

Net-based Architectural Design: The Difficult Path from the Presentation of Architectural Design in the World Wide Web to Teamwork in Virtual Planning Offices: A Field Report

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In the last 18 months, students from the Institute for Industrial Building Production (ifib) have undertaken six design projects as so-called Netzentwurf ("Net-Design") studios in collaboration with different universities in Europe. These studios have used a web-based collaboration platform established at an independent web site [Elger, Russell 2000] and use didactical methods for web based design collaboration established over the past four years at ifib. [Forgber, Russell, 1999] A total of some 500 students have been involved in these projects and all have used the common platform to carry out their presentation and communication work. Alongside the search for a design solution to the particular design studio problem, attention was attuned to

1. The nature of the presentation of architectural designs on the Internet as well as
2. The use of the Internet based communication technologies to assist the individuals or groups to discuss and criticise their work.

The number and scope of previous Netzentwurf projects means that current student participants using the Netzentwurf platform are able to draw upon a wealth of web-based architectural graphics as precedents for their presentations. [Russell et al 1999]. All previous work carried out in the Netzentwurf environment is archived on the platform and is available freely to all. It could be said that a general

approach for logging and presenting architectural design has been established in the past four years of net-based studios. With this in mind, recent work has focused on creating a web-based environment conducive to distributed collaboration. The paper describes the methods used to introduce the students to the platform as well as the personal and technical support offered to the students and tutors alike.

Presenting on the Web

Although the focus from the teaching standpoint has been on the use of the Internet as a communication medium during the design phase, attention is still given to the web-based presentation and documentation methods developed over the past four years. The work of the students then comprises three aspects: the design solution, its presentation using web based media and design collaboration using the Internet as a communication medium. Using design themes similar to previous projects, the students undertook to find design solutions to the following design themes in the winter semester of 1999-2000:

1. The conversion of a nineteenth century fort near Strasbourg, France. This project was performed in cooperation with the Fachhochschule beider Basel, Switzerland and the École d'Architecture in Strasbourg, France.
2. An Office Building for a European urban situation

Go to contents 14

twenty years hence. Students in Karlsruhe and Cottbus, Germany, performed this work in parallel, however it was not undertaken as a co-operation project.

Using various presentation tools, the work was presented solely over the Internet. It is interesting to note that many students invested over-proportionate amounts of time and energy in producing graphically sophisticated web sites. While impressive, this led also to relatively shallower research and less thought-out design solutions by most of these students. This is not to negate the gravity of producing good web presentations and tackling problems such as screen size, loading time, browser types etc.. however this comes at a cost. [Elger, Russell, 2000]

Ten years previously, the education of students of architecture with the then new CAD systems, brought upon wonderment and critical evaluation of the graphical effectiveness of the resulting plots. The situation with the World Wide Web is similar in that the new types of interactive presentation stir wonderment in the audience, but also raise critical questions as to how best to use the new medium. Issues such as scale, detail and storytelling have been raised in the final reviews. True, there exist several computer applications for the easy creation of web sites, however, the students must still calculate for extra time and energy in order to present their work in the Internet, whether they use animated gifs, Flash

or JavaScript goodies. But effective presentations need not involve these new technologies. Using simple methods and technologies, it is possible to use a simple cardboard architectural model and an endoscopic camera lens to obtain base perspective images. These are then further modified using pixel-editing applications such as Adobe Photoshop (see Figure 1).

Cooperation between different schools

The cooperation between schools of architecture in Switzerland, France and Germany were organised so as to enable cooperation without making it necessary to participation. A workshop was held at the beginning of the semester where all participants were present. Mid-term reviews as well as a final review were also cooperatively undertaken. Student collaboration was not required and as a result, the amount of interaction between the schools was almost entirely limited to the physical meetings. The cultural differences (in teaching style as much in language or nations) made cooperation difficult, perhaps more so among the tutors as among the students. [Koch, Russell 2000]

Collaboration

In order to truly test the Internet as a communications medium (for collaboration and not only presentation) we sought to establish a studio market along the lines of a white paper developed at ifib. Contacts with two other universities in Germany (University of Kaiserslautern and the Brandenburg Technical University in Cottbus) enabled us to set up a trial studio market in the summer of 2000. The market offered projects ranging over the entire scale of design problems. These covered:

- a) Regional Planning (a study of the German State of Rheinland-Pfalz),
- b) Urban Planning (the re-use of the Expo 2000 grounds in Hannover, Germany), and
- c) Architectural Planning (the re-use and refurbishment of a former grain mill).

Figure 1: Cyber Soap, Stephanie Knebel <http://www.netzentwurf.de/work/ifib/Entwuerfe/zukunft/Knebel/entwurf/index.html>



Each of the three participating institutions organised and offered a design studio theme. Students at each of the three universities were free to choose which design studio they undertook and to build student teams across the different universities. The small number of schools involved allowed the tutors to quickly solve problems that arose in trying to follow the framework described in [Russell, Forgber 2000].

Perhaps the largest organisational hurdle was to co-ordinate the differing schedules of the individual German States. This was, in an extreme case, as much as four weeks out of sync. The organisers met this problem by extending the syllabus to include a research phase at the beginning of the semester as well as a documentation phase at the end so that schools starting early or late would cover these phases with all schools collectively undertaking the core design and design development phases. However, the timing differences lead to problems in organising a kick-off workshop, especially when some students had been working on the project for almost a month.

This is important, as it has become clear that the workshops are a necessary component of the distributed cooperation in that they allow an intensive study of the project as well as allow interpersonal relationships to become established. The experience of the *Netzentwurf* concept has shown that it is often meaningful to initially group the students into larger groups in order to study or brainstorm overlapping aspects of the design problem. Topics such as the urban context, building history, material and energetic aspects help feed discussions about broader issues. This initial grouping is then reformed after one day into smaller groups. These are either set as the design teams for the semester or a third round of partner shuffling is undertaken. The workshops are held over two to three days in order to allow enough time for social interaction alongside the assignments. After an initial “mixer” on the first evening, the social aspects of the workshop are usually left unstructured.

It is also important to explain to the students the advantages of teamwork in the field of architecture and the absolute need for practitioners with these

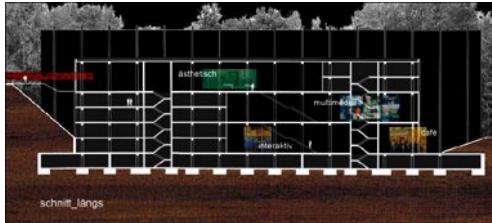
abilities. Although some students are aware of this situation, many are not yet cognizant to the fact that architects work with constantly changing teams and that the ability to work within and steer a project team is of utmost importance to a successful career.

Student feedback through a reverse critique by the students immediately following the final review as well as through questionnaires distributed after the studio’s completion show a wide support for the *Netzentwurf* format. The work load encumbered through the three part assignment of communication, design and presentation led many to comment that they would recommend the project to their colleagues, but would think twice about undertaking another such studio. Similarly, the students were almost unanimous in their wish for better co-ordination among the participating schools and tutors. This is especially so in the areas of assignment description and expectations (a problem solved through more preparation and collaboration among the partner institutions) and timetables (a problem not so easily solved in the near future).

Examples

For the project “Expo 2000”, Claire Dugard (a visiting French architecture student in Cottbus) and Christoph Durban in Kaiserslautern created a well thought out and clearly presented design. Although they were 700 km apart, the Internet based cooperation platform at netzentwurf.de helped them to coordinate and “meet” regularly. Ms. Dugard is an architecture student whereas Mr. Durban is a regional planner. This allowed them to complement one another in developing their design solution. It is also important to note that they, like most of the *Netzentwurf* participants, had little or no web graphics experience (fig 2).

The students Christine Beisel and Simon Ell from Kaiserslautern teamed up with Denis Hildebrand from Cottbus and Annette Greuter from Karlsruhe to tackle the re-use of a grain mill. Their work is impressive as much for their teamwork as for the final design presented. Having participants at three universities meant that they used all sorts of communication



media, including meeting at a service station somewhere near the geographic centre of their three cities (fig 3).

Tutoring and Criticism

The consultation and tutoring of these groups requires precise coordination among the tutors and professors at the various universities. This especially so when the students groups are counselled from more than one university or Professor. The breadth of varying opinions available from such a group of tutors is not always seen as enriching by the students; it is often seen as an example of a lack of coordination among the participating Universities. It is especially important to be able to clarify (to students and tutors alike) the unanimity needed in organisational aspects (what is expected when) and the divergent opinions that are acceptable, if not wished for, in the design issues themselves.

Collaboration II

The latest project run under the umbrella of the Virtual Upper Rhine University of Architecture (VuuA) was intended to incorporate experience won in previous



Figure 2 (left): Expo 2000, Claire Dugard and Christoph Durban <http://www.netzentwurf.de/work/expo/Gruppe6/expo2000b/index.htm>

Figure 3 (right): Holzmuehle, Beisel, Ell, Hildebrand and Greuter <http://www.netzentwurf.de/work/ifib/Entwuerfe/Holzmuehle/gruppe1/index.html>

semesters into the tri-national program. Students from Strasbourg, Basel, and Karlsruhe (as well as in parallel by students from Dresden, Germany) undertook the communal design problem of an archaeological museum near Basel.

Approximately 150 Students participated in the project during the winter semester of 2000-2001. Initial feedback during the semester showed that didactical differences between the various universities led (once more) to partly insurmountable hurdles in enabling inter-university cooperation among the students as was initially envisioned. While these hurdles seem inevitable, the spirit of the endeavour is such, that almost all participants are willing to try and surmount them each time. The intention of collaboration was made clear to the students who, in turn, undertook to maintain groups beyond the required phases.

Important to the establishment of such an enabling environment is a strict, clear and democratic process in establishing the ground rules, goals and methods to be communally used during the studio session. This carries over to aspects such as the exercise description, methods used in consultation and criticism, and the inevitable evaluation at the end of the semester. University specific conditions or structures must be reduced in importance, in order to allow a high level of flexibility between the partner institutions. In the VuuA project "Römermuseum" in the winter of 2000-2001, the schools were able to establish inter-university teams for at least the initial phases of measurement, documentation and initial design. The development of the design solutions was finished in each university individually and where possible, presented in the Internet (fig 4).

Figure 4 (left down): Augustica Raurica, Karen Faller and Sandra Wilfinger http://www.netzentwurf.de/work/extern/augst/LP3/group_lp3_23/entwurf/website/home.htm

Collaboration III

With the collaboration experience of the previous two semesters (and four years of experience with so-called “Netzentwurf” design studios) the Institute for Industrial Building Production, has invited five other Universities in Aachen, Siegen, Cottbus, Kaiserslautern and Weimar to take part in the communal design project entitled “Liquid Campus” for the summer semester of 2001.

The project has started this spring with a group workshop on the island of Rugen in the Baltic Sea and has given the 14 Student groups comprising 44 Students a good basis for distributed, collaborative teamwork. The design topic, a virtual university, is more than a bit self-referential and so we have high hopes that innovative design solutions based on well thought out theoretical groundwork will be presented at the end of the semester.

The summer semester is a true test of several Netzentwurf concepts in that the students may only work in teams of three or four where each member is from a different university. What is more, the architectural criticism is provided from a tutor at a fourth (or fifth) university with technical support being provided by the local university.

Outlook

The groundwork is also being laid for a smaller, but more varied constellation of interior designers, architects, landscape architects and engineers for a group design project starting in the fall of 2001. This design studio will attempt to integrate the horizontal and vertical aspects of the design process in cooperation with the Fachhochschule in Basel.

Interest at other schools has been raised and other schools are likely to adopt the Netzentwurf format for the winter semester of 2001-2002. Indeed, the Platform itself will likely host twelve institutions offering between 6 to 8 differing design themes open to the students of participating universities in a studio market previously described. [Russell, Forgber 2000]. As many as 500 Students will be using the platform simultaneously during the next semester.

This expansion must be tempered with the results of the previous studios. Namely, a much greater amount of preparation on the part of the tutors is needed in ensuring that consistent information is flowing to the students.

The platform has shown to scale well. The technical aspects of the studio have remained more or less stable over the 18 months and the need for technical support for the platform itself has also remained constant despite the rising number of students. The authors are actively seeking sponsorship or research support for the project, but are well aware of the fact, that successes achieved over the past four years of development owe as much to the current independence of the project as much to the technical and didactical groundwork established.

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