Are computers, in an design office, used in a creative way?

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The Leonardo da Vinci project AVOCAAD-stage (Added Value of Computer Aided Architectural Design Stage, with the help of the European Commission) is a placement program which enables young architects to gain practical experience in the use of computers in design offices, especially during the early phases of the design process. Experiments and the creative use of new possibilities offered by computers are encouraged. Through placements, discussions and experimentation the project gains valuable information on the possibilities of computers during the design process.

As a result of these placements we will obtain reports from people in several design offices. We will first give an overview of the main experiences. The authors will then formulate the main results and discuss the possibilities offered by computers for collaboration, what the implications of 3D Modelling are and what the implications can be for the design process.

Topics and ideas will be illustrated with presentations of design work.

The project AVOCAAD

The project AVOCAAD (Added Value of Computer Aided Architectural Design) is a Leonardo da Vinci project of the European Commission. It tries to develop course material specifically focusing on the creative use of computers during the early architectural design phases. The context of this project is the following.

The unlimited availability of new technologies in our rapidly changing society, inevitably influences to a great extent our communication and working methods. Parts of these new tools do imply a change in the way of thinking for the people working with them. Some of these new technologies however do not show their possibilities at first sight. They offer a series of hidden qualities, which in most cases opens a completely new world of thinking, communication and working once one has a deep understanding of it.

Computers nowadays make a lot of the work of architects easier. Office software speeds up the administrative work and working tools make it easier to produce plans and graphical documents. CAAD however offers a lot more possibilities. It has the potential to open doors to new ways of thinking during the design process. Architectural quality and the creativeness as well as the smoothening of the building process can be improved substantially. It can for instance help the architect to see in an early phase the implications of his design decisions, so to improve the final quality of the built environment.

Most offices limit the use of CAAD to drawing and drafting, and do not use the computer during the actual design process. More and more architects experience the need for an added value. It is therefore critical to make this potential more explicit for practicing architects as well as for students.
Within this context the group is thinking on ways to course contents and course modules focussing on these not explicit and not yet available possibilities of software packages.

**AVOCAAD-stage**

Within the context of the pilot project AVOCAAD, several practical placements were executed. Students and young architects had the possibility to have a period of training in a design office in another country. The offices were selected based on their intensive use of computers on a high level. We report here on the report of the young architects after their period of training. The placements were executed in the following offices: Atelier De Bondt Architecten (B), Van Berkel en Bos Architectuurbureau bv. (NL) en Rene Jacobs bvba (NL).

**Experiences**

In all three cases it turns out the designers use a mixture of computer aided design and pen and pencil techniques. They try to benefit from the qualities from the classical ways of working as well as from the new possibilities and advantages offered by computers.

Quality of this interaction between those two ways of working, influences the quality of the final design. When the interaction is better, it turns out that they benefit more from the possibilities offered by the computer. Several offices implemented an own way of working. They have one global system for the names of layers, for making bills of quantity, for producing the final documents, …

Most frequently, the computer helps the architect to test and investigate better the many different possibilities and solutions for a problem. It is now much more easy to make many different drawings and pictures of an idea to get better insight. These enable the designer to take his decisions on more insight and information. In a later phase the computer is always used to produce the necessary documents (perspectives, sections, plans, renderings, …).

Once, the design is more or less fixed, the detailing phase is in all cases carried out on a computer, frequently by one person or by a special group which makes all detailings of all the designs made in the office.

In all offices several softwares are used together: wordprocessing, spreadsheet, CAD-package (mostly 2D and 3D), packages for stability calculations, rendering software, presentation software, … The integration in a network and the possibility to transfer information from one package to another give an important gain in time.

Due to its large memory and its high calculation power in combination with large libraries of all kind of objects relevant to the architect, designers start using the computer as a memory for ready to use components. This for the moment begins to stimulate some kind of object oriented way of working and thinking. This can be an important consequence for the future as there is a lot of investment in computer departments in object oriented technology (C++, JAVA, …).

Networks originated from academic environments. The benefits of networks become also clear in the design offices. All offices where at least some good results were obtained, had all computers and/or workstations connected in a local network. This turns out to be a necessity to have a good working and communication environment. It gives great comfort to the designers working in the office and facilitates good communication, which is of great importance when many people work together.

Moreover, the use of the Internet and Email is growing very fast. Architects now more and more communicate (even with clients and building companies) through electronic media.

It turns out 2D is more frequently used than 3D. Mastering a 3D-package turns out to be much harder
than a 2D-package. On the other hand, if a designer masters 3D effectively and uses it to design and to develop his projects, it turns out he gets much in return: a building and an environment are experienced in a much more realistic way. Using an electronic 3D model makes it much more likely to detect spacial problems (e.g. connections, stairs, …) than using only classical 2D drawings.

In all cases people working with the computer collaborated with architects not using this medium and frequently having no experience with computers themselves. So, non computer users supervise the design decisions. Collaborators work out the ideas on the computer.

In all cases, people have the experience the quality of design is augmented. They say they have worked out their ideas more profoundly.

Conclusions

The execution of this placement program enabled the Institute to develop more profound and intensive relations with design offices. There were several discussions and both parties got more insight in each other.

The Institute got better insight in the needs and demands of professional design offices in general and related to CAAD especially. An important idea seems the request for a tool to work in perspective view.

Another general remark is that most people from practice see CAAD as one of the different changes in the profession and want to place CAAD in a broader context (Internet, other presentation technique). As such it is not a discussion on media but on tools to be used as a help to design.

References


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Picture of the office Van Berkel en Bos Architectuurbureau