

Reimagining Search Interfaces by Optimizing for the Needs of
People with Different Information Foraging Types

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of Design in Inclusive Design

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Abstract

e-Commerce experiences are increasingly an essential part of everyday life, as people use it for both essential and non-essential purchases. How e-commerce websites work, including their features and design, have changed relatively little since the inception of e-commerce. While most people find e-commerce easy to use, for others, it is a frustrating and overwhelming experience that can lead to longer purchasing times or failure to complete the process entirely. This study explores those experiences, with a focus on people with different information foraging and attention phenotypes, to examine what e-commerce features lead to positive and negative experiences, and by using co-design to explore how interfaces could be designed differently to match their needs. The results indicate that current e-commerce experiences present too much information in ways that do not align with the information processing needs of participants, that more personalization and user control is needed in interfaces, and that trust is built on the positive experiences users can have when their needs are supported. In this project we make recommendations for potential features and approaches e-commerce websites can take to support different user needs, and areas for future exploration in this space.

Keywords: e-commerce, online shopping, internet shopping, information foraging, consumer purchase decision making, co-design, personalization, inclusive design.

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1 Introduction

e-Commerce website search experiences are designed and developed to optimize for the “average” user experience, resulting in less optimal or negative experiences for anyone who falls on the margins. Our research objective is to determine what the needs of people with different information foraging behaviours are in relation to these experiences, and whether it is possible to design better experiences that are more optimal for them.

We propose that users of the web and e-commerce fit into different attention phenotypes, and that users who fall into more exploratory attention phenotypes may have difficulty using existing search interfaces in comparison to the “general” population. This more exploratory attention phenotype can be connected to neurodevelopmental differences such as ADHD (Attention Deficit Hyperactivity Disorder) or other forms of neurodivergence but may not be exclusive to this population. People in this phenotype forage for information differently from the rest of the population (Barack et al, 2024), and these different information foraging styles may need different user interface considerations (Pirolli, 2007). An interface that accommodates and empowers a different information foraging style may result in better e-commerce experiences for this user group.

The inspiration for this project started with my own shopping experience: I needed to buy a couch for my living room. The shape and size of my living room provided some constraints, the couch could be no more than 80 inches wide and 32 inches deep, otherwise it would overlap walkways and doors. My lifestyle also demanded some additional constraints, I own two cats, one of which loves to climb under furniture and destroy it, which is why I was looking for a new couch in the first place; my other cat loved lounging on the arms of the couch. I needed a couch that had wide arms and very little ground clearance. In addition to these fixed requirements, I had

some parameters I desired in a new couch but wasn't firm on. I wanted something comfortable that looked nice, with colourful upholstery, and hopefully, something easy to keep clean.

The shopping journey to find a couch felt like it should have been easy; there are many retailers offering wide selections online and in retail stores. The interfaces that they created offered features that let me put in most of my parameters, and I could narrow my options from 100 or more possible designs from a store to around 30. To see some of my more specific interests, I would need to look at each product and its options or features individually. In a single session, I could have websites open for three to five different retailers, and 20 or more tabs to look at and compare the different possible offerings from each. To find what I wanted, it took multiple sessions over several months, as each session ended in a feeling of cognitive overload and frustration with trying to compare and contrast multiple options over multiple screens.

My journey ended with me finding an option where I could see it in person at a local store and assess the comfort and fit in person before purchasing it online. Despite finding what I was looking for, it left me wondering if the experience I had was unique or shared. If the experience was shared, could there be a reason for it, and if there was a reason, could it be addressed with research and user feedback? As a person who is neurodivergent, I also wondered if my experience was related to how my brain processes and interacts with information.

For this project, we view the online shopping experience as a journey, with distinct phases representing different actions that take place during the process. Each phase can be viewed in the information foraging model as a patch or region being foraged for resources (Charnov, 1974; Pirolli and Card, 1999), specifically information that leads to making a buying decision. Moving within and between phases expends resources as well, such as cognitive capacity and attention, meaning that there are limits to a person's capacity to forage within each

phase. The ideal is expending a balanced level of effort in return for an equal or greater amount of information, but if conditions are not in place to support that foraging process it is possible that capacity is exceeded. The goal of this project is to determine what that process looks like, what leads to positive or negative outcomes, and whether those outcomes can be changed to lead to success. We found consistent patterns in what can lead to both positive and negative outcomes, and through co-design, developed recommendations and sample designs that could support future shoppers.

2 Background and Prior Research

2.1 Information Foraging and Attention Types

How people seek out information may depend on more than their personal motivations. Information search has been found to be no different a task than foraging for resources such as food (Hills et al, 2009). When searching for something such as a physical or abstract resource, optimal foraging patterns have been observed in both animal and human populations, described by the Marginal Value Theorem (MVT) (Charnov, 1974). The theorem states that an optimal predator will travel through different patches or areas where resources are found by leaving each patch once the capture rate for that area is reached and will travel between patches in a way that attempts to optimize energy intake or success. However, human and animal populations are diverse, and not every person or species will forage for resources in the same way.

There has been research on the notion that neurodevelopmental conditions such as ADHD may be a biological adaptation to address resource limitations (Jensen et al, 1997). In studies of foraging behaviour, it was found that participants with elevated scores on self-report ADHD scales engaged in more exploratory foraging behaviours with higher reward rates (Barack et al, 2024). Their behaviour aligned more closely with what was predicted by MVT than participants who had lower scores on the ADHD self-report scale. In Barack et al (2024, p. 10), this is described as an “ADHD-like cognitive phenotype” but can also be described as a difference in attentional skills. This difference in attention suggests that people in this phenotype may have a bias towards exploratory patterns of activity in resource foraging (Van den Driessche et al, 2019).

Importantly, people with this phenotype or difference in attention perform search tasks at the same overall level of performance as other phenotypes but with some differences (Van den Driessche et al, 2019). The differences depend on the type of task or the environment (Barack et

al, 2024; Van den Driessche et al, 2019). Barack et al (2024) found that decision contexts where multiple options were presented simultaneously could result in reduced performance, and Van den Driessche et al (2019) describes differences between visual and semantic search performance where the performance visually was lower. Understanding these differences in performance may provide insight into the challenges and opportunities for online product search.

2.2 Types of e-commerce Search

It is generally agreed that there are two types of search tasks: exploratory and lookup (Marchionini, 2006). These tasks apply to many types of searches, including search on e-commerce websites. In the e-commerce context, exploratory search can also be referred to as browsing (Pradhan et al, 2023), and there are a number of methods that have been explored to optimize the user experience in e-commerce search.

A number of studies have been done to explore how to optimize the search interface and experience in e-commerce. One area of interest to this project was faceted or parametric search interfaces. Faceted search provides consumers with the ability to interact with the “facets” or characteristics of a product area to further narrow down the search, either by mentioning them in their queries or through interfaces that allow them to filter or sort by specific product facets. Pradhan et al (2023) explored this topic but identified an early issue with faceted search relating to the scale of facets available for a product area. A product area can have a large number of possible facets, but how can an interface surface the most relevant or helpful ones to the customer? Possible approaches to this challenge included assessment of queries and product information to create a taxonomy of the best facets to display (Pradhan et al, 2023), or observing user behaviour involving facets to create personalized experiences (Koren et al, 2008; Wang 2024).

In a survey on faceted search interfaces, Wei et al. (2013) found several challenges with search interfaces, including problems with vocabulary, result display, and a “trial-and-error” experience when interacting with search. In response to these challenges, faceted search, search result ranking, and diversification of results are used. The high possible number of facets further requires sorting or ordering by most applicable to the search, and two possible methods include attribute-based and correlated ranking. Facets are ranked either by their relation to the search query or to similar user behaviour patterns (Wei et al, 2013; Koren et al, 2008). These challenges and the methods to address them contribute to e-commerce website usability.

2.3 Usability of e-commerce Websites

The usability of e-commerce websites, like all websites, is essential to their function. In the case of e-commerce, there are additional concerns in regard to the usability of interfaces such as search and product listings to consider. Venkatesh and Agarwal (2006) suggest that website usability is a precursor to purchase behaviour. In their view, the more usable a site is, the more likely a customer is to remain on the site long enough to complete a purchasing task and return in future.

Information presentation and how it aligns with the user’s intended task is a key part of the e-commerce website experience. Hong et al. (2005) used cognitive fit theory to consider how different types of information display on e-commerce websites might align with different search tasks. When both the information display and the task align, a consistent mental model is constructed to aid decision-making. They also considered competition-for-attention theory in their analysis, considering the impact different information display methods may impact attention (Hong et al, 2005). Different user interfaces performed better or worse depending on the search task being performed.

In addition to how information was presented, specifically search results, the quantity and quality of results also impact usability. Techniques such as content filtering based on individual user preferences and history, or collective user behaviour, are possible methods to personalize the results experience (Wang 2024). As discussed in the previous section, personalization of search facets can also contribute to information presentation (Koren et al, 2008). Personalization of information was consistently described as a feature performed on behalf of the user by algorithms and methods developed based on user behaviours or cohort behaviours (Wei et al, 2013; Koren et al, 2008), not by direct user input. This is one of the areas explored in this project.

2.4 Information Overload and Consumer Decision Making

Information overload is related to the prior sections as it is often a result of usability, search, or content display challenges. Information overload directly influences consumer decision-making, there is a balance to the amount of information provided and the customer's ability to make decisions (Jacoby et al, 1974). How a website is designed, how information is provided and organized in the user interface all impact a person's ability to complete a task and their perception of the task (Schmutz et al, 2009). Prior knowledge or experience with a product or product area can also have an influence on a customer's experience with an e-commerce site, where experienced or "high knowledge" users experience different levels of cognitive load in comparison with less experienced ones (Cowley and Mitchell, 2003; Jacoby, 1984; Kamis and Stohr, 2006). Karimi et al (2015) found that high knowledge customers were more selective in their information search and processing actions, leading to less overall load during the process. Alternative methods of information display in order to aid information load have been explored

(Mushtaq et al, 2020), though user interfaces seem to remain relatively static in their design (Chen et al, 2009; Hong et al, 2005; Pradhan et al, 2023).

2.5 Gap in Research Approaches

Previous research on the usability and performance of different search interfaces has focused on quantitative measures such as task completion time (Schmutz et al, 2009), knowledge recall (Cowley and Mitchell, 2003), decision quality vs search effort (Kamis and Stohr, 2006), and click-through rate (CTR) (Pradhan et al, 2023). Measures such as the IBM standard usability survey (Lewis 1995; Mushtaq et al, 2020), and the NASA Task Load Index (NASA-TLX) (Schmutz et al, 2009), and post-task questionnaires with ratings for cognitive effort (Hong et al, 2004), were used to provide some qualitative context in some studies, but still assessed these findings quantitatively. The only study to look at more qualitative data with regard to user experience in online shopping was Karimi et al (2015), who conducted interviews and recorded sessions with participants to develop their framework of consumer decision making, (see Figure 1). Despite the different approach, the final results still focused on the production of a framework supported by data.

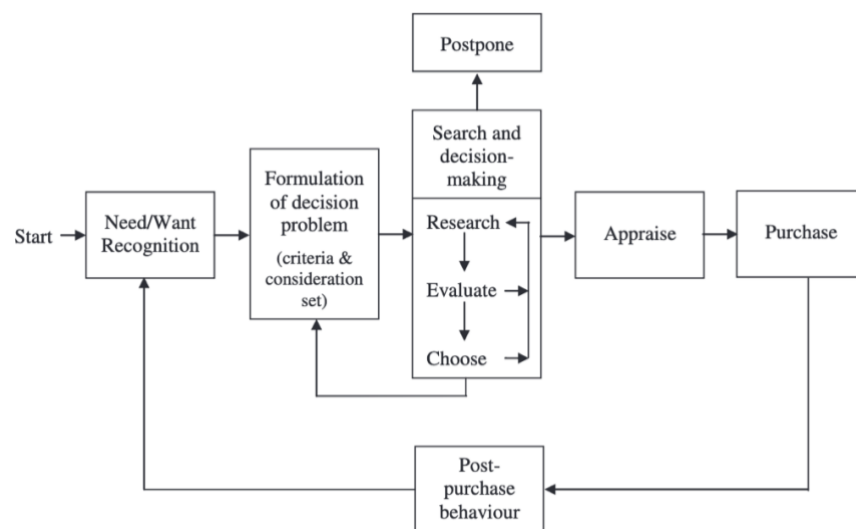


Figure 1: Karimi et al.'s (2015) consumer purchase decision making framework.

Most of the literature reviewed for this project focused on the results from the perspective of the majority or average, or in cases where a specific population was in focus, did not investigate outliers. Many of these studies could have benefited from further qualitative research to understand the motivations or patterns that led to their results. This is best exemplified in Hu and Feng's (2015) research on information search by people with cognitive disabilities. Their findings point to unique information search patterns in people with cognitive disabilities, but their focus on strict objectives and definitions of task success may have obscured potential findings. They identify some of this in their discussion of future research: "future longitudinal studies will be helpful to understand how people with cognitive disabilities learn to navigate within a new website and how their interaction strategies evolve" (Hu and Feng, 2015). These findings point to a need for a more participatory approach to research in this area.

3 Methodology

3.1 Recruitment and Participants

Five participants were recruited based on their responses to a screening survey that was shared through social media. The participants were selected from all respondents based on their high usage of e-commerce and stated difficulty with e-commerce experiences. Demographic information such as gender or ethnicity was not gathered as part of this project as they were not relevant. Participants were asked if they were over the age of 18 as part of the screening survey but not asked to disclose their exact age. This project received approval from OCAD University's Research Ethics Board (REB) under REB number 2026-24.

3.2 Research Design and Procedure

The research approach for this project involved combining informative interviews (see Appendix A) with participatory design. Interviews were designed to focus on the shopping behaviours and experiences of participants, both positive and negative. The aim of the interviews was to develop an understanding of how participants interacted with e-commerce interfaces, their shopping journeys, what challenged them, and what they preferred.

Once the interview was complete, participants were invited to participate in a co-design session exploring their ideal e-commerce interface. The co-design session design employed elements of Sanders and Stappers' (2014) approaches to making by using probes to encourage development of prototypes. Each session began with a blank virtual or physical page, and participants were invited to draw or create the rough outline of their ideal interface. As each session proceeded, design elements created during previous sessions or by the researcher were introduced as probes to encourage further design. The goal of these sessions was to facilitate non-designer participation in a design development process (Sanders and Stappers, 2008).

Sessions were primarily held virtually using online collaboration tools including Zoom and FigJam, with one session being conducted in person using Zoom for recording audio and the screen while looking at different e-commerce websites. Careful planning for activities was done to ensure using different tools and switching contexts was smooth, with planned fallbacks for each task in case of technical difficulties or participant preferences (Johansson et al, 2026).

3.3 Data Analysis

Data was collected through researcher notes, audio and video recordings, transcripts, and co-design materials. Session results were analysed and key points were assembled in an online whiteboard tool to contrast and compare results between sessions (see figure 2). In addition to the key points, user journey maps were created to plot each participant's experience with a different purchasing journey. Based on those user journeys and the interview findings, a model was developed to understand the experience of using e-commerce and where there was friction.

4 Results

4.1 Interviews

Each research session began with a semi-structured interview with the objective of developing an understanding about the participant's usage of e-commerce sites, shopping processes, their preferences and frustrations, and whether they had used AI or natural language search features.

Several themes arose from these sessions, including challenges with the clarity of site information, search result accuracy or completeness, distractions, performance, and trust in the retailer or platform. Participants cited a variety of retailers in their interviews, covering many different types of retail including home goods, clothing and accessories, electronics, personal care, and building materials. Retailer size ranged from the most well-known large e-commerce platforms to small businesses.

4.1.1 Usage

All participants were selected from the screening survey because of their frequent usage of e-commerce. All participants used e-commerce sites for a variety of online shopping tasks, including research, comparing products, and purchasing. They all used a variety of retailers and platforms depending on the type of shopping, and supplemented specific retailer browsing with broader browsing behaviours on Google. Most participants still conducted in-person retail transactions in addition to online, and some used the online experience to determine whether they would visit a store in person or not. All participants mentioned using e-commerce and online search for research, especially when trying to narrow down what product to purchase. Many used multiple websites to explore and compare options or used Google search to do that comparison in one place versus visiting multiple websites.

4.1.2 Shopping Process

All participants were asked about the process they followed when making purchases online. Amongst all participants, there was a common process for planned purchases, and two participants discussed a different approach for “impulse” purchases. The process described by participants closely followed Karimi et al.’s (2015) consumer purchase decision-making framework (see Figure 1).

As described by Karimi’s model, all participants started with a need or want, conducted research on the products to address that need, compared potential options, made a final decision, and in most cases, made a purchase. For this project, we have simplified Karimi’s model to five stages: Problem/Need, Research, Compare, Finalize, and Purchase (see Figure 3). This simplified model diverges from Karimi’s as we discovered that participants described how of these phases could be recursive as they learned new information or ran into challenges. Challenges in the process could be met at any phase, though most frequently they were met during the research and comparison phases. Tolerance for challenges was highest at the earliest phases and reduced as they went through the journey.

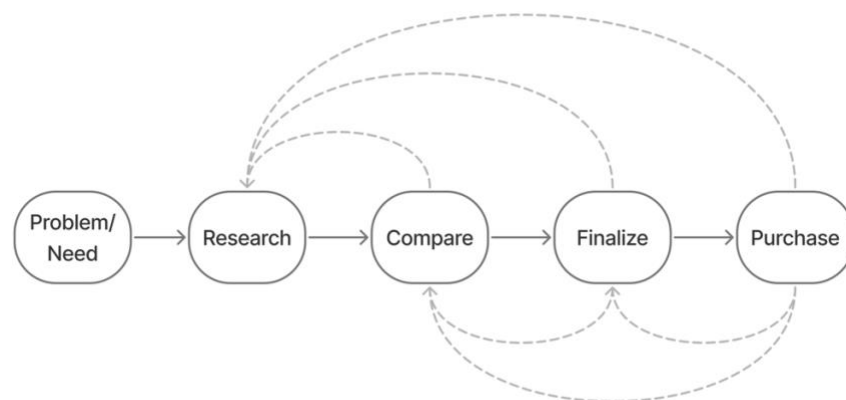


Figure 3: Simplified purchasing journey model, with each stage of the journey linked by the ways a user can travel through the process.

For “impulse” purchases, the journey is truncated as the research and comparison phases are skipped, and the initial “Problem/Need” phase includes “Interest”. Both participants who discussed impulse purchases cited social media ads as a major driver for these types of purchases, particularly on platforms such as Instagram. In these scenarios, the participant was presented with a product they were interested in, a direct link to purchasing it often with some kind of deal or discount applied, and they completed the purchase. Impulse purchases still followed the “Finalize” and “Purchase” steps of the framework.

4.1.3 Preferences and Frustrations

During the interviews, participants were encouraged to share their screens to demonstrate the features or experiences that they liked and disliked. Despite the variety of e-commerce platforms and retailers discussed in the interviews, the features and challenges with the platforms were quite consistent. Participants frequently mentioned concerns with being unsure about online retailers knowing their location, or if currency information was correct. Multiple participants expressed frustration with websites that showed popups, particularly if there were multiple or if they felt intrusive or deceiving. Patterns such as hidden close buttons or refusal text that seemed to guilt the user (e.g. “I don’t like saving money”) were mentioned as especially concerning and sometimes led the participant to exit the store without looking at the products. User agency in what information was shared was a common theme, while there were concerns about being in the right location such as being on the Canadian store not US one, participants mentioned being annoyed by location popups or a large amount of information being asked for up front. This was especially true for experiences with retailers that the participant had never visited before. Another area of frustration was search engines or search results on retailer websites that did not

prioritize the specific product being searched for, showing either related products or sponsored products ahead of the desired product.

Features that participants liked or that contributed to a positive experience included precise search results, clear display of item information in search results, sort or filter options that felt contextual to the products, clustering of related items in search results, photos in product reviews, product-specific fit information, and product pages that provided information in clear, simple, and organized ways. Precision was especially important in cases where the participant mentioned searching for a specific product by name, brand, or model number. Several participants mentioned search result interfaces where if products came in multiple colours or options that those options were clustered in the search results and not just the product page, either by offering a way to look at all options in the same item listing or by placing the products together in results. Reviews were a common way for participants to assess different products in the research and compare phases, and the best review experiences included features such as photos, tagging reviewers as “verified buyers”, or inclusion of product-specific information such as a reviewer’s rating of the fit or their body type and what they purchased (See Figure 4).

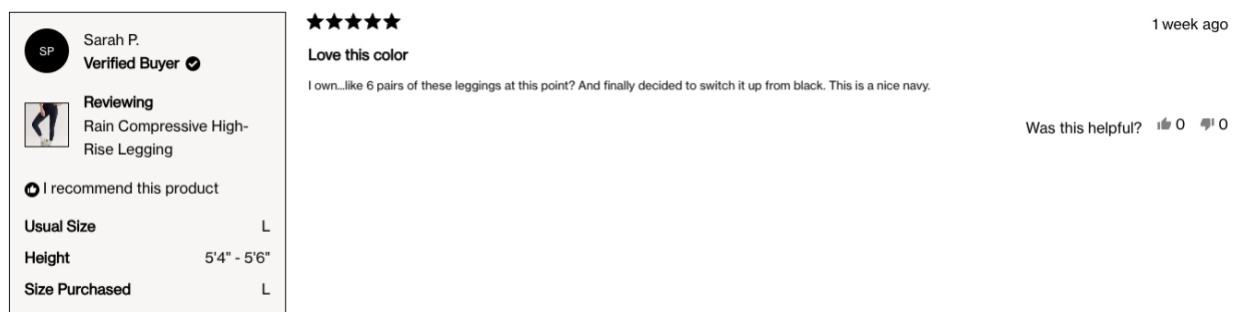


Figure 4: Screenshot from a clothing retailer featuring a product review with detailed, product-specific information from the buyer's perspective.

Participants preferred interfaces that were simple and focused on the specific information needed to communicate product options, information, and what options were available to the

user. Particularly in relation to sort or filter options, participants favoured retailers that offered options that felt contextual to the products they were searching for and noted frustration with options that felt out of place or were missing entirely. All participants expressed a preference for multiple options and ways to view results, particularly being able to sort by attributes such as price and popularity. The ability to find information both in the search results and individual product pages was important to all participants, and there was a preference for information that felt specific to the product, particularly in relation to attributes such as size or fit. Simplicity, information availability, and clarity were all common preferences.

All participants expressed different levels of tolerance for frustration in their shopping processes, however their reaction to reaching the limit of tolerable frustration was consistent: they would quit the shopping process. Some would quit a retailer or shopping journey entirely, though this often depended on the need for the product, products with higher need increased the participant's threshold for tolerance. However, completing the transaction or satisfying the need did not necessarily mean that the participant would rate or view the retailer favourably, in particularly severe cases, it was likely the participant would refuse or avoid the retailer in future unless absolutely necessary.

4.1.4 Trust

Trust in e-commerce was an unexpected theme that arose during the interviews. The attributes that both built and eroded trust in a retailer or platform related to multiple parts of the decision-making framework. All participants brought up or alluded to trust in their interview responses, and how they determined the trustworthiness of a platform had common themes. With all participants, it appeared that when dealing with any retailer or platform for the first time, there was a baseline of trust granted from the start. When discussing trust, participants often

framed comments as ways a retailer would lose or gain trust against the baseline. Examples of attributes or characteristics that lost trust were aspects such as a website looking too generic (Participant 3: "...because it was so generic looking with the Shopify templates, I'm like, are these guys real?"), reviews without photos or buyer verification, displaying unrelated results to search queries, unclear retailer policies, and lack of clarity around a product's source or applicability with promotions/offers. Characteristics that built trust in retailers included easy to find information about the company and its policies, consistent branding, and clear product information.

Several participants raised areas of mistrust in e-commerce related to common practices across retailers. The usage of search engines such as Google during the research and comparison phase was one example of this mistrust, as several participants cited a lack of confidence that searching on any one retailer would give them the most complete results. There was a perception that using a search engine would ensure "completeness" of results because they index the entire inventory of stores. Another driver for using a search engine for search and comparison was a reduction of noise in results, particularly for unrelated items. Notably, when participants who used Google for search were asked about Google Shopping, the platform's online shopping feature, a similar frustration about unrelated items arose. On e-commerce platforms using a marketplace model, such as Amazon or Walmart, mistrust could arise from being unsure about the source of the product, a product's applicability to promotions or offers such as free shipping, and differing levels of information for products. Dark patterns such as popups, adding customers to newsletters or marketing content by default on purchase, or demanding user information to proceed when it is not yet required were all mentioned as reasons participants may not favour a platform or might avoid it entirely.

Occasionally, what built or eroded trust in a platform relied on difficult to quantify perceptions and preferences. Multiple participants cited good user experience and website design as a builder of trust, but what made a website “good” could differ. Interfaces that were too crowded or dense, such as Amazon, often were cited as examples of bad design, but were still often mentioned as places purchase were made. Similar to frustration, every participant had a trust threshold that was dependent on the importance of the problem or need, but crossing the threshold likely meant abandoning that retailer entirely in favour of others.

4.1.5 AI and Natural Language Search

All participants were asked about their usage of AI-powered or natural language search features. Two participants had never used it, one was interested based on social media information, but the other was opposed to its use. The other three participants had used AI search features or AI tools as part of their work, with mixed results and perceptions. Participant 3 liked using AI search in the research phase to look at options, particularly for search queries that contained flexibility, such as travel. He felt these were better handled by AI or natural language interfaces, though he maintained a level of skepticism about the results and their accuracy, and preferred to use it as a starting point. The other two participants who had used it for work avoided it for personal use, partly because of their experiences in the workplace. There was skepticism on the completeness and accuracy of results, or whether the tool being used would hallucinate results.

4.2 Co-Design Sessions

After the interviews, co-design sessions were conducted with each participant, focused on the question of what their ideal e-commerce experience would be. Participants were invited to sketch out their ideal scenario using pen and paper or through an online whiteboarding tool. For

each session, the aim was to start with the participant working from their own ideas before introducing other material, then proceed to introduce them to ideas from prior sessions at a point where they seemed stuck or needed inspiration.

4.2.1 Session #1

Due to technical constraints, much of this session was done verbally, with the participant describing the features and characteristics he would like to see in his ideal e-commerce experience. His design ideal emphasized simplicity, a focus on contextual and important information in product views, performance, brand consistency, and clear information on the shipping time and policies of the retailer. He had a strong dislike for ads and recommended content, especially when it fell ahead of related search results. The elements most important to him were trust and performance, as he often experienced limited access to high-speed internet and many websites would not load. Trust was important as he often ordered from abroad and needed to rely on companies to have clear shipping and return policies.

4.2.2 Session #2

Megan's dream e-commerce experience had no popups, clearly defined categories, and a simple design that provided information at the right moments. She described difficulties with loose terms and marketing language in product listings, noting that descriptions of features were helpful, but only if she understood them, for example a couch being described as "pet-friendly" – does that mean it is washable, hair resistant, or something else? Her most common sorting preference was for pricing low-high, but she expressed concern when using filters if something met her criteria but was just outside her range, such as setting a price limit of up to \$2000 but the perfect item is \$2100, her concern was missing out when she might have been willing to pay that little bit extra. In her designs, we explored options to address that type of concern, discussing

ways to mark search criteria as “hard” or “soft” requirements. Megan used filters on her searches as she could feel overwhelmed by too many choices but also wanted to feel confident she was not missing out on items she might be interested in because they fell outside of strict criteria. Some ideas explored included applying a “thumbs up/down” to search criteria or filters, using a Likert scale-style interaction to indicate the strength of a preference, or ordering parameters by most to least important.

One new design idea that came out of Megan’s session was adapting search results to filters and updating the visible data or images to reflect what the user has indicated is most important. In Megan’s example, if the size of a couch was input as a filter or constraint, an ideal design would have the product cards update to show the image with the dimensions in context (length, width, height). One of her frustrations with some e-commerce sites were ones that forced her to click through to find important information about the item, taking her to a new page instead of showing key details up front. She described a “battery of task capability” and how smaller, more engaging tasks like exploring the search results page were less taxing than visiting a new page, looking for the information, returning to the results, and doing that repeatedly.

4.2.3 Session #3

Participant 3’s ideal e-commerce website had a significant emphasis on trust building, information clarity, and anticipating user needs. His design included putting key information such as the locale, currency, or local store close to the beginning of the page, where someone will see it quickly. The search input had to be prominent and feature a preview of what to expect through helpful autocomplete features. The homepage of his dream website would feature recommendations of products that were either seasonally/topically appropriate for new users or based on an existing user’s known preferences. Product info should be easy to see, and products

should have large images to help the user. Design should focus on setting expectations and anticipating needs in order to reduce the cognitive load of the shopping experience, as they put it “every action is an investment”.

For participant 3, his ideal design aimed to address the trust gaps he experienced as a shopper online. It was important to know that search results matched the intent and query, we explored some ideas around showing how well items matched, such as a “% match” badge or context such as “30 of 200 items” when a filter is applied. Participant 3 was skeptical of this badging solution based on experience with other retailers, such as “Amazon’s Choice”, where the criterion for the badging is unclear. Another gap was around performance; the ideal design would have consistent loading to avoid distracting delays and flashing of content as it loaded.

4.2.4 Session #4

Mariana’s ideal e-commerce experience put a focus on the products and features that made browsing a variety of products easier. The ability to search and filter results was important and should be prominent on the page, but also dismissible as needed to give more space to the products and search results. Product information should be contextual to the search intent or filters, with information updating to reflect her preferences. This idea was taken from Megan’s session and resonated with Mariana as something that would be especially helpful in areas like clothing. The example used was washing instructions and the frustration of discovering a piece you purchased was dry-clean only.

Prominence of product photos and specific information was important in Mariana’s ideal design. Too much information could become overwhelming, but contextual information tailored to her needs or interests was essential. Mariana described herself as someone who enjoyed thrifting or using mobile shopping apps like Depop, where part of the experience is discovering

something interesting amidst many other items. Simpler, more focused interfaces also instilled trust for Mariana, who cited marketplace sites like Amazon as a negative example, where the layout and intensity of information made it feel less trustworthy.

4.2.5 Session #5

For Alyssa's ideal website, emphasis was placed on strong visibility for categories, search, and essential information such as region or currency. In addition to having these features on the homepage, they should be consistent throughout the website and easily accessible on all pages to make navigation flexible. Alyssa is concerned with the ethics and business practices of the stores they engage with, so in their ideal model, that type of information is prominent on primary pages and easy to find within product pages or common areas on the site.

Product pages were a big focus for them, and a lot of time was spent discussing the features they would like to see on pages. This included ensuring that products had a variety of pictures and were modelled on different bodies with photos taken at different angles to illustrate the fit. Detailed reviews that included information on the reviewer's usual sizing or body type were also a priority. A layout that ensured key product information was easy to find was also important.

For the search results interface, the emphasis was on seeing the available categories and options, prominent product photos, and options that appeared together or adjacent to one another. Filter attribute prioritization was also introduced here, and Alyssa found the idea compelling, especially for more complex or specific searches. Another important feature for Alyssa in the clothing context was not being restricted to high-level categories such as gender, instead having an option to see all products of a type, such as shirts or pants. The ability to explore categories fully and trust that all products of that type are part of the results was another priority. Another

idea from prior sessions was introduced here as well, showing product information based on selected filters or search intent. Alyssa extended this idea by suggesting that offering a way for users to “personalize” what metadata is visible for results would be compelling and make them feel in control of their shopping experience. Personalization was a continuing theme as different result layouts were discussed, including list, grid, and large or small image options.

5 Discussion

How people shop online and their experience of shopping depends on a number of different factors. These factors include the problem they are looking to solve or the need being fulfilled, their knowledge on the area they are shopping for, their experience with the platforms they use for research or comparison, the interfaces they interact with, the business practices of the platforms they use, and their own capacity for cognitive load or stress. For people with different information foraging styles, these factors can have a more pronounced impact on their experiences, especially when their needs are not being met by the interfaces they are using.

It is possible to think of each stage of the purchasing journey as patches being foraged for resources, where the resources spent are attention and cognitive capacity, and the resource gained is information. If we define information as a reduction of uncertainty (Gleick, 2011; Shannon, 1948), we also can define frustration as the feeling of not having uncertainty satisfied with information. While the most direct path through the purchasing journey looks like it should be linear, recursion through the process is possible, but would only be perceived as satisfactory if information needs are met. Too many unsatisfactory experiences lead to increased cognitive load and frustration and leads to quitting a shopping journey or pausing it for another time, therefore extending it beyond the initial session.

In this section we'll discuss different factors that impacted each participant's experience using e-commerce, and how they addressed those factors in their designs.

5.1 Capacity and Tolerance for Frustration

All participants in this project expressed frustration with using e-commerce websites. However, they all used e-commerce regularly, though all shared examples of experiences that led

them to abandon their task. In discussing their experiences of frustration when using e-commerce, overarching patterns emerged around capacity and tolerance for frustration when shopping.

Capacity for frustration was proportional to what stage of the process the participant was in. Capacity is highest at the beginning stages of the journey, and lowest at the end. Capacity is also proportional to tolerance, with tolerance diminishing in the latter stages. This capacity also aligns with the patch foraging view of the user journey, at the beginning of the journey the need for information is highest and the capacity for processing that information is highest as well, but this capacity is diminished as more energy or cognitive load is expended as the journey proceeds.

5.2 User Journey

The journey through the different stages of the shopping process varied for each participant, though each followed similar steps for each phase. Where the journeys differed depended on the barriers or challenges faced by each during their shopping experience. User journeys were rarely linear, and frequently followed a recursive pattern where participants found themselves going back to previous steps to overcome an issue they encountered. At each occurrence of an issue, their levels of frustration increased, and the further they were into the journey, the more likely that the setback would result in abandoning the task.

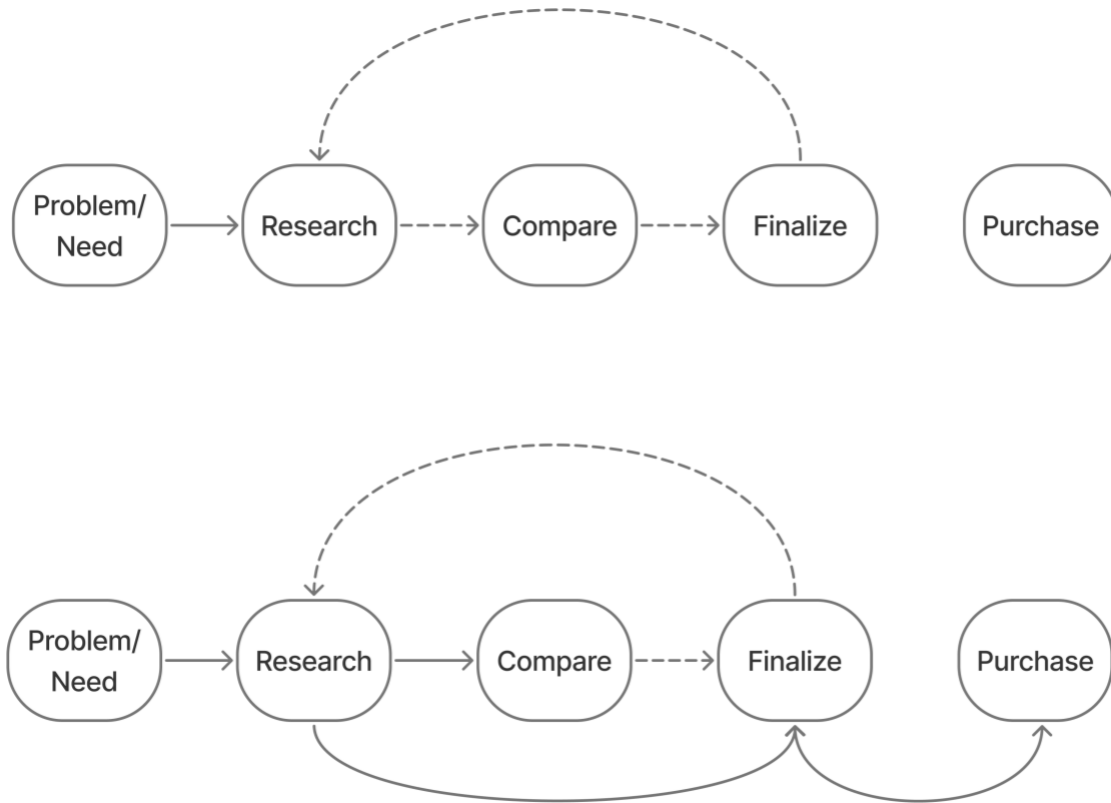


Figure 5: User journey models for Participant 3 (top) and Participant 1 (bottom), where solid lines represent information needs being satisfied, dashed lines represent unsatisfied needs.

In the interviews with participants, patterns also emerged around the types of features or interface designs that either contributed to frustration or made the process easier for the participant. When viewing the different journeys, it is possible to see patterns emerge in how participants travelled through the process. In Figure 5, we compare participant 3’s journey with participant 1’s. Participant 3 proceeded through the journey from Research to Finalize, but never fully satisfied their information needs, leading to abandoning the process. In comparison, Participant 1 faced some information challenges resulting in a move from Finalize back to Research, but was able to recover and satisfy their needs, leading to a successful outcome.

5.2.1 Research Phase

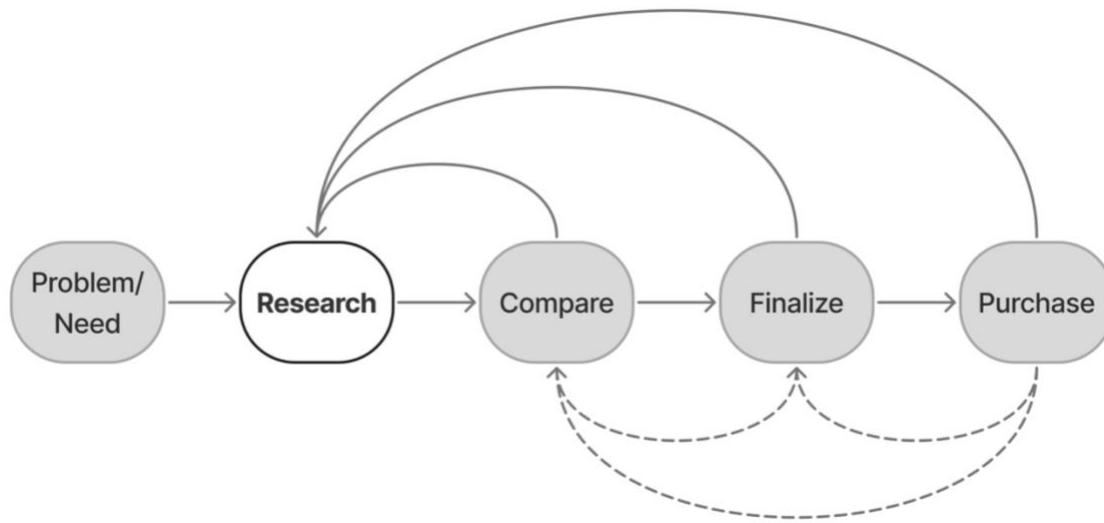


Figure 6: The Research phase within the user journey model; the Research phase is the earliest phase but can also be returned to from any other phase.

In the research phase (see Figure 6), it was most common to see research behaviours that moved between different platforms depending on the level of information needed. Most often, research started through a search engine or social media platform, where more general information could be found on recommended brands or products. Once a subset of products was identified, research would then move to more specific retailer or company websites. In some cases, if the product was already identified, the research may look specifically at retailers in order to find the best price or availability. In all these cases, the preferred interface or design pattern was displaying results that best matched the search intent with little to no distractions. The search interface itself needed to be flexible and offer assistance through suggestions as needed but should not force the user into specific patterns or formatting. In the research phase, the most likely driver of frustration or even abandonment was displaying unrelated or sponsored content that was either only partly related to the search or completely unrelated. A particularly frustrating experience for some participants was ad content that did not reflect search intent at all but still appeared in the top end of the results.

5.2.2 Compare Phase

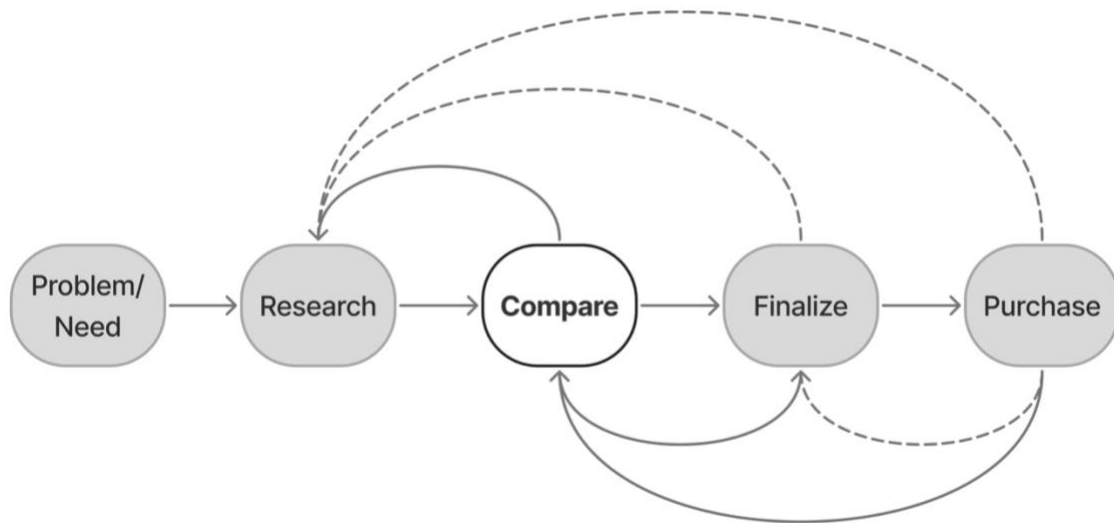


Figure 7: The Compare phase within the user journey model; the Compare phase can be returned to and moved from to either Finalize or Research.

In the compare phase, as shown in Figure 7, behaviours often focused on a specific retailer or group of retailers that were identified in the research phase as carrying the product that best met the identified need. In this phase, the user actions included locating options through search on retail platforms, comparing similar items in search results, exploring product pages to find detailed information, and assessing product reviews. Features or interfaces that led to positive reactions were contextual to the products or search queries, offered clear and well-organized information on the products in the search results and product pages, and encouraged detailed, contextual product reviews. Negative reactions came from websites that offered too many distractions in the form of popups, unrelated items appearing in search, poorly laid-out or missing product information, and reviews that had little detail or were too vague.

5.2.3 Finalize Phase

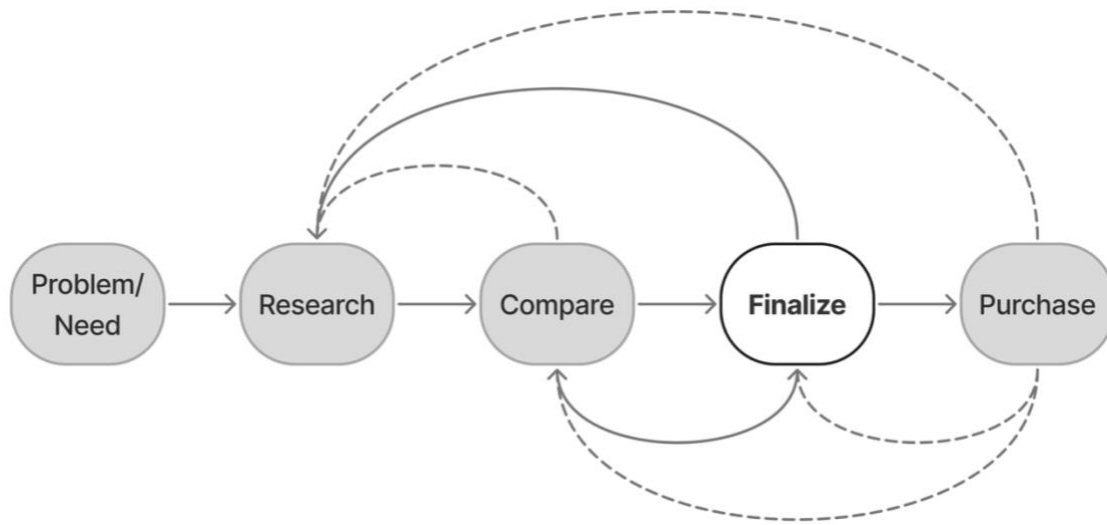


Figure 8: The Finalize phase in the user journey model; Finalize can proceed to Purchase or return to Compare or Research.

In the finalize phase, as seen in Figure 8, the priorities are for confirming that the chosen product is available for purchase, the pricing is accurate, the retailer has policies that meet user needs, and that the business meets the ethical or moral values of the shopper. In this phase, the decision on the product has been made or is close to being made, and the user is focused on ensuring they can acquire the item. Clarity and availability of information is essential here, and frustration arises when information is vague or difficult to find. Particularly for platforms that are multi-national, there is an emphasis on ensuring the correct location and currency are applied, and that shipping is available. Platforms or interfaces that did not have clear information, or obscured information on location, currency, and available offers or policies produced the most frustration. At this phase, the tolerance for frustration is much lower, and hitting a barrier here can easily lead to abandoning the process or the user being forced to go back to a previous step.

5.2.4 Purchase Phase

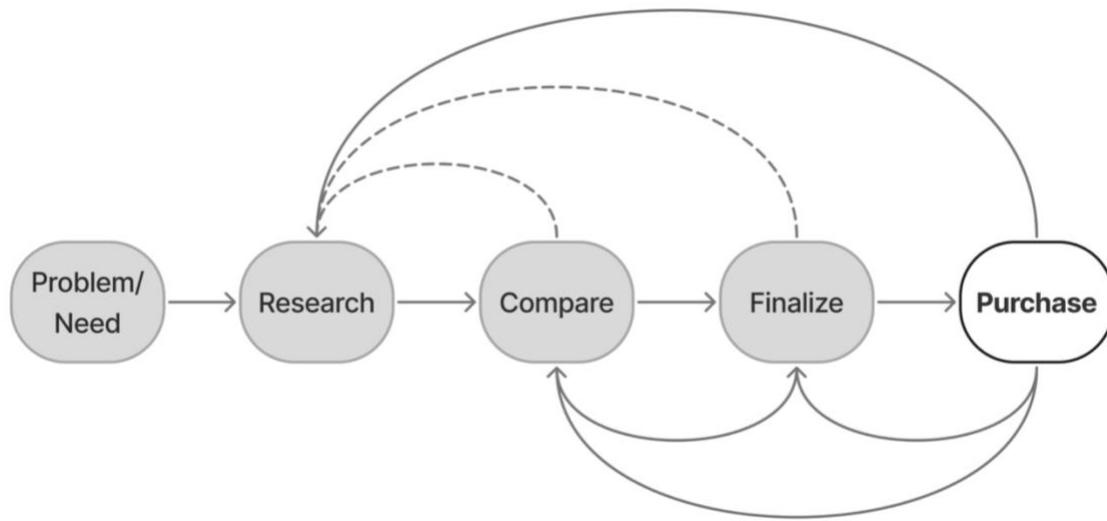


Figure 9: The Purchase phase of the user journey model; Purchase is the final phase of the process but can still regress to any of the prior phases.

In the purchase phase (Figure 9), the primary tasks are entering information to complete the purchase and confirming that the purchase has taken place. This phase has the lowest tolerance for frustration and challenge, especially as the user has invested so much time and effort already. There was strong preference for interfaces that either remembered user information for repeat interactions or made first-time interactions easy through forms that guided the user through data input. Data confirmation is essential here too, and frustration arose from interactions that obfuscated information until this phase, such as final cost or actual currency. This phase was also one where there was a risk for the appearance of dark patterns (Gray et al, 2018) such as forcing opt-in for marketing materials or subscriptions. Once purchasing is complete, confirmation is important for retaining user trust with clear information on next steps and shipping expectations.

5.3 Designing the Ideal e-commerce Experience

In the co-design sessions, participants were asked “If you could design your ideal e-commerce website, what might it look like?”. The ideal looked different for each participant but

patterns emerged that aligned with the preferences expressed during each phase of the buying process. Participants became co-designers in developing e-commerce experiences that prioritized information clarity, accuracy, context, and personalization.

5.3.1 Information Clarity and Interface Consistency

Multiple co-designers discussed the importance of information clarity and hierarchy in their design process. For them, it was essential that key information about the retailer and products was easy to find, consistently located, and well-structured. In web interfaces, a focus was placed on the header.

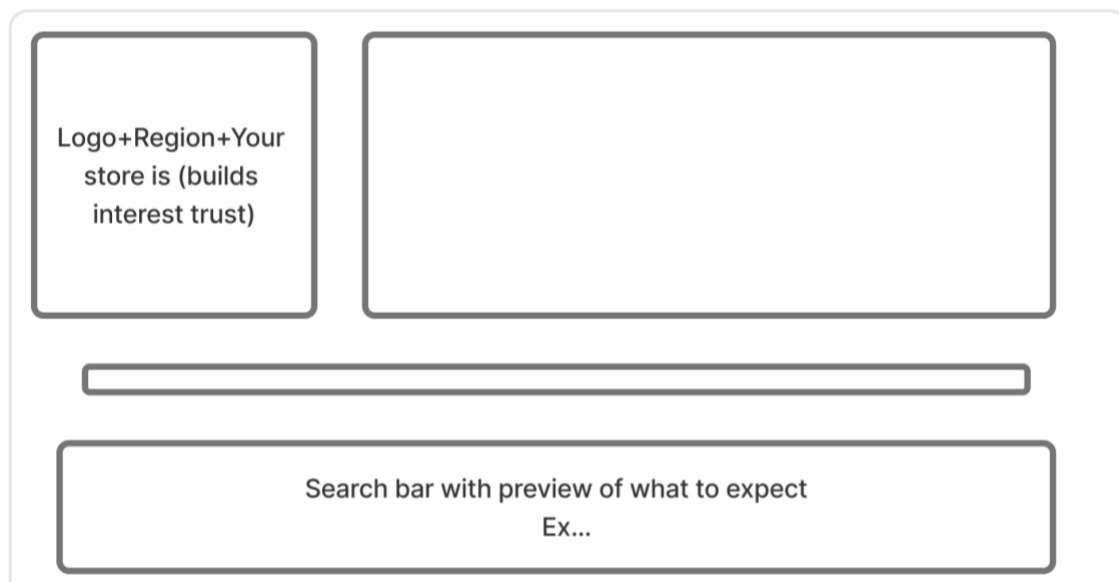


Figure 10: Header design from session #3, featuring prominent information about the retailer, location, and an easy-to-find search input.

Interface consistency was important as well, with multiple co-designers emphasizing that content like the header should remain the same or similar across pages. Essential browsing features such as navigation and search should be easily accessible at any time.

Information clarity extended past the header into components such as the main website landing page, search results page, and product page. Co-designers agreed that prominent, well-sized product images were essential but needed to be accompanied by equally prominent textual

information about key product attributes such as name, brand, colour, size, and price. There was a strong desire from multiple co-designers about product information being contextual to search input or recommendations to help explain why a product had appeared in the results. None of the co-designers had designs that featured sponsored or ad content, which is a common business case for online retail. In discussion on that type of content, it was most often a driver of frustration for the participants, especially as the content often did not match the search context and was considered distracting or disruptive to their process.

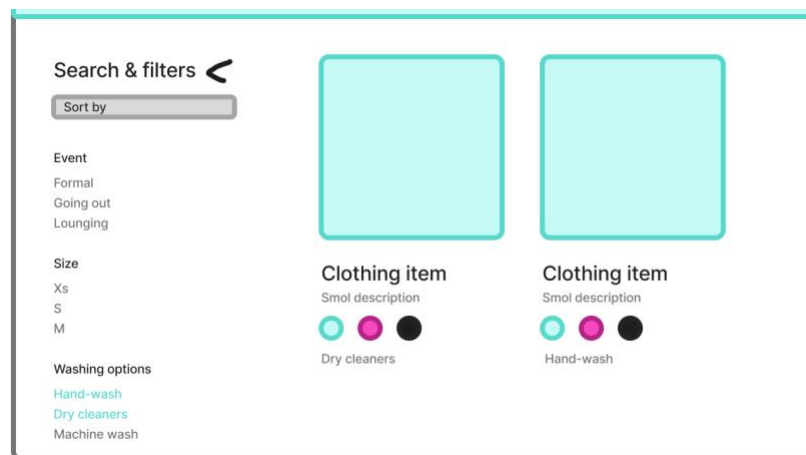


Figure 11: Co-designer Mariana's ideal search results page includes information that appears based on filters.

An ideal feature that was discussed but is not present in current interfaces is the option to personalize product information or have it update based on what filters or sorting methods are chosen by the user. An example of this can be found in Figure 11, where a filter option is provided for Washing Options on a clothing website, when some of the options are selected as filters, the product listings update with information on the product's specific washing instructions. This idea was first brought up in the second co-design session and introduced to other co-designers in subsequent sessions to gauge interest when the co-designer seemed stuck or fixated on existing interface conventions.

6 Recommendations and Next Steps

Online shopping affords the ability to look at more products from more retailers from the environment of your choice. In many ways, the current e-commerce landscape is already inclusive of many users, offering people the ability to shop for both essentials and desired items in ways that accommodate their needs. However, the e-commerce landscape is also a challenge for many users. More products from more retailers also means more information to process and more interfaces to interact with, resulting in cognitive overload and reduced satisfaction (Jacoby et al, 1974; Schmutz et al, 2009).

While there is a longstanding consistency to e-commerce interfaces (Chen et al, 2009; Hong et al, 2005; Pradhan et al, 2023) that affords a level of user knowledge regardless of the retailer, there are features that stood out for participants that only appeared in some interfaces. Improving usability of e-commerce is a key driver of positive user sentiment and returning customers (Venkatesh and Agarwal, 2006). In all sessions with participants, everyone could easily name retailers they liked and disliked, and a significant driver of their sentiment was the usability of their websites.

6.1 Opportunities for e-commerce Websites

One of the aims of this project was to discover areas of friction that could be addressed in the design and usability of e-commerce websites. In the interviews and co-design sessions, several themes and possibilities arose that could present opportunities for improvement to current e-commerce websites.

6.1.1 Personalization, made personal

A theme of the co-design sessions was personalization. Personalization has been a pervasive topic in website and e-commerce development for many years, but the approach has

typically been undertaken through observing user patterns and inferring opportunities to personalize results or experiences automatically (Koren et al, 2008; Wang, 2024). Participants expressed positive sentiment for these current implementations, but also identified that when they go wrong, or when data is insufficient, the experience can be frustrating.

Multiple participants expressed interest in being able to directly personalize experiences for themselves, specifically through user settings or interactions with elements like search result filters or results. One example of this was offering the ability to customize what information was presented on a product card in search results (see figure 12).



Figure 12: Product item card featuring an option to customize the product information being displayed.

Another example was providing the option for users to select preferred filters or settings for search results. User-specific defaults for results were described by several participants as a way to reduce the overload of being presented with a lot of information at once, particularly if it was in a format or order they did not like. While the effort of selecting settings such as sort order and display type is low, it must be viewed in context of all the other actions that have taken place already. A retailer will not know if this search is a user's first or tenth, but by easing the effort by offering pre-set preferences, they could create strong user preference for their website. The more

options a website offered for display and customization of search results, the more positively it was viewed, as personalization is truly personal.

6.1.2 Rethink common patterns

One of the most common drivers for frustration amongst participants was distracting content in the form of pop-ups, ad content, and sponsored content. From a business perspective, participants understood why this content appeared, but their responses to it ranged from tolerable to the reason they might leave a website without purchasing. A common point of frustration was how distracting the content could be, especially if it did not fit the context of the action they were taking. Examples of this were ad or sponsored search result content that did not fit the parameters of the search query. One participant shared a situation where they were on a travel website looking for a hotel with a pool, and while they were initially fine with the ad content as it was for the correct location, they did not realize it would not update to fit the search parameters, and they nearly booked at hotel without a pool, because it was in the results and assumed to be applicable to their search settings. All participants shared a general dislike for ad and sponsored content, but especially when it distracted from their search intent. Ensuring ad and sponsored content conforms as well as other content to search queries and filters would reduce this frustration.

Pop-ups offering discounts in exchange for signing up for email or SMS was consistently a frustration for participants. Frustrations with these stemmed from a variety of issues, including the use of dark pattern UX practices to obscure close buttons, or the use of refusal text that feels judgemental to the user. Context was an issue with these pop-ups as well, where they could be especially disruptive in the research phase when a user is not sure if they want to purchase from the brand. The discount might be appreciated when they are closer to making a purchasing

decision, but when placed up front can be a deterrent. Another deterrent is the request for personal information on its own, especially when the user is unsure of their opinion of the retailer. Asking for this information closer to the decision point for users might relieve this frustration and foster a better perception of the retailer.

It is important to note that not all pop-ups were viewed as problematic, as participants did appreciate pop-ups that confirmed their shipping location or currency.

6.1.3 Enhanced search result interfaces

The last area of opportunity is with the search result interface. Multiple participants discussed challenges with how restrictive the search interface felt, and due to those restrictions, a concern that they were missing out on possible results. As discussed previously, one of the main drivers of frustration in the shopping journey is information needs not being met, lack of trust in results is an example of this problem. This concern would often lead to approaching search activities through multiple methods such as different search queries, turning on or off filters to show content, or exploring the same content on multiple websites, to ensure nothing was missed. Using multiple methods increased cognitive load, leading to an increased likelihood of abandoning a shopping task.

Introducing methods to declare the priority or importance of search parameters was the solution most favoured by participants (see Figure 13). Multiple approaches to this were discussed, including adding the ability to sort filters by most-to-least importance, flagging filters as hard or soft requirements, or offering options to present results just outside of filter ranges (ex. for price, once all options in range are shown, show others after). This feature would be a major paradigm shift in search results presentation but could offer significant opportunity for improved e-commerce user experience.

Filters

Use the star to indicate most important filters.

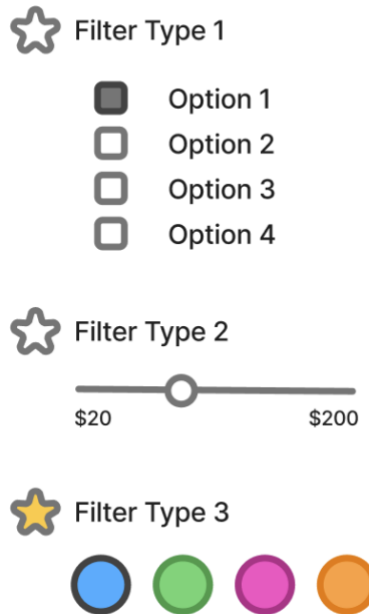


Figure 13: Example of a filter menu with multiple options and the ability to note specific filters as being the highest priority.

6.2 Areas of Future Research

One of the original goals of this project was to take the co-designed interfaces and create testable prototypes to perform user testing with. Due to time constraints, we focused on the initial research and co-design sessions. Taking some of the recommendations from the project and implementing them in another study would be an opportunity to test these recommendations.

Further research opportunities also exist in exploring the needs of people that fall outside of the average or majority in studies of usability or effectiveness of e-commerce experiences. Exploring these user groups that fall outside of the majority may reveal perspectives and needs that open up future possibilities for the development of standards and interfaces that support more users.

7 Conclusion

e-Commerce experiences are an essential part of everyday life and offer tremendous benefits and opportunities for users of all kinds. From the perspective of inclusive design and accessibility, e-commerce is rich with potential. The current gaps in the e-commerce landscape appear in the same places we see in many online experiences – a lack of inclusion for users outside of the “average”. A design focus on what works for “most” users has missed opportunities to develop interactions for more diverse needs, especially those relating to different information search and attention phenotypes. We know that there is a spectrum to how people seek out and process information. The needs of people on this spectrum differ, and while we have studied what interfaces or presentation styles may benefit different types of information need and search behaviour, we do not see that reflected in current interfaces.

This project focused on participants who self-identified as finding current interfaces challenging, even as they engaged with them on a daily or weekly basis. e-commerce is essential, and all participants used it frequently, even though it often caused frustration or cognitive overload. In a quantitative study, their experiences would likely appear as incomplete tasks or sessions that took longer than others, as outliers to the “average”. By engaging with them and their experiences in a qualitative manner, and by engaging them in a co-design exercise, we were able to not only develop a better understanding of the challenges and opportunities present in e-commerce experiences, but also design a better future, one where they can potentially find shopping easier. This is the start, there are a number of areas requiring further study and exploration, particularly around the impact of some of the recommended features in real implementations. This project did not answer those questions, could inspire further exploration.

8 Epilogue

In the introduction I told a story about a real experience I had trying to buy a couch. That experience took place over several months, hundreds of browser tabs, and many incomplete shopping journeys.

In an ideal world, I would have been able to input all of my requirements, select the options I thought were most important, and reduce the many hundreds of couch options I explored to just a few that really met my needs. My dream interface would let me explore all the different colour and style options quickly, without jumping from one page to the next. I would be able to compare options easily, and see key information like maintenance instructions up front, without have to drill into product pages and sub-menus.

The retailer I eventually chose to buy from had much of this experience already – in their physical store. In their physical retail space, I could see the different models all in the same room, laid out in different configurations. There was a diagram with each one describing all the options available, I could easily pick them up and compare them side by side. When it came down to choosing the fabric and colour, I was able to explore the options hung up together, each one accompanied by information on their maintenance. It was an interesting contrast to their online store, which had many optimized features for online purchasing. The retailer was an online-exclusive brand only until recently, the physical store was a new development for them. The difference between the online and in-person experience was fascinating. Both were clearly carefully designed but had very different experiences.

e-Commerce presents a tremendous opportunity for people with diverse needs, especially people with disabilities, to address their needs independently. For that to be possible, we need to develop interfaces that empower everyone and recognize each individual's agency. I believe that

is possible, as long as we design inclusively, with those populations, working together for a better digital landscape.

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Appendix A: Interview Protocol

Objectives

- Develop an understanding of the participant's recent e-commerce experiences, both positive and negative.
- Determine what defines a positive or negative experience for each participant.
- Record participants' impressions on their experiences using e-commerce websites and interfaces.
- Discover the rate of usage of conversational or AI-driven search experiences.
- Determine the process that each participant follows when making buying decisions online.

Introduction to the Interview

Each interview started with an introduction to the topic, researchers, and the agenda for the session. This was followed by a review of the consent form which included an opportunity for participants to ask any questions or withdraw from the study. The consent form review included reminders the participant could withdraw at anytime before the cutoff date of April 13, 2026. Participants were also informed of the data storage and usage policies for this project.

Questions

- Describe some recent experiences you've had using e-commerce sites, either successful or frustrating ones. (Invite them to share screen and walk through experiences if they want to.)
- If we were to map out your process of shopping, what would it look like?
- When you're buying things online, do you have a process or approach you like to follow?

- Does it depend on what you are purchasing?
- Do they have sites they like, dislike?
- What are some features you really like when you see them on a site?
- What are some features you dislike?
- What happens when you feel frustrated by an interface, what do you think makes you feel frustrated?
- (if not mentioned) Do you ever use AI search features or conversational search inputs when looking for things on e-commerce sites?

Appendix B: Co-Design Facilitation Guide

Objectives

- Collaboratively explore what each participant views as their “ideal” e-commerce experience, with a focus on search and search results.
- Describe and discuss different experiences and features they are inspired to include in their ideal design.
- Translate participant preferences or frustrations into low-fidelity prototypes.
- Have participants iteratively collaborate on prototypes by introducing previous prototypes into subsequent sessions.

Explanation of Activity and Prompt

Once the interview concludes, participants will be introduced to the co-design activity. The activity will be conducted virtually using FigJam, and participants will be given an explanation of how to use the tool and what to do, if needed. Each session will begin with a blank interface, and they will be given the prompt:

“If you could design your ideal e-commerce website, what might it look like?”

Participants will be given 45-90 minutes for this activity, depending on the time remaining after the conclusion of the interview portion of the session. The facilitator will be there to ask questions about what is being created, offer prompts if the participant seems stuck, and to take notes. The facilitator will also offer assistance with FigJam to help participants bring ideas to life if they prefer to talk through their design.

In situations where the participant seems stuck or fixated on a particular design, designs from previous sessions will be introduced to inspire reactions to build out their design. Sample

filter and result interfaces designed during preparation for the study (see Appendix C) will also be offered if needed.

The co-design sessions will wrap up with final questions or discussion of the prototype once the participant feels happy with it. There will be a final opportunity for questions at the end as well. Sessions will end with a thank you from the facilitator and ask for their preferred retailer for the study compensation.

Appendix C: Sample Filter and Result Interfaces

As part of the literature review and preparation for this project, several sample interfaces were developed to explore ideas around alternative search interface design. These sample interfaces were used in co-design sessions to offer inspiration or alternative approaches to ideas raised by the participants, or as suggestions for ways to address areas of frustration.

Sample 1: Added “Attributes” filters

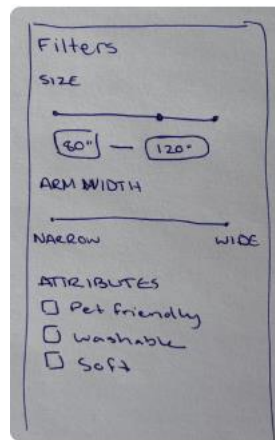


Figure 14: A filter interface with fixed structural attributes (size), and additional informative attributes.

Sample 2: Filters ordered by importance



Figure 15: A filter interface displaying product attributes listed in order of importance, with instruction to "order by".

Sample 3: Parametric exploration interface

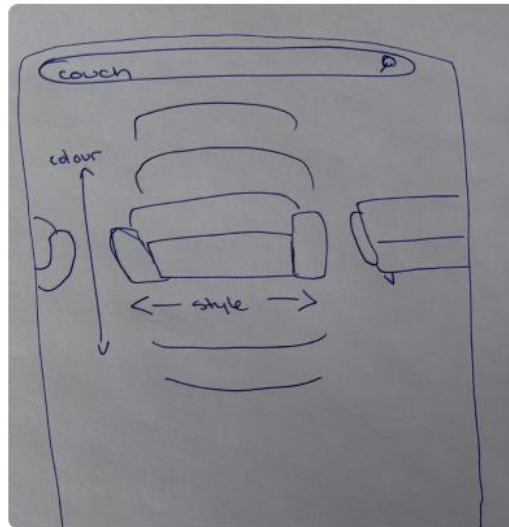


Figure 16: A search results interface where product attributes are placed on different axes and options can be navigated through directionally.

Sample 4: Granular filter menus

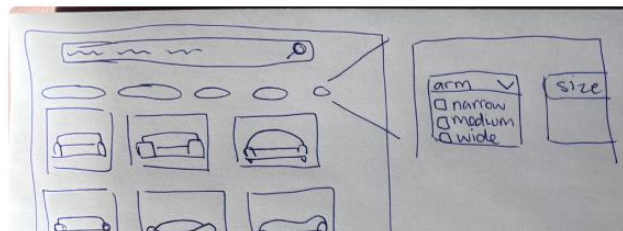


Figure 17: A search results interface showing granular filter menus with specific options for each product attribute.

Appendix D: Recruitment Materials

Recruitment Message

Research participants needed for a study on the usability of search experiences on e-commerce websites.

We are looking for people who find online shopping or searching for items challenging.

Participation in the study will consist of an interview and co-design session, held online, which will take approximately 1.5-2 hours of your time. There is no obligation to participate if selected for the study, and participants can withdraw at any time, even after the interview is complete.

In appreciation for your participation, you will receive a \$100 digital gift card to the retailer of your choice.

If you are interested in participating, please fill out our survey [LINK]. Please note that only eligible participants will be contacted.

For more information, please contact Wendy Reid at [EMAIL].

This study has been reviewed and received ethics clearance through the OCADU Research Ethics Board (#xxxxxx).

Screening Survey Questions

- First and Last Name (Text field)
- Email Address (Text field)
- Are you over the age of 18?
 - Yes
 - No (if participant answers No, the survey terminates here)
- Have you shopped online before? Shopping includes searching and researching items online.
 - Yes
 - No
- How often do you shop online?

- Weekly
 - Monthly
 - A few times a year
 - Never
- How often do you find it challenging or frustrating to use online shopping experiences?
 - Every time
 - Frequently
 - Sometimes
 - Depends on the retailer
 - Rarely
 - Never
- Participation in this study will be done online over Zoom, if selected for this study, do you require any accommodations to participate? This could include sign language interpretation, written materials, large print materials, bringing a support person or anything else required for you to participate fully. (Text field)

Appendix E: Informed Consent Form

Date:

Project Title: Reimagining Search Interfaces by Optimizing for the Needs of People with Different Information Foraging Types

What's Involved

You are agreeing to participate in a co-design session that will take approximately 1-2 hours to complete. This activity will involve you and the researcher exploring e-commerce websites you commonly use together. You can take a break at any time, and we will proceed when you are ready to continue. Please read through the following information and if you agree to participate in the co-design session accept the consent statement at the end of this document. If you wish to decline consent, we will not conduct the session. There is no obligation to participate, and you may withdraw consent at any time during the session and we will end it and destroy any data gathered.

Potential Benefits and Risks

There are no risks in this activity greater than those you might encounter in everyday life. Your participation in this activity will help the research team develop a greater understanding of how people with cognitive disabilities navigate websites and manage usability barriers. Your participation and feedback will also contribute to recommendations on how to build more inclusive websites for user experience professionals.

Confidentiality

The student researcher and OCADU will keep your responses confidential. All study materials, including audio and video recordings, notes, and co-design products will be stored

securely on OCADU servers and accessible only to the research team. Your personal information will be redacted where appropriate, and never visible to anyone outside of the project.

Quotes and Recommendations

You will not be identified individually in written reports of this research. If you consent to being quoted or attributed, you can select the appropriate checkbox at the end of this document. If you are quoted and consent to it, we will send you a link to the report prior to publishing.

Data Files and Processing

All data will be stored on a server accessible only to the student researcher and faculty supervisor. This server will be hosted by OCADU and will be maintained until [DATE], after which all data related to this study will be erased from the OCADU servers.

Data collected during the sessions will include audio and video recordings, research notes, and any materials created during the co-design process (ex. sketches, prototypes). AI tools such as Zoom AI Companion will be used during the interviews to create transcripts and summaries from the meeting.

Voluntary Participation

Participation in the co-design session and this study is voluntary. You may decline to answer any questions or perform tasks at any time during the session. For participating in this study, you will be reimbursed for any travel costs (if participating in person), and receive a \$100 CAD digital gift card for a retailer of your choice. The research results will be disseminated after May 6, 2026. If you wish to withdraw from this study or request withdrawal of your data, please send your request by email to Wendy Reid at [email]. Withdrawal from this study may be done up until April 13, 2026 and without any penalty or loss of compensation.

Publication of Results

The results from these co-design sessions will be published as part of the student researchers Major Research Project, which will be published in the OCADU online research repository: <https://openresearch.ocadu.ca>. This report will use data presented in aggregate, and we will not quote any statements made by you or attribute them to you without your permission. If you consent to be quoted or have your name stated with the quote, please use the checkboxes at the end of this form to indicate your consent. A link to the report will be sent to you via email prior to publication and when the final version is published.

Contact Information and Ethics Clearance

If you have any questions or require further information about this study, please contact the Principal Investigator, Dr. Peter Coppin, or the student researcher, Wendy Reid, using the contact information provided above. This study has received ethics clearance through the Research Ethics Board at OCADU (2026-24).

If you have questions regarding your rights as a participant in this study please contact:

Research Ethics Board c/o Office of the Vice President, Research and Innovation
OCAD University
100 McCaul Street
Toronto, M5T1W1
416 977 6000 x4368
research@ocadu.ca

Consent Statement

I agree to participate in the co-design session described above. I have made this decision based on the information provided in this Consent document. I have had the opportunity to request and receive any additional information, and understand I can ask questions in the future. I understand I may withdraw my consent at any time during and after the co-design session up to

April 13, 2026. I give additional consent for specific activities indicated by the checkboxes below.

- I have read and understood the above information. I certify that I am 18 years or older. I consent to participate in this study

Please select one of the follow options for your quotes:

- I do not want my responses quoted directly.
- My responses may be quoted anonymously.
- My responses may be quoted and attributed to me (my name will appear along with the quoted material).

Participant Name: _____

Participant Signature: _____

Date: _____