ELECTRONIC PIN-UPS: ON-LINE DEPOSITORY OF GRADUATION DESIGN PROJECTS

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SUMMARY: The paper elaborates on the development of a repository of on-line graduation design projects. This repository has come to be as a side product of fast passed changes in the design studio culture in the Master of Architecture Program at Texas A&M University. The paper elaborates on such changes of culture, the emergence of a de-facto standard for on-line display of design work, and current efforts oriented towards making use of the repository in support of a wide range of pedagogic objectives.

KEYWORDS: digital library, on-line repository, electronic pin-up, design project.

1. BACKGROUND

Since the early 1990s, a growing number of schools of architecture have been experimenting with the concept and implementation of Virtual Design Studios (VRD). The motivations for such implementations have been diverse (Andia, 2002). In some instances we can see clear pedagogic objectives that address international collaboration, multidisciplinary interaction and geographically distributed design processes. In other instances the motivations have been less clear, but in every case the need of displaying the design work of our students to an audience that is geographically dispersed has been a common challenge (Vasquez de Velasco, 1998).

As a means for providing an on-line substitute for traditional pin-up documents, Virtual Design Studios have promoted the development of a variety of templates for displaying design work through the World Wide Web (WWW). In the case of the Virtual Design Studios implemented at Texas A&M University, students have produced what we call "Electronic Pin-ups". Our Electronic Pin-ups have evolved in time and generated a de-facto standard. Currently, the accumulative repository of such electronic pin-ups constitutes a valuable resource that has adopted the form of a digital library of design projects.

2. A CHANGE IN DESIGN STUDIO CULTURE

In conventional design studios, students work in the development of their projects and at pre-established dates during the semester they present their work for review. It is common to find that such reviews are implemented in a sequence that will address different levels of development in the design project. For instance we may find that a review on conceptual design is followed by a review on building design and this one yet followed by one on detailed design. The format of such reviews is somewhat standard. The most common standards are the "desk crit" and the "pin-up review". A pin-up review is an event in which the student will pin-up drawings that represent his/her design work and a group of design instructors or peers will deliver a critical assessment of the design attributes of the project. A pin-up review can be a "presentation review" if the student is asked to explain his/her project, or can be a "silent review" if the students is only allowed to answer the questions of the reviewers.

Traditionally, students devoted a large amount of time to the production of hand drawings and physical models to be used in reviews. Hand made drawings were very laborious and in many instances where the source of a great deal of drama when instructors made red ink annotations on the original documents. This was a traumatic experience that most students of architecture of previous decades will remember with an emotional blend of

pain, romanticism, and humour. Today, conventional pin-up reviews are conducted on plotted or printed media that may have been subjects of change only few hours before the pin-up review. Yet it must be mentioned that the act of annotating a pin-up drawing with a red marker continues to be a source of drama.

The Virtual Design Studios at Texas A&M University started to use electronic pin-ups in conjunction with traditional pin-ups in 1998. The students were trained on the production of posters in Adobe Photoshop. The posters combined scanned drawings, CAD documents, 3-D renders of digital models, and pictures of physical models. Shortly before a review the students would simultaneously convert their Photoshop files into plot files and html files. The plot files were sent to plotters and the HTML files were sent to web servers. In such a way without much additional effort, the design work of the students was simultaneously available for traditional pin-up in the school and in the World Wide Web for review by their virtual reviewers and peers.

In 2000 the students of our Virtual Design Studios started to use Adobe ImageReady in conjunction with Adobe PhotoShop in order to add functionality to the Electronic pin-up. With that additional functionality it was possible to zoom in and out of the posters and replicate the effect of approaching a traditional pin-up in order to see more detail. Further more, on top of that additional functionality, CAD drawings where displayed in DWF format in order to allow not only zoom and pan functions but also the manipulation of layers in the drawings during the reviews. In 2003 the Virtual Design Studio at Texas A&M University stopped conducting traditional pin-up reviews and implemented the use of large-format interactive plasma screens for conducting electronic pin-up reviews at remote and local level. The use of electronic pin-ups and interactive plasma screens has dramatically changed the design studio culture of our graduate studios.

The following images illustrate the general characteristics of "Electronic Pin-ups":

FIG. 1: Electronic Pin-up of first semester M.Arch student. The actual electronic pin-up is available at: http://archone.tamu.edu/~gvv_f02/Class_f02/Final_boards/Jin_rao/index.html

FIG. 2: Electronic Pin-up of second semester M.Arch student. The actual electronic pin-up is available at: http://archone.tamu.edu/~gvv_f02/Class_f02/Final_boards/Jin_rao/index.html

In our experience Electronic Pin-ups have a large number of uses. Here we elaborate on some of such uses:

2.1 Virtual Reviews

Electronic Pin-ups continue to provide service in their original role in Virtual Design Studios. By means of Electronic Pin-ups virtual reviewers can visit the design work of our students and deliver valuable comments. Virtual reviewers extend the review capacity of the professors of record and in some cases bring a new perspective into the development of the projects. This is in particular true when professors in other countries or architects in professional offices question the default and/or academic design decisions of our students. The following URL address illustrates the implementation of Virtual Design Studios that combine an international and professional dimension:

FIG. 3: Web site of a Virtual Design Studio in which students of Texas and Mexico collaborated under the guidance of architects in the firm SHW Inc.: http://archone.tamu.edu/~gvv_s01/

2.2 Electronic Reviews

As previously mentioned, we have recently started to use Electronic Pin-ups for local reviews using interactive plasma screens. This new implementation is not only saving us a substantial amount of money on printing resources but it is having a very positive impact on how we conduct design reviews. These are some of the benefits:

- The students can continue to work on their designs until only minutes before the review. All it takes is to upload a final version of the drawings to the server and the student is ready to display an updated representation of his/her project for review.

- The professor can approach the plasma screen and make annotations over the interactive overlay. The annotations can be recorded by means of a screen capture function and sent to the student's e-mail box for further study and consideration. The original media is not damaged, or in any way modified during the review process.

- Fellow students are more open to approach the plasma screen and annotate the drawings making suggestions for improvement. If the suggestion is relevant the annotation is recorded and forwarded to the e-mail box of the student under review. If the annotation is not relevant, the display can be refreshed and there will be no record of it.

- Professors can reference and actually bring to display on the plasma screen the electronic pin-ups of other projects that may serve as case studies in the explanation of a design solution or mistake.

FIG. 4: A studio at Texas A&M University in which an interactive plasma screen is used for conducting electronic reviews. The following URL address contain the archived stream videos of electronic reviews that illustrate the interaction of students and professors with electronic pin-ups on a 61" interactive plasma screen: http://archone.tamu.edu/~gvv_f03/

Please note that in order to view properly the stream videos you must install RealOne Player in your machine.

2.3 On-Line Gallery of Design Work

Electronic Pin-ups of completed projects are kept in a repository that can be used in a number of valuable ways. These are some examples:

- Design instructors can use the electronic pin-ups of previous semesters in order to illustrate their expectations in terms of design sophistication and project deliverables. This use of electronic pin-ups is critical in upgrading the level of design performance within a professional program. If the students have a clear idea of what it is expected from them they are likely not only to fulfil our expectations but are more likely to exceed them.

- Recruiters for graduate design programs can reference potential applicants to outstanding work in electronic pin-up format and offer a clear understanding of the level of performance that the students of the program are expected to achieve. In many instances potential applicants will seek on-line examples of student work in the web sites of the schools they are planning to apply to. We are constantly told by our new students that the availability of electronic pin-ups and the quality of the work that is displayed in such format has played an important role on their decision to apply or accept an admission offer from our program.

- Potential employers can review the on-line design work of job applicants from our program. This is in particular important because in most instances design portfolios do not display compete projects but a collection of images that employers address as "eye candy". The possibility of reviewing a compete project, in particular the Final Professional Study of the applicant is of great value on their hiring decision.
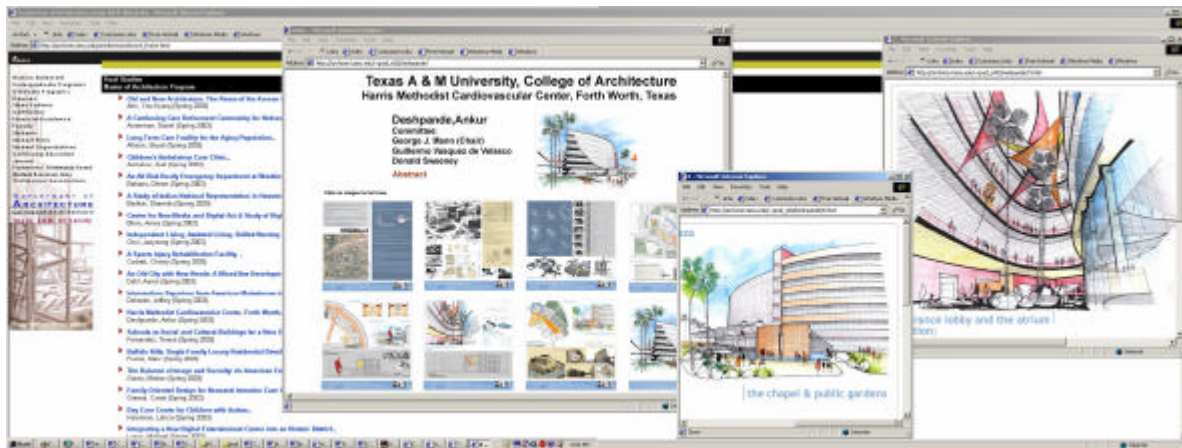
FIG. 5: Web site shows an unstructured Gallery of Final Professional Study Projects. Every hyperlink provides access to a Final Professional Study in Electronic Pin-up format:
http://archone.tamu.edu/architecture/stwork_frame.html

3. LIBRARY OF ELECTRONIC PIN-UPS

The Master of Architecture Program at Texas A&M University has experienced substantial growth in both qualitative and quantitative measures over the last few years. In May of 2004 we will deliver 48 new graduates into the professional market. Each of them will deliver an electronic pin-up of his/her final professional study. These electronic pin-ups will go to add themselves to a growing depository of on-line projects in the same format. At this rate it will be impossible to continue to manage this unstructured depository of electronic pin-ups. Because of the usefulness and magnitude of this depository we have perceived the need of transforming it into a library similar to the libraries we already have for managing our depository on research thesis and dissertations.

The repository of graduation design projects at Texas A&M University is located at the following URL address: http://archweb.tamu.edu/college/degree_papers/search_projects.html

Access to the repository is unrestricted. Even in the case of graduation projects based on actual real-life design and construction projects, it is understood that the resulting graduation projects will be available to the public in general. We feel that without unrestricted public access some of the benefits of having such a repository will be limited and in some cases lost. That will certainly be the case of potential applicants to graduate school accessing the repository in order to compare the work of our graduates with the work of graduates in other schools. The only concern with posting graduation projects in unrestricted repositories has been the issue of access of student grades. In our case such is not an issue given the fact that our graduation projects are graded on a pass/fail basis and we only put on-line the work of students that have achieved graduation status.

The repository is equipped to respond to the following queries:

3.1 Query on the complete repository

For the next few years, the magnitude of the repository will remains to be manageable and users may wish to query the compete repository under a given set of sorting parameters. For that purpose, the system provides main sorting functions on the basis of alphabetical order and numerical order. These sorting functions will be applied to the name of the author, name of the advisor and date of graduation/presentation.

3.2 Query by title of the final professional study and keywords

This may be one of the most frequent queries. Students, faculty, administrators, and potential employers may want to query the library using keywords or words that are present in the title of the final professional study. In most case keywords and titles will identify the issue under study or the building typology that the study is exploring. For instance, this kind of query will be able to render a list of all the projects that address hospitals, or all the projects that address buildings in Seoul, or for that matter, all the projects that address hospitals in Seoul. Queries in this category will be instrumented by means of a type-in window in which users can declare keywords and request a search for relevant items in the library. The query report should identify the title of the final

professional study, the name of the author, the names of the advisory committee members, and the year of graduation.

The Master of Architecture Program offers certification on a number of areas of emphasis. If a student takes a substantial number of electives and design studios in an approved area of emphasis, the student can be awarded certification in that area of emphasis. Among others, the following keywords will render entries that address areas of certification and emphasis: Architectural Visualization, Health Facilities, Instructional Facilities, Facility Management, Hospitality, Sustainability, and Hazards Management.

3.3 Query by committee chair or member

Final Professional Studies are sponsored and guided by individual advisory committees that work in close contact with the students during their last semester in the program. Choosing the right committee members is of critical importance. The ability of students to perform queries based on specific faculty members makes possible for the student a better assessment on the kinds of projects that a given faculty member is likely to be interested on sponsoring. At the same time, faculty may use this query for documenting the work of their students during faculty annual review. It is becoming common for faculty to have on-line teaching portfolios that can make use of the library of electronic pin-ups. Queries in this category are instrumented by means of a type-in window in which users can provide the names of Graduate Advisor Committee members.

3.4 Query by name of author

If the user is seeking access to a single project, the most common form of query may be the last name of the author. Authors can access the electronic pin-up of their own projects by typing their names and potential employers can do the same by typing the last name of job applicants. Queries in this category are instrumented by means of a type-in window in which users can provide the names of the former students.

3.5 Query by year of graduation

In many instances it may be relevant to query electronic pin-ups based on the year of graduation of the students. This kind of query will be very useful to visiting teams of the National Architecture Accreditation Board (NAAB). In such a way, NAAB teams will not be restricted to the review of few projects displayed on the walls of the school they are visiting. Actually all graduation projects can be reviewed, and year by year qualitative improvements can be measured. Queries in this category are instrumented by means of a multiple choice cascade menu in which the user can select from a list of academic years.

4. IMPLEMENTATION TECHNOLOGY

The Electronic Pin-Ups Library is a three-tier system consisting of a back-end SQL Server database, a front-end Web user interface, and a middle layer of business logics. The Web user interface is developed using HTML and JavaScript. ASP and Visual Basic are used to implement the business logics that handle client requests, determine what data is needed (and where it is located), generate queries on-the-fly, query the database, and send the query results back to the user. The system is using a page-centric approach that involves request invocations being made directly to ASP page. This model allows ASPs direct access to the database. The ASP page is where the incoming request is intercepted, processed, and response sent back to the client. The advantage of this approach is that it is simple to program, and allows the page author to generate dynamic content easily, based upon the request and the state of the resources. The back-end SQL server database stores all the information of electronic pin-ups. Using ASP and SQL Server Database System assures the benefits of multithreading and easy integration. SQL Server also enables the indexing of any text or document stored in the database. This is an important feature of the library system. The SQL Server indexer can enable fast and accurate searching by parsing text into meaningful words or phrases, and create an index for searching. Macromedia Dreamweaver MX is used as the main development tools.

5. THE FUTURE OF ELECTRONIC PIN-UP LIBRARIES

The history of Internet-mediated communication of architectural information is rich in magnitude and diversity. In 1993 Jerzy Wojtowicz addressed this challenge, and opportunity, by the use of File Transfer Protocol in order to move CAD files between design partners (Wojtowicz, 1993). Later, with the advent of the World Wide Web,

many studios around the world adopted collaborative protocols that were tailored to their particular operational objectives. In some instances, as in the case of Phase-X, the objective was to maintain around-the-clock and around-the-world collaboration on a design project (Engeli and Mueller, 1999). In other instances, as in the case of EVAL, the objective was to jury on-line design competition entries (Johnson and Kolarevic, 1999).

In the case of Virtual Design Studios at Texas A&M University, as it may be the case of the Tex-Mex Virtual Design Studio and the Las Americas Virtual Design Studio, the main objective has been to replicate the format of traditional pin-up reviews in an on-line environment for real-time interaction between students and reviewers. Because of that objective our implementations have been substantially different from those mentioned above and have concentrated on the reduction of set-up effort and intuitive access to project information.

It is fair to say that the development of electronic pin-ups at Texas A&M University has been a side-product of our Virtual Design Studios. The natural evolution of electronic pin-ups has resulted in a de-facto standard that is easy to implement and offers a multitude of potential uses. The magnitude of the depository of electronic pin-ups that we currently have on-line, and the expected growth of that depository makes feasible the establishment of a library of electronic pin-ups. The library described in this paper is an initial implementation that provides fundamental query functions as a first step in the development of a more sophisticated manipulation framework in the future.

As we continue to conduct Virtual Design Studios and other institutions follow to embrace the format of electronic pin-ups as a standard for the display of on-line design projects, we see the potential for the establishment of a distributed library that articulates not only the electronic pin-ups generated at Texas A&M University but also the electronic pin-ups generated at other schools of architecture as part of Virtual Design Studios or Final Professional Studies. It may be feasible to coordinate actions within networks such as the Las Americas Digital Research Network (http://taz.tamu.edu/~americas/) and the Association of Collegiate Schools of Architecture (http://www.acsa-arch.org/) for the consolidation of a collective depository of electronic pin-ups.

6. REFERENCES

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