Lessons from Distributed Design Practice

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Parallel to the expansion of the internet, the acceptance of computerization in architectural practice is clearly evident. This paper signals the emergence of long-distance design collaborations over networks as a pragmatic condition of contemporary design practice, and reports on several successful design projects conceived under these new circumstances. Experiences from these projects were important in formulating both the limits and opportunities derived from the distributed design condition.

Keywords*: Design Collaboration, VDS, Networks.*

Introduction to VDS

In the final years of the millennium and following the rapid dissemination of computing, we are witnessing the global expansion of the internet. In architecture, the connectivity over this "mother of all networks" is becoming an integral part of design practice and design education. This connectivity can be seen both as an instrument for communication and for the remediation of past conventions. Geographically and temporally distributed design collaboration is illustrated and discussed in this paper as a new condition for making architecture both in terms of limits and opportunities. Furthermore, this paper reports on recent long-distance design collaborations and their impact on the nature of contemporary practice.

The authors have attempted to utilize the Virtual Design Studio (VDS) method in a professional context. This method of architectural design is based upon experimental work which began in the early 1990s, primarily in an academic context [A]. It was named the Virtual Design Studio to signify the physical absence of a studio, and demonstrated that creative design collaboration was possible over wide area networks. Early projects documented the collaboration of architecture students and tutors working from diverse geographical locations, and tested methods of working in such a context. The term Virtual Design Studio was coined as the new paradigm for Computer-Aided Design, refined from being a purely technical and creative process to being also a social endeavour.

Aspects of Distributed Design

The five case studies presented below were formulated and directly experienced by authors in both the professional and academic realm. The professional context is particularly interesting here. Separated by six time zones, the authors successfully worked in the distributed mode. Since the beginning since of the collaborative projects, they did not meet outside of the virtual realm, but do for the first time to deliver this paper in Liverpool and perhaps that is why they offer somewhat distinct views of this experience. However, they are united in their belief that the creative aspects of a long-distance design studio merits more attention as it becomes the major factor in re-defining professional conventions, work habits, issues of authorship and authenticity in architecture.

The intent of the few competition projects illustrated below was to develop the design under seemingly adverse conditions, and to compete on an equal basis against teams which did not have to face the challenge of distributed formulation of concept or teleworking. It is seen by the authors as the ultimate test of the VDS method, as the projects were to be

judged on professional merit alone. Thus, even though the method of design development was not disclosed when the authors' competition entries were submitted, their submissions were often among the awarded finalists. This is not to be taken as proof that distributed design is as effective as any mode of making architecture, but as an opportunity to look closer at the case studies and their limitations.

From strange to shared design universe

Housing Competition, Sczecin-Dabie, Poland, 1999, Second Prize.

The subject of the national competition was a vacant site, located in the old center of the small city in north-western Poland. Defined by strict height limits and urban design guidelines, the project made no direct reference to the historical fabric adjacent to the site except for the urban form. The following sequence of images is related to designing the shophouse, one of the two typologies used in the project. The process of collaboration involved the conceptual development of a massing strategy, the individual development of housing types, and the collaborative assembly and fine-tuning of the project. It involved an intense deployment of digital media throughout the collaboration, with the exception of the beginning and end of the competition. As the terms of reference and site information were provided by the organizers in paper form, digitizing the data at the beginning of the project was required. The submission of the project called for predictable A1 format boards, and the need to publish a completely digital project in analogue form was time consuming and redundant. Although the project was developed over the network, the final delivery of it was only possible via courier. This rather absurd process is not unusual in the hybrid condition of the contemporary design practice where paper output remains the common levelling ground.

None of the collaborating authors visited the site in question and their understanding of the context and the problem was limited to the terms provided by the competition organizers. This created a uniform but simple design universe at the start of the project. Later
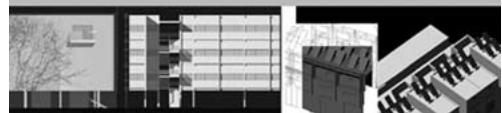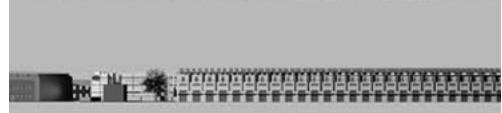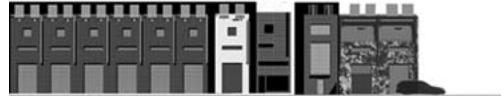
on, this universe became complex and populated by numerous ideas. In retrospect, this particular case of the distributed design process can be described as a story of assembling two distinct ideas, still readable in the typology of the final submission. While one of the authors proposed a shophouse, the other conceptualized an apartment type. Later, these initial ideas were critically reviewed and enhanced by the co-authors as the project changed hands. Communication in this case was largely asynchronous and relied on e-mail attachments for the small-sized text, vector and image files and on ftp transfer to a server in Krakow for the larger files.

Hierarchical structure and the efficiencies of role playing

Competition Entry for Library Addition, University of Bialystok, Poland, 1998, Honorable Mention.

The second competition project produced a semi-transparent, skewed cylinder which housed the reading room and stacks of the expanding university library. The computational environment engaged in the development of this project at the two major sites was not homogenous. The software used included Arch+, MiniCaD, FormZ, 3D Studio, Corel Draw,
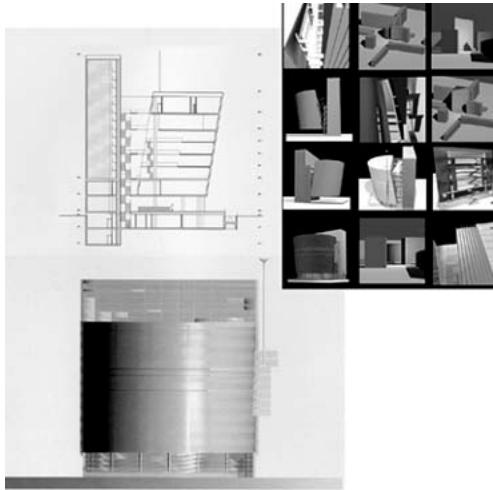
Photoshop and AutoCAD in various configurations. The context photographs and site maps were digitized, and 2D CAD drawings were developed together with the 3D models. The figures below illustrate the final versions of the projects, followed by an assemblage of icons which depict a small subset of the evolving solutions. The concept for this project was formulated largely by one author, and the other was the critic at the initial stages. In the final stages, in order to meet the deadline of the competition the latter abdicated his role as an equal partner, and played a purely supportive role developing the final project visualization. Hierarchical role playing was found to be efficient in this case.

Diversity of tools vs singularity of idea

Olympic Hockey and Winter Sports Arena Competition, Krakow, 1998, Third Prize [B].
Proposal for Conversion of Airplane Hangar to Civic Use, Krakow, 1999.

Both sides secured high-speed access to the Internet, enabling efficient communications via e-mail, WWW, FTP, and desktop video-conferencing. The initial phase consisted of e-mail exchanges and attaching scanned material related to the site and to

precedent studies. The WWW was used to locate precedent studies and exchange ideas in VRML format. Fragments of the design process and the final solution are illustrated below (see Fig. 3). The software and hardware for design and communications were diverse and, for the most part, different at both ends. Through the experience gained in working together on the Arena, the authors were able to develop at distance a second project — this time asynchronously — a proposal for converting an old military airplane hangar to a mulitpurpose community assembly space with flexible seating. The space was to be used for sports and entertainment events. To expose the character of its wide-span roof, elegantly suspended from two space trusses built in 1927, contemporary transluscent material was to be used as the roof membrane.
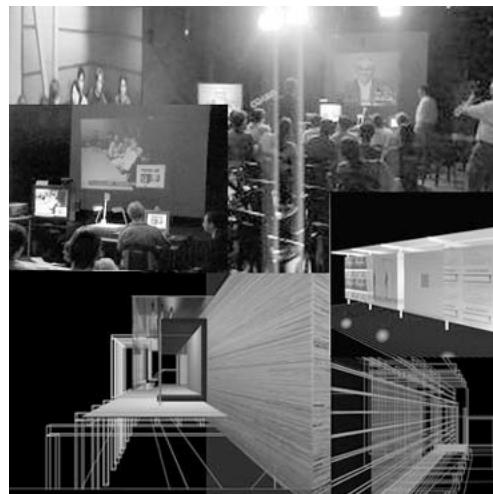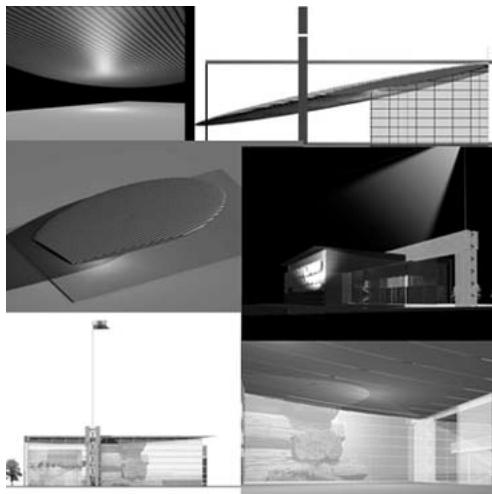
Negotiation takes time as the new media create new problems

Competition Entry for Polish Pavilion, Expo 2000, Hanover, 1999

The Pavilion project attempted to explore information technology through assigning materiality to the neutral box, and combine that with an idea of a

changing and programmable elevation. In addition, the project explored the notion of virtually augmented reality by combining computer controlled projection with the exhibition of physical artifacts. The final submission for this competition derived from merging these several initial ideas. However, as revolutionary as the concept appears, it was hard to convey on paper the notion of electronic collage and dynamic, cinematic facade within the limits of a fixed pictorial space of white A1 board. The Pavilion was developed under very rigid deadlines, forcing the authors to limit their time and tools devoted to negotiating and fine-tuning the design solution.

Together - Apart

VDS98, UBC, Canada and Universidad UNIACC, Chile.

Developed in an academic context, this was an intercollegiate project involving two schools of architecture, 10 000km apart. One of the authors was the originator of the studio and worked with Dr. Alfredo Andia as tutors, while the other was the visiting virtual critic offering his feedback to the participants at key project stages.

The subject of the Virtual Design Studio was the design of an information kiosk which would celebrate the 1997 free trade agreement signed between Chile and Canada, as well as foster an information exchange among its citizens. In particular, the studio explored the idea of an ephemeral, popular, and public architecture in which the potential of new communication technologies could unify two remote places and cultures. The participants of the VDS first developed a prototypical design idea in reference to the distant site and at the same time they answered queries related to their home context. After a generic design concept was formulated, the kiosk design was tested at the home site. Although the project began with different and discrete cultures, by the end the two schools came one step closer to each other, thanks to web-based technology such as threaded discussion pages and Spanish-English language translators.

Lessons: Limits and Opportunities

Information Technology facilitates design collaboration. It expands the possibilities of creative design work if computers are regarded not as tools, but as the means to further engage with other

designers in the creative aspects of design development. New forms of practice, such as distance design collaborations over the internet and participatory design in virtual environments, are being integrated into the creative process of the contemporary architect.

However, the emergence of computers onto the stage of architectural design has been extremely rapid and, considering developments since the last decade, rather overwhelming. Has it upset established conventions? The guiding power of abstraction in established conventions needs to be acknowledged. After all, the use of two-dimensional, orthogonal projections of plan, elevation, and section since Vitruvius developed an abstract design notation and exclusive language well understood by initiated professionals. Today, an ease of visualization and design digital simulation of early design stages enable the collaborator, client and ultimately the public to develop a full understanding of design proposals from their conception. Yet the need for abstract conventions in conceptualization remains.

In the practice of design, IT should be now accepted as *media*, crossing the boundaries of familiar conventions to those of non-architectural disciplines. The nature of these media permits the designer to think more naturally in three dimensions and to a greater degree than previously imagined, but the ease with which simulated complex surfaces are generated by new media could be disturbing to the additive rigour of traditional design conventions.

VDS expands the definition of new media types used in architectural design, acknowledging the necessity of communication media for the discussions and negotiations which occur in the design cycle. In the not-to-distant future, immersive environments will amplify this VDS paradigm even further. The use of collaborative architectural authoring can be reformulated by the Virtually Augmented Reality environment, further enhancing the ability of collaborating designers, as well citizens, to construct design solutions across the borders of time and space.

As the result of the above projects, we believe that a few aspects of distributed collaboration as particularly significant. Among the main points we observed are:

First, Asynchronous collaboration can seen to be an asset in the design process, since the design universe can be stabilized and structured by the limited feedback in the temporally distributed studio. Moreover, diverse individual schedules can be easily accommodated with little consequence on the project overall.

Second, the see-saw between abstraction and simulation as well as between virtual and real are central conditions of contemporary design. The design process can easily be recorded and the possibility of backtracking through design might be a significant source to its understanding.

Third, the team dynamic is a very important factor affecting collaborative efforts. The distributed design task force is often short-lived and intense, and not unlike a Hollywood movie production involving groups of creative people. However, there is very limited evidence that new design conventions are emerging. In fact, the traditional modes of conceptualization and representation are still in force.

In the near future, VDS should expand the possibilities for professional design work by bringing clients closer to the design process, communicating visual information more effectively and more often. The authors consider Information Technology as a design facilitator that can impact the nature of contemporary practice through the development of a new relationship with the public. It will be truly interesting once user participation and feedback is facilitated by the distributed design practice.

As Information Technology enters the design field more and more today, distance collaboration exercises afford a glance toward aspects of participatory design environments of the XXI century. However, we are not without problems: "The summation of human experience is being expanded at a prodigious rate, and the means we use for threading through the consequent maze to the momentarily important item is the same as was used in the days of square-rigged

ships," warned Vannevar Bush [C] (1945). The broadening of the design universe through conducting distanced architectural practice will become rapidly evident, however, architects at large tend to be mal-equipped to deal with the onslaught of this new condition of the Information Age.

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Notes

[A] For a comprehensive summary of academic VDS projects, see http://www2.arch.ubc.ca/research/vds/

[B] Detail discussion of this project is published in proceedings of eCAADe, Paris, 1998.

[C] Turing contemporary Vannevar Bush was a professor at MIT and Director of the Manhattan Project. He outlined Memex, the theoretical prototype of hypertext, and by extension html.

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