STRUCTURAL APPROACH TO THE ORGANIZATION OF INFORMATION

A teaching Experiment at SEU

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Abstract. Design studio still plays a very important role in architectural design education today since teachers and students can exchange their thinking directly. In the whole teaching/learning process, there are a lot of information to be exchanged between the teachers and the students. How to organize the information and record the whole teaching/learning process is very interesting to us.
The increasing use of CAD raises some problems with its advantages when the amount of compute-files becomes very big and they are in different formats. In the third year design studio teaching in the academic year 1998/99 at Department of Architecture in Southeast University, we try to use WWW techniques and features to organise the design information. We try to integrate the teaching programme, the project information, the reference material and the students' work together, to record and monitor the teaching process. Since the teaching programme is clearly organised, we could use some strategies and ideas to control the organisation of file storage and presentation. It creates the basis for the further development of applying network to aid the studio teaching.

1. Introduction

Design Studio still plays a very important role in architectural design education today since teachers and students can exchange their thinking directly in this environment. Today the notion of Virtual Design Studio (VDS) becomes very important since it creates a new design and teaching environment, which takes place in the network. VDS allows people to interact quite directly without face-to-face meeting. Although many technique problems exist, the way of using network to aid the studio teaching is quite productive.

Using computer as a drawing and design tool is very popular today. With computer, it becomes easier to produce 2D drawings, 3D model, renderings, animations and so on, presenting and representing the architectural design. Another advantage of using the computer is that the files can be easily copied to allow people to record the design process or continue his work. So normally when the design work comes to a certain phase, there are already a big amount of files produced. If they are not stored orderly, it would be a pain to find a

certain file afterwards. On the other hand, the computer files can be in different formats like DWG file, image, text, and movie file. The problem of how to organise different formats of files becomes crucial.

The development of network today offers an opportunity to solve the problem. Since World Wide Web (WWW) creates a network to link people and information together, it allows people to be aware of others' work and enable them to react to each other. This feature is very helpful to the studio teaching.

In the third year design studio at Department of Architecture in Southeast University, we try to use WWW techniques and features to organise the design information in order to integrate the teaching programme, the project information, the reference material and the students' work together, recording and monitoring the teaching process. This is very important since the participants can check the process at any time and it also creates a material for further debate.

2. The Teaching Program

There are four projects as design exercises in the third year studio teaching dealing with different building types and architectural problems. They are "Restaurant Design", "Museum design", "Theatre Design" and the national competition among the university students in China.

While the last project is not clear at present, the process for other three projects is clearly organised. Each one is separated into three steps: "Volumetric Model", "Structural Model" and "Architectural Model". For the "Volumetric Model", the students are asked to analyse the site, including the structure of urban space, the transportation of the area, the controlling points and so on. Based on the analysis, the students start their design on the volumetric level, presenting their concept in relationship with the surrounding. The "Structural Model" deals with the organisation of the functions, the interaction between structure and space. The "Architectural Model" deals with the materialisation and details [Figure 1.].

We have 30 students altogether, among whom 18 students are in the computer group, and 8 of the computer group students test the WWW techniques, forming the "Internet Group". At every step, the students in the computer group have to build up their models with AutoCAD, and then manipulate their models to produce isometric, perspectives of eye level. The students also use 3DS to produce the rendering to present the materiel, lighting and etc. The students in

the "Internet Group" are asked to use WWW techniques to produce their documentation to organise their representation.

There are two mornings a week for the interaction to take place between teachers and students in the design studio. The work of the computer group is on the computer in a clear structure. We can check the students' work before the studio discussion. This works very effectively for aiding the interaction in the studio.

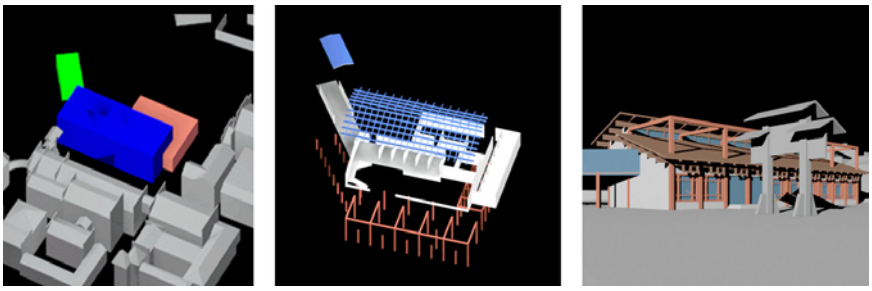

Figure 1. Volumetric Model, Structural Model and Architectural Model

3. The Organization of File Storage

There is such a lot of information in the studio. In order to make it easier to access, we use some strategies to control them. Upon the file storing structure, each participant can easily find the file he or she needs. This also creates a basis for systematically monitoring.

3.1. THE NAMING RULES

While the file contains the substance, the file name also plays a very important role since it creates the basic interface between people and the contents of computer files. Good name works as the good label allowing people to recognise what the file is easily. For the systematic monitoring programme, the file names provide the basic clues for searching and sorting.

The students usually give very simple names such as "a.dwg" "b2.3ds" which seem simpler when they generate the files. They seldom notice the difficulties for themselves and others to find out the proper file for further purposes. At the beginning of the semester, we declared the naming rules to them to organise their file and folder names. According to the teaching/learning process, the students had to give their file name clearly, beginning with "stepNumber". For instance, the name of DWG file for the

plan in step 2 is "stpe02-plan.dwg"; the HTML file for the step 3 is "step03.htm".

3.2. THE STRUCTURE OF THE DIRECTORIES

We opened an account on the server to allow all the participants to access and all the files were stored in the same account. All the files are stored in a hierarchical directory. Figure 2 shows the whole structure. The "proj01", "proj02", "proj03", "proj04" on the first level contains the information according to the different projects. For every project, a subdirectory called "teacher" contains the guidance and monitoring program for the design. The subdirectory "public" contains some files for all the students such as the site plan, the site model. And the "students" subdirectory contains all the students' work. The student built subdirectories named "stud01", "stud02" and so on for each one according to the numbering the teachers gave within the group. Every directory contains the subdirectories with the name of "2d", "3d" and "www", and the "2d", "3d", "www" contains the subdirectories "step01", "step02" and "stpe03", which contains correspondent files.

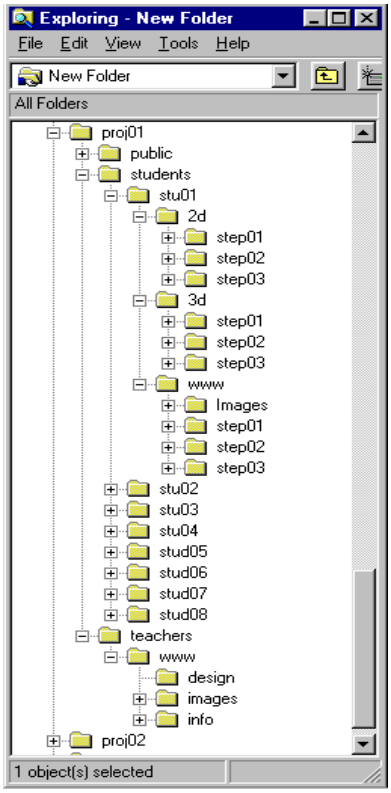

Figure 2. Directory Structure

4. The Organization of Presentation

With WWW techniques, the information can be linked to each other. This allows us to organise the products of the computer files together as a whole. Since there is almost no limitations to make links, this technique could also be dangerous if they are not carefully managed. We notice a phenomenon when we navigate in the WWW. If the links have many levels or the pages are cross-linked complexly, people are getting difficult to find out where he is and the way to go back when he has gone through several links. In order to avoid this, we organised the information in a simple hierarchy. One page only contains links to the upper level, the backward page and forward page at same level, and the

sub-level pages it indicates. If one link indicate pages out of this rule, a new window was used as the link target.

The page "index.htm" is the entrance for presenting the teaching process. There are two parts indexed, the "Information" and the "Process".

4.1. THE "INFORMATION"

Figure 3 shows the structure for presenting the design information. The "information" part consists of the following sections:

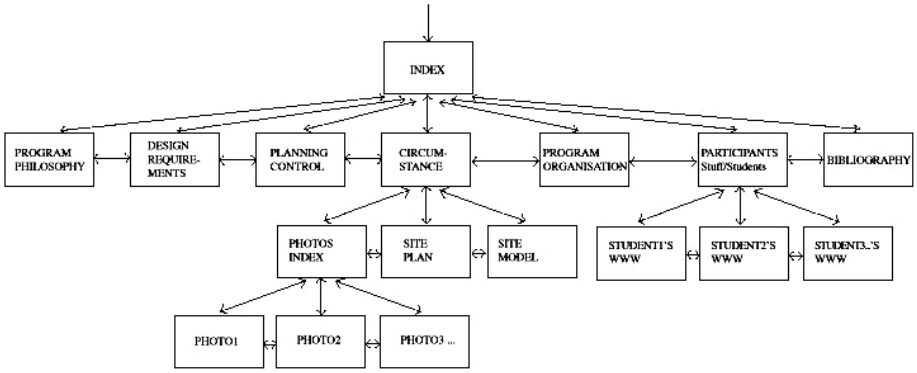

Figure 3. Design Information Structure

1. PROGRAM PHILOSOPHY
2. DESIGN REQUIREMENTS
3. PLANNING CONTROLS
4. CIRCUMSTANCE
5. ORGANISATION OF PROGRAM
6. PARTICIPANTS Stuff/Students
7. BIBLIOGRAPHY

All the information is the input for the students to start their design. The structure is clear presented and it's very easy for students to navigate inside to find the information he need.

4.2. THE "PROCESS"

Upon the clear structure of the file storing, we can monitor the teaching process easily. We developed a small program with JAVA to arrange the student's pages. On the entrance page, if the item "Process" is clicked, all the pages that students made are presented together in different frames (Figure 4). All the pages can be seen in a single window and then the student's work can be accessed page by page with the links he has made.

4.3. SAMPLE FILES

The students had no experience in making HTML files. Although there were many applications available for them to use, they were encouraged to make their pages with the text editor directly because in this case they needn't know many techniques. In order to help them to overcome their lack of the experience, some sample files had been made. The students can copy the samples and make some small changes to make their page work easy. Figure 5 shows students pages, which were produced according to the sample.

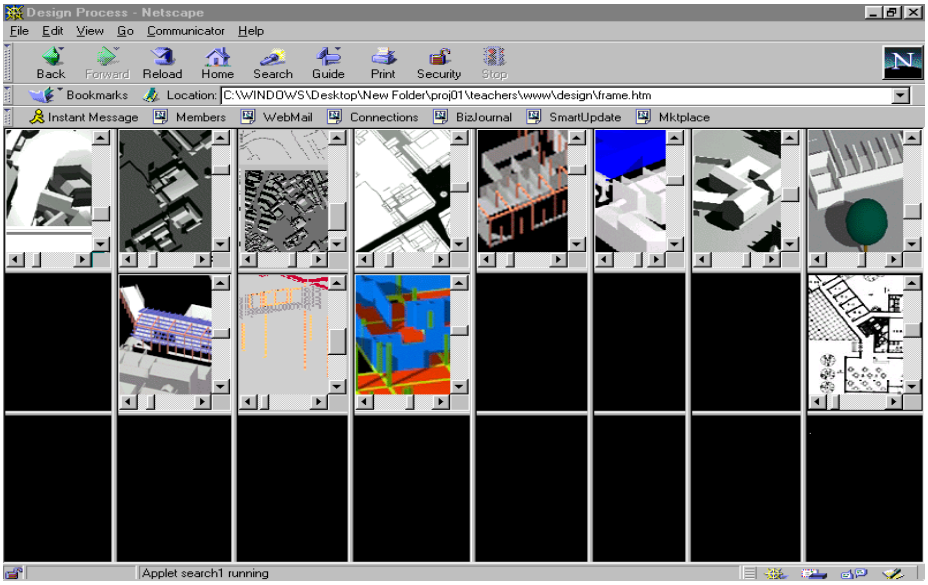

Figure 4. Layout to Show the Students' Design

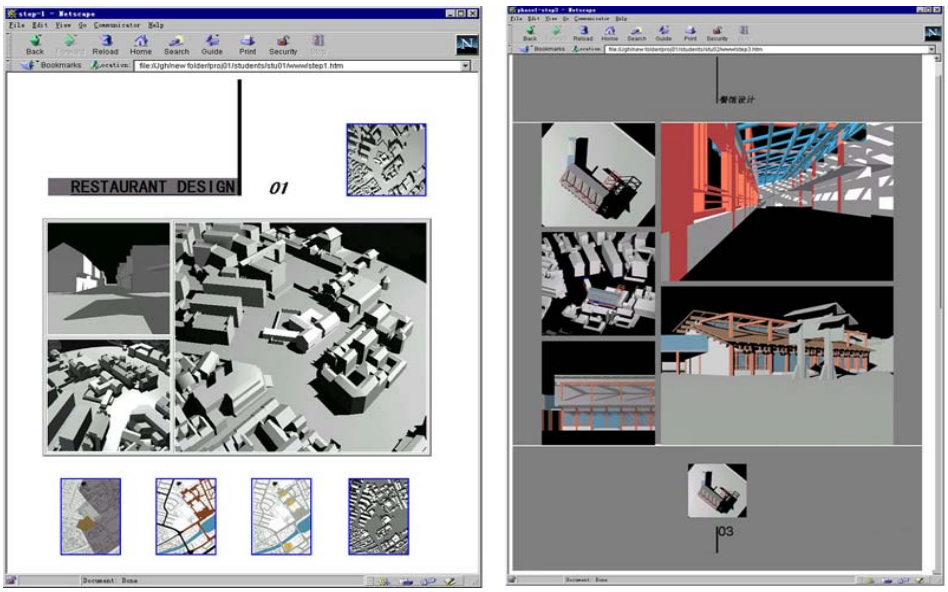

Figure 5. Students' Pages

The students used AutoCAD and 3DS mainly for their design. While the text and image can be contained in HTML files, it has the limitation of resolution to present line drawing. With AutoCAD R14, the dwg file can be saved as Drawing Web Format (DWF), which is viewable with browsers directly or added to an HTML file. With the DWF format, the functions like "Zoom in" and "Zoom out" can be used in the browser with the "WHIP! plug-in". In order to help the students to use the DWF for their presentation, we also made some samples to show the format of the documentation and the way to contain the DWF file within the HTML.

5. Conclusion

The new development of network allows us to combine the pieces of information together in the virtual world to offer the teaching a more effective way to present them. Without applying many techniques, design information can not be managed very well. The simple and clear information structure is crucial for the systematic recording and monitoring of the teaching process.

This teaching experiment is the beginning of our research on applying the network to studio teaching. The key problem of this study is to make the interaction between teachers and students happening easily in the virtual environment. Some future improvement could be made in this direction. For example, we are going to develop a database to handle the information automatically, and some tolls like graphic-based interaction interface will be developed.

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