An other focus of recent researches is the reduction of response time, or lag. The recent VR systems are still much costly in terms of computational processing. For a reasonably realistic experience it is necessary the use of a high-capacity system.

However, due to real-time execution, the evaluation of the computational model to present continuity for human perception in virtual worlds should be made not only in terms of processing speed but also in terms of database bandwidth and network capacity.

The availability of GBPS (Gigabit Per Second) networks will enable a major paradigm shift from data-text based information transmission to multimedia-based communication. Gigastream communications will enhance the currently developed cyberspace concepts that permit computer systems and existing developed cyberware environments to be interconnected long haul.

According to Chorafas and Steinmam (Chorafas, 95), within the framework of the new computational perspectives, a key role will be played by the concepts of interactive simulation and navigation among widely scattered, heterogeneous databases.

6. Shared Virtual Environments

Virtual Environments (VE) are one of the most significant steps towards a more natural human-computer communication, allowing an ease-to-understand presentation and a more intuitive interaction with complex data. They are able to represent various aspects of a natural environment or even a totally artificial world.

While in use, a DVE (Distributed Virtual Environment) can change continually in every aspect. As on the Web, someone new can enter and share a computer "space" by just downloading the space's current content. Also, a DVE can grow dynamically by accepting contributions of objects and structures from many sources.

According to Waters (Waters, 1997), the DVE researchers have been conducted in two separate communities: the Internet world, paced by commercial developers, and the DIS (Distributed Interactive Simulation) world, lead by developers of military simulations. Both communities have the same goal – a complex yet flexible DVE fully shared by many users. Still, while the DIS side is working on very expensive environments, the Internet side is focusing on affordability.

As for Internet side, a DVE must run on the computers most people own and over network connections most people have. Until not so long ago, this meant giving away voice communication and the sense of immersion in a DVE in order to get the mass access.

To know how are virtual environments used on the internet some of them were analyzed according to some pre-established criteria, including performance, realism and usability. Such analysis had the focus of attention on the recent situation of VR systems on the Internet. Being a world wide communications network and therefore having extremely different users, the Internet is a good laboratory for analysis of the use of VR for different people. From the studied environments, it was extracted characteristics that can attract users to this environments and establish some parameters and functional requirements for virtual worlds. The systems in this survey are well known and used by Internet users. Preferences were given for open systems
which would permit the analysis of questions such as ease to use. The choice was also based in a variety of types of systems, ranging from chats to interactive worlds and games. The analyzed systems were: Active Worlds, by Circle of Fire; Community Place Browser, by Sony; Quake, by ID software; and Blacksun.

Active Worlds

Active Worlds is developed by Circle of Fire inc. It is a browser for shared virtual environment systems. The scope of Active Worlds is to become a system which supports a great variety of functions, including virtual shopping, technical meetings, among others. But the most common use for this software has been entertainment, such as games and chat.

Active Worlds have a great number of virtual worlds, created by people or companies which had licensed the Environment Server for Active Worlds. There are thematic environments (Brazil), fantasy environments (Medieval Castle), access environments (Alpha World), among others.

The moving inside the worlds is simple and intuitive, by means of keyboard or mouse. Also the user can decide between ground or flying moving, what guarantee a variety of visions to the user. There is a simple collision detection system using bounding boxes contact among static objects, dynamic objects and avatars.

The system gives the user the opportunity to build inside the virtual world by creating object copies which do exist inside the virtual world, structure objects such as floor, ceiling or walls, or decorative ones such as trees, fences, pictures and so on. For the new objects, user can add cyclic behaviors such as moving, textured animations or even connect actions such as a mouse click to web resources. Avatars have movement animations as well as pre-programmed communication animations (pointing, gestures).

The browser has integrated support with web browsers. In this way, actions in the virtual world can connect to web pages, making the user interface richer. As an example, when the user clicks on a data pad, a map can be showed on the web browser.

Active worlds is a fast and realistic system specially when compared with VRML browsers. On the other hand, it is not so easily extensible for programming as VRML based worlds are.

Community Place Browser

Developed by Sony Corporation, Community Place Browser is a browser for virtual environments based on VRML, being used as stand-alone or as plug-in of an HTML browser. It also gives Java support and extensions which can be used for creation of shared virtual interactive worlds. The virtual worlds are not included in the pack. In fact, there are some them in the products site and others are developed by various virtual environment developers.

Community Place has good realism when used by well developed virtual worlds. The weak of the system, shared by most of all VRML browsers, is the high computational costs, which limits a good VR experience to the user accessing a system such as a Pentium 200 with 32 Mb RAM.