

**Thesis Portfolio**

**User Experience Design to Synchronize Government Acquisition Strategy and Schedule**

(Technical Report)

**Exploring Human-Centered Design Through Video Games**

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science  
University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree  
Bachelor of Science, School of Engineering

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## Sociotechnical Synthesis

For the technical research portion of this portfolio the client we worked with requested a novel approach to the interface design of project management technologies specific to contract acquisition. This technical project explores the considerations taken and process of creating a design for a platform that provides users with a way to synchronize government acquisition strategy and scheduling. The second project, the STS research paper, was chosen to be in line with the methodology and techniques used in the technical project with regard to human centered design. The process of designing the app for the client gave the opportunity to put into practice the ideas being explored in the STS research paper, namely that of user testing. By observing participants play games I was able to tell what parts of the games design were effective in teaching the individual how to play the game. This observation technique was also useful when receiving feedback from acquisition personnel.

Due to the complexities and interdependencies inherent in the acquisition process, government contract specialists face challenges in managing tasks and meeting deadlines. Since most acquisition personnel do not remain in a job for a long duration, and thereby lack hands-on experience, they require technology that can act as a mentor and guide. Current tools fail to deliver such support and therefore demand new paradigms to optimize the workflow and scheduling of the projects. To fill this gap, we designed a novel approach to project planning, via a mobile user interface, to synchronize the government acquisition strategy and scheduling. Our approach focuses on visualizing the timeline and progress of tasks in a mass data display. By helping users to identify tasks that can be accomplished simultaneously, and illuminating the connections between activities and people, the display enables personnel to effectively manage a large acquisition project. Indicators are designed to inform the user of the completion status of

tasks, person-specific goals, and interdependencies between documents and the timeline. The design also incorporates gamification, based on the hive mentality of bees. To evaluate the design's effectiveness, heuristic evaluations have been conducted with experts in the field and focused on flexibility, learnability, intuitiveness, and ease of use. Success was measured by ease of navigation and user understanding of the dependencies and non-linearity of the acquisition process represented in the mass data display.

The STS research paper consists of a study on how people of different backgrounds learn to use new technologies, whether that be mechanics or general understanding, in a virtual environment. One may analyze this by exploring the influence of prior experience, gamification non-game interfaces, and the learning curve associated with putting forth non-standard interfaces. Mainly observation was utilized through an informal experiment and subsequent surveys. The informal experiment conducted included observation of subjects with varying gaming experience in order to assess their approach to problem solving in games the subject has never played before. In this experiment, ten university students were approached and asked to play a game they had never played before for 20 minutes each without any assistance from the conductor of the experiment. It was concluded that in general, many different types of people learn through trial and error. Although this approach seems to work for most people, the efficiency of trial and error may be questioned in that there is often a faster way to achieve the same level of understanding. While researching the subject, it became apparent that some friendly instruction is not only a good way, but an efficient way, to introduce people to new pieces of technology.

These topics both dove into the importance of keeping human centered design in mind when designing digital interfaces. The capstone portion emphasized the iterative nature of user

interface design, and how working with a client impacts the way a project is executed. As opposed to the STS topic chosen, which was researched through the perspective of the actual users. By working on my STS paper topic at the same time as my capstone I was able to learn from mistakes I had made in the observation portion of my experiment when it came time to conduct user testing on actual contract acquisition employees put in contact with our team through the client. Gathering key points was made easier since I had already gone through one round of observing participants play video games and asking the right questions to gain insight on the challenges users of the app faced came more naturally.