

# image of architecture in electronic age

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## Architecture in Electronic Age is Figuration of Vortex of Information

From the primitive age, the human body has been linked with nature as a member in which water and air circulate. People today are equipped with an electronic body in which information circulates, and are thus linked to the world through network of information by means of this other body.

This virtual body of electron flow is drastically changing the mode of communication in family and community, while the primitive body in which water and air flow still craves for beautiful light and wind.

The biggest challenge for us is how we can integrate these two types of body. The same applies just as well to architecture today. Our architecture has traditionally been linked with nature through figuration of movements of vortices occurring in water and air. With contemporary architecture, we must link ourselves with the electronic environment through figuration of information vortices. The question is how we can integrate the primitive space linked with nature and the virtual space which is linked with the world through electron network. Space which integrates these two types of body will probably be envisaged as an electronic biomorphic one. For, just as the figure of a living body represents the loci of movements of air and water, the virtual space will most likely be figured as the loci of human activities in the electron flow.

### **Architecture in Electronic Age is an Extended Form of Media Suit**

In 1960s, M. McLuhan said that our clothing and shelter are the extended form of our skin. From old times, architecture has served as a means to adjust ourselves to the natural environment. The contemporary architecture needs to function, in addition, as a means to adjust ourselves to the information environment. It must function as the extended form of skin in relation both to nature and information at once. Architecture today must be a media suite.

People, when clad in a mechanical suit called automobile, had their physical body expanded. People clad in a media suite have their brain expanded. Architecture as media suit is the externalized brain. In the whirlpool of voluminous information, people freely browse through information, control the outside world and appeal themselves to the outside world. Instead of appealing to the outside world by armouring themselves with a hard shell-like suit, people do so by wearing a light and pliant media suit which is the figuration of information vortex.

People clad in such media suit are the tarzans in the media forest .

### **Architecture in Electronic Age is a Media Convenience Store**

The curtain has been fallen for an age when museums, libraries and theaters proudly showed off their archetypal presence. Paintings on the wall and books in paper are no longer an absolute existence. They are turned into something relative by the electronic media.

Media with established styles such as paintings, books and movies will in future be ranked parallel, free of hierarchy, with electronic media such as CDs, CD-ROMs and video tapes. People

will use both types of media in mixture and in a complementary manner.

Enjoying paintings and books through electronic media will surely demolish the once established form of archetypal museums and libraries. They will all be fused into one and there will be no boundaries between a museum, an art gallery, a library or a theater . They must be reconstructed as a mediatheque. It will be a convenience store of media where a variety of media are arranged in arrays. and a convenience store of culture which offers different cultural functions.

This new form of convenience-store-like public building should not be a symbolic presence across a public plaza, rather. it should be located near a railway station and be open until midnight to serve the public in their daily life.

### **Architecture in Electronic Age Changes the Concept of Barrier**

Various types of barrier in today's society define the form of architecture. It is not merely the barrier between healthy and elderly or handicapped people. A great barrier exists between the administrator of a building and its users, between private and public spaces, between archetypes in different genres such as library and museum, between one's mother tongue and a foreign language, and between different media such as visual images and printings.

Development of electronic media may invalidate these barriers one after another. Introduction of personal computers is now radically changing our mode of communication. The educational and social systems which are rigidly restricted by the traditional media such as printed matters and paintings will also confront the need for drastic reform. In future, distinction between different physical senses such as vision, hearing, smelling, taste or touch may become meaningless as the development of electronic media may enable signals to be input directly in the brain or the nervous system without relying on such organs as the eyes, the ears or the nose.

The advent of automobile navigation system has changed the concept of a map. Drivers are constantly informed of their location and are guided to their destination by communication satellite. They do not look up in the map but are immersed in the virtual space called a map. Such a navigation system can also be employed to guide people in urban or architectural spaces.

Architecture in the electronic age will probably radically change our concepts such as of healthy people versus handicapped people, administrator versus users, or public versus private spaces .

### **Architecture in Electronic Age is Architecture That Designs Time**

Process of design will change by the introduction of computers. It does not simply mean that plans drawn on tracing papers with pencils are replaced with images displayed on computer screen. We can erect a virtual building and experience it in the designing process. We later experience another building as a physical existence. The process of shifting from virtual architecture to physical one is continuous. These two types of architecture overlap each other and proceed simultaneously.

Eventually, the physical building will emerge. By that time, however, there will be still another virtual space created by the introduction of electronic media. Even after the physical building is completed, its architectural programs may continue to undergo modifications as new media evolve. Thus there will be no end to our spatial experiences as the real and virtual spaces overlap in our experience. Design in architecture will refer not only to traditional hardware design but also to a more flexible software design that includes programs. We will be designing the time just as we design the space.

### **Program and Concept**

Sendai Mediatheque embodies our proposal for a completely new concept of architecture. The project started with an open competition held by Sendai City, and its basic design and working drawings have been completed. The complex includes Mediatheque, an art gallery, a library, an

information service center for people with visual and hearing impairments and a visual image media center. During the open competition and subsequent phase of basic designing, our primary effort was on demolishing the archetypal ideas of an art museum or library to reconstruct a new idea of architecture called "mediatheque" utilizing the state-of-the-art media. This process of reconstructing the architectural concepts not only extended to hardware but to software as well.

To this end, repeated public hearings and discussions were held inviting experts from different circles during the basic design phase.

Our proposal has always been prototypic and conceptual rather than formalistic from the very beginning. It consists of three elements of "plate", "tube" and "skin". By "Plate" we mean six square slabs, and we attempted to diagrammatically express different modes of communication between people and things that may vary depending on the media used. "Tubes" are 13 tree-like elements that vertically penetrate the plates to organize and integrate the latter. They are the flexible structural members acting also as the vertical traffic line and as the space where energies (light, air, water, sound, etc.) and information flow. Presence of the tubes creates movements of natural elements and of electrons in the homogeneous spaces defined by the plates. Although by "skin" we mean the elements that separate the inside of the building from the outside, it particularly refers to the skin that surrounds the machine spaces located at the top and the bottom of the building and the double-skinned facade facing the main street.

With its three simple component elements, the mediatheque will offer a space where a body of electron flow and a primitive physical body which is linked with nature are integrated.

### **Structural System**

This minimal and pure form of structure consisting simply of plates (flat slabs) and tubes (shafts) that define the building is our version of steel-framed Dom-ino system. Steel honeycomb slab structure (400mm depth; 1,000m grid span) and light-weight concrete (70mm thick) are combined to make a steel sandwich panel (50m<sup>2</sup> 50m). Use of thick-walled slender steel pipes (120<sup>2</sup> 240<sup>2</sup> / t-10<sup>2</sup> 30mm) as single-layer truss structure realizes a highly transparent and tough main structure while assuring structural integrity and rigidity.

Our new proposal for aseismic design is the use of energy absorbing mechanism in the underground structure (basement 1F) which is expected to be as effective as the traditional aseismic structure. By structurally disconnecting the bottom, underground space from the upper space (main structure consisting of the tubes) in a flexible manner, earthquake energy exerted on the building can be absorbed by the bottom structure, alleviating the impact imposed on the upper part of the building. A hydraulic jack will do for repair even for damages caused by a great earthquake that may occur once every several hundreds of years.

### **Air-Conditioning System**

The system may be compared to the biological activities of a tree. Machine spaces for air-conditioning system are located on the rooftop and the bottom floor (basement 2F) and are communicated with each other by the tubes penetrating the plates. Just as various elements produced by Photo-synthesis and the nutrients absorbed by the roots from the soil flow inside the trunk of a plant, various forms of energy produced in the machine spaces at the top and the bottom flow inside the tubes. Air flowing in the tubes is gently and slowly discharged into each of the free-access floor spaces via the air inlet duct

provided near the floor surface, with the dual-floor structure acting as the plenum. This system gives the feeling of coziness to otherwise, vast expanse of the spaces created by the floor plates.

The double-skinned facade on the south facing the main street breathes like the human skin. During summer, the upper and lower opening mechanisms are released to generate ascending air current inside the double-skinned wall to cool the wall surface temperature to thereby reduce the need for forced air conditioning. During winter, the opening mechanisms are closed so that the double-skinned wall can function as a highly insulating layer of air, thus reducing the heating

needs.

These mechanical technologies are combined and integrated at different levels to make the building as a whole an organic and functional structure.

### **Natural Lighting system**

The tube also acts as an effective device to introduce natural light into the building. Natural light is effectively taken into the building by means of an optical mechanism (light intake) provided on the rooftop, transmitted in the downward direction by the optical reflection sheet (light extractor) provided inside the tube, and diffused into the inside spaces on each of the floor by means of prisms and lenses (light outlet) . Artificial lighting means are also arranged inside the tube.

The color temperatures of natural and artificial lights are mixed to adjust the brightness. During the day, an environment is created where the abundant natural light and man-made light coexist. These devices are promising as the first step toward positive utilization of natural light.

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