Chapter 2.2
Challenges in Virtual Environment Design:
An Architectural Approach to Virtual Spaces

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ABSTRACT

In this chapter we will discuss some fundamental questions concerning creation and development of interfaces searching for the best way to promote interaction between the subject and information/interface. It starts from the fact that the fundamental and most revolutionary aspect introduced by the Internet is based on its sophisticated technological mechanisms that enhance substantially the concepts of space, time, perception, representation, limits, distance, presence, etc. Our everyday practices gain access to a new realm, cyberspace, which enables us to embrace multiple experiences where we exist in the propagation of our "Id." This condition represents a huge challenge, for example, the necessity to (re)design the image we have from the world in its physical and virtual spaces. We discuss the imagined trends related to the conception and development of virtual environments, addressing the issue of virtual environments in three levels of complexity: realized spaces, possible spaces and imagined spaces.

INTRODUCTION

As a result of the innovations and the potential inherent to this media, the expansion of the Internet in the 1990s launched a multitude of transformations in the ways of living of what is now referred to as the information society. Analysis of a social context requires us to analyze its technological model, which from a contemporary point of view means presupposing that both technology and society are part of the same system and, thus, should not be analyzed as isolated entities. As Castells

puts it, scientific discovery, and consequently, the challenging of established paradigms is a process dependent on a series of imponderable factors, the result of which is intimately linked to how these factors interact (Castells, 2000).

The observation of the technological context in the information society shows significant changes in social organizations and in the fundamental principles related to conditions of existence, such as, for example, space, time, perception, representation and presence. All of them are altered in their fundamental aspects when faced with the fact that sophisticated technological resources, developed from a technology that is imbedded in this society, allow one to conceive of immersive environments, interactive environments, simulated spaces and so on. There seem to be three essential aspects to the characterization of this information society context: information technology (IT) as a technological paradigm, the dynamism with which processes evolve in this context, and the virtual dimension as a principle for events.

The significance of information technology as a paradigm for the social, economic and cultural models surpass the idea of a simple change in the productive system of society. IT is connected to a productive system which is in fact composed of a set of technological and computational resources that have an intangible good as an object: information. This means that we have moved from the implicit tangibility of the industrial society, a world with established limitations, to a fluid and inexhaustible world.

Up until recently, when we simply contributed to industrial society, we saw our physical abilities being reproduced by gadgets able to replace us in most mechanical tasks. Nowadays, we participate in simulations of our cognitive capacities by means of intelligent systems, in a dimension that transcends the physical space of objects and takes place in virtual space or cyberspace, as suggested by William Gibson's 1984 book *Neuromancer.* In this book, for the

first time, the term cyberspace makes reference to "a physical and multidimensional representation of the abstract world of 'information.'" "A place you can visit with your mind, catapulted by technology, while your body is left behind," as Alex Antunes, responsible for the book's preface in its Portuguese version, adds (Gibson, 2003). Since then, not only the term cyberspace has expanded to a myriad of connotations, but also many other terms have been used to refer to it. Virtual environment, virtual space and virtual reality are some of the other terms employed by specialists when referring to cyberspace.

In this context, things basically take place in a virtual-digital dimension. Commercial relations, for example, become virtualized. Similarly, human actions become virtualized, in a way that the concept of presence, inherent to tangible bodies, is altered. Therefore, computerized intelligent systems simulate human cognitive capacities, from the simplest ones, like sharing information in public places, such as shopping malls, banks and supermarkets, to the most complex ones in highly specialized areas such as biotechnology and nanotechnology, among others.

The technological model for the information society introduces a condition never seen before in the history of civilization: a new spatial dimension, cyberspace, that not only becomes the parameter for the development of socio-cultural processes, but also opens up the possibility of exploiting new forms of experiencing and thinking within new models of experimenting in the most diverse fields of our social life.

In the Virtual Dimension: Virtualization, Space and Time

The *cyber* culture, the virtualization culture, reinvents time and space. Understanding aspects related to this reinvented time and space necessarily depends upon the virtual because it is the reference to this domain. In Pierre Lévy's *Becoming Virtual*, the author explores the virtual

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