent economy free from centralized authorization. NFTs are spreading across various industries, including architecture and design. The purchase of the digital artwork *Everydays: The First 5000 Days* by Beeple for $69 million, the first digital work sold for this amount [15], has led to the creation of digital environments tailored to NFTs. In 2021, Zaha Hadid Architects designed *NFTism*, a virtual gallery exploring new forms of cultural processing and fruition associated with digital art and virtual art museums [16]. The gallery was commissioned by the German gallery Nagel Draxel [17] and features artist Kenny Schacter [18] as curator. For the virtual spaces of NFTims, it was developed a Software as a Service (SaaS) based on proprietary MMO (Massively Multiplayer Online game) technology, integrated with audio–video interaction capabilities, and provided network and cloud-hosting services. The project applies the well-known parametric procedures used in Zaha Hadid Architects' projects around the world, hybridizing them with the needs of a virtual public that interacts with the simulated space and perceives the exhibited works through a variety of electronic devices such as VR visors, desktop computers, tablets, or a LED Wall installed at the Miami fair during the days of the exhibition. The team behind the project includes Cesar Fragachan, Vishu Bhooshan, Henry David Louth, Shajay Bhooshan, and Patrik Schumacher. In a 2021 interview [19], Patrick Schumacher outlined the objectives of a virtual architecture designer. He noted the importance of traditional architecture and the semiological profile that is linked to design questions, such as the type of space, event, and context. A virtual environment is purely phenomenological and sign design, requiring architects to focus on organization, connection, and cognition. Social meaning and protocols are important considerations, rather than the physical and technical constraints of building. Ultimately, architects must create meaningful cyber-spaces that enhance

the end-user's experience, which requires eloquent, readable, and information-rich environments. For the architect, both real and digital architecture share the same goal of guiding users to perform tasks using a particular set of protocols and signs, whether physical or immaterial, which are clear, intelligible, and simple. This vision closely relates architectural design to the design of digital interfaces, where the UX/UI (user experience/user interface) binomial is fundamental. The exhibition space consists of two communicating spaces of different shapes and colors in the parametric style typical of the Hadid studio. One space features sinuous green surfaces hosting rectangular sunken blocks that display videos by the artists in the exhibition (including Schacter, Kevin Abosch, Olive Allen, Sarah Friend, Rhea Myers, Kenny Schachter, and Theo Triantafyllidis). The other two spaces, with a circular layout, have surfaces that function as wraparound video walls displaying videos and three-dimensional images.

The gallery also showcases several objects defined as hybrid furniture-sculptures, previously commissioned by Kenny Schachter to Zaha Hadid. These include the Z-boat, the Z-Car One, the Belu bench, and the Orchis stool. Although only visible during the art fair in Miami, the digital space of *NFTism* represents an interesting starting point for the synergy between digital architecture and NFT, whose future implications are yet to be discovered.

3 The VM Project of Ephemeral Architecture, Between Research and Teaching

As part of a broader study on the conformation of Virtual Living [20] which, between research and teaching, has long involved a number of professors from the Department of Architecture of the University G. d'Annunzio of Chieti-Pescara, we present the latest results of an experiment (still in progress) on the interdisciplinary theme of the Virtual Museum in architecture and design (Fig. 1).

In particular, we would like to reflect on the workflow adopted and the semantic models elaborated for the realisation of a prototypical *Virtual Museum for Ephemeral Architecture*—named VM5 (Figs. 3, 4, 5, 6, and 7)—conceived as a post-digital thematic Metaverse [21]; a digital architecture in which to experiment, in the awareness of today's techno-cultural potential—especially in the field of artificial intelligence, VR and AR—habitable spaces in the Web through avatars.

As emerged from the survey of the history of the phenomenon—cf. Chap. 2. The State of the Art Survey: Conceptual Map, Timeline—since its beginnings in the 1980s, the interdisciplinary idea of VM, following the techno-cultural conquests of the times, has explored multiple conformative dimensions of digital space, experimenting with various visualisation systems and different forms of interaction, both in the online and offline dimension. The examples studied and included in the conceptual map created [4] have been many, from the now historical Virtual Museum commissioned by the Guggenheim Foundation in '99 to the Asymptote Architecture studio, to

the great theme of digital heritage preservation and exhibition (cf. the 2003 UNESCO Charter for the Preservation of Digital Heritage)—e.g. the exhibition *Archaeology of the Digital*, curated by Greg Lynn in 2013 for the Canadian Centre for Architecture in Montréal—up to the recent proposal of the Virtual Museum *NFTism* by Zaha Hadid Architects, a fascinating adventure of ideas emerges, which above all in representation finds the reasons, metaphors and sense of its being inhabitable space.

In this phase of surveying the state of the art of the VM idea—which is especially fundamental for didactic training—after having studied the main conceptual and visual references, the most significant works were then catalogued and classified, also attempting to highlight the different types of application and use of the realised digital architectures.

As we have already discussed in more detail in the previous chapter, we can remember, with other words, the three different types of VMs.

- The VM as a simple website of the real museum; these are the first forms of digitisation of museum centres.
- The VM as a kind of digital copy of the existing museum, represented above all by means of 360° photographic visualisation (panoramic photos), in a kind of virtual tour of the spaces and works.
- The VM as an autonomous digital architecture, a metaverse that can be explored in network space. This is a structured set of thematic environments designed for the use of digital works; interactive environments created with different media, which aim to present works and objects created and designed for virtual space.

Having thus assimilated the history of the VM in architecture and design, including its main conceptual and visual references, the design contents of the VM5 prototype were then defined, both in compositional terms and with respect to the type of hypothesised user experience. With respect to the prevailing types of VM previously noted, we decided to experiment with the third form, namely the design of an architecture explorable in FPV (First Person View).

The choice of the VM's exhibition theme is ephemeral architecture [22], temporary works that require posthumous representation-documentation projects in order to be historicised; immaterial representations that reconstruct the events, rearranging the sense of the ephemeral work, from the spatial–temporal forms set up to the performative actions.

Thus, five semantic models were designed for the VM5 project of ephemeral architecture, each corresponding to what we can call an 'exhibition hall'.

In Room I (Fig. 3), examples of Historic Ephemeral were represented: from Andrea Pozzo's Teatro Sacro (1695) to Giovanni Battista Piranesi's Carceri d'Invenzione (Table VII, 1745).

In Room II (Fig. 4), some historical examples of 1960s Light Shows were represented: Thomas Wilfred, Lumia Suite, Op. 158, 1963; Mark Boyle and Joan Hills, Son et Lumière for Earth, Air, Fire and Water, 1966; The Joshua Light Show, Liquid Loops, 1967; Pink Floyd, 14-h Technicolor Dreem, Alexandra Palace, London 1967.

In Room III (Fig. 5), The EPI Model was reconstructed: Andy Warhol, Velvet Underground and Nico, Exploding Plastic Inevitable, 1966.

In Room IV (Fig. 6) an example of Postmodern Ephemeral was simulated: Al-do Rossi, Il Teatro Del Mondo, Venice 1979.

Finally, in room V (Fig. 7) an example of a Contemporary Urban Ephemeral was simulated: Roger Waters, The Wall Live in Berlin, 21 July 1990, Postdamer Plaz; Peter Eisenman, Berlin Memorial to the Murdered jews of Europe, Postdamer Plaz, 2005.

Finally, as we will discuss in more detail in the last chapter of the essay—see Chap. 4. The workflow to realise the VM5 prototype—we proceeded to define the workflow to realise the project, defining simulation methods and techniques, and verifying the feasibility of the work in digital space.

In conclusion, at the end of this research path, designs emerged that enable new transitions of meaning on the VM theme.

Digital architectures continually fed by cultural hybridisations and aesthetic recycling, which find in the representation a profitable laboratory of experimentation to historicise the forms of ephemeral architecture, translating them into new spaces that can be inhabited virtually, even in the dimension of the metaverse, in which the divide between analogue and digital (between real and virtual) is reduced.

By also highlighting some possible research developments, we can hypothesise a new design experimentation where we can develop more immediate simulation methods and techniques that are more characterised by the recent potential of artificial intelligences.

4 The Processing of the Workflow to Realise the VM5 Prototype

After analysing the complex characteristics of architectural design in digital space—primarily in relation to the awareness of the different physicality of the project's space of action—we try to summarise the working method used here.

In this phase, we proceeded to define the methods and techniques for setting up the project (workflow), verifying the feasibility of realising immersive environments, navigable in real time in digital space.

In particular, the main phases of the set-up, script and elaboration of the VM5 project can be summarised as follows:

- Realisation of the 3D digital models of the works exhibited in the VM5.
- Digitisation of the virtual museum space and its import into the real-time 3D creation tool software (Unreal Engine).
- Importing of the digital models into the Twin Motion real-time visualisation software and exporting of the 360° panoramic photos, usable through web pages retrieved by QR code.
- Editing and post-production, from video editing to the use of sound (sound design) and special effects.

- Programming of interactions between actor (or avatar) and objects through technology level blueprints.
- Finalisation and testing of the final project.

The first phase of the work was mainly developed using 3ds Max, Autodesk's modelling, animation and rendering software. The majority of the polygonal modelling elements within VM5 were processed and produced on this programme.

Subsequently, all models were mapped using the UVW map and UVW unwrap modifiers, generating the relevant channels for mapping and subsequent texture insertion. Again in 3ds Max, the animations were processed (timeline activation), using in particular the internal 3ds Max plugin Massfx for simulating the gravity of objects.

Once the modelling was finished with the relevant mappings, we moved on to the positioning and modification of the pivots (local axes) on each element of the various models. This part of the initial process is very important, as incorrect positioning of the pivot will not allow easy movement/rotation of the elements in subsequent work steps. In this case, it is necessary to select the pivot and centre it on the object and reset XForm (Transformation) to align the spatial coordinates with the universal coordinate system.

Regarding the export of the various models, we have two distinct modes. We proceed with the export of static models in Fbx format, trying to keep the amount of polygons for each object unchanged and exporting them separately from each other. In a second step, the dynamic models are exported, in Alembic format, which will maintain the temporality of the movement in three-dimensional space; in this export mode, a reduction in the number of polygons (low poly) is recommended.

Let us now move on to the next phase of the work, carried out within the real-time render and game development software; Epic games' Unreal Engine.

First, a basic World Level was created, where all three-dimensional models were imported in Fbx and Alembic format. The models were subsequently textualised, and in some cases animated video-textures were created.

Once the various models were inserted, the goal was to make the VM5 visitable. This is where the Collisions Complexity comes into play, which allows, when entering the VM5, to cross or not cross certain geometries.

At the same time as the work on the Unreal Engine, certain spaces were experimented with in Twinmotion, a real-time rendering software (also developed by Epic Games), especially for architectural visualisation.

This experimentation was done in order to realise panoramic images of certain works within VM5, which are subsequently uploaded to a 360° visualisation platform and then inserted into Unreal Engine via links.

Now let's delve into what is defined as the editing and post-production phase of the visual parts to be inserted into VM5, here in fact the graphic and audio/video components realised for the project come into play.

Textures and images were processed in Adobe Photoshop and then exported in PNG format without background. The audio/video components, on the other hand, were designed and processed in Adobe Premiere Pro. After a process of image construction and composition, video and audio editing, the export in mp4 format

takes place. All this will then become textures/videos, environmental audio and images in succession that will characterise certain exhibition spaces through various software processing (Adobe Premiere Pro).

Once all the necessary components for the realisation of VM5 have been imported into Unreal Engine, the programming part of the museum events takes place. This process is carried out via a code writing language (converted into a graphic visualisation) called 'level blueprint'. On this interface, all interactions between actor (avatar) and exhibition space are written and linked. Through the insertion of Trigger Boxes (volumes of interest) located within the model, it is possible to trigger these events and interactions with the surrounding virtual space; the passage of the avatar in these areas triggers all interactions (event begin overlapping).

The last phase of experimentation is dedicated to the finalisation and testing of the various components of VM5. During this process, it is verified that all interactions and collisions are in synchrony with the actor (avatar), paying particular attention to the three-dimensional physical components, animations, audio/video components and lighting. In the light of the experimentation carried out and with respect to the recent innovations offered above all by artificial intelligence software, it seems necessary to update the workflow described here and to discover further potentialities of architectural design in digital space.

5 Conclusions

At the end of this phase of research on the general theme of VM in architecture and design, which is the result of a broader study program on Virtual Living, the experimentation provided many data and interesting critical insights that we can refer to two foundational themes, which are closely related to each other: methods and techniques of representation and shaping of spaces, and the design of immersive thematic environments for digital living.

The first topic, which is often noted, belongs to the techno-cultural order and is part of the history of the science of representation. Specifically, it concerns the evolution of systems of visualization, simulation, shaping and interaction of a space inhabited through avatars, and immersive environments capable of broadening the idea of the Museum. In this dimension of design, the complex relationships between representation and techno-culture of one's time are also expanded, as well as a mirror of the different socio-political contexts of reference; an interdisciplinary thesaurus of knowledge that can also become a valuable shaping medium for the project.

Thus, the main foundational themes of the second topic emerge, which is the representation project of digital space. This topic is fueled by the creative role of the VM project, which is designed here, in particular, to elaborate the poetics of the ephemeral in architecture. This is a complex aspect that is always approached in continuity with the historical immaterial, virtual, ideal, utopian, and radical design of architecture.

This project, which is between research and teaching, is still open. In the current post-digital context, we hope to propose it as an active proposal to set up shared spaces to inhabit in the network.

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