NuCourse Project Reflection

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IS 4300
Section 10226

ABSTRACT
The experience of graduating high school and moving on to college is unlike no other. Student schedules are no longer chosen for them and the vast number of available courses can become overwhelming. The amount of time researching and correctly choosing the required courses for the semester is the starting point of all problems. With the implementation of a newly improved UI and the ability to correctly register for courses and perform teacher evaluations for the previous semester all within one webpage, significantly decreases the time it takes traditionally.

PROBLEM
Every semester I struggle to find the appropriate schedule that meets my academic standings. Upon registration I would do countless research through sites like ratemyprofessor.com and talk to student who have already taken the courses with particular professors to try and get a sense of the overall class before registering. The problem is I would have several tabs open on my browser, my degree audit open to search for required classes, and numerous other tabs to view course pre-requisites and descriptions. This can become a lengthy process when it should only take a view minutes at most to register for courses.

I also encounter the very problem of having to search over and over through my degree audit to see if I’m taking the correct classes for my current year and curriculum. There should be no need to do all of this, since it creates confusion and may have students register for classes that are too advance for them at that time.

USERS
The targeted users are going to be college students particularly those at Northeastern University. Although the overall UI can be redesigned to fit different universities needs, the main audience remains the same.

- Primary users are undergraduate and graduate college students who are required or need to self-register for courses each semester.
- Secondary users are considered to be university or college teaching staff that receives evaluations and enrolled students each semester.
- Tertiary users are college or university deans, and board of directors whose primary role is to oversee campus activities.
- Facilitating users are considered to be university or college registrar staff whose primary role is updating the database (backend) before the registration process begins and provide maintenance.

TASKS
There are 3 main user tasks that are used throughout the UI design process. These tasks are used to debug certain components of the UI and test for inconsistency.
• **Task 1: Teacher Evaluation (Fig 1)**  
  User is required to successfully login and perform teacher evaluations for each available professor.

• **Task 2: Course Selection (Fig 2)**  
  User is required to successfully login and view available courses, course descriptions, sections, etc.

• **Task 3: Registration (Fig 3)**  
  User is required to successfully login, select, and register for available courses.

**DESIGN**  
During the design process I had some rough ideas of what I wanted the UI to look like, but after further evaluations the final design of the user interface was slightly altered. (Fig 4)

**Paper prototyping:** Paper prototyping was the very first element that allowed me to visually picture the overall design of the UI without any major coding. During the paper prototyping trial I was able to clean out processes and focus on the user experience. The evaluation process involved rough sketches of the design and allowed me to distinguish the problems that users were facing from the very beginning. The problems that were reevaluated after paper prototyping was performed were the navigation menu, and icon/button locations.

**Heuristic evaluation:** During the heuristic evaluation, although not fully implemented yet. I found that numerous users were having problems with the navigation tabs for teacher evaluations, the consistency of button actions were incorrect, and information was misleading in some cases (typos, etc.) This evaluation process allowed me to further iron out the wrinkles that were created after the first computer prototyping.

During this phase most if not all of the components were intact and ready for user testing.

**User testing:** User testing was the last of the evaluation process for my user interface. At this point most of the UI has been completed and only minor touch ups were needed. During user testing I found that the corresponding bar graphs on the teacher evaluation was misleading, registration popups were unneeded on each course selection, and there was no real way to register by a single button click.

**IMPLEMENTATION**  
The implementation process began as a Java Applet in Netbeans, and then transpired to a HTML/CSS webpage, then back to a Java Applet, which lead to the final decision to keep it simple and design the user interface as a webpage. The reason for this decision was to due to the fact that Java Applet was relatively new to me, and Java Applets were unstable across multiple browsers. I did not want to put in more time than needed to learn how to program a Java Applet to work the way I wanted it to.

Being familiar with HTML/CSS allowed me to quickly design a rough prototype of the UI and change it on the fly without the need to redesign the entire interface. I was able to implement basic HTML, CSS, and JavaScript, while keeping the entire interface simple to navigate by the average user.

I adapted the overall interface to be somewhat Google like, keeping it plain and simple while performing its intended tasks. This way a user would quickly recognize the interface, and adapt accordingly, without the need of a great learning curve.
EVALUATION
Through each round of evaluation testing I learned that something simple in my eyes, does not necessarily mean its simple in others eyes. I’ve designed more complex webpages before and found that users were getting lost at different stages of navigation, and I never really understood why, it seemed simple enough to me. The evaluations performed on this project however, provided a great understanding of users actions. They allowed me to think outside of the box and focus on the average users experience, rather than complex designs.

Paper prototyping: Through paper prototyping I learned that implementation should not be the first step in the design process of any user interface. Being able to draw up paper mockups and perform trial runs with users really lightened the workload in the long run. Although, paper prototyping at first seemed silly, it allowed me to quickly scratch and redesign ideas with a lift of a pencil, rather than code.

Heuristic evaluation: Through heuristic evaluations I learned that users have a keen eye on usability and performance. Users would find flaws that I never knew existed.

“Evaluation page lacks any padding around text (especially evident on left side)”

“Evaluation page ‘registers’ for classes just by clicking the class”

“Slight inconsistency in menu”

“Consistency – clear button in the evaluation section doesn’t clear the radio buttons”

Although there was good criticism, I feel like heuristic evaluations is a means to focus on the bad instead.

User testing: Through user testing I further learned that not all problems corrected during the heuristic evaluation were solved. Design wise the UI was complete, but performance did have some bugs that user testing found, and was fixed in the final stages of implementation.

Through user testing I also learned that most users enjoyed the simplicity of the UI and that detail was not lost in the reengineering of the interface.

Overall all three evaluation processes allowed for a more fluid UI that allows users to navigate the system without much knowledge.

REMAINING PROBLEMS
The final user interface design still has some usability problems that were not solved due to time constraint and limited resources. One problem is the completion of the backend of the system. Without actual data from the universities registrars’ office I was unable to design a relevant backend of the UI. Another problem that still exists is the entire registration and evaluation process. My original intent was to allow students, teachers, and university personnel to receive a confirmation, whether through email or spreadsheet of some sort. The problem is without a legitimate email server, I could not implement this design approach.

I’m sure that with actual data from the university and a valid email server the entire user interface would be usable. If I or someone else were to pick up on my UI design I would recommend them to implement a valid system for registration and evaluations rather than a popup dialog.
REFLECTION
Throughout the entire iterative design process of the user interface I learned that valuable time and effort is needed to create a simplistic, convenient UI that users are able to pickup with little to no knowledge. Looking back at the entire scope of the project whether it is my very own project or those of my classmate, I’ve come to realize that simplicity is the key in all aspects of a user interface. I’ve evaluated some very complex interfaces that were just too complex and confusing that I practically gave up digging into them at times.

To be honest in all retrospect, over the entire iterative design process, it seemed like I was performing the same steps over and over, but in reality I was creating a better all-around system.

If I were to redo the entire project again I would completely redesign the interface to support the design elements that are currently missing in the final design. I would choose to completely redesign the interface because I found through the further testing that it is cluttered in some aspects, but manageable. I would like to fix these minor problems so that users wouldn’t turn away from an already complex process in registration.

During the redo of the project I would stick with the paper prototyping and heuristic evaluations and drop the user testing. I feel that user testing is really similar to heuristic evaluation and heuristic evaluations provide a greater detail of pros and cons versus those of user testing. I understand that all types of iterative evaluations are important, but feel that not all is needed if one process provides better results than the other.

CONCLUSION
In conclusion of this iterative design of the redesign of the registration and evaluation systems, I found the entire process was extremely useful.

Through the original problem, to the design, implementation, and testing phases, each process created different challenges that were worked out before the final design. Some phases involved a complete redesign of the entire UI and others resulted in minor tweaks. Whatever the situation may be, I can say that valuable lessons were learned, over the project span, and they will be useful throughout my future.

This project scope allowed me to think outside of the box during the design and development stages, and ultimately, the final product (Fig 5) showcases a fully working system with a mocked up backend.
(Fig 5)
### Available Courses:

**IS 4300 Human Computer Interaction**

**Description:**
Studies the principles of human-computer interaction and the practice of user interface design. Discusses the major human information processing subsystems (perception, memory, attention, and problem solving), and how the properties of these systems influence the design of interactive systems. Reviews guidelines and specification languages for designing user environments, with an emphasis on tool kits and standards.

**Graphical User Interface (GUI) objects.** Introduces usability metrics and evaluation methods. Additional topics may include World Wide Web design principles and tools; wireless/mobile device interfaces; computer-supported cooperative work; information visualization; and virtual reality. Course work includes designing user interfaces, creating working prototypes using a GUI tool kit, and evaluating existing interfaces using the methods studied. Prereq: CS 3500.

- **Credit hours:** 4
- **Lecture hours:** 4

**Sections:**
- **TF 11:45am - 12:55pm**
- **Where:** International Village 222
- **Final Exam:** December 12, 2013 @ 8:00am - 10:00am in Hayden Hall 221
- **Associated Term:** Fall 2013 Semester
- **Levels:** Undergraduate
- **Attributes:** Computer and Information Science
- **Instructors:** Timothy W. Bickmore

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- **CR 3:35pm - 5:05pm**
- **Where:** International Village 222
- **Final Exam:** December 12, 2013 @ 8:00am - 10:00am in Hayden Hall 221
- **Associated Term:** Fall 2013 Semester
- **Levels:** Undergraduate
- **Attributes:** Computer and Information Science
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- **Do not register for this course**