

COLLABORATIVE DESIGN: A FRENCH/THAI EXPERIMENT OF CO-DESIGN

Sylvain Kubicki

Gilles Halin

Jean-Claude Bignon

Research Center in Architecture and Engineering

Architecture School of Nancy

2 rue Bastien Lepage 54001 Nancy Cedex

kubicki@crai.archi.fr

halin@crai.archi.fr

bignon@crai.archi.fr

Walaiporn Nakapan

Master of Science Program in Computer-Aided Architectural Design (M.S.(CAAD))

Faculty of Architecture, Rangsit University,

Muang Ake, Lak Hok, Patumthani 12000, Thailand.

nakapan@rangsit.rsu.ac.th

Abstract

This communication describes an experimentation of co-design carried out between two teams of French and Thai nationalities. The objective of this collaboration is to design an exhibition of work from CRAI at the Art Gallery of Rangsit University (Thailand). We describe here the setting up of this collaboration (objectives, stakes) as well as its progress. This project enables us to apprehend the co-operative dimension of a design project, and particularly its sociological aspects. We describe also the tools implemented to assist the collaborative activities (discussions, file sharing, etc.). The characteristic of our experiment is the geographical and cultural distance of our two teams. The difficulties related to this distance enabled us to see how the tools can assist the actors in their co-operative tasks.

Key words: Virtual Design Studio, Collaboration, Co-design experiment, Groupware tools.

1. Introduction

This paper aims to make the assessment and to analyze the contribution of the data-processing tools at the time of an experimentation of co-design carried out by two distinct and distant organizations: CRAI laboratory of the school of Architecture of Nancy (France), and the "Virtual Design Studio" class of M.S.(CAAD) program, Faculty of Architecture, Rangsit University (Thailand). The VDS is a new practice which consists in connecting groups of individuals (students for example) with an aim of designing together [1] [2]. We chose, as an object for this experiment, the design of an exhibition of work of the CRAI in the Art Gallery of Rangsit University, Thailand.

This article describes this project in three principal stages: (1) description of the project set up, (2) design development and interactions between teams and (3) assessment on the contribution of the tools in the collaboration. We will seek as much as possible to identify the collaborative activities around the design project. For that we will be based on the principal concepts relating to the theory of the activity (see figure 1): actor, object, tool and coordination [3].

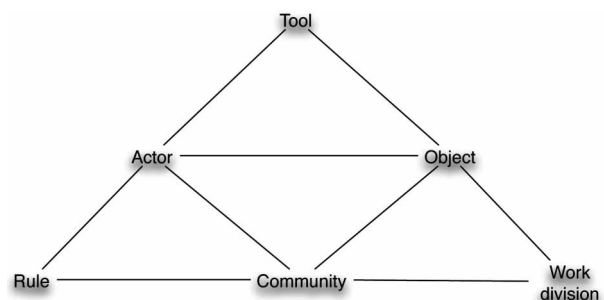


Figure 1: structure of a system of activity.

2. Setting up the project

We will describe in this part the framework of our collaboration: object to design, community of collaborating actors, tools used and coordination. Initially, emails and instant messengers were the only tools used. A proposal for collaboration around a design project was put forth and the framework of the experimentation was built around this proposal and of these primary tools.

2.1. Object of the Co-design

The object of the co-design relates to the realization of an exhibition of work of the CRAI to Rangsit University. In our experimental purpose, financial dimension was taken little into account.

2.2. Subject/Community

Two teams work on the project. The Thai team consists of Master students of the "Virtual Design Studio" class, M.S.(CAAD) Program, Rangsit University. The French team is composed of PhD students, interested by the collaborative design in their PhD work. We distinguish two levels of granularity: the first level considers two teams of different origins; the second level describes actors and individual roles in the community.

2.3. Tools

Harmonization of the design tools

The first step was to define the design tools used. If the traditional tools of office automation are largely shared, the CAD tools are more numerous so it was necessary to define it.

Tools for communication and transfer of information

We planned working sessions internally (within a team) and communally (dialogue between the teams) and chose a certain number of tools for communication and information sharing.

- Asynchronous communication

Electronic mail is largely used by all and makes it possible to communicate messages and documents. However, even by using "mailing lists", the follow-up of the diffusion of information and the evolution of the documents in circulation remain difficult to control. We chose to set up a groupware, based on a "freeware" tool: PhpCollab. This tool makes it possible to centralize information of the project: tasks by actor, documents at disposal, shared calendar or discussion board.

- Synchronous communication

The server primarily allowed sharing documents relating to the project. We also programmed synchronous weekly meetings. For that we chose traditional tools for videoconference: instant-messenger + webcam. With that we added a tool for desktop sharing (VNC). Installed on a computer in server mode, this tool makes it possible to visualize the shared screen from a standard Web browser.

2.4. Coordination

From the very start of the project, we clearly defined the type of coordination to be implemented.

Rules

1. It was defined that team works internally during the week, and that a joint meeting for coordination takes place in a regular way,
2. Each team takes turn to write meeting minutes in order to keep a hard copy of the decisions taken,

3. The common language to be used is English, Concerning the exchange of documents:
4. Naming of the numerical files: "Country of origin" _ "Number" _ "Internal or External" _ "Name",
5. Interchange format to be used according to the type of document,
6. ...

Division of the task

Each team has a particular role: to provide the contents of the exhibition for France and to describe the place of exhibition for Thailand. The following tasks are related to producing: (1) information on the exhibition contents and (2) information on the exhibition place. Moreover, we made a point of allotting a role to each actor in order to reinforce the cohesion of the community: coordinator of team, person in charge for modelling, designer, ...

3. Development of the experiment

3.1. Modes of exchanges and progress

Two working methods were adopted: internal working in each team and the joint meeting. During the working week, tasks assigned with each one are to be realized. The planning of these tasks is validated in joint meeting (synchronous). The synchronous meeting is the moment of exchange privileged between the teams. The documents can there be validated or not and the tasks to come are defined.

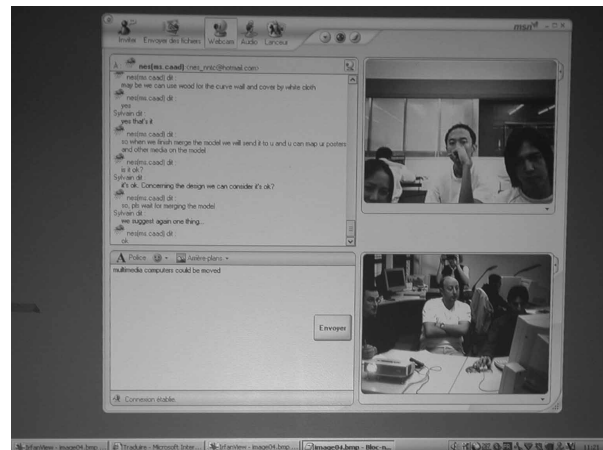


Figure 2: Screen capture of the videoconference application.

Each meeting's fallout is the drafting of a report in which the principal decisions or raised questions are reported. We incited the authors to illustrate the document in order to make it clearer.

3.2. Final state of the design

The collaboration around this project of design took three months. One distinguishes two great phases from work: (1) definition of the contents and the place of exhibition and (2) design of the exhibition itself. At the end of collaboration, we

have reached a level of rather fine detail of exhibition spaces, without entering, however, in a technical level of detail. The project in its current state is ready to be submitted to the various institutions for fund raising.

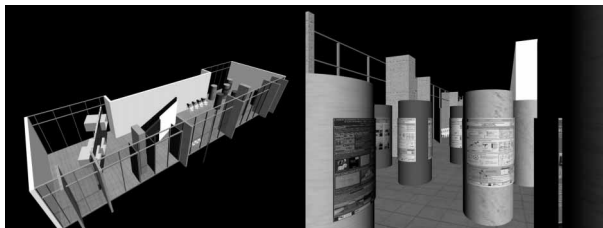


Figure 3: 3d final representations of the project.

4. Evaluation – contribution of tools

4.1. On collaboration

The experimentation described here puts in scene two very different teams by their culture and geographical origin. We can underline the practical problems “usually” generated by the distance: time zone, common language to choose, ... These aspects were taken into account very early in our project. A rigorous organization and a communication of the rules to all the actors made it possible to overcome these problems. Then, we are confronted with a problem of a sociological nature, caused by the difference in cultures between the two teams and accentuated by the difference in composition of the teams described above. This aspect does not concern the organization, but rather requires a strong will of each one to facilitate the communication (concision, clarity of expression).

The various data-processing tools for collaboration do not make it possible to remove these problems related to the nature of collaboration itself. They can all the same improve comprehension of the context of the project by the various actors. However, it should be noted that the minutes of meeting remain an essential tool for synthesis, which makes it possible to clearly expose the considering topics or the choices carried out during the meeting, thus avoid misunderstandings. The various groupware tools could propose functionalities making it possible to assist the drafting of the report.

4.2. On coordination

We made a point of explicitly identifying the role of each actor in the project, in order to support “group awareness”. The purpose of the tasks definition on the collaborative server was to make it possible for each member to be kept informed of general advancement of the project and of his or her “obligations”. We can note today that this functionality of the server was largely under exploited.

That can be explained by a “limit” of the PhpCollab tool, which makes it possible to assign tasks to an actor, but does not allow him a possibility to reject them. In addition, the superabundance of emails sending automated information coming from the server weighs down its use considerably. Another reason with this problem resides, perhaps, in the fact that it is not necessary “to

describe” the activity in very fine detail. The designers need “freedom” to work.

It seems interesting to define the main tasks in advance in order to determine deadlines, but to leave the actors to organize themselves freely in the achievement of the “sub-tasks”. Another under-exploited tool of the server is the “discussion board”. Is its utilization too complicated to be effective? However, with an idea to centralize the project and documents on a single server, it would have been interesting to keep track of the asynchronous exchanges, the true “tracks” of the evolution of the design.

4.3. Limits and prospects

With regard to the collaboration implementation, basic elements make it possible to define the objectives and the project of collaboration (object, community, tools). It is around this base (two actor coordinators) that can be grafted all the elements of collaboration. Modeling of the collaborative activity using a groupware raises certain questions. For example, we think that a stage of validation of assigned task by the concerned actor would be essential. Indeed, from a sociological point of view it is important to take into account the opinion of each one.

The modeling of the collaborative activity on the server seems to us very interesting to ensure the cohesion of the actors around the project. It makes it possible for each one to be located in its general advancement. Moreover, one keeps tracks of the exchanges, the decisions, etc., which make it possible to capitalize the single information and the experiment of the design. The PhpCollab tool tested during this project has its qualities and its limits. Other tools fill some of these gaps partly. We think, however, that two main concepts are to be developed more deeply in these tools for collaboration:

- First, to improve visualization of the project’s context (activities, documents, requests, etc). On this issue, the proposals were outlined, in particular by Damien Hanser who proposes an adaptive navigation using hypergraphs [4].
- Then, to assist groupware’s tool to draft the report, which contains all information on the state of collaboration. We can note moreover that the coordination meeting described here is very near of the building construction meeting. The objectives of this essential tool are common for every collaboration: (1) control the task progress and conformity and (2) unforeseen management.

5. Conclusion

The project of collaboration presented here enabled us to highlight a certain number of problems related to collaboration between design teams. This experiment is strongly characterized by the geographical and cultural distance of the teams. We saw how the collaborative tools can assist such collaborative project. It appears clearly that the tools must take into account the sociological dimension of collaboration. They must make it possible to the actors to obtain a “vision of the evolution of their work” in order to “increase in their potential of action”, with an aim of improving quality of the exchanges and the design.

Our experiment made it possible to show the interest of the use of a groupware's tool to allow the modeling of the tasks of each actor and group activities. We could appreciate how such a step reinforces the *group awareness* and thus the contribution of each one in the project. Also let us note that the centralization of the documents ensures not only their effective diffusion, but also an optimal traceability of the evolution of the project.

References

1. Laiserin, J., From atelier to e-telier: Virtual Design Studios, in Architectural Record, Digital Practice, Digital Architect 2002.
2. Schnabel, M.A., et al., The first Virtual Environment Design Studio. Education and Curricula - Virtual Meeting Places.
3. Engeström, Y., Learning by expanding., Orienta-Konsultit. 1990, Helsinki.
4. Halin, G., D. Hanser, and J.C. Bignon, User Adaptive Visualization of Cooperative Architectural Design. International Journal of Architectural Computing, 2003. **01**(02): p. 89-107.
5. Halin, G., Modèles et outils pour l'assistance à la conception. Application à la conception architecturale., Ecole Doctorale IAE+M. CRAI. 2004, Institut National Polytechnique de Lorraine, Nancy.