Course-Management System: Final Report

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ABSTRACT
A *design* final report for a course-management system is presented here. Such a system allows University students to enroll in courses, view their schedule and perform other course-related tasks from a web portal. The proposed project as well as suggested improvements are first explained. Four Canadian university course-management software surveys are then presented. Each survey has a brief description followed by a critique of the major usability flaws and strengths. Three personas are then presented to give the reader an idea of the people likely to be using this system. A section for information about the usablily tests conducted for this system is presented next followed by a result, a discussion and a conclusion section about the results obtained from the usability tests

PROJECT PROPOSAL
The project proposed in this document is the design of a new university course-management system. Through scrutinization of several pre-existing systems, we will apply design concepts discussed in class to determine what features and design choices are crucial to the success of a course- management system's design.

It is commonplace for educational institutions to have one central course- management system which hosts all tools and information that students and staff may need to access. This includes tools to allow students to enroll in courses, view their schedule and view other course-related information. Additionally there are a variety of other tools to perform financial and administrative tasks, however this project's scope is focusing only on the course-related functions.

Course-management systems have achieved near omnipresence in the world of education, but there remains significant variability in their design, structure, and functionality. It is our goal to take the best aspects of the existing systems as well as consider the most prominent criticisms to develop a protoype of a new system.

In the following section we will introduce several possible improvements that could be made to these systems, informed by the system surveys below. It is these suggestions that we plan to incorporate into prototypes for later milestones.

Suggested Improvements to Existing Systems
There were a variety of improvements that have been made to the course-management system when compared to existing products. The software surveys identified several key areas of weaknesses, and solutions to those are presented below.

Dynamic Element
One of the highlighted points of weakness in all the systems surveyed was the ability to surface the most relevant data to the user quickly and consistently. To improve this aspect, the concept of an intelligent, "dynamic" element was proposed. This prominent element is the first thing users see when accessing the webpage. Several factors including the current date and enrollment status were used to determine which task the user is most likely to perform.

For example, when the user accesses the system during exam season, the element displays the student's exam schedule. During the course registration period, the element displays information related to course registration. If a user is not yet accepted into University, the element displays their application status.

This dynamic element helps users quickly find the information they are looking for by making information more visible and easier to access. All functions continue to be displayed below in a static and consistent manner, in case the user wishes to perform a less common task.

Improved Navigation
Many tasks performed by users of course-management software are broken into several steps. A weakness of the existing products was in visually showing the user at which step they were at. A navigation element was included for when the user is engaged in a multi-step task. This element shows which step the user is currently on, and includes the ability to go back to a previous step, or jump ahead to the first uncompleted step.

This visual indicator improves the user's comprehension of how the system works, and gives them the ability to better navigate between steps. It also improves user satisfaction, as they are less likely to become impatient when they know exactly how many steps they have completed and how many remain.

SOFTWARE SURVEY
Four course-management systems from Canadian universities were selected for review. For each system, a brief description was followed by a critique of the major usability flaws and strengths. From this, the main goals and tasks of users using the systems was extracted.

McMaster University – Mosaic
Description
The purpose of the software is to allow students to manage their courses (enrolling, dropping etc.), and view information about their current status (current timetable, enrollment sta-

tus, financial balance etc.). The main interface for the software consists of several collapsible modules encapsulating different aspects of the software in a main column. These include Academics, Finances, Personal Information, and Admissions. A small column to the right holds less common sections, such as Enrollment Dates and Graduation. The focus of this analysis is on two common tasks – enrolling in courses and viewing one's course schedule.

Critique

The largest usability flaws in Mosaic center around difficulty to access required information. Combined with an unintuitive and inconsistent navigation interface, the software is . The HTA for enrolling in a course demonstrates this through the large number of steps required to perform a routine and common task. Other functions are hidden behind dropdown menus, and are difficult to discover.

The navigation is separated into a top navigation bar separated by user-type (e.g. Students and Employees). Within the student center page, functions are separated into modules, an effective strategy to group related functions. Navigating to one of the sub-functions (such as enrolling in a course) presents secondary and tertiary menus below the main one. Navigation within one of these is handled by blue text hyperlinks back to previous pages. Native back and forward browser functionality does not work. There is little visual indication of where the user is beyond the navigation bars at the top, which do not go to a depth sufficient to cover all pages used when performing common actions, such as enrolling in a course.

Guelph University – WebAdvisor
Description

Guelph University's course enrollment software, WebAdvisor, provides a variety of functions for students to manage their courses. The student page interface contains two columns – a main column with course-related news, and a righthand column with links to each of the functions (Register for Courses, View Schedule etc). These "function" pages are one column, and may contain several sub-pages as processes are broken into steps. Navigating between sub-pages is done using native browser back and forward buttons. If an error occurs, such as no courses found for specific search criteria, a large box is displayed with information about the error and the option to search for a solution.

Critique

There are a variety of usability issues associated with WebAdvisor that could be improved upon, especially in the area of navigation. There are also certain strengths to the system as compared to others surveyed. The navigation issues largely stem from a lack of consistent navigation elements to show the user where they are. For example, when enrolling in a course there are several steps that must be completed (refer to HTA – WebAdvisor, Enrolling in A Course). The user is not aware how many steps there are total, how many they have completed or how many remain. Another large us-

ability issue is an inefficient use of space on the main page. The visibility of important functions is reduced by putting all functions in a small column to the right of the main content. This main content contains news items, such as exam period times and service outages, generally information that the user is less likely to need than the functions beside it.

WebAdvisor does do some things quite well from a usability perspective however. One of the most common tasks is enrolling in a course, and WebAdvisor has the most streamlined process of all universities surveyed. Although it is not always clear at which step the user is at as discussed above, the process is straightforward and contains much fewer steps than performing a similar task using a different system.

Carleton University – Central
Description

Central is the course-management system for Carleton University. It has a similar feature-set to the other systems surveyed. This includes allowing users to enroll in courses and view their schedule. The user interface for Central primarily is based on text links to different pages, with very little use of icons or colour. The main student page is a one-column list of text links to the various student-related categories of functions. A tab bar at the top lets the user switch between different sections of the system including Student Services and Employee Services.

Critique

There are a large number of prominent usability flaws in Carleton University's Central course-management system. Visibility of common functions on the main page is very low, as a long list of hyperlinks contains all the categories (e.g. Registration, Student Records etc) requiring the user to read each one until they find the correct one. Once a category is selected, then another list of hyperlinks to each of the functions in that category is shown (see figure 4). Again, the user must read through each one until they find the desired function.

Another large usability flaw is the poor mapping between many actions. For example, when adding a course, the user first enters a course number into one of several (unlabeled) input boxes, and then they click the Submit button (see figure 3). The submit button is aligned with other buttons for Class Search, which takes the user to a separate page, Reset, which undoes their changes, and Return to Worksheet which navigates the user to a page showing them their preferred courses. These buttons are not all related, and grouping them together may confuse the user.

Overall, Central is a relatively unintuitive system, requiring users to spend more time finding the information they need through poor mappings and a lack of a visual hierarchy.

Waterloo University – Quest
Description

The Quest system is designed to let students manage several aspects of their university enrollment, such as course management, financial inquiries, and contact information. Stu-

dents can also sign up for a GO Bus pass, view their grades and transcript, and check the status of scholarships and other applications. The main page is broken up into 8 collapsible sections, 4 main sections (Academics, Finances, Personal Information, Admissions) with another 4 sections in a sidebar (Holds, Finance Information, Academic Information, Other Useful Links). The critique will focus on enrolling in courses and viewing a user's course schedule.

Critique

Quest has some major usability issues when it comes to providing the user to information and functions they can use.

The system is notorious for hiding options and menus from the user, requiring several screens of drill down menus before being able to access any meaningful options. The menus look unfinished or poorly formatted, and it is easy to become lost and confused while navigating the various pages. Navigation on the main page is done using hyperlinked text, while traversing the deeper options is done using blue menu tabs. Native browser back and forward commands generally work as expected, which makes navigation a little more manageable.

PERSONAS

This document initially presents the personas used to develop our design. These personas are based off of the *Persona Template* as linked from the assignment outline from McMaster University, COMP SCI 4HC3 These personas were created to archetype the most common user types, and have been integral to developing a product that will satisfy all of them.

Trevor Clark

- Born: London, ON

- Age: 22

- 3rd Year Engineering Student at McMaster

"When do classes start?"

Trevor is a third year Civil Engineering student at McMaster. He currently lives 10 minutes away from campus with some friends he met in first year. Trevor's parents are paying for his tuition and he has a student loan which he uses to pay for rent and food.

Trevor is unorganized and rarely goes to class. He also forgets to hand in assignments on time. Trevor is not a part of any clubs and prefers to spend his free time with his housemates playing video games.

Trevor has trouble remembering important dates, like his course selection or when his exams are. When he searches for information, he usually gives up after five minutes if he cannot find what he is looking for. Trevor would like it if the new course management system was quick and easy to use. He also would not mind it if certain information was made more accessible during certain times of the year (easy to see link to exam schedule around exam season).

Candice Smith

- Born: Oakville, ON
- Age: 18
- Grade 12 High School Student

"I don't know what electives I want to take for university next year"

Candice has been accepted to the chemistry program at McMaster. Candice currently lives at home with her parents and will be moving into residence in the fall. Her parents are paying for her tuition, but Candice is paying for her residence and meal plan. Candice works part time at the Fortinos in her home town to save up money so she can go to the movies whenever new movies come out.

Candice has done well in all of her classes in high school and is a part of several high school groups; such as the volleyball team, track and field team and the Harry Potter fan club.

Candice has several electives that she can take, but she cannot decide which ones to enrol in. She has heard that she can change courses during the first couple weeks of class and plans on doing that if she ends up changing her mind. Candice has already made a list of classes she would like to take in her first year and is waiting for the course registration to open up. Candice would like the new course management system to allow her to browse all the courses available to her and would like it if there were descriptions for each course that she could read before she registers.

Adrian Lopez

- Born: Mexico City, Mexico
- Age: 20
- 2nd Year Geography Student on Exchange to McMaster

"I have a lot of new things to get used to in Canada"

Adrian is a geography student from Mexico on exchange at McMaster for the year. Adrian is living in a house 20 minutes away from campus with other students in the foreign exchange program. Adrian's tuition is being paid for by a grant he received for being a part of the foreign exchange program. His parents are giving him some money for rent and food but Adrian has to pay for some of it himself. Adrian is a hard working individual during the week and can be found in the Thode library between classes. Adrian likes to get all of his assignments done during the week so he can spend his weekend going to clubs with his housemates and friends.

Adrian is a part of the improv club which he regularly goes to. Adrian has chosen a light course load this year as he would like some time to experience Canada before he goes back to Mexico next September.

Since English is not Adrian's first language he sometimes has trouble reading and understanding websites that are primarily text, and he can get confused while navigating to the information he is looking for. Adrian would like it if the new course management system was easy to navigate and intuitive enough that he doesn't need to read an instruction manual to know how to use it.

USABILITY TESTS
Results
Discussion
Conclusion