

## Architectural Design of a Virtual Campus/

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The design of a virtual campus, while considering the role of technology in education, also can be influenced by the place that more traditional architectural design provides. This approach need not result in a virtual campus that looks like a physical building, the main concept is to intricately link learning with an experience in a place with other people.

The design project described here is in response to the need for a third and virtual campus for ETH in Zurich. Our design while using place as the basis for the learning experience, organises the various places into three distinct functional spaces: the administrative space, the academic space, and the professional technology transfer space. These three spaces form the organisational backbone, bringing together the physical campus, the virtual campus and technical infrastructure supported the campuses.

The design concept includes a 3D Virtual World as a place for building the community through meeting people and a 3D space for accessing the variety of information repositories. Often, the use of internet technologies results in "downloading" information and managing information navigation. In other words, the person is not part of the information and the information is sent out to each person's personal computer. Our design concept is to bring the community into the campus to access information and people. The technical infrastructure supports this concept by including representation of the individuals that are part of the community and organising information in a variety of technology formats to facilitate information handling, creation, maintenance, and access.

The plan view of the Virtual World is circular, with curved glass panels creating three ovals that are indicative of the boundaries of each space. Providing glass panels for the boundaries allows a person to see other parts of the virtual campus regardless of their location. The boundaries of the separate spaces provide levels of privacy, security, and interactivity through their implementation as software agents. We intend that the objects in the virtual world carry metaphorical reference to the physical world while being made of software modules.

In the design concept, the use of shape is consistent and intentional: curved shapes indicate movement and rectangular shapes indicate stability. For example, portals and corridors are curved and an office is rectangular. We use open frame malls to provide a visual boundary that can also be functional as a frame for holding information and tools. Sound design is also a consideration. Sound in a physical world happens naturally. In the virtual world, the sound is design (to create ambience and to provide information).

Within the Academic space, there is a structure modelled to be similar in style to the buildings in the Honggerberg campus at ETH. The buildings that house the Faculties, Departments and offices are rectangular and stable. The portals and the corridors have curved shapes indicating movement. Access to the physical campus through video windows provides access to activities occurring in the physical campus through the virtual world. Within the Administrative space, the curving walkway with circular spaces provides access to enrolment and administrative information Management staff also have access to manage the campuses virtually. A stylised representation of the Visdome ETH provides a 3D space for virtual presentations and demonstrations. The Professional space provides a virtual

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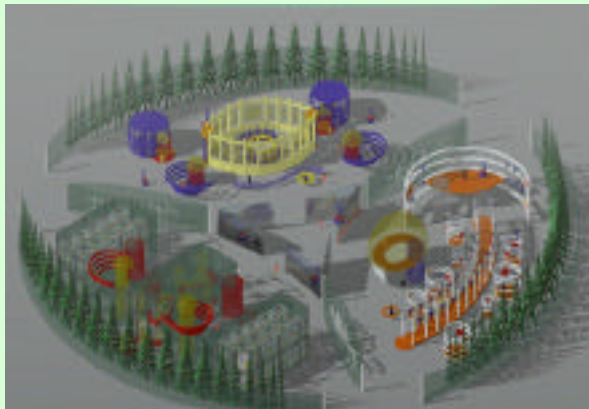
**COUNTRY: Slovenia/**

display area for professionals to participate in the activities of ETH. This is equivalent to a physical conference facility or a suite of professional offices in a physical campus.

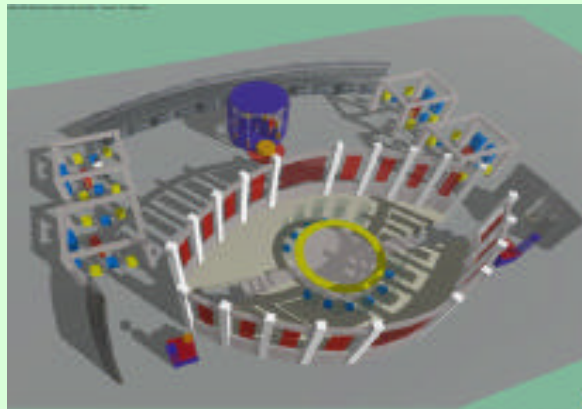
The technical infrastructure provides data to support all campus activities, both for the physical campus and the virtual campus. The infrastructure is divided into three categories of information representation: the World Wide Web for integrated multimedia information, documents for reading material intended to be printed, and databases for structured information storage and retrieval. Each of these different types of information repositories have their own portals for access and modification. Casual access is through the Virtual World. Authorised access to make changes to the information is provided through special portals into each repository.

The implementation, similar in many ways to the construction of a physical campus, is an object-oriented persistent database of the world that can adapt to any new technologies in supporting virtual communities, communication, and interaction. The object-oriented database represents the properties and methods of an immersive 3D world with people represented as avatars; similar in concept to Active Worlds (<http://www.activeworlds.com>) or Microsoft Vworlds (<http://www.vworlds.org>). Each object in the database is an object in the Virtual World, with a 3D model for visualisation and properties and methods to represent the object and its interactivity with other object in the world. The basic classes of objects include; rooms, portals, things, and people. These classes are extended and specialised to provide an implementation on of the virtual world where each object has intentional functions, behaviours, and structure. The virtual world object database is linked to the World Wide Web, the documents, and the other databases.

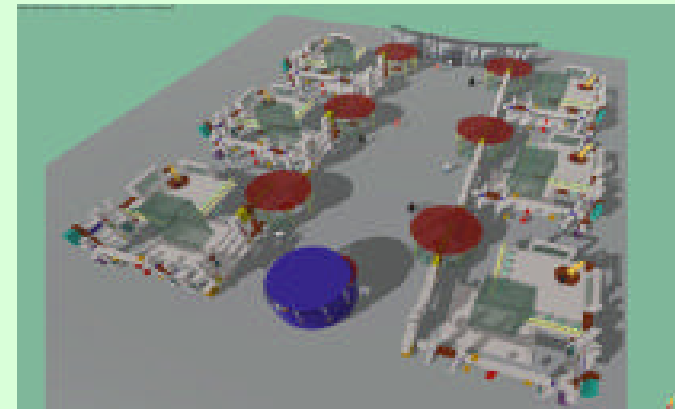
In summary, the virtual campus design not only combines the physical and the virtual through the 3D space provided for the community access, it provides a particular style and presence for a sense of place that can change over time to reflect changes in the activities and people.



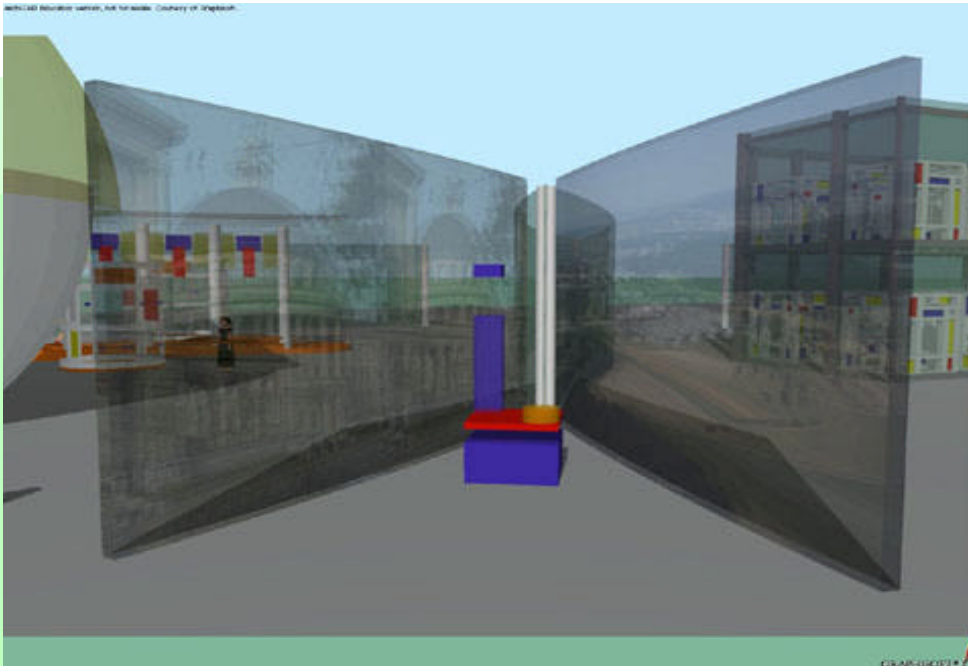
The virtual campus as three functional spaces in a virtual world. Each functional space is occupied by people as avatars and provides access to information and events.



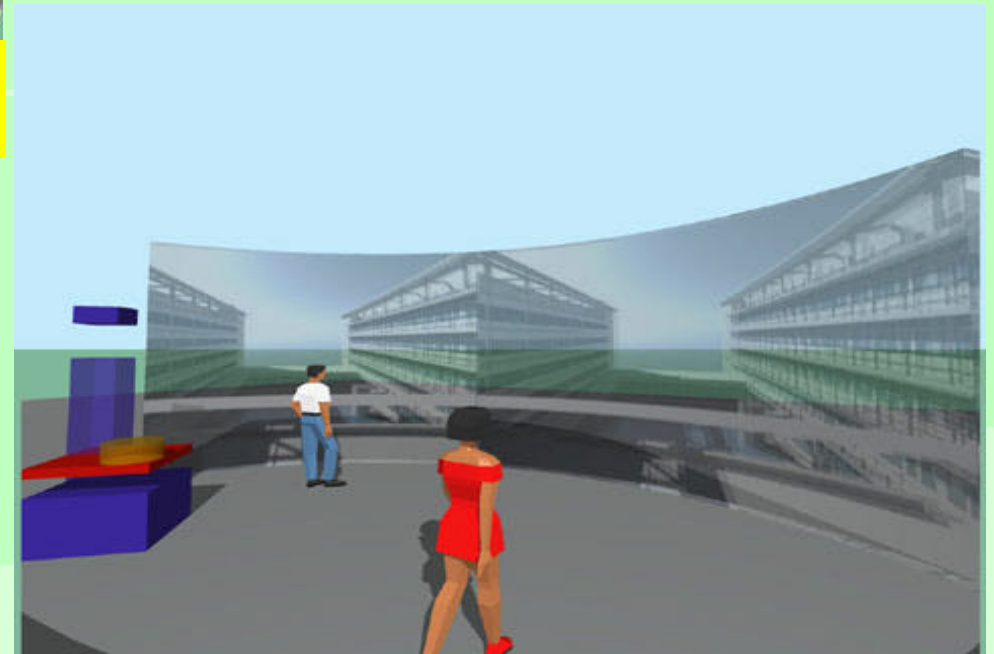
A virtual classroom that provides a focal point for discussion and the presentation of slides or shared drawing boards



The virtual office has unlimited space



The main entrance to the virtual campus places the person in the centre with views to all three functional places. The glass partitions indicate the transition from one place to another and the information kiosk at the entrance provides instructions for the use of the virtual campus



A virtual meeting point set up in one of the departments as a public place for the campus community. The glass panel can also provide video conference facilities