Architecture and Cyberspace: Reciprocal Spatial Contamination

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Abstract

Fascinated by the possibility of designing the world, human being has always searched for tools to mediate this process. Cyberspace became one of this tools. Virtual technologies associated to communicational technologies are changing human's cultural, social, and material context, consequently changing the idea of architecture itself. The decreasing material content of our activities and their increasing perceptual, communicative and cognitive contents are drawing a new framework to our spatial experiences. Objects, spaces, buildings and institutions can now be constructed, navigated, experienced and manipulated across cyberspace. The particular focus in this paper is to discuss the architectural aspects of the Virtual Architectures (VAs) and an initial framework for its design.

Resumo

Fascinado pela possibilidade de projetar o mundo, o homem tem se lançado na busca por ferramentas que mediatizem este processo. O Ciberespaço se tornou uma destas ferramentas. Tecnologias do virtual associadas as de comunicação estão mudando o nosso contexto cultural, social e material, consequentemente alterando a própria idéia de arquitetura. O decrescente conteúdo material de nossas atividades associado ao crescente conteúdo perceptivo, comunicativo e cognitivo das mesmas, têm gerado um novo contexto para nossas experiências espaciais. Objetos, espaços, edifícios e instituições podem agora ser construídos, navegados, experienciados e manipulados através do ciberespaço. O foco particular neste paper é discutir aspectos arquitetônicos das Arquiteturas Virtuais (VAs) e esboçar um quadro inicial para sua projetação.

1. Introduction

The use of cyberspace (understood as a spatial metaphor for the globally-interconnected set of computer networks) is changing the architectural matter. Our aim in this paper is to present the first steps of an ongoing project research about the reciprocal contamination between two spatial realms: the physical space (architecture) and the virtual space (cyberspace and its virtual architectures). The biggest challenge is to define a methodology to identify and analyze (qualitatively) this reciprocal contamination. The difficult relies on the necessity to establish a framework to design virtual architectures, identifying their vocabulary (architectural elements) and spatial grammar in order to draw analogies (maybe in function, maybe in form, maybe in symbolic content, etc.) with those of the physical architectures.

2. Architecture and cyberspace: vortex of perceptions, meanings and transformations

William Gibson (Gibson, 1984) - novelist who coined the term cyberspace - had already recognized some architectural possibilities of cyberspace. He borrows some metaphors from reality in order to describe the spatiality embedded in cyberspace, giving to Case (his central character in *Neromancer*) the possibility of seeing the real world as mimicking cyberspace. The world of images and forms circumscribed by architecture (physical and virtual) reflects values that go beyond the instrumental boundaries of the designing process: it reaches psychics and somatic aspects of the human culture. Conceptual and pragmatical links between architecture and cyberspace are transforming our perception, conception and use of spaces. These links are based upon the new paradigms and behaviors related to the notions of hypertextuality, virtuality and interactivity, which are contributing to the creation of a completely new social and cultural framework related to our spatial experience.

Mutations in the concepts of space, place, identity and alterity are associated to the actual evolution of virtual, informational and communicational technologies. Physical architecture is progressively loosing its hegemony as ideal shelter to man's activities - some of them attempt to respond the necessities of a completely virtual world. Architects assume a privileged position in this context: they are potentially able to modeling with forms and meanings our environment (physical or virtual); they are at the same time producers and consumers of this spatial mutation process configured by a vortex of perceptions, meanings and transformations which is the structure of the virtual architectures.

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3. Virtual architectures (VAs): expanding the physical dimensions

Computers in the architectural profession has been largely used as facilitators, as tools to help conceptualize (mainly by graphical representations) or produce a final object (architectural artifact). Today with the role and characteristics of cyberspace as information delivery (Whittle, 1996), we witness the emergence of an architecture which nature and objectives are completely associated to virtual world: the Virtual Architectures (VAs). These architectures are associated to perception of information as a spatial phenomena. Marcos Novak calls them "*transArchitecture*" or "*Liquid Architecture*", because they distribute the notion of space and place through cyberspace. (Novak, 1995). Identifying some general characteristics of the VAs: they are visual, conceptual, psychological, symbolical and metaphorical architectures. In the rhetoric of the virtual realists, they "*are not simply a mathematical space nor a fictional metaphor but a new frontier, a very one that was opened to exploration and, ultimately, settlement*". (Wooley, 1993).

3.1. Designing Virtual Architectures (VAs): a general framework

Our focus in this section is to present some basic points concerning the design of VAs which are helpful to define a methodology to identify and analyze (qualitatively) the spatial reciprocal contamination between physical and virtual architectures. According to our point of view, to understand VAs we need to consider some variable points which are independents but at the same time keep a narrow synergy between them:

·Designing VAs involve both architectural design and computing disciplines.

·Designing physical or VAs deals with a set of relationships that occurs among people, modalities of representation and the phenomenon of an specific environment. But in cyberspace, objects can obey or ignore the rules of physics, and its users are not limited by gravity.

·The constructability of VAs is based on algorithms rather than bricks. They associate the synthesis of human requirements and technical constraints in 3D virtual space. The parameters used to design and construct VAs go beyond those to design buildings and landscape, including 3D information visualization techniques. (Gloor, 1996); (Goulette, 1998)

· The process of presenting or communicating architecture refers to a kind of mental activity for distributing knowledge which need to be rationalized into forms and presented through adequate media. With the emergence of VAs we need to include cyberspace as a multi-dimensional media embedded with experiential expression. It means that through VAs the visualization of information stored in databases can lead to experiencing a multitude of dimensions in time and space.

· Interactions in cyberspace (user-user and users-environment) are not based on a space-time continuum as in the physical world. A better spatial model to VAs should be based on "our memory of space" and not in our perception of space. (Anders, 1997); (Goulette, 1998)

· Architects of VAs need to specify:

· spatial elements (vocabulary) and their grammar (space-establishing elements); i. e., what is a continuity or limit between the spatial elements, what is a public or individual place, a path, an intersection, "indoors" and "outdoors"…

· modalities and levels of interactions; i.e. what is a place in these virtual architectures that may encourage individual and/or collective participation…

· aesthetics and ethical characteristics...

3.2. Example of Virtual Architecture: the GVM

Unlike most museum's web presences, the Guggenheim Virtual Museum (GVM) adopts an architectural model. It is a virtual architecture (developed by the New-York based architecture firm Asymptote) which objective is to do in cyberspace what Ghery's Bilbao museum did in the physical world. Defined as the "*latest stage in the evolution of museums as both: exhibitor and exhibitionist*" (LangHo, 2000), the GVM goes beyond the wire-frame models and fly-through that have until now been the basis of VAs. Its design attempts to simulate the viewer's experience of physical architecture, which relies on, among other things, the "*user's sense of spatial progression, with a perception of destinations as well as memory of where one has been (…) it attains a physical spatiality that brings it closer to an architectural experience* ". (LangHo, 2000). The GVM shape morphs constantly, nevertheless it has an structure which is the basis of its navigation. The architecture changes according to how are used its three basic "areas":

Figure 1: **Atrium** *(http://www.guggenheim.org/exhibition/virtual/)*

Figure 2 : **Venues** *(http://www.guggenheim.org/exhibition/virtual/)*
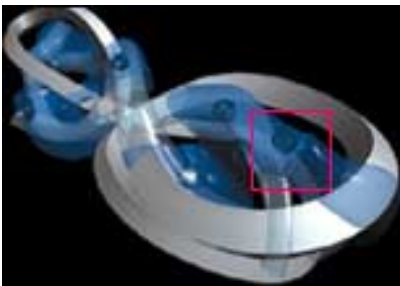

Figure 3 : **Galleries** *(http://www.guggenheim.org/exhibition/virtual/)*
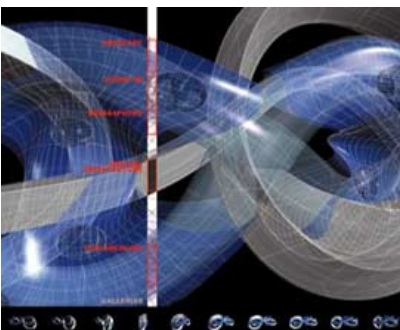

Figure 4 : **Galleries detail** *showing the wire-framing of its structure. The vertical bar bisecting it is a navigational tool that passes back and forth through the structure like a scan. The smaller images bellow show the different states of the structure as the viewer moves through it. (http://www.guggenheim.org/exhibition/virtual/)*

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· Atrium – connects to the museum's service areas and public function; information about programs, events and exhibitions are found. (figure 1)

· Venus - links to other Guggenheim presence in the physical world (Bilbao, New York, Venice) each one represented by a unique elevation; also contain a cyber theater and other amenities. (figure 2)

·Galleries – contains space for on-line exhibitions and artist's projects, as well as archives for past versions of the GVM as the project is updated over the course of three years (figures 3,4)

Another important aspect associated to GVM concerns its impact on art, its reception and production: " *The GVM can bring us back to the original purpose of art : to be about experience. The same ambition could apply to architecture*".(LangHo, 2000) Emerging from the fusion of information, space, art, commerce and architecture, the VGM not only provide a compelling spatial environment to be experienced but creates a new design paradigm.

4. Conclusions

We have claimed in this paper that the evidence of the spatial contamination between physical and virtual architectures, has already brought some structural and semantics mutations in the way we mentally and physically structure space. These mutations are making arise a new conceptual and experimental environment to be explored by architects: the cyberspace. We've presented a general framework about the architectural design of VAs and an example: the Guggenheim Virtual Museum (GVM). We believe that VAs can be submitted to Vitruvian principles: "commoditas", "firmitas" and "venustas", because they may serve a human function, be constructable in cyberspace and be perceptually pleasing.

" … *commodity will be as much a matter of software functions and interfaces design as it is of floor plans and constructions materials. Firmness will entail not only the physical integrity of structural systems, but also the logical integrity of computer systems. And delight? Delight will have unimagined new dimensions*". (Mitchel, 1995)

As we further explore cyberspace, the virtual architecture will not be addressed as a second order reality but as a reality within its own nature.

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