

A “digital process book” learning tool for the design studio: Concept and development

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NARRATIVE

INTRODUCTION

The purpose of this study is to introduce a new learning tool to the interior design studio, namely, a “digital process book.” Paper-based process books are not new to the studio. A process book includes representations of the activities that occur and artifacts that are constructed as a student completes a design project. It allows the instructor, jurors, and others, to see the processes a student goes through to complete a project. It is also intended to assist students as a tool in the learning and design process. Schenk (2007) similarly describes this process work in the graphic design context as “job bags,” where this material, for the most part, provides the “drawn record” of the design process. However, paper-based process books are mostly a linear compilation of the design process that provides little of the scaffolding that a novice designer needs. The goal of this project is to take the existing strengths and capabilities of the computer and other digital technology, and merge them with the positive qualities of the paper-based process work, while also incorporating an underlying structure that is grounded in educational psychology theory.

The main impetus of this project is to answer the following questions: Can a digital teaching and learning tool be developed for design studio classrooms that would: 1) complement and augment design thinking and the design process, 2) provide an intuitive, adaptable, and dynamic environment within which design processes could be structured for students, and 3) offer a framework for both students and faculty to communicate ideas effectively? In this paper, we present the conceptual basis and design of the digital process book.

LITERATURE REVIEW

Recently, many new technologies have been developed in content management, e.g., collaborative content management, user generated content, and learning management systems. Many of these technologies can be used effectively for educational purposes. Learning Management Systems (LMS) are web-based systems that allow instructors and/or students to share materials, submit and return assignments, and communicate online (White & Larusson, 2010). While these course management systems can be effective in work-flow management, document distribution and collaboration, inter-institutional communications (Johnson & Tang, 2005), the structure of these systems are not conducive to the design process and the studio environment.

FRAMEWORK

The motivation for this work stems from the belief that by incorporating our understanding of the processes of design with the capabilities of computer technologies, we can augment students’ cognitive processes and give them the expert structure and tools to solve the complex problems that design entails. To begin the discussion of the digital process book (DPB) we first address the characteristics of, and improvements to the existing process book. Instructors acknowledge that even paper-based process books hold several important teaching and learning purposes to the studio experience, including:

- 1) A demonstration of the importance of a formal approach to design; a celebration of the process as an important way of defining design, not just design as an end product,
- 2) A means of regulating and holding students accountable for their design ideas and decisions; an authentica-

tion of the designer's claim to a particular approach to solving the problem,

3) A genealogy; the real time serial documentation of design activities; helps students see where they have been and to see where they are going; a very clear evidence of the progress of the project,

4) A medium to let instructors know how the student thinks, how they develop, build upon, and refine the ideas, and

5) A student's internal communication,

6) A medium that provides a talking point for faculty and discussions on what steps have been fruitful or not,

7) A medium for students to store ideas; to hold good ideas in reserve until their goodness emerges; quite often the role and fit of an idea does not become evident until it is paired up with other ideas (Brunner, 2008)

These are laudable standards, but they are many times not fully met. A digital learning technology is capable of improving upon the paper-based process book, as well as introducing other valuable functions for the novice designer. Thus, the DPB serves all of these purposes, but extends and improves them with the assistance and convenience of a dynamic, intuitive web based interface.

Other motivations for developing the DPB include: encouraging and supporting evidenced-based design, reinforcing the process of design through scaffolding expert practices, providing a direct way to expose students to excellent "worked examples," providing a medium that offers students examples of various design methods (Brunner, 2008), and introducing a structure that encourages reflection upon their design activities.

RESULTS

The digital process book will be a dynamic, assistive, interactive web-based environment that allows continuous design process flow. This learning tool is a blend of many things: 1) a secure cloud-like environment to store, organize files, 2) a project management software, for calendars, timelines, milestones, 3) sketchbook, to assemble a student's analysis, synthesis, and evaluation activities, 4) a learning portfolio, so the output can

be readily accessible to current professors and future employers, 5) a communication interface, for self-reflection for the student, and for student-instructor communication, 6) a database to compile, organize, categorize, and sort, 7) a scaffold for student learning/designing, or an expert structure for novice design students and 8) an artifact of a student's design process. The main page and major navigation buttons, in conceptual form, are shown in *Figure 1*.

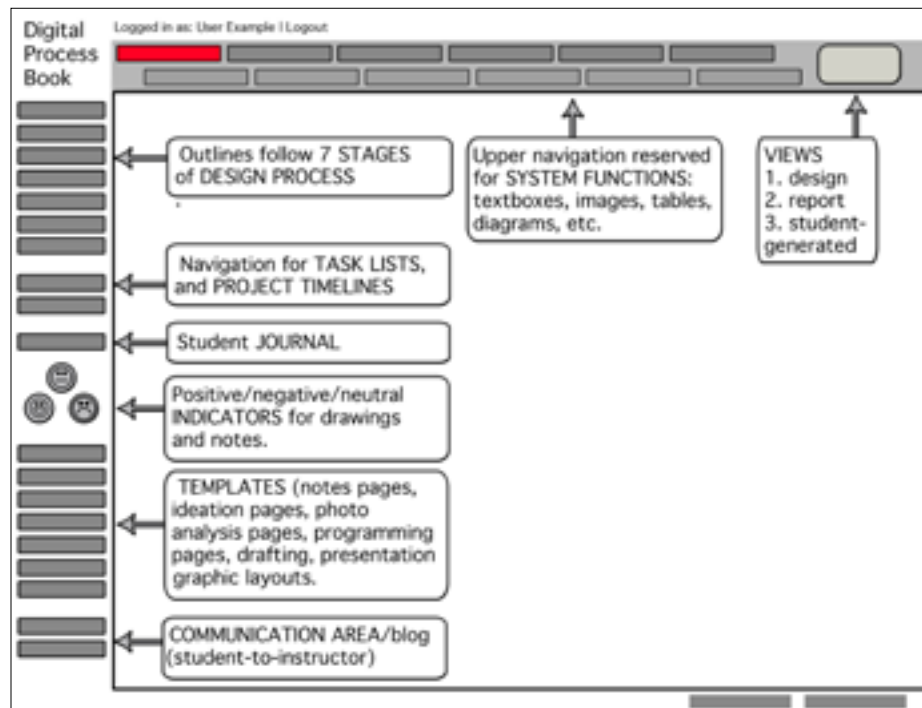
Designed to be reminiscent of paper based process books in form, the DPB maintains familiar process book structure by generating 'pages' on which a wide variety of objects and functions are capable of being placed and grouped by the user. *Figure 2* shows an ideation page, highlighting a sketch drawing with several linked pieces of information including a comment element, an associated PDF file, and a student evaluation indicator of the drawing. The core of the DPB is structured around pre-existing structures following the seven primary design phases (Problem Identification, Programming, Theory & Concept Development, Design Development, Design Documentation, Construction/Installation, and Evaluation), as well as an unlimited number of additional user created pages allows for the infinite expansion of ideas and output.

The DPB allows users to sort and add a nearly infinite amount of information in ways best fitted to the user's particular mental model of their process. The DPB allows users to add files, make personal notes/lists, and public notes which can be included in final page output for teachers and employers. The system also allows users to drag-and-drop content among pages, creating customized visual arrangements for workflow and output with files, graphics (including but not limited to: user-scanned images and sketches, papers for reference, and audio files), and quickly overview the progress of their process books. If desired, students may also generate project blogs, allowing discussion and participation with other students and faculty.

CONCLUDING REMARKS

In many classrooms of the 21st century, learning management systems or other digital technology systems have become standard tools for both students and instructors. However, the design studio has its own set of challenges and pedagogies that set them apart from the typical university classroom. Therefore, in this project

Figure 1: Main page and navigation buttons



we propose a customized, dynamic, digital environment that transforms the paper-based process book into an internet-based, interactive sketchbook and file management system.

The digital process book has a number of implications for faculty and students. Students will have more efficient organization of process and design materials, easier access to more effectively organized notes, sketches, and idea generation tools. They can view and modify their projects 24 hours a day, accessible from their mobile devices through the development of an iPhone application. Faculty and future employers will have a transparent view of student process, allowing them to visualize the student's design thinking processes. It acts as a portfolio of the process, where the student's design thinking is

the focus, instead of a finished design solution. In short, the digital process book is a celebration of the design process, and has the potential to transform design studio pedagogy for the 21st century.

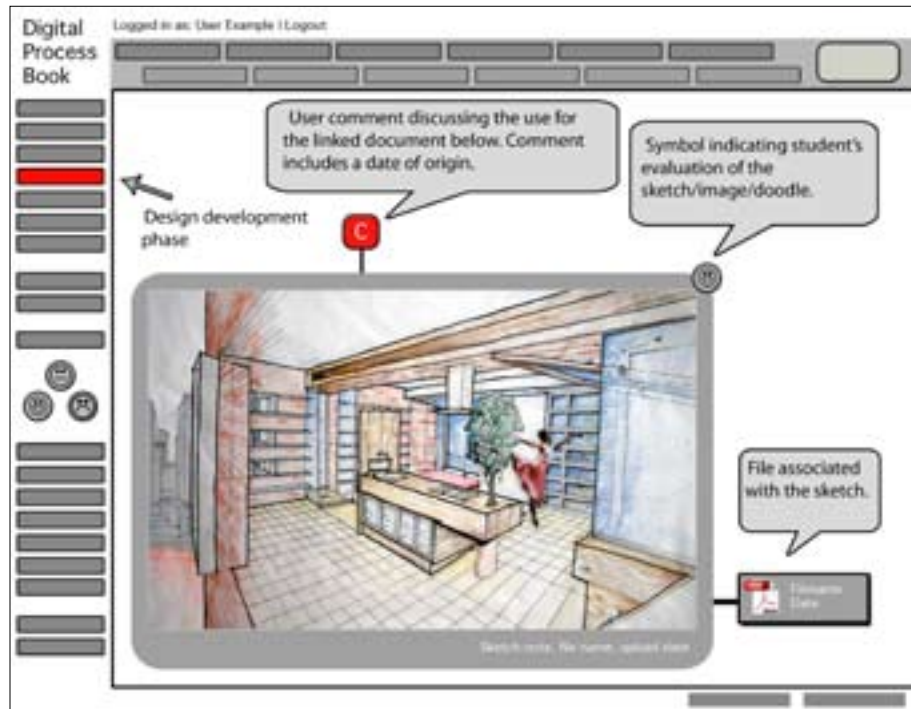


Figure 2: Ideation page

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