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Project Portfolio

One Stop (Fall 2013)

Improving the Use of Technology in Higher Education

Along with three classmates, I undertook an exploration in rethinking the role that interactive and multimedia tools play in learning experiences at the graduate level. We began by using observational techniques including journey mapping, visual image capture and interviews with students, professors and teaching assistants across a range of Harvard programs. One of our most prominent findings was that tactile engagement with traditional media was emotionally, habitually and cognitively ingrained in student learning processes—almost universally so. On the other hand, technology provided superior possibilities in the realm of indexing, tagging, communication and aggregation. This tension ultimately led us to reframe our approach to the problem, committing to align learning methodology with student behavioral and psychological tendencies in a way that leveraged the benefits of both physical and digital media.

Our next step was the application of SIT (systematic inventive thinking) processes in order to rapidly generate ideas, which we grouped into themes and evaluated on the basis of their feasibility and projected impact (Figure 1). The winning concept, *One Stop*, was brainstormed through imagining a union of the physical note taking and digital indexing processes. Our vision was a form of "smart paper" with the ability to digitize handwritten materials, making them instantly searchable and accessible from a single online hub.

Figure 1. Output of SIT Brainstorming session.

Our next step was to construct a paper prototype capturing crucial screens from the envisioned platform. This was the phase of the process in which I took a strong leadership role, as my background in product management and experience with interface design allowed me to quickly generate a rough model for testing (Figure 2).

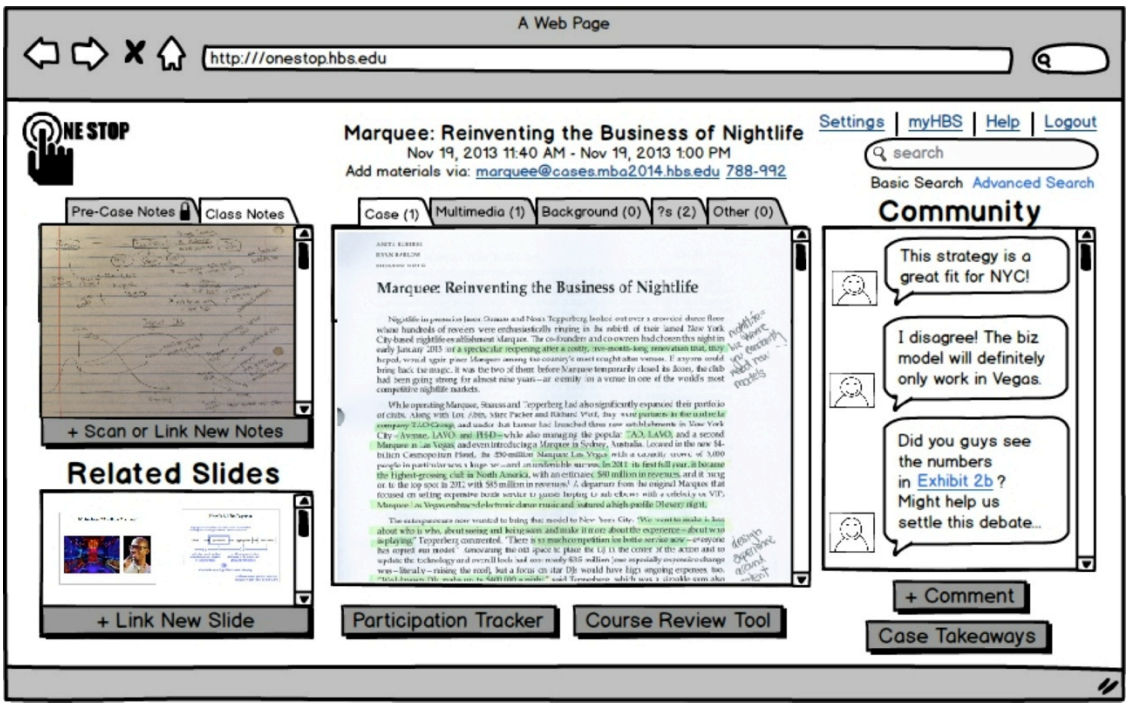

Figure 2. Screen view from iteration of One Stop Prototype, demonstrating how physical and digital materials would be seamlessly integrated onto a single platform for rapid efficient analysis and recall. Version 1 (above) illustrates a minimum viable product utilizing basic scanning technologies designed to test the value of the concept to students. The ultimate product vision, requiring the development of "smart paper" for automatic digitization, would require additional investment.

After performing usability tests, I created a second iteration of the prototype, incorporating additional functionalities and addressing high-level issues such as feature prioritization (students favored a simple interface and advised us to focus on just the key product elements for launch) and privacy concerns.

Our next steps towards establishing the viability of this product hinge on: 1) Evaluating the advantages of building a platform tailored to the needs of a specific institution such as Harvard Business School and 2) Mapping the platform roadmap to the ongoing evolution of handwriting digitization technologies.

TheWhistle.com (Spring 2011-Summer 2012)

Beta Website: Sports Programming for Children

As the first employee hired at The Whistle, a multiplatform sports network in development providing content for children ages 9-14, my primary role was coordinating the development of our beta web platform from the ground up. I was responsible for interfacing between a team of designers and developers in order to generate a set of mockups that mapped to the technological capabilities of our hosting platform. Through

Figure 3. Early mockup of TheWhistle.com's Activities page. We used this portion of the site to test audience interest in the submission of user-generated content and other interactive functionalities, which evolved to play a crucial role in our content strategy.

coordinating the visions of the creative, strategic and technological stakeholders within our organization, I guided our development team in creating a balanced platform reflecting input from diverse functional perspectives. Once we had an early prototype up and running, we invited a small beta audience of children to use our product. We leveraged the platform as a communication tool and testing ground. I spent the next twelve months in extensive dialogue with our early users via survey, interview, focus group and curation of their content submissions to our site (Figures 3 and 4).

Figure 4. Early mockup of TheWhistle.com's "My Locker" page, testing personalization functionalities such as customized decorations, fitness tracking, high scores, rewards and a sports journal.

As an early stage venture, our design and engineering resources were limited. I led a team of interns and editorial staff in populating the site with sufficient placeholder content to accomplish the required testing, often leveraging workarounds such as creative html patches to overcome shortcomings in the base code and utilizing my basic Photoshop skills to design icons and other visual assets to supplement the work we outsourced to costly freelance artists.

Using this beta platform, we were able to derive actionable product insights through the process of watching an audience interact with our prototype, gradually revealing their unvoiced needs and preferences. Today's platform (http://www.thewhistle.com/), currently undergoing its third major iteration, is the result of extensive evolution and improvement from the original vision using the methodologies described above.

Investigation of 3D Animation Techniques (Fall 2009)

Exploration of Processing Pipelines for Character Modeling

Animation has been a longtime personal passion of mine. In Fall 2009, I undertook an independent study with the support of the Yale Computer Science department, in which I experimented with techniques for three-dimensional character modeling. Using illustrations from a short science-fiction narrative I had scripted as a basis for my characters, I focused primarily on two processes: 3D scanning via triangulation technology (Figure 5) and computational modeling using a commercial 3D graphics software package, Autodesk Maya (Figure 6).

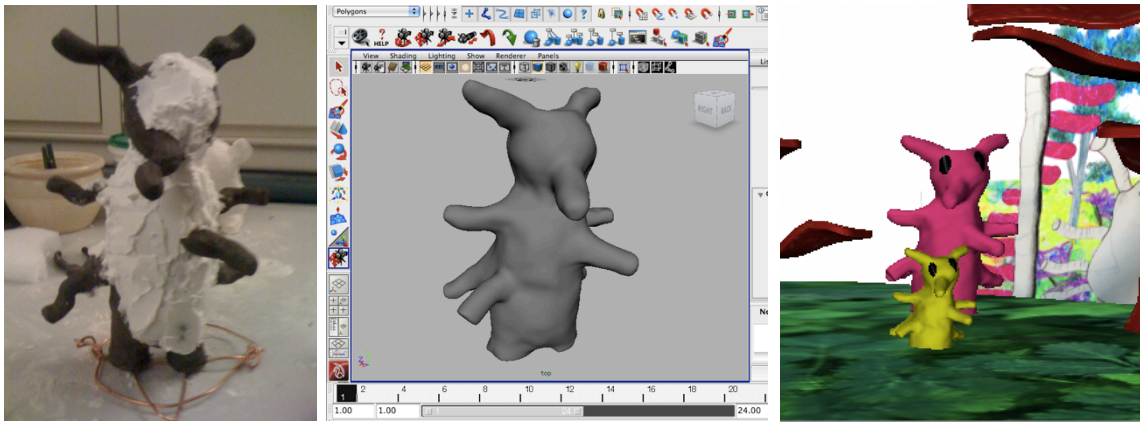

Figure 5. Processing pipeline utilizing 3D scanning technology. I commenced by sculpting clay models by hand (left), which I then covered in spackle and sanded in order to achieve the necessary color and texture for laser recognition. Next, I placed the model on a rotating platform and worked with a graduate technician to record a series of laser projections onto the model using a CCD camera. Depth values from all angles were then aggregated to create an object mesh, which I imported into Maya (center) in order to add texture, color and detail (right).

Though I performed the ultimate rendering using the Autodesk Maya software for all characters, I found that the technique I employed to originate a model had a significant effect on the ultimate look and feel of the design. Different strategies proved effective in capturing distinct aesthetics.

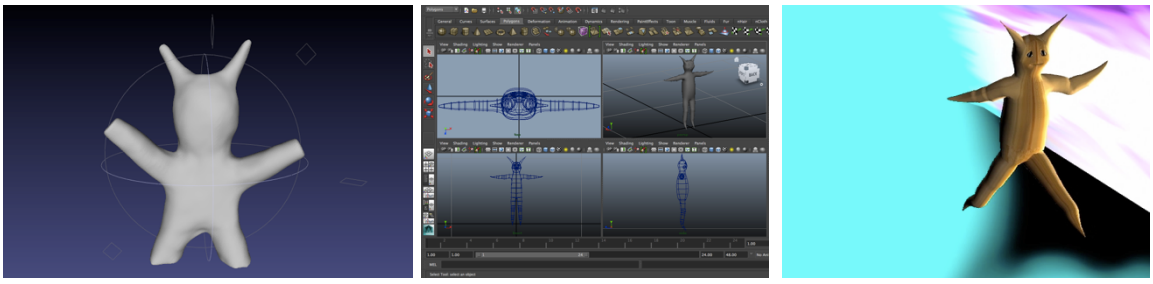

Figure 6. Processing pipeline utilizing computational modeling. After first experimenting with a 3D scanning process similar to the one above, I determined that the resulting model (left) was not sufficiently delicate to capture the aesthetic I had envisioned for this particular character. I instead utilized computational modeling techniques, inputting vertices based on the dimensions of scanned hand-drawings composed from two dimensions. I then digitally extruded the resulting model in order to generate a realistic character representation (center), which was ultimately processed through the addition of colors, textures and dynamics within the Maya software package (right).

In spite of the relative predictability and ease of the computational modeling process, I found 3D scanning to be the more intriguing and rewarding of the two. The ability to translate a handmade aesthetic into digital form creates, in my opinion, a unique look and feel that effectively captures the charm and originality of classic hand-drawn 2D animation.

This simple but hands-on foray into 3D scanning provided me with an exiting opportunity to experiment with the combination of physical and digital building techniques. Given the widespread applications of computer graphics and digital imaging, from entertainment and design to architecture, medicine and simulation, I am very excited to see how these technologies continue to evolve down the line.

TicketSwap v2 (Fall 2013)

Mobile Ticketing Platform for Harvard Business School Community Events

Last semester I undertook the task of designing a mobile platform which would allow organizations within the HBS community to manage the ticketing process for events and conferences. My goal was to improve upon a previous generation of the product, a mobile website designed to connect buyers and sellers in the secondary market, but which lacked the functionalities of authenticated login, payments integration, primary market ticketing and social attendance tracking.

I began with a qualitative analysis of the market to gain an understanding of the most pressing user needs. I interviewed a number of students from a diverse range of backgrounds, administrators in the student association and HBS staff members involved with managing student clubs and the school's IT department. Simultaneously, I profiled existing technological tools and platforms used by students to sell and exchange tickets (Eventbrite, WePay, Paypal, Facebook, GroupMe, Email).

Several distinct high level needs emerged. In order to make prioritization decisions, I designed a simple one-question survey to obtain a quantitative assessment of audience sentiment (Figure 7). Based on responses from almost one hundred students, I determined that the two most popular product concepts were 1) an integrated primary mobile ticketing application and 2) a communication and attendance-tracking tool.

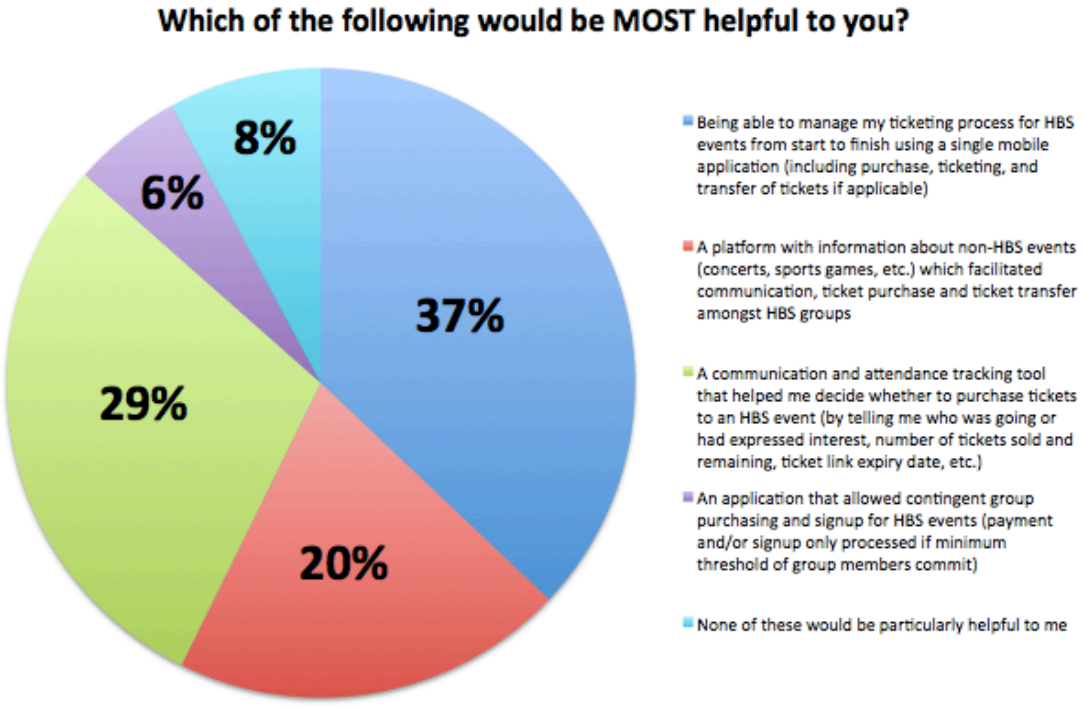

Figure 7. Survey results indicating relative popularity of product concepts. The two front-runners, integrated comprehensive ticketing functionality (37%) and the addition of social features to the platform (29%), were combined into a single product vision. The third-place idea, the coordination of ticketing and information exchange around non-HBS events such as local sports matches and concerts (20%), was temporarily excluded for the sake of simplicity and feasibility.

Combining these into a single product vision, I authored a series of use cases to bring to life the scenarios in which such a platform might be used, carefully outlining the human-computer interaction that would be required at each step in the process.

I next began the process of generating detailed product wireframes, performing usability tests, and creating subsequent iterations of the UX and functionality based on user feedback (Figure 8).

Figure 8. Wireframes for TicketSwap v2 mobile application. From left to right: main menu, event ticketing page, payments flow (based upon planned integration with WePay.com), attendance tracking tool, event administrator controls.

During this phase, a classmate with an engineering background joined me in my endeavor. Working with a technical partner provided a valuable cross-functional lens for the project. Together, we clarified the information architecture for the application, including what data would be necessary to store and how it would be structured and transformed. We worked to simplify and streamline the product specification, devising a roadmap for realistic implementation given the timing, environmental and marketing requirements for launch. This project has been given the green light to receive funding from the institution for development in 2014.