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COMPUTER - TOOL VS. MEDIUM

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CAD should be a medium; but it is (only) a tool.
Ranulph Glanville, 1994

We have arrived an important juncture in the history of computing in our profession: This history is long enough to reveal clear trends in the use of computing, but not long to institutionalize them. As computers permeate every area of architecture - from design and construction documents to project administration and site supervision - can "virtual practice" be far behind? In the old days, there were basically two ways of architects working. Under stress. Or under lots more stress. Over time, someone forwarded the radical motion that the job could be easier, you could actually get more work done. Architects still have been looking for ways to produce more work in less time. They need a more productive work environment. The ideal environment would integrate man and machine (computer) in total harmony. As more and more architects and firms invest more and more time, money, and effort into particular ways of using computers, these practices will become resistant to change. Now is the time to decide if computing is developing the way we think it should. Enabled and vastly accelerated by technology, and driven by imperatives for cost efficiency, flexibility, and responsiveness, work in the design sector is changing in every respect. It stands to reason that architects must change too - on every level - not only by expanding the scope of their design concerns, but by altering design process. Very often we can read, that the recent new technologies, the availability of computers and software, imply that use of CAAD software in design office is growing enormously and computers really have changed the production of contract documents in architectural offices.

CAD SOFTWARE

Then X - CAD it is an independent, professional tool used for designing the architecture of all kinds of objects. With the use of the X - CAD the technological documentation and spatial model are created at the same time. One can generate out sections and elevation views from them. The project may be realized according to the prepared plan of rooms of optional shape and area, on many floors, in many views and projections simultaneously, and the totality can be printed on one drawing in the freely chosen size. The X - CAD generates the comparisons of all kinds, from the joinery comparisons to the reckoning of the area of walls and to the appraising definition of materials. The automatization of works performed in designing with computer use, is the aim realized by the X- CAD program. The projects created with the use of the system can be finely shaped or contain innovational, unusual engineer's solutions. Moreover, everywhere where the program has been installed, the work develops faster and more efficiently. the X- CAD automatizes the process of designing and placing the windows and doors, stairs, roofs and other typical elements. Well abounded library of equipment elements available in projection size and spatial models facilitates the completion of projects as well as its technological documentation and preparation for photorealistic visualization which can be elaborated with the use of 3D - X package integrated with the X - CAD. The 3D-X is a personal visualization tool-kit that makes your designs come alive for clients. The 3D-X gives architects all the tools they need to create the high-quality renderings. The 3D-X meets the designer's need to visualize a project during every stage of development. From the quickly shading a

design to mastering a full animations. This software offers varying levels of sophistication for conceptual planning, design development, design studies, and presenting projects for approval. 3D-X helps designers evaluate the design model from many angles with its View Finder feature. VF is a camera-like utility that orients your position in the model and allows you to alter the perspective of your view. Visualizations of a project are valuable to the designer during development, to the client during reviews, and as marketing tools to demonstrate a firm's sophistication and regard for client service. Whether you are an architect walking a client through a building project before construction, or an interior designer checking patterns, colors, and textures before committing to furniture and selection - 3D-X gives you the power to render your revelations and animate your dreams. Through renderings and video animations, 3D-X maximizes the impact of presentations and helps viewers truly experience the design of a project.

COMPUTER AS A TOOL

The computer program described above concerning the adaptation in the architectural designing, does not exist. The description of this program was created as a collage of many descriptions of other programs. As a consequence of the compilation presented above one can say that computer has been treated by software companies as a tool, more and more perfect, but still as a tool. This kind of software can be used by architects to create high-quality presentations on every stage of design process from the conceptual modeling to photorealistic video walkthroughs of a completed design. New versions of this software are easier to use and provide more professional results than those available only a few years ago. There is a trial below taken in order to consider new possibilities of the new tools on the particular stages of the architectural designing.

Conceptual sketching

New tools allow designers to see the concept develop on the screen as they think. Paper sketches or a site plan can be scanned in as a template to serve as an initial drawing for design development.

Form creation - modeling

At the next level of design, modeling programs have the capability to perform accurate and sophisticated modelling, rendering, and animation. New modeling packages offer unlimited layers, Bezier curves, unlimited light sources, and allow the designer to combine simple shapes such as 3D cubes, prisms, cones, pyramids, spheres, and cylinders to construct architectural models.

Form visualisation

Rendering

Once a 3D model is completed, either as a conceptual sketch or as a design completed in CAD, it can be rendered. At this stage, as mentioned before, the designer chooses the optimal view points, camera angles, and light sources.

Image editing

At this stage, software packages can be used to create a photomontage combining a rendered architectural model with site photographs. This is a particularly useful tool to present renovations to existing structures or to demonstrate the effect of several different design solutions on a sensitive site.

Output

Created images can be output as a combination of electronic sketches, models, and renderings with text. CAD software can create professional multimedia presentations.

Having done the above-presented analysis of the computer as a fundamental tool in the process of the architectural designing, the question is arising: What has changed in methods or process of elaboration of

ideas? Did we manage to build a friendly environment for architectural form creation? In my opinion computers have not had much impact on architectural design process, especially on architectural creativity. "Computer-aided drafting is uncommon (...), and computer-aided design is almost nonexistent..." (Stevens G., 1991)

In architectural design process we can define three phases: an investigation of the form, a technical documentation, a presentation. Computers application in the second phase became already obvious. Their application in the third phase causes many discussions - as we faced at the conference in Lund, where the problem of photo-realistic renderings making was discussed as a dangerous problem. The most controversial thing at the moment seems to be computer use on the stage of creative experimentation. First, that computer cannot always take place of impressionistic first sketches and that CAD could not be a substitute for pen or pencil and a fat roll of tracing paper at the conceptual phase of a project. Second opinion is, that full-function sketching workstation, supported with a tablet and pressure-sensitive stylus and painting program, like Fractal Design Painter, which simulates standard drawing and painting techniques, the designer is able to sketch initial concepts electronically.

However, it seems that neither first nor second opinion touch the essence of the problem.

It is nonsense to compare computer with a pencil or other traditional tools and media of architectural design. Accusing computer that it cannot be used for sketching is equally right as the opinion that pencil does not make digital renderings. A pencil is incompatible. (Asanowicz A., 1997) We should find a creative way of using computer - transforming the tool into medium. CAAD programs can not be reduced to the level of a simple project representation tool. We should, according to suggestion of M. Porada "use the tridimensional computer model to develop the virtual simulation approach, which deals not only with geometric representation of an object, but with other "scales" of representation as well. Throughout the superimposition and correlation of diverse representations, it must allow the user to evaluate at any given moment the different hypotheses established, and their realization in architectural space. (Porada M., 1996)

COMPUTER AS A MEDIUM

In connection with the computer transformation from a tool into a medium one should ask a few fundamental questions.

1. How computer-modelling technology affects our thinking about design?

Traditionally, CAD software development has mimicked the hardware tools (pencil, paint brushes) used in the practice of architecture. Sophisticated software, however, is superposing the mere automation of traditional tools and contributing original methods to architectural design. These methods are nonlinear and depend on tight integration of design, presentation, documentation, and quantification. Creativity is a not linear deterministic process. It is activity in which the sequence of particular functional components is of no crucial importance. The creation activity is multiplanar. (Asanowicz A., 1996) This new model of creation process and concentric working model offers the architect and client many more options to intervene in the design and see the effects simultaneously elsewhere in the design.

2. Will the design of virtual systems used for designing space fundamentally influence the kind of space created?

One of the fruits of the creative architects works are to be found in the abstract geometry of super-computed models of chaotic systems, the full-screen worlds of industrial light and magic, the battlefields of the video arcade, and new three-dimensional communities of the net. Architect are developing more complicated geometries today. The question, though, is whether our interest in these geometries drove our adoption of modelling technology or whether the modeling technology allowed us to become interested in the geometry? The visual, clearly spectacular character of changes, which found it place in visualisation technics of architectural form could be explained only by the analysis of change in perception process itself. Considering specific type of perceptual consciousness, we would also get a

specific type of visual art. Each type of a perceptual consciousness requires matching it means of expression. Each perceptual phenomenon expresses itself only through some, being able to express its components of a form. Each new set of means of expression is simultaneously a new set of formal means. Transformation within processes of architectural visualisation derive from transformation of perceptual consciousness. In order to see a new meaning of a new subject we ought to change a method of observation. (Asanowicz A., 1997)

3. Will people reared in virtual (Nintendo) environments relate to space differently?

The best answer is the growing interest for the technology of the Virtual Reality. Now, I would like to present my personal reflection. I remember very well my first contact with the VR on the ECAADE Conference in Eindhoven in the year 1993. After putting my helmet on I found myself in an unexisting kitchen where G. Smeltzer was preparing an unexisting toast for me. I have been keeping the picture of that event in my mind until the present day.

The fullest presentation of the VR possibilities was made by the Electronic Visualization Laboratory of the University of Illinois in Chicago on SIGGRAPH'94 the Electronic Visualization Laboratory of the University of Illinois at Chicago. His VROOM is a 10-foot x 10-foot x 9-foot cube with three of its faces receiving projected images of a single model, each face driven by separate RealityEngine2. People enter a VROOM wearing special goggles that reveal the stereoscopic projected images, while manipulating views, parameters, equations, time, or anything else the programmer allows. The illusion of physically being inside a virtual space is wonderfully disorienting. As a three-dimensional space for visualizing three-dimensional digital space, a VROOM would seem perfect for architectural exploration. (Larson K., 1994)

CONCLUSION

A tool becomes a medium as it is used for things that were not its original intention. When a tool becomes a medium, it gains immeasurably in potency and in its ability to help for our thinking - and thus to take a role as a partner in enhancing our creativity.

It is one of many possible definitions of the transformation process of the tool into the medium. As a necessary condition of that transformation, it mentions the interactive participation in the process of as well as designing and perception of both creator and spectator. According to a little ironical words of Erkki Huntamo-"I am interactive, therefore - am I?" (Huhtamo E., 1992)

The art of interactive media was born owing to the connection of two tendencies:

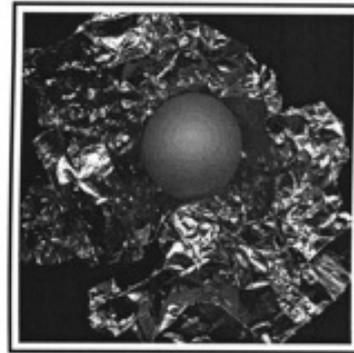
1) The process of the improvement of the electronic technologies, making a new dimension in communication and in creating the virtual worlds - those experiments are accompanied by the progress in studies on the artificial intelligence.

2) The evolution of production, giving more and more space to the receiver's activity. He turns out to be the fragment of the some structure / process of which he seemed to be just an exterior observer, the fragment of conclusive meaning to the shape of that process and to the sense actualized in and by it.

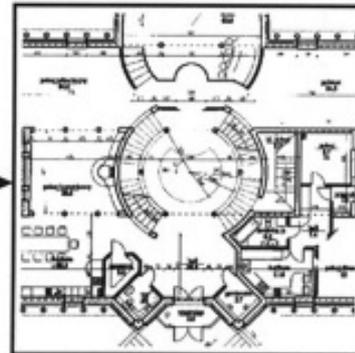
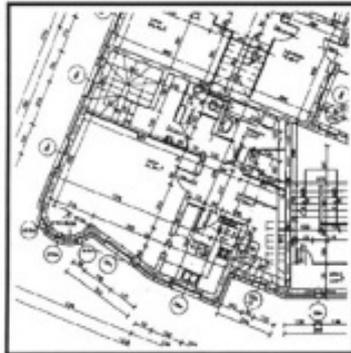
As A. Leuscher properly remarked: "The architecture is created in media, represented by media and, quite naturally, conditioned by media in which it is conceived, through which it is developed. But it seems equally obvious that any medium whether a pencil or digital logic circuitry is essentially contentless. The medium are all about process, not substance" (Luescher A. 1996)

The scheme elaborated in the result of above presented consideration is a trial of defining on which stage of designing process we deal with a tool and on which with a medium.

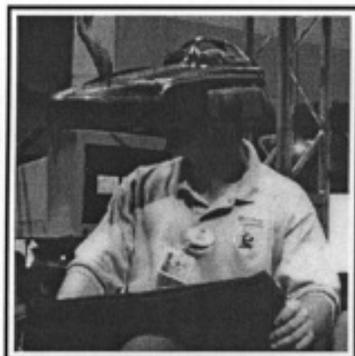
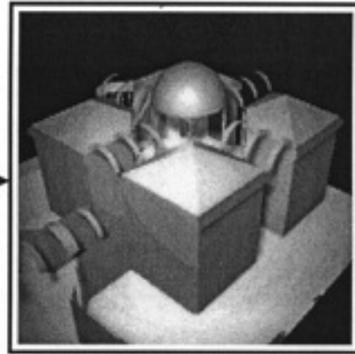
SEARCHING OF DESIGN IDEA



TECHNICAL DOCUMENTATION

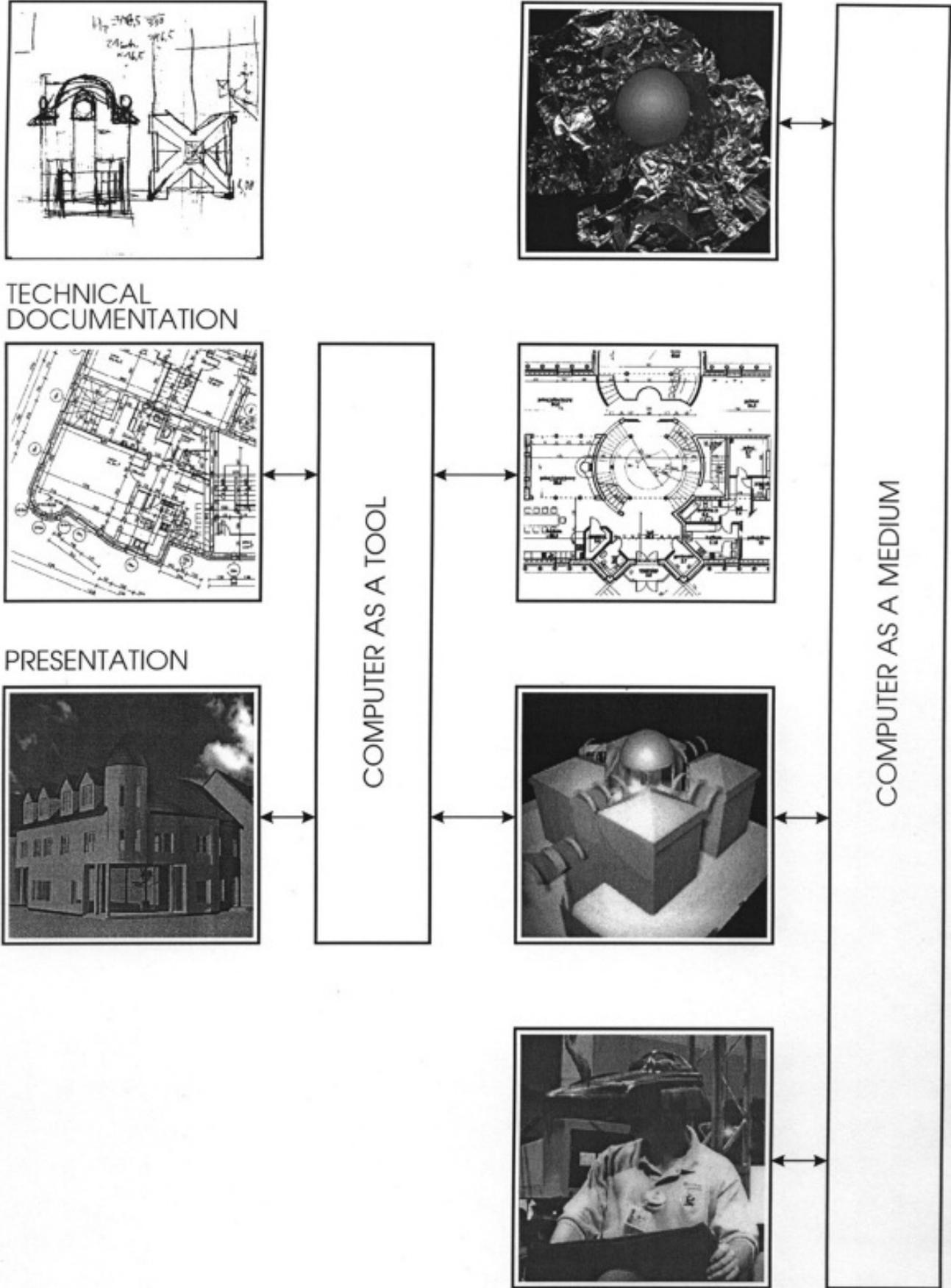


PRESENTATION



COMPUTER AS A TOOL

COMPUTER AS A MEDIUM



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