THE VISUAL BRIDE: REPRESENTING TANGIBLE HERITAGE BETWEEN DIGITALITY AND REAL CONTENTS

Stefano Brusaporci
University of L'Aquila
Department of Civil, Construction-Architectural and Environmental Engineering
stefano.brusaporci@univaq.it

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Aim of the paper is to reflect on the visual relationships between the digital heritage from real contents and its tangible reference. First of all the paper analyses the evolution of the Culture in relation to the growth of digital technologies. Then it highlights the role of visual perception and communication. Consequently, it focuses on the nature and characteristics of digital models, intended as complex meta-systems of information. Finally, it points out the multiple dimensions of tangible and digital realities, and how advanced visualizations favour a reciprocal re-mediation.

The title of the paper paraphrases the one of the well-known essay "The Mechanical Bride" (1951) by McLuhan. It was an anthropological reflection on how the tele-vision medium influenced the culture and related behavioral models. Many years have passed, and subsequent cultural and technological revolutions have influenced the way of living and thinking, perhaps even more pervasively, according to a line where the "Digitality" –using the wording diffused by Negroponte (1995)– has certainly constituted a substantial turn. The so-called "digital culture" cannot simply be referred to a discrete data systems or to the use of computers, but to a universe of experiences: technological aspects, virtual processing, forms of instant communication, social media that in a global and ubiquitous way define a large part of our life (Gere, 2002, p.11).

From the 60s, the technological innovations in data transmission, visualization and development of computing capabilities have focused attention on the dimensions of "Virtual Reality" (Sutherland, 1965). Often this term is used in opposition and in alienation from the Real: VR is both an enthusiastic and dystopian vision where the cyberspace enhances our potentialities, and compresses space and time in the "immediate use" of the information. In particular, following the diffusion of personal computers and video games between the 70s and 80s, the "Virtual" has become a trend topic, even in popular culture, as evidenced by the numerous publications on this subject (just to mention a few publications Krueger, 1991; Rheingold, 1991; Benedikt, 1992). In parallel, on an opposite but conceptually related front, there are the experiences of telepresence based on remote sensing and data transmission, where the operator interacts with a reality located away from him, through a two-way virtual repetition (Fisher, 1985).

Meanwhile, cultural considerations on possibilities induced by the Digitality have been developed in many fields (Barret, 1992; Feenberg & Hannay, 1995; Floridi, 1999; Ware, 2000). The reflections on how the "Digital"

re-medializes the communication processes are of particular interest, according to new and multiple multimedia, multidirectional, non-linear, interactive, and ubiquitous communication modalities (Murray, 1997; Bolter & Grusin, 1999; Manovich, 2001). Virtual Reality, Telepresence, Augmented Reality blur in new advanced ways of representation. The term "Mixed Reality" – created by Milgram and Kishino (1994) to describe the different states that digital representation can take in the "virtual continuum", according to six main states between the "only real" and "completely virtual environments" – gains more and more importance.

Unthinkable new dimensions of ICT and A.I. Artificial Intelligence boost the potentialities of The Internet, so that smart devices immerse us in a constant and ubiquitous on-line state (Floridi, 2015), where computational barriers are almost canceled, and "Participatory Culture" expressions take on central importance (Jenkins, 2006; Jenkins, 2009). In particular Jenkins (2009) highlights how the questions posed by participatory culture are essentially cultural issues and not merely technological ones: "The importance of culture's complex relationship with technologies is why we focus in this paper on the concept of participatory cultures rather than on interactive technologies. Inter-activity is a property of the technology, while participation is a property of culture" (p. 8). The processes of collection, digitization, sharing, remediation, processing of data and information favor forms of "Collective Intelligence", based on a multitasking cognitive approach. Follows that the culture-making configures no more like a linear process but as a complex evolving discourse. In the networked society, consumers have become active content producers, according to new kind of media (Lévy, 1994). It is the so-called "Second Digital Turn" (Carpo, 2017) which involves both the tangible and intangible sphere: trade, industry, tourism, culture, everyday life. Where the user becomes the

protagonist and the digital production individualizes the products.

The above mentioned scenario might seem to outline what described by Baudrillard (1976), with the reality under the threat of simulations: the "Hyperreality" as a re-duplication of the Real, where the Real at the same time evaporates but also becomes stronger in its own destruction, in a fetishism of lost objects, in an ecstasy of negation, in an overall loss of meaning. But in our Post-Digital age, despite the pervasive, instantaneous and ubiquitous applications of VR, AR, and ICT, the "new spectacular" by Virilio (1993) does not seem to have had the predicted extreme nihilistic outcomes, although not denying the fact that we are often "overexcited" "victims of the scene", because visualization technologies influence our culture, our way of thinking and acting.

Perhaps what has already been predicted by Baudrillard in the title of his work ("L'echange symbolique et LA MORT") has come true: the closed and self-referential system of Hyperreality died, because it imploded, killed by the disenchantment of post-modernism. The emptiness made by the Hyperreal around the Real has been filled by an ontological return to the "physical" and to the "material". It is the philosophical line of the "New Realism" (Ferraris, 2011): without prejudice to the lesson of post-modern and hermeneutics, it focuses on the observation of reality as an effective presence, based on a re-evaluation of the role of Perception: "In a certain sense, the function of perception is similar to the falsification in Popper, only that here it performs an ontological function and not, as in Popper, an epistemological one" (Ferraris, 2012, p. 154). The perception is proposed as representative of an "external" with which the viewer has to confront.

Moreover, a constant re-appropriation and re-valorisation of the "Visual" seems to outline the whole technological growth. Many times during centuries, media renewed the relationship between people and "images",

but today digital technologies profoundly influence it (Mitchell, 2017. Purgar, 2017). It is the "pictorial turn" (Mitchell, 1994) that does not oppose a visual paradigm to a verbal one, but considers their semiotics in a consubstantial way. There is a change of perspective in the visual disciplines according to a re-thinking of the postmodern "linguistic turn": an "iconogical" parallel reading of "images" and "logos", in a non-conflictual interpretation but in a cohabitation (Mitchell, 1986) of "mixed media".

Fig. 1 S. Giovanni Battista Convent in Lucoli (IT). Digitalization of the architectural complex.

This long introduction is useful to frame the theme of Digital Heritage from Real Contents (Nofal, 2019). The "Charter on the Preservation of the Digital Heritage" (UNESCO, 2003) ratifies the role, dignity and importance of digital tools and methods in the creation of cultural heritage at the international level: "The digital heritage consists of unique resources of human knowledge and expression. It embraces cultural, educational, scientific and administrative resources, as well as technical, legal, medical and other kinds of information created digitally, or converted into digital form from existing

Fig. 2 Exploring the point cloud.

Fig. 3 Surfing between raw data.

analogue resources" (Art.1). Unlike Stone's (1999) definition of "Virtual Heritage" – i.e. "the utilization of technology for interpretation, conservation and preservation of Natural, Cultural and World Heritage" –, in the Charter the Digital Heritage tends to assume an independent connotation and value. Focusing on digital heritage from real contents, the digital objects assume a new meaning of "real", "but conceptually this meaning derives from the active relationship with the physical content, from which it derives. In this kind of digital heritage, there is not visualization without a prior reality and, in a philological study of a digital model, we cannot forget its real reference from whom it is born. Therefore, the issues related to data and information grow to include the relationship with

history and materiality" (Brusaporci, 2017a, p. 56).

In general, Digitality roots on hypertexts, that is on network open systems of delocalized information grains, instantly accessible, where the concepts of unity, identity and localization vanish. This involves new ways of fruition where the act of "reading" merges with "writing", because it consists in traveling freely over the hypertext, each time giving rise to new systems of signs and to new interpretations: the meaning of the text emerges from the intersection between a de-territorialized semiotic plane and the line followed by the reader. But in the Built Heritage we have a material constraint: the "hic et nunc" of the Real. In Built Heritage, there is not visualization without a prior reality (Ch'ng, Gaffney, & Chapman, 2013; Ch'ng, Cai & Thwaites, 2017), and in a philological study of the model, we cannot forget its real reference from whom it was born.

Focusing on the topic of Built Heritage, in particular archeology immediately interested in the subject of 3D modeling as an effective tool for virtual reconstruction and research methodology (Forte, 2000; Forte & Siliotti, 1996; Frischer, 2008; Forte, 2008). From these experiences rises "The London Charter" (2009), addressed not only to archeology but to all disciplines interested in 3D models from tangible heritage. Fundamentally, it is aimed at defining the principles of scientificity and validation in the virtual reconstruction of cultural heritage, where the concept of Transparency and the use of Paradata are references for the philological analysis of the digital models, referred to the real findings or documents (Bentkowska-Kafel, Denard & Baker, 2012).

More generally, an interesting dissertation on the concept of Built Digital Heritage is presented by Pescarin (2016) which analyzes the wording "Digital" + "Heritage" in the light of "Digital Heritage Congresses" experiences. She points out : "Which trends can be recognized, looking at this overlapping area, which is Digital Heritage, through presented projects and demonstrations? One of the first element to appear is

the position of the 'human dimension', considered more and more a key element. Heritage professionals necessities are better taken into consideration, from digital projects early stages; end users, such as visitors of museums, tends to be involved in some cases during the planning phase. The 'wow' effect of ICT technologies for heritage researchers, practitioners and curators is now diminishing, while the sustainability of digital projects and their effectiveness as referred to a specific goal, in constantly increasing. The role of design and co-creation is emerging [...], filling the gap among audience,

Fig. 4 Palazzo Camponeschi in L'Aquila (IT). The 3D model.

developer and heritage curator. The role of 'narrativity' is also considered as important as the coding, for the success of a digital heritage project [...]. Mixed digital outputs (i.e. serious games including short movies, VR immersive applications that includes passive and active moments, etc.) are experimenting different levels of user interaction and involvement, while trying at the same time to find and define new communication styles and approaches, since the traditional proved to be unsatisfactory [...]. Finally, most of the projects have demonstrated a high interest toward the quality of user

involvement, a topic currently under investigation from different perspectives" (p.3).

Moving to the field of architectural heritage, 3D scanning tools and advanced modeling programs have encouraged reflections on modeling as intruments for visualizing, enhancing, designing, and enhancing new methods of analysis (Chiavoni & Filippa, 2011; Brusaporci 2015a; Brusaporci 2016). In a peculiar way, the AEC sector holds two important revolutions: the one of Building Information Modeling – HBIM when referred to historical buildings (Brusaporci, Maiezza, Tata, 2018a; Mingucci et alii, 2016) –, and the one of parametric modeling related to visual design (Brusaporci, Maiezza, Tata, 2018b; Calvano 2019). The issues of Transparency and Reliability of the model with respect to the real referent are essential, according to both metric-informational and conceptual issues (Brusaporci, 2017b; Maiezza, 2019).

With reference to the Architectural Survey, the traditional surveying process changes: the digitization phase is anticipated and the critical interpretative processes are translated into the post-processing (Docci & Maestri, 2009; Gaiani, 2012a; Bianchini, 2014). Above all, the nature of the restitutive

e graphic changes substantially: the digital model configures as an information system, primarily of a spatial nature (3D model), but also of material, historical, construction, economic nature. In short, the model becomes a spatial platform for database management. As our relationship with technology changed over the years, so the relationship of the modeler/user with the digital model is changing: no longer a cultural and aesthetic interest in images of simulacra, but an "anatomical" attitude to the system, an "obscene" X-rays look to the complexities of data interactions and information. In this way, the gaze moves from the observation of synthesis render to the interactive working interface, where models are processed, where there is a live interaction with and between users and computers. In this place, data becomes information, and information becomes

knowledge. This is the place of the "master model", where the model is computed through graphic systems. In this sense the master model is a "Meta-Model" of information from which to derive infinite multimedia views (Gaiani, 2012b; Brusaporci, 2015b). It is a truly "Virtual" digital model in the sense of Lèvy (1995): starting from a reserve of initial data, from a model or from a meta-text, an infinite number of events can be processed, always different depending on the situation or user demands. On the display, the user experiences the new plasticity of the re-mediated text, through a selection, re-edition,

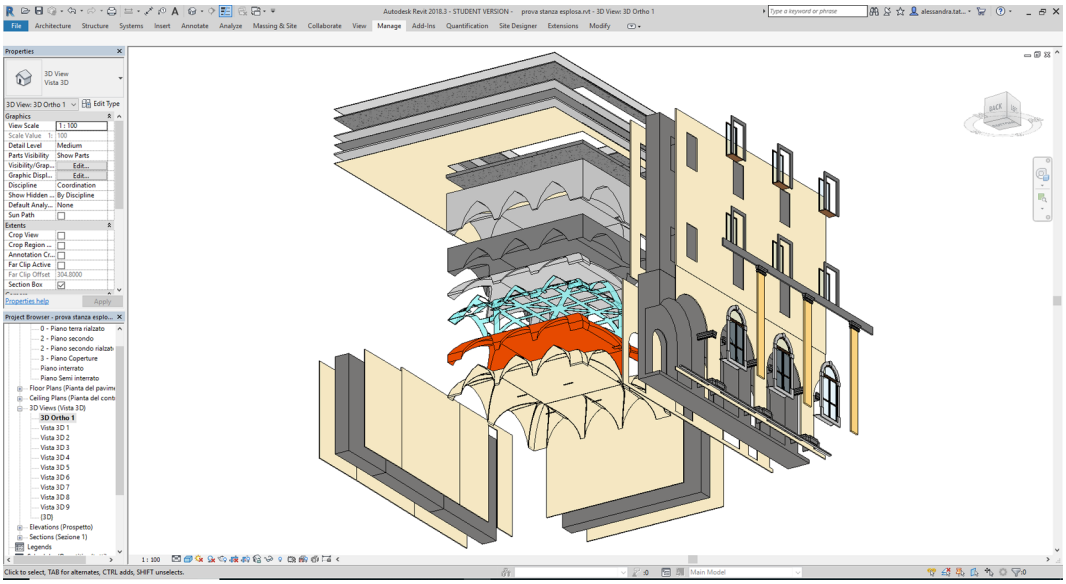

Fig. 5 The HBIM model.

and re-processing of information. Therefore, we have a concept of Virtual not as schematic opposition between the "Real" and the "Other", but "Virtual" as actualization and resolution of a problematic field. And in this game, a non-secondary cultural role is played by users who interact each other (Brusaporci, Maiezza, Tata, 2018c). In de digital representation field, the effective and final restitution is the interpretative critical meta-model, and not the individual and ephimeral static rendering.

Fig. 6 San Basilio Square in L'Aquila (IT). Visualizing the historical reconstructions in Augmented Reality.

The reflection on the concept of "Meta-Model" combines with the potential offered by Augmented Reality applications offered by ICT: through visual devices, information is superimposed in transparency on reality, that is on the direct vision of the observer, in the moment of the experience itself. There is no deception: the observer has clear that the digital image is different from the material world, it is information that accompanies the "Physicality". An addition, an informative enrichment, but in the absolute ontological respect of the Reality itself. There is no contact, the Reality is not altered in its materiality, but in its mediated through the image. The concept of avatar changes: the user does not alienate himself in another-self within a synthetic environment, his feelings are not artificially produced as in VR. The user interacts with the real world: it is not correct to say that the user becomes the concept of avatar of himself but rather the avatar no longer makes sense to be. On the contrary, in a certain sense, there are the avatars of the physical objects, that is they are partially virtualized through AR visualizations, but in the sense of Lévy (1995): they acquire a "poten-

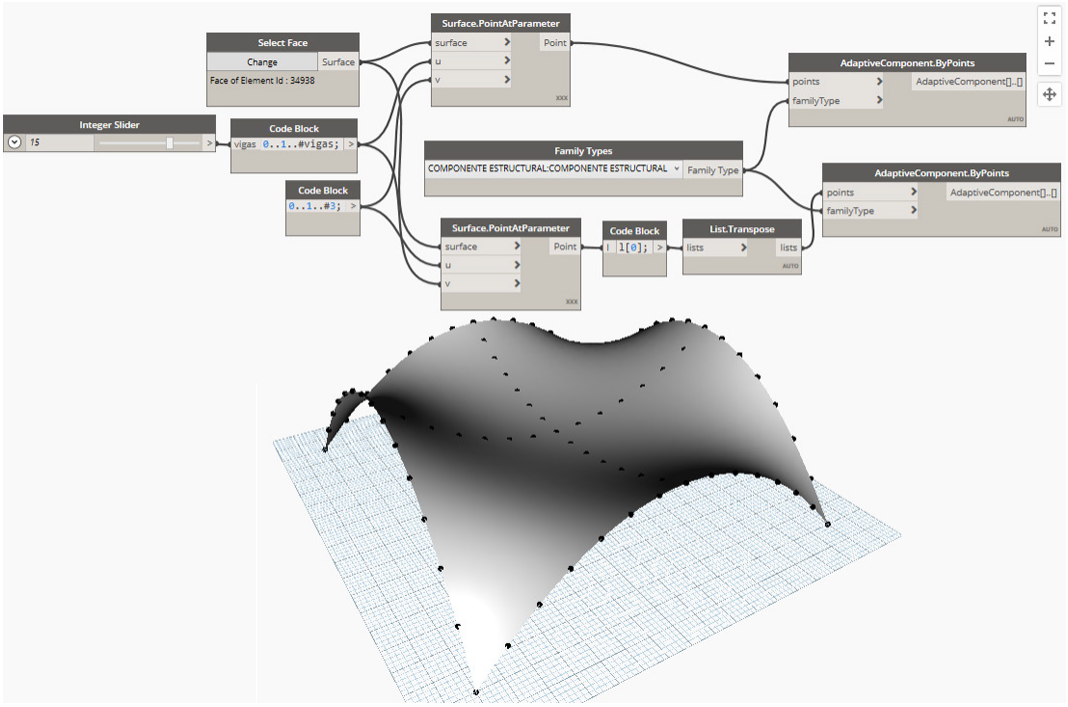

Fig. 7 Visual Design. Modeling a vault.

tial" in each specific visualization. There is a marriage between digital reality and tangible reality that occurs in the field of the image (Brusaporci, 2018; Brusaporci, Graziosi, Franchi, Maiezza, 2019; Brusaporci, Centofanti, Maiezza, 2017; Ch'ng, 2019).

Maybe this situation may look as dangerous as the one preconized by Baudrillard, but in the post-digital age, for the digital natives (Prensky, 2001), the ontological game is with cards on the table: there is no doubt about what is digital and what is tangible. Both of them are Real. Certainly there could be critical issues, even related to the "wow" effect – that is the fascination of the spectacular – especially related to the continuous technological innovations. Even if, as the generations go by, people are by nature ever more used to surfing among the different visual manifestations of the Digitality (Jenkins, 2007). We recall the concept of "Uncanny Valley"

(Mori, 1970), concerning how the feeling of familiarity aroused by anthropomorphic robots increases as their resemblance to the human figure increases, but at a certain point the human likeness produces a sharp drop in emotional reactions with unpleasant sensations and repulsion; this accentuates if the humanoid has the ability to move. Mutatis mutandis, reflecting on digital visualizations, in today's "pervasive digital visualizations", the disturbing element would rise by the excess of photorealism in VR that the user knows is not from reality. Moreover, it could be also induced by the perception of "too human" interactions given by A.I., that is – similarly to Mori's moving humanoids too similar to real people not only in the aspect – the disconcert could be provoked by an A.I. too insolent in its consciousness of "humanity" and "inhumanity".

In any case, the perception of Reality (once again we remember the "New Realism") is pivotal. The very problem is the relationship between the images of tangibility and the images of the digital model – images of the model both as a final product and as meta-model –.

In conclusion, Tangibility and Digitality are both visual expression of different realms of reality. The digital model, in its manifestations, works for a re-mediation of tangibility: it is a restitution of the tangible content, where the interpretative model elaborates information in a visual way, but images have to be compared with the physical reference from which they rise and on which they are rooted. In this marriage, like a wedding dancing, the tangibility come back to re-mediate itself through digital images.

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