

# Team Team Team - Phase 1

CSCC10 - 2021

## Group Name:

Team Team Team

## Members & Signed By (Name, UTORID, Email):

- Hansel Ernst Ferari, ferariha, hansel.ferari@mail.utoronto.ca
- Saad Syed Ali, alisaad2, saadsyed.ali@mail.utoronto.ca
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## Team Agreements

- **Methods of communication (email, phone, texts, ....)**
  - Discord
- **Communication response times (email, phone, texts, ....)**
  - Respond to messages within at least 24 hours on Discord
- **Regular Meetings (frequency of meetings, whether all meetings are mandatory,...)**
  - One meeting per week Sundays at 9pm EST
  - Emergency meeting can be called within reasonable time by pinging @everyone
- **Running meetings (when, where, face-to-face vs. online, who takes minutes, ...)**
  - Online through Discord voice
- **Meeting preparations (whether preparation is needed, what to prepare,...)**
  - Have your planned work/updates ready to be presented
- **Division of work (how to divide work, who will decide who does what, ...)**
  - Work will be divided at the end of every meeting so that all members
  - know what is expected for next meeting
  - Work will be divided as equally as possible between all members
  - Division of labour will be decided per meeting by group consensus
- **Submitting work (when to submit, who will submit, who will review the submission,...)**

- Revision of work will happen as a group
- Compilation and submission will be delegated to Saad Ali
- **Contingency planning (what if a team member drops out, what if a team member is sick for a significant period of time, what if a team member consistently misses meetings, what if a team member is academically dishonest, ...)**  
**We suggest that in these cases, a team promptly seeks help from the TA.**
  - Should a team member is unable to complete their work for any reason, their workload will be delegated equally to all other available members of the group.
    - As part of this, delegated work amounts will be clearly noted for future reference
  - Should a member be missing work or meetings consistently, they will be given a warning. Should they continue, they will be reported to a TA or professor
  - Academic dishonesty will not be tolerated and will be immediately reported by the group

## Team Contract

By writing their names on this document, all members of the group agree to follow the terms and agreements stated above for the duration of the Summer 2021 Term for CSCC10.

# Proposal: Costco Redesign

## Costco and our Redesign

### The Purpose of Costco

Costco Wholesale's website, [www.costco.ca](http://www.costco.ca), allows users to shop for retail products such as Groceries, Furnitures, optical items (glasses), and services such as vaccinations, photo/prints, installations, and travel packs. Being the 5th largest retailer in the world as of 2020 (NRF), costco.ca garners 24.81 million total visits according to similarweb.com, with 1 million views just this month of April.

### The Purpose of our Redesign

Launched on April 17, 2001 (Investor Costco Article), the site has not been designed to follow the recent findings of UI/UX principles. The main problems we'll discuss and propose solutions to are design clutters and item separation. Visiting the site, visual clutter is very apparent as all the categories, coupons, and promotions are jumbled together and some would even say overwhelm you. With all the uniform blocks of items, the item separation, *or the lack of*, would confuse users into where and how to navigate from the home page.

## Target Audience

The target audience for our Costco is general middle-class users with access to the internet and a need for groceries.

Our redesign's purpose is to improve the usage of the site for both disabled and general users, with a focus on visually impaired and cognitively impaired users. The details of how the current design works for each group, and how it can be improved upon, is detailed below.

## Costco's UI Problems and Proposed Solutions

### Clutter

The main problem with Costco's user interface is the amount of cluttered banners in the home page. Clutter reduces the quality of user experience by increasing the amount of time needed for visual search and navigation. According to Hick's Law, the reaction time is formulated as the following:

$$t = a + b * \log_2(n)$$

where reaction time ( $t$ ) is directly proportional to the amount of stimuli ( $n$ ) within the page (Proctor, 2018). The amount of clickable elements in Costco's pages makes the site difficult and slow to navigate. The solution to this issue is either to reduce the amount of elements on the site as suggested by Hick's Law or to include guiding attributes to feature search, as mentioned in Jeremy M. Wolfe and Todd S. Horowitz's cognitive psychology study on visual search (Wolfe, 2017). Some of the "undoubted guiding attributes" are the use of colour differentiation, variation in size, and orientation (Wolfe, 2017). In the current user interface design, each banner in Costco's website is colourful but there are no guiding colours that differentiate one banner from the other. From the perspective of Hick's Law, the banners in

itself are excessive stimuli that reduce navigation time. In addition, the site does not properly use the guiding attribute of colour differentiation to improve speed of visual search. Each banner should be coloured differently or consist of consistent colour tones that differentiate them from other banners, thus showing categories more clearly. Shapes and depth are also proven guiding attributes that can increase the quality and speed of visual search (Wolfe, 2017). From the guiding attributes included in Wolfe's research, it can be concluded that excessively colourful, flat, and crowded user interface designs like that of Costco are inefficient for visual search. Properly using different colours, tones, shapes, and depth can improve Costco's user interface in a significant way.

Costco's homepage is filled with a lot of advertisements that overwhelms users when entering the home page. The homepage is a very important aspect of any website because it is the first thing any user would see and first impressions are important aspects for any website to attract their users. According to a research done by Wei and colleagues, "On the other hand, among all kinds of human perception, the homepage of a website is more attractive to the users' vision than their other inborn perception" (Wei et al., 2010). From the previous explanation, the huge clutter of advertisements provided on the homepage of the website, along with no contrast for banners and other things, is making it hard for users to process and take in all the information given there. A solution to this problem is to simply remove the overwhelming amount of advertisements and replace them with a few advertisements (probably the most relevant ones) with good interesting designs on the homepage.

### No Feedback and Subcategory Disorganization

Also, when hovering over the *Grocery* section of the website, all the subcategories presented are not in alphabetical orders, making it harder for users to navigate that subsection. Furthermore, that subsection does not give instant feedback for users when hovering over the subcategory, which is suboptimal to the user experience.

### Item Separation

Another problem with Costco's user interface is that there is a lack of separation between different types of items on the homepage. In [Image 1], there is no label for the type of product such as "Food & Drinks" for the first row. Moreover, the second row is not even categorized as it contains air fresheners, knives and fans. A solution would be to categorize and label featured products, similar to what is done by Amazon in [Image 2].

There is also an inconsistency in spacing between elements on the website. For example [Image 4] has significantly more vertical spacing than [Image 3] when the spacing is around the same thing, dots to represent multiple pages. In addition, there is way too much vertical spacing in [Image 5] between the boxes and featured items. Our solution is to keep both vertical and horizontal spacing consistent between elements on the homepage, similar to what is done by Amazon in [Image 6]. This will ensure that all items are consistently separated, which makes viewing easier and reduces wasted space on the homepage.

### Accessibility

From Ron Mace's Principles of Universal Design (A Web for Everyone, 2014), the Costco website violates the following principles:

## Equitable Use - Exclusion of Visually Impaired Users and Screen Readers

Upon initializing the webpage using a screen reader, the selector falls on a “Skip to Main Content” link. First-time users do not know what “Main Content” refers to, meaning that users may miss site menu options that the link skips. Also, regardless of whether or not they skipped, users are constantly stepping through a myriad of advertisements in order to get to the items they want, and most products on display are not organized in any neat way. All these issues decrease the learnability of the site greatly, which can be improved upon by our redesign focusing on proper link hierarchies, separated lists, and organized items that will reduce uncertainty and make the site much more Screen-Reader friendly.

## Perceptible Information - Sensory Overload and Readability Issues for Cognitively Impaired Users

A big point of order for accessible readers is the importance of minimizing distracting clutter (A Web for Everyone, 2014). Users with accessibility needs are constantly trying to find strategies to avoid useless information and reduce cognitive load.

Upon the opening of the Costco webpage, users are bombarded with items, products, advertisements, and colors. These elements are not only numerous and distracting, but also chaotic in their color schemes and font styles. This goes in the complete opposite direction of recommended practices for designing for users with cognitive disabilities, mainly the ASD Rating for autistic users (Yu et. al, 2018), and can be greatly improved by reducing the number of items on screen at once, putting advertisements into sections or flipbooks, and homogenizing all the different font styles as much as possible in order to create a much clearer, less cluttered visual for users to engage with.

## References & Literature Review

Issaquah, W. (2001, April 17). Costco Wholesale Corporation Launches B2B E-commerce Site for Faster and Easier Business Shopping. Costco Wholesale Corporation.

<https://investor.costco.com/news-releases/news-release-details/costco-wholesale-corporation-launches-b2b-e-commerce-site-faster>.

- Article referencing the launch of Costco's online shopping site

Ray Gaul, (2020), "2020 Top 50 Global Retailers." NRF. [nrf.com/blog/2020-top-50-global-retailers](https://nrf.com/blog/2020-top-50-global-retailers).

- List of the Top 50 Global Retailers.

Wolfe, J. M. & Horowitz, T. S. Five factors that guide attention in visual search. *Nat. Hum. Behav.* 1,0058 (2017).

- A research paper in the field of cognitive psychology studying the effectiveness of different factors in guiding visual attention, offering a foundation to user interface improvements to increase speed of visual search and navigation with the use of colors, shapes, and other factors.

Proctor, R. W., & Schneider, D. W. (2018). Hick's law for choice reaction time: A review. *Quarterly Journal of Experimental Psychology*, 71(6), 1281–1299.

<https://doi.org/10.1080/17470218.2017.1322622> (2006).

- A research paper on the use of Hick's Law in the field of Human-Computer Interaction, explaining the relationship between the amount of elements in an interface and user's response time. Hick's Law provides scientific support for the importance of reducing clutter in user interfaces to reduce cognitive friction and improve experience.

Horton, S., Quesenberry, W., & Gustafson, A. (2014). *A Web for Everyone: Designing Accessible User Experiences* (1st ed.). Rosenfeld Media.

- A book collecting, explaining, and analyzing a myriad of different accessibility needs and principles proposed by numerous sources on the topic of accessible web design.

Yu, B., Murrietta, M., Horacek, A., & Drew, J. (2018). A Survey of Autism Spectrum Disorder Friendly Websites. *SMU Data Science Review*, 1(2), 8.

- A research paper consolidating, reviewing, and analyzing a number of methods and measures used to assess and improve the accessibility design of websites for users with Autism.

Soegard, Mads. Hick's Law: Making the choice easier for users. Interaction Design Foundation. 2020.

<https://www.interaction-design.org/literature/article/hick-s-law-making-the-choice-easier-for-users>

- An article on Hick's Law explaining the importance of the theory in explaining the relationship between clutter and user's decision-making speed.

Wei, W., Chen, Y., Chen, L., & Chu, P. (2010). Web Design and Assessment for E-Commerce: A case study on the visual design of a commercial homepage. *2010 International Conference on Management and Service Science*.

[https://ieeexplore.ieee.org/abstract/document/5576161?casa\\_token=Ft9-2k7N4isAAAAA:j9oU-EDHnvQ-\\_rMUugCCx8WADeb-0hamOKYWk6WfqVoF-EcX6z7otnAAfhrczhFps-IEKfrZ9Q](https://ieeexplore.ieee.org/abstract/document/5576161?casa_token=Ft9-2k7N4isAAAAA:j9oU-EDHnvQ-_rMUugCCx8WADeb-0hamOKYWk6WfqVoF-EcX6z7otnAAfhrczhFps-IEKfrZ9Q)

- A study on visual web design, its quality, evaluating criteria and other aspects. Conclusions of the study showed that the homepage is the most important thing that users pay attention to unconsciously.

## Appendices

Image 1:

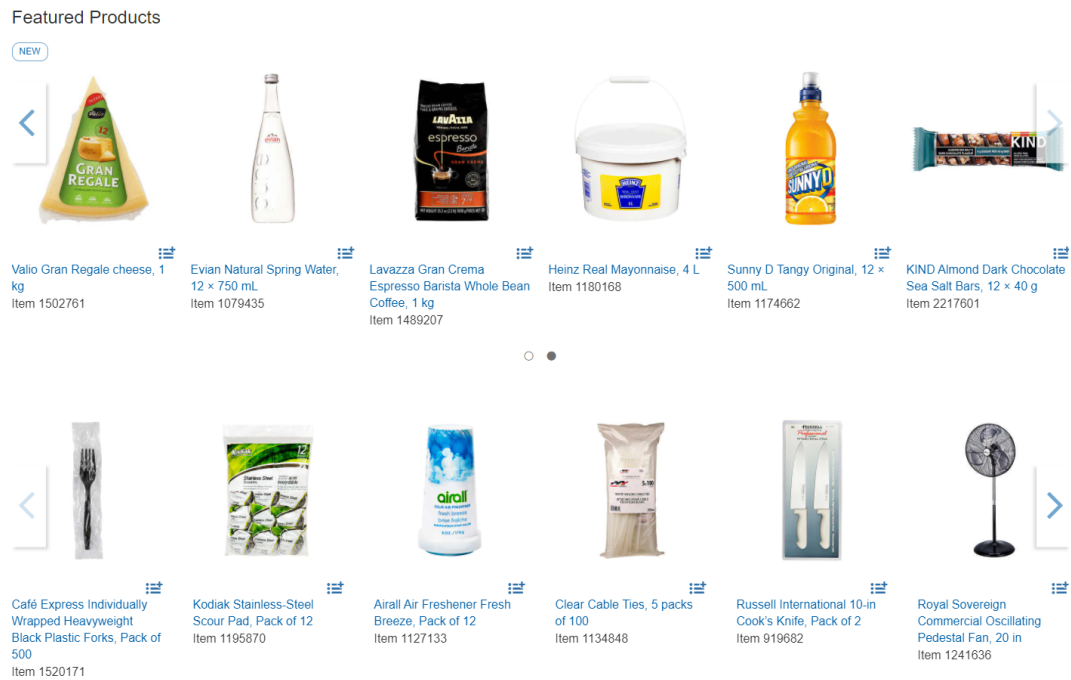


Image 2:



Image 3:



Image 4:

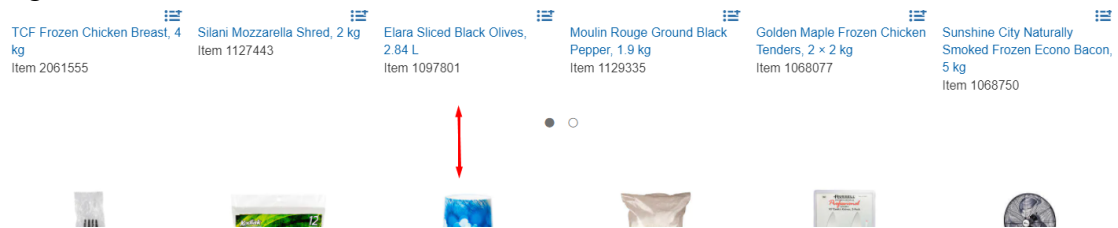


Image 5:

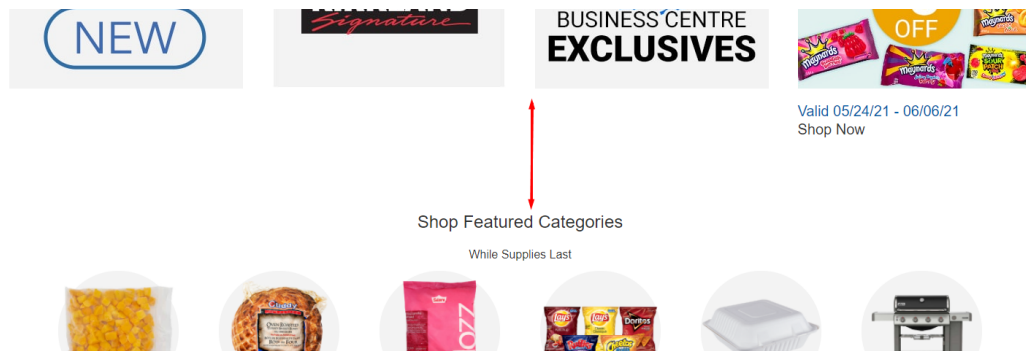


Image 6:

