

CSCC10
Phase 1 – Project Proposal

Usability Squad

Team Members:

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Description and purpose

The Markham eConnect website (econnect.markham.ca) allows residents of Markham to register for recreational programs and book public facilities online. As a public service of Markham, it serves a diverse population, including a variety of ages, cultures, and levels of technical ability. Unfortunately, eConnect as it exists today exhibits many usability and user experience problems, as expressed to one of our team members by local residents. By thoroughly examining the problems with eConnect's user interface design, we aim to devise an updated interface which, if implemented, would improve residents' ability to use the eConnect site for its intended purpose, fostering better engagement and participation in Markham's vibrant communities.

Target audience

The target audience for this project is individuals that live in Markham and users who register for recreational activities or book facilities offered by the city of Markham. More specifically, we would like to target seniors above the age of 60 and individuals whose native language is not English. Around 20% of Markham's population is above the age of 60, many of whom are not well-versed in technology, additionally 64% of the population has a mother tongue other than English (City of Markham, 2018). Thus, to create a more usable and accessible experience, there is a great need to cater public website design to these demographics.

Proposed solutions

To enhance Markham's online booking portal, our primary focus will be on three major areas of development: enhancing inclusivity and usability, creating an intuitive design, and introducing new features aimed to simplify the booking process. This includes focusing on the needs of users with disabilities or limited technological proficiency. Our solution to improve these three areas of development involves a visual overhaul to make the interface more welcoming and straightforward to the user. Additionally, we will redesign its needlessly complex and restricting search interfaces and take steps to diminish the language barriers the website presents.

Searching and filtering

One of the most important features of the website is its ability to book facilities and join programs. Despite that, the interface to search for and reserve these services is extremely complex and not intuitive. As shown in Figure 1 and Figure 2, it requires a set of filters, date inputs, and drop-down menus with duplicated functionality. Such needless complexity will result in usability challenges for the elderly, visually impaired, and cognitively impaired. We aim to simplify user input (at registration and booking pages) to allow users to enter required information as intuitively as possible (Patsoule et al., 2014). Our solution involves simplifying options in search filters. For example, in Figure 2, there is no need to separate searching for facility information, availability, and booking. Our design will condense all this information together in the search results. In the main search bar, as seen in Figure 3, we will include keyword searching instead of exclusively searching by barcode number. Additionally, we will implement visual features, such as the ability to choose facilities from a map, and dates from a more accessible and easy-to-use calendar component.

Inaccessible layout and design

As seen in Figure 1, the website's general layout and design choices fail to be inclusive to the elderly, visually impaired, and cognitively disabled. Firstly, the small font size can make it difficult to read for such audiences. As listed in Friedman & Bryen (2008), a top web access design recommendation is to support font enlargement for Web browsers. Our solution is to use a larger default font size and introduce scaling fonts to follow this recommendation. Furthermore, the website has long sprawling texts as shown in Figure 5 and Figure 6. Many individuals with cognitive disabilities experience difficulty in using the Web due to a lowered information overload threshold (Friedman & Bryen, 2008). To help alleviate this we will: simplify the amount of text, clearly distinguish headings from the main content by using a larger font size, and use a more appropriate choice of spacing so that the text is not cramped. Moreover, the excessive amount of text makes it inconvenient for those using screen readers to navigate through. We aim to follow Takagi et al (2007)'s suggestion of incorporating heading tags as landmarks into the functionality of the website to allow for easier navigation.

Session timeouts

The W3C Web Content Accessibility Guidelines 2.1 (WCAG 2.1) dictate that if a website feature involves any form of a timer, the user must be able to turn off, adjust, or extend it; otherwise, the feature will likely prove frustrating or debilitating for people with "blindness, low vision, dexterity impairments, [or] cognitive limitations" (WCAG 2.1). Currently, Markham eConnect includes a session timeout feature, which automatically forces users back to the home page after 5 minutes of "inactivity" (Appendix B, Excerpt 1). To improve usability, we will eliminate site-wide session timeouts and only keep them during the checkout process to protect users' financial information. While session timeouts are enabled, users will be able to extend them by answering a simple prompt.

Registration

We will introduce a new registration process to replace the existing one. The current registration procedure is inconvenient as it requires contacting a service center, which has limited hours of operation. Our solution is to allow users to register with an email and password. Furthermore, the user will be able to upload documentation to their account, which can then be verified by service agents. This feature will eliminate the hassle of contacting any service agent. Moreover, the users will be able to register at their convenience as they are not limited to any operating hours.

Language barriers

Markham is home to many people with a wide range of cultural and linguistic backgrounds. For many residents, English is not a native language, and reading it can be difficult. Unfortunately, the eConnect portal is only provided in English. It also often employs technical terms and advanced turns of phrase, such as in the usage instructions on the main page (Appendix B, Excerpt 2). This presents usability challenges for many. To improve cross-linguistic usability, we will strive to minimize the use of complex descriptive text and technical terms. Common and unambiguous icons will be displayed alongside technical terms where possible, as this aids comprehension (Dodd et al., 2017). We also plan to include a site-wide translation feature so that users can view the user interface in their preferred language.

Literature Review

Web accessibility design recommendations for people with cognitive disabilities

Friedman and Bryen explore web accessibility for the cognitively disabled. They compile a list of various guidelines for accessibility across the world and diagnose the most common guidelines. Examples of how to improve accessibility to the cognitively disabled included using graphics alongside text, ensuring text was simple and clear, using consistent navigation and design, and more.

User experiences of older adults navigating an online database of community-based physical activity programs

Lowndes and Connelly explore the experiences of older adults using a database of local physical activity programs, comparing the feedback with available guidelines and assessing the database for completion. They found several issues that older adults struggled with such as website navigation, unclear language, and a confusing page layout. They recommend redesigning websites to follow available guidelines in order to improve accessibility for older adults.

Redesigning websites for older adults: a case study

Patsole and Koutsabasis investigate how to incorporate the requirements of older adults into web technologies through the redesign of a touristic web portal. Through this, it was identified that changes such as ensuring consistent styling, adding tabbed browsing, and simplifying user input greatly increased the usability of a website for older adults.

Analysis of Navigability of Web Applications for Improving Blind Usability

Takagi et al investigate the inaccessibility of visual-based websites such as shopping websites to the visually impaired. Takagi et al also explore the methods visually impaired people use to tackle these barriers. The researchers use automatic analysis and manual inspection of how the visually impaired navigate these sites and analyzed the data to provide design alternatives that are more accessible such as enabling landmark-based navigation on a website, improving HTML specification, and simplifying the navigation interface.

Designing User Interfaces for the Elderly: A Systematic Literature Review

Dodd, Athauda and Adam conduct a large-scale literature review into the question of how to design interfaces suitable for use by diverse populations of older adults. By categorizing the findings of 30 relevant studies, they discover three main types of challenges experienced by these users: physical issues, lack of computer experience, and cognitive issues. Following, they describe how UI element design, nontraditional input methods, plain language, and “cognitive evaluation” testing have been repeatedly shown to improve usability outcomes in the face of these challenges.

Appendix A – Screenshots of the current interface

Barcode Search

Enter barcode number

Advanced Search

Currently searching:
All categories/subcategories
☐ Search all categories

Containing Keyword

☐ **Whole word only**

Start date between

and

Days of the Week
☒ All ☐ Mon ☐ Tue
☐ Wed ☐ Thu ☐ Fri
☐ Sat ☐ Sun

Registrant's age
 ☒ Yrs. ☐ Mos.

Browse for Courses

☐ Available for registration only

Category/Sub-category

- ▶ Fitness
- ▶ General Programs
- ▶ Pay before you Play
- ▶ Special Needs
- ▶ Summer Camps
- ▶ Swimming

Figure 1: Search Feature for Programs

Facility Search and Booking

Facilities Information

Search for
☒ Facility information
☐ Facility availability
☐ Facility Booking

Function

Type

***Limit to Complex(es)**
☒ All
☐ Aaniin C.C.
☐ Aaniin Library
☐ Angus Glen C.C.

Feature
☐ Dressing Rooms
☐ Scoreboards
☐ Showers
☐ Timekeeper Boxes

Figure 2: Search Feature for Facilities

Start **Programs** **Facilities**

Search for programs by barcode.

Figure 3: Main Search Bar for Programs

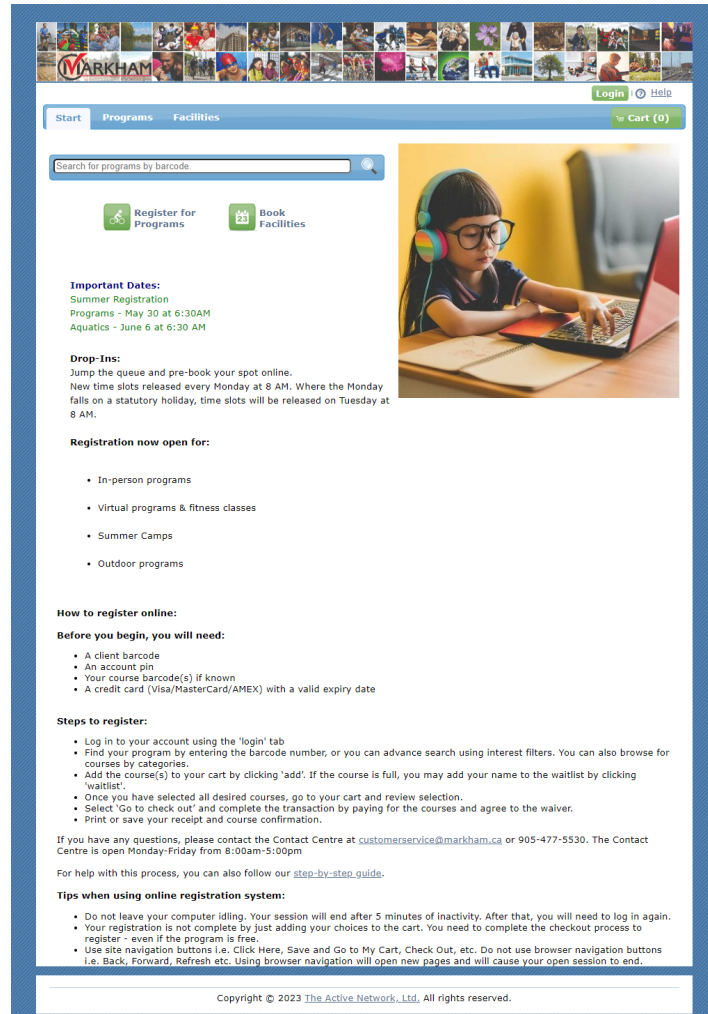


Figure 4: Markham Ez Reg Start Page



Figure 5: Facility Search and Booking

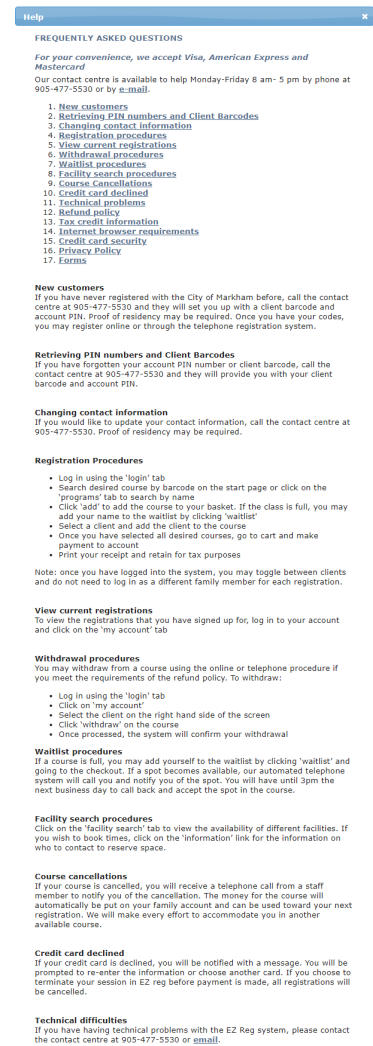


Figure 6: Help Popup Text

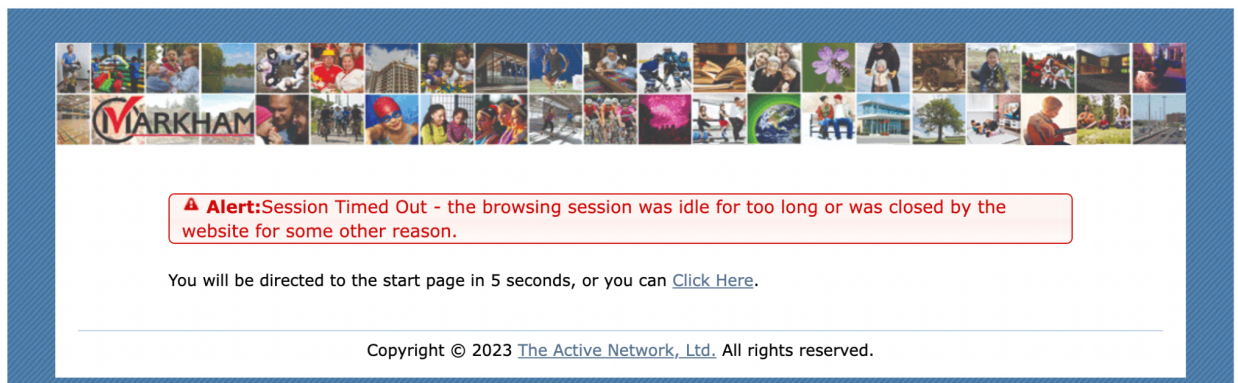


Figure 7: Message presented to the user when their session times out

Appendix B – Instructional text from the current interface

Excerpt 1

Tips when using online registration system:

Do not leave your computer idling. Your session will end after 5 minutes of inactivity. After that, you will need to log in again.

— <https://econnect.markham.ca/> (bottom of the page)

Excerpt 2

Steps to register:

- Log in to your account **using the 'login' tab**
- Find your program by entering the barcode number, or you can **advance search using interest filters**. [...]
- Once you have selected all desired courses, **go to your cart and review selection**.
- Select ‘Go to check out’ and **complete the transaction by paying for the courses and agree to the waiver**.

— <https://econnect.markham.ca/> (color added for emphasis)

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