Organization Principles in Virtual Space
Digital Casa in Media City

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Omitting the "virtual-: the organization of the space - that is architecture. How the design process itself has been changed by the new media, is the topic of this discussion - the process of designing in its penetration and extension into other techniques and media. For example video montage or image data banks. The process of designing becomes an electronic working of images differing substantially from the traditional process by the employed electronic devices.

The brain, the superlative computer in architectural design

Designing and creating, to get from the idea to the object by means of drawing is a complex and intelligent performance of our human computer - of our brain, our super computer. The way of outlining, the line as an addition of separate points can express the kind of the material, the plasticity, shape, colour, light, atmosphere, weight, movement, dynamics and statics - a synaesthetic system. That is why the process of designing starts with the traditional media - the sketch and the model. The new medium, the computer. offers extended possibilities for the process of designing, but it would be an unfortunate mistake to forget the traditional methods and only to rely on the computer.

Designing is the interaction of the eye, the hand and the brain - the intuitive sketch is the calculated alteration of the reality. The basic features of this process can he learned. but without an idea - no design. You have an idea, which you have to -handle-. By having a pencil in my hand I possess an instrument, which represents a level of reference to the fiction of reality more fluently than the pressing of the keys, which is done bit by bit and is in its addition like a score.

The language of the images

The starting point is to create a space that communicates on a visual level, that is to say create a certain atmosphere.

For example, the Reichstag project the organisation of several rooms in the "Reichstag" in Berlin and what is the CAD-images tell me? These are synthetic images without any relation to the real perception of seeing, hearing, feeling, tasting or smelling. the three-dimensional world of the computer is based upon geometric data. Only after we have coordinated the resulting geometric elements and the attributes of perception, the rooms appeal to us as images, only then they are removed out of their dimensionless and speechless state.

Slide - CAD Reichstag
Slide - real Reichstag

Multimedia

ART + COM was founded in 1988. ART in this case does not only mean art itself, but comes from the Greek artisan, or craftsman and ART as in artificial - künstlich. This leads to the actual problem of what we call "geistige Zersplitterung" (mental splintering), COM stands for Computer as well as for communication. ART + COM follows the interdisciplinary conception of the BAUHAUS. One model is the MIT Media Lab in Boston, USA. Using the most advanced technology, an interdisciplinary and multi-media centre for progressive research and design methods is being built. The characteristics of our way of working are to be open to new projects and ideas, to be prepared to revise old patterns and ways of thinking and to accelerate complex development processes.

My aim of "FUTURE DESIGN EDUCATION", should be a "Schule des Sehens", a school, where one can learn how to see. The road to specialisation hides the road to intelligent combination. It needs the synergy of different specialists and it is our innovative characteristic to work as anti -specialists on a basis of specialisation. What a student should learn is: SOLVING PROBLEMS LIKE CHRISTO DOES.

Slide Christo

Layers of perception in space - The geometric space turns into a semantic space

The ways of seeing and hearing in virtual space are supported by specially developed software programs. The spheres of light and sound, in reality connected levels of perception, are keys to the entering into a virtual world. the methods to visualize complex lighting situations support the illustrations and variation of the atmosphere in space. With the help of computer simulations light planners, architects and designers can present their conceptions before the actual realization.

The aim was to make "the invisible" visible. The three-dimensional world of architectural design and the cityscape consists only of geometric elements - to these we added the fourth dimension of time and movement and the fifth and sixth dimensions of light and sound. To the smooth synthetic design the corresponding elements of reality are supplied and materialized. As intelligent picture information they address the level of tactile perception. The synthetic picture can be experienced.

HP-Slides- Bulbs

Luminosity - a program, that actually figures spatial data in a dimensional way, not only in 2D, and thus can be a legible code for specialists as well as for non-specialists. The construction data of the architects and the given by the interior decorator data for the installation are correlated with the data for the requested lamps: after the calculation of the dispersion of the light density a three-dimensional simulation of the light effect in space emerges on the graphical screen. Space that had been reduced to a two-dimensional level, becomes legible in a three-dimensional way. Here the ability of the computer, to show things which actually can't be seen, becomes clear -to show the quality and the quantity of the atmospheric.

Radiosity- an algorythm, that is able to calculate the dispersion of light and shadow in space. The medium of information as image and data record at the same time. The depth and plasticity of space, distance and proximity become visible with the help of this program. At the moment the use of these programs still requires an immense expenditure of communication between the designers and the programmers. The aim

is to offer the architect kind of library, where he can request certain light data for certain kinds of lighting, light colours, etc. An extension of the architectural designing that includes the basic physical elements. Thus you can go for a walk through imaginary rooms and switch the lights on and off.

Audiosity - a program, that echoes the acoustics of the room, no matter if it is built of stone, wood, metal glass or a combination of these materials. Sounds arc memories; the room lives through its acoustic characteristics. The floor of a church, of an exhibition-or concert-hall, of a theatre, of a bathroom causes an echo of our steps across the ceiling. The material makes the room either a scene or a martyrdom. The characteristics of sounds are collected in this library and can then be requested.

All these programs we call "Tools", tools for designing. The computer-integrated model represents experiences of space in advance and allows not only to develop shape and design, but also atmosphere in an experimental way.

For example the I-IP project: a communication office for HEWLETF PACKARD. Public and private room is created through distance or proximity, adjustable by means of revolving room elements. An artificial layer fades over the reality of every-day-life, a kind of independent world of images is integrated into this -view of life- office. For the colleagues a layer of communication, for they have something to talk about with their clients- fertile soil for communication.

It is owing to the persuasive power of the preceding simulation on the computer that the project became reality.

The first pictures we got out of a very valuable HEWLETT PACKARD Computer-had this quality:

> *Slide*

We produced explosions, because we didn't know the software very well and therefore we made a lot of mistakes:

> *Slide-Serie*

The space has no depth and plasticity, one couldn't see how big the room really is. The pictures look empty and synthetic. On the monitor we could walk around the space, but missed something.

> *Slide HP-Tiefenvergleich*

What was wrong? There was no light, no material, no feeling of a space. We missed the factors of perception, like light and shadow, like texture on the different materials. Our client HP was quite happy about the electronic images at this time, but most of the time we discussed the new off-ice space together on a real model, scaled 1: 100, because everybody could use and handle it, everybody could play with it.

> *Slide 4 1:100 Modell-Foto*

It is High-End-Systems that allow the atmospheric visualization of a constructed room, before that there is always the level of the electronic drawing of plans. This process takes more time than the drawing of traditional plans. In real life the computer still looses the race. E. g.: a change has to he drawn and has to be at the building site by Monday to me presented to the 12 involved specialists. The draftsman takes the original, scratches the mistake out with a razor-blade, puts in the corrected version, makes 12 copies and sends them to the site. The computer takes longer because of the indirect working process. In future this will be accelerated with the help of communication networks like ISDN-B or fibreglass, when it will be possible

to actually send three-dimensional data via telephone. But it will still take a while until all people involved will have fibreglass-connections at their disposal.

Video-HP

Virtual models

In the technical revolution that's taking place at the moment. experiments with eye substitutes (Eyephone) and hand substitutes (Dataglove) are being carried out. as a result we will make new experiences with our real eyes, hands and ears. We become aware again of the quality of our real hands, eyes and ears. There will he an expanded field of vision for the eyes, an expanded field of hearing for the ears and an expanded field of action for the hands. With the help of computer-technological segregation of the sense organs, which in the end become a whole again, we achieve on the one hand an improvement of our perception and on the other hand we improve our ability to think in the abstract.

"Virtual reality in intelligent buildings" or "How to build in virtual reality in an intelligent way"

In future houses will be -inhabitable- even before they are built. Every house will be finished virtually - as the original -, then the copy will be built out of stone. The virtual model floats as a holographic model in the construction office, is a model of reference for the real building process. When the house is finished, the original model is available to the propery management, the firebrigade and the insurance-company for the status quo and all future changes. The house of the future will exist twice-first as a virtual model of planning and designing and second as a real house. Thus a virtual world is created, in which everything can appear everywhere - the realization of the POSTMODERNE, where everything also appears everywhere, only in another context. From my chair in front of the TV 1 can click to everywhere, for example via modern - to the library, to the university. to my office -a media city is created. Very utopian and maybe fright rening; of course, for this immense navigation systems will become necessary.

Cyberspace - movement and interactivity through virtual reality. It is the movement in space which causes the three-dimensional perception of the room. Up to now the two-dimensional screen has been a handicap. As a result of the development of the Virtual Reality Tools. that is to say the dataglove, the data-glasses and data-suit, it will become possible to move in virtual worlds, to navigate through virtual spaces. The process of planning and designing will undergo substantial changes as a result of the use of electronic glasses/eyes and hands. The tools lie on the floor or are attached to the walls of the virtual space as menus. DANIEL DUSENTRIEB with his "Brain-cap". The data helmet becomes a brain-cap, concentration and silence.

At the verge of real and virtual reality we gain as an addition to our previous way of perceptions a new level of perception, which may he similar to that of the astronaut out in space, or the prophet in ancient times or of the child who explores his world. On the threshold of the virtual world we don't yet miss the categories of perception in space like light, sound, air, fire, water, earth. The first contact causes confusion. it is "unfamiliar" in this at first "empty", "dead" space, it has to be learn again how to walk, to see, to feel. "Reality has 80 million polygons-, that means that it can't he an attempt to imitate reality, but rather to learn more about reality with the help of artificial worlds.

Video

"The simulated world"

"When you find simulations in a mathematics book, it becomes dangerous." (Friedrich Kittler)

Computer models are simulations, designing is also a kind of simulation. Here the interior image-machines of the eye and the computer meet. Simulation is make-believe, the imitation of the world in a model, but also the possibility of new models of reality. Our present view of fife is an unlimited quantity of substance. It consists of separate details, of atoms - no matter whether this substance is visible or not - we find ourselves in a full space - a closely packed rnolecular space. Simulation can always give only a image of this reality. It is an addition to reality, in order to learn from mistakes. To simulate an architectural building is only then reasonable when plans can be made transparent this way. when ideas can be checked and seen in their environmental context.

The media dimension of the city

"In future it will he necessary to learn about space as well as to learn how to drive." (Werner von Braun, 1930)

Reality and thus also the city can be compared with a self-organising system - that is to say a biological system. These systems can't be planned. They react to impulses: Neuralgic points of these systems can be influenced - as in acupuncture - by well-aimed and well-placed stitches. In architecture these stitches are the jewels of the landscape or city in question. As the cathedrals in medieval times have been placed across the landscape like a mental network, today a virtual network of communication is installed. If you consider the planning of cities as a network-planning, today the immaterial networks of future are to be designed and installed in space.

Slide Navigation -systerns

The problem of navigation in space is. how to find your way in it, how to get to the place your want to get to. how to orientate in the infinite space of the computer. Our human system of orientation and relation has to be extended on a global scale - because the reality takes place in 4D. It is required to think in connected systems. Weizenbaum: the movement of a butterfly's wing ... Mandelbrot: information, telematic. That may lead to places that can't be distinguished any longer, the question of copy or original presents itself in a more global way as before, because everything can he all the time and at all places. A sampling of events, which happen by chance and unexpected at age place at the same time - different, contradictory worlds. Venturi's "Mainstreet is almost right" may serve as a comparable image.

Example project Potsdamer Platz competition: installation and complex working process.

The planning at the computer means to have available both the 2 D sketch as well as the 3D model, to he able to see ideas in the context of the urban space - in every stage of the plan, to be able to illustrate and check different versions quickly.

Dias Pots Platz + Video

Collage city

The city as a "scenery" responds to todays experience. You enter the streams of traffic, which pass the anonymous space, in order to get to your own apartment, your own four walls. There anarchy dominates - exactly the same like everywhere in the anonymous space - exactly the same like in the inside and outside of free enterprise. The leisure chaos increases this anarchy and causes more waste as a result of immense density. Inside and outside get mixed up.

Is there a lack of stadiums, forums or arenas? Is it just a problem of density? A tribe constisted of 500 persons and everybody knew everybody else. In the knew airport area of Singapore 5000 persons are checked in within one hour. Soon a kind of exclusive travelling will develop: helicopter-service, privatejets, high speed trains with new stations. On the immaterial level: digitalization, telematic, video pictures. Via fibreglass space and time get surmounted. A virtual reality, in which we don't have to carry around matter, but can move in a free spirit and communicate with far-away partners.

Will there be a relief for the urban space? Is the virtual city, the virtual urban landscape near? Shall we leave all the old things as they are and declare them to be museums, while we form new virtual networks?

The vision of many computer specialists, to hide in Cyberspace, in a beautiful artificial world. isn't near! You can't live in a data space. There is no warmth, no smell, no sense of touch and computers don't react to feelings.

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