



Final Project Report

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Link to GitHub Repository: <https://github.com/ryandela44/soen357Project>

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**We certify that this submission is the original work of members of the group
and meets the Faculty's Expectations of Originality**

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Abstract

The DiscountFinder app helps people save money by making it easy to find discounts when they shop online or in stores. This report explains how we built the app and made sure it works well for everyone. We checked out other apps and talked to shoppers to see what they wanted. Then we built our app to make sure it gave them deals that they would like. We also tested it with different people to make sure it was easy to use and really helped them save money. Our tests showed that people could find discounts faster and easier with DiscountFinder, which could help them spend less when they shop.

Introduction

The way we shop has changed a lot because of technology. These days, people like to buy things online, but they also want to save money and find the best deals quickly. This is where the DiscountFinder app comes in. Our app makes shopping easier by showing people the best discounts for what they want to buy, all in one place. We built this app because we saw that shoppers need help finding discounts without having to look at lots of websites or emails. We also know that everyone loves a good deal, especially when the cost of living is going up.

Our team looked at how other apps work and what shoppers really need. We found that people want an app that's easy to use and gives them discounts that fit what they're looking for. The DiscountFinder app does just that. We put a lot of work into making sure it's not only simple but also really helpful. This report talks about how we created the app, from the very start with our ideas, all the way to testing it with real users.

Research Question

The central aim of our project is to develop an app that simplifies finding the best shopping deals. We face a critical question: How do we design DiscountFinder's features to best serve our users? To answer this, we must explore the options currently on the market and assess our competition by testing existing discount shopping apps and studying their features.

We plan to download these apps onto an emulator and examine how they work. By reviewing customer feedback on platforms like the Google Play Store, we'll get insights into the user interface (UI) and user experience (UX) that shoppers value. Additionally, we intend to conduct an online survey to understand precisely what potential users are looking for in an app like ours.

Another layer of our research involves how we'll source the deal data from stores, specifically their current and future discounts and weekly flyers. We'll investigate if stores provide an API for data retrieval or if we'll need to access alternative databases or, as a last resort, create our own. Creating our own database presents its own set of challenges and complexities which we are prepared to tackle.

Moreover, as we plan to handle sensitive user data, such as location, we're also questioning how to design DiscountFinder to be secure and respectful of user privacy, ensuring that

personal information remains protected. Our research will delve into these aspects to establish a robust framework for the DiscountFinder application.

Hypothesis

We believe that a single platform aggregating discounts and deals can substantially simplify the shopping experience. Because users tend to look for ways to minimize time and effort while maximizing savings, our hypothesis is that DiscountFinder will meet this need effectively. By consolidating deals from multiple sources and personalizing them based on user preferences, DiscountFinder aims to offer a more efficient and satisfying shopping experience compared to traditional methods of deal-hunting or using multiple apps.

To evaluate our hypothesis, we will conduct user studies focusing on usability, satisfaction, and the potential for savings when using DiscountFinder. This study will consider several factors related to the user experience, including the app's ease of use, the relevance of the discounts presented, and the efficiency of the search and retrieval process for deals. We also plan to assess how well the app safeguards user privacy and security, given its handling of personal data.

Related Work

The development of the DiscountFinder app stands on the shoulders of significant advancements in the e-commerce and retail sectors. A range of studies and existing applications have laid the groundwork for creating a comprehensive platform that brings together deals and discounts from various retailers.

A study by S. Verma [1] highlighted the importance of personalized shopping experiences in e-commerce platforms, demonstrating that users are more likely to engage with apps that offer tailored recommendations. J. B. Williamson and colleagues [2] conducted a comparative analysis of various discount aggregation methods, concluding that centralized platforms have the potential to significantly streamline the consumer's shopping journey.

Further, research by M. Iranmanesh [3] investigated the impact of user-friendly interfaces on the adoption of retail apps. They found that applications with intuitive navigation and accessible features saw higher retention rates among users.

Our work, which builds upon the foundational research and existing market solutions, is driven by the imperative to deliver an easy-to-use, efficient, and secure discount-finding service that respects user privacy and meets the evolving needs of today's savvy shoppers.

Methods

The website was developed in JavaScript and CSS using the React library. The project was broken down into React components, these include:

- **Assets:** all the product pictures and website logos.
- **Cards:** the frame in which products and offers are displayed.
- **GoogleMap:** google maps API to show nearby stores.
- **Header:** header of the website containing the logo, search bar, navbar, profile button, and cart button.
- **Home:** home page component where exclusive deals and categories are displayed.
- **LeftColumn:** vertical menu present on the left-hand side of the settings page.
- **Login:** login page component which includes the email and password input boxes, a 'login' submission button, "forgot password" and "Sign Up" buttons.
- **Modal:** component used to populate cards with product information and images.
- **Settings:** displays different settings card depending on the option selected from the left column.
- **SettingsCard:** body of the settings page broken down into 3 categories:
 - Account: contains the "update store search radius", "update email", "change password" input boxes along with a "Update Radius" submission button.
 - Notification: contains the "email notifications" and "push notifications" checkboxes.
 - Privacy: "profile visibility" dropdown menu and "search engine indexing" checkbox.
- **SignUp:** sign up page where the "email address", "password", and "confirm password" input boxes are located, as well as the "sign up" and "log in" submission buttons.
- **UserContext:** keeps track of the context of each user, similar to a cookie.

The website's backend was also created in JavaScript using the Node.js runtime environment for server scripting. The database was created using NOSQL and hosted on the MongoDB platform.

The IntelliJ IDE was used to develop the project and the Google Chrome PC and mobile versions were used to test the website.

Main Functionalities

The main functionalities of DiscountFinder are:

1. Create an account:
 - a. Having information about each user allows us to track their habits and preferences to provide better customized recommendations.
 - b. Enables us to create a profile of each user that includes their geographical location as well as their most visited stores.
2. Log into account:
 - a. Let users see offers catered to them.
 - b. Users won't have to re-enter their preferences each time they visit the platform.
3. Search for a particular product.
4. Browse through exclusive deals.
5. Browse through deals by product category and stores.
6. See nearby stores on an interactive map.
7. Update account, notifications, and privacy settings.

The overall goal of the website is to allow shoppers to find relevant store offers in a simple and intuitive way. This was achieved through a user-centric UI thanks to the aforementioned functionalities which were all successfully implemented and tested.

Simplified interaction was at the center of our design, web page components were purposefully limited and reduced to basic shapes. Commonly used buttons are placed at the top of the page in the header which is separated from the body of the page by a horizontal line. Important sections of pages such as "Exclusive Deals" are highlighted by the use of a blue background. Each product or offer is distinctly enclosed in a uniformly sized card where a category is shown at the top, an image in the middle, the name of the product underneath the image, followed by the price. This was done to achieve consistency and improve learnability as users' assumption of where to find information on a card, and what happens when it is clicked is consistent throughout the website, giving them a sense of familiarity and control.

Typography:

The color scheme used for the project is:

Primary Blue: #0077CC (highlights or headings)

Accent Blue: #33BBFF

Dark Blue: #005699 (footer)

Neutral Gray: #F2F2F2 (background)

Text Color: #333333

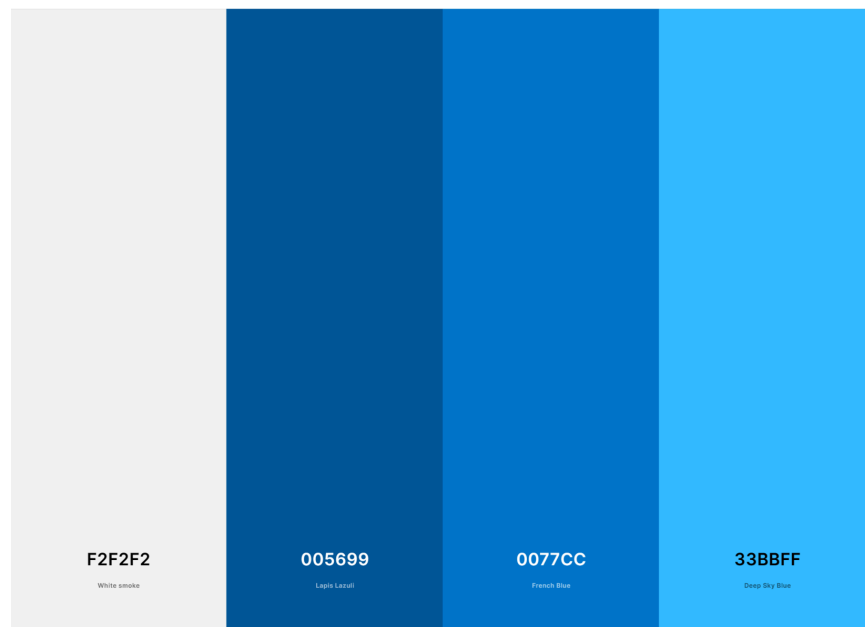


Figure 1. Colour Scheme

As for the typography, the following fonts were used

Headings: Montserrat

Body Text: Open Sans

Quotes: Merriweather

The blue color was selected for its calmness, with darker shades highlighting a sense of strength and importance, and lighter shades inviting interaction. As shopping can be a stressful process, we felt compelled to provide a look that inspires calmness and reliability.

Evaluation

To understand if our project will enhance the shopping experiences of consumers and deliver them with an economical way of consumption, we surveyed a diverse set of participants ranging from young professionals to family members and the elderly. The survey began with understanding the general background of the participants and further on understanding their state of mind and potential external influences on their shopping behavior.

Risks

Discount Finder relies highly on gathering data from multiple retailers and involves dealing with various data formats and possible inconsistencies. Forming partnerships with dealers or vendors that have direct data access and establishing well-structured data mitigation is important. This involves updating data in a timely manner and delivering accurate information about commodities to users remains a serious challenge. Our platform should also be adaptable to various demographics with varied levels of technological proficiency. The adoption of a minimalistic and intuitive design that focuses on user-centric content that plays a crucial role in user retention and engagement.

Results

The majority of the participants (76.9%) indicated that they conduct shopping for groceries and household items several times a week. This shows us that there is regular engagement with retail environments and users would benefit from receiving frequent updates on promotions and deals through our platform[See Figures 1 and 2]. Our participants showed a keen interest in finding discounts specifically for groceries. This aligned well with the core functionality of Discount Finder.

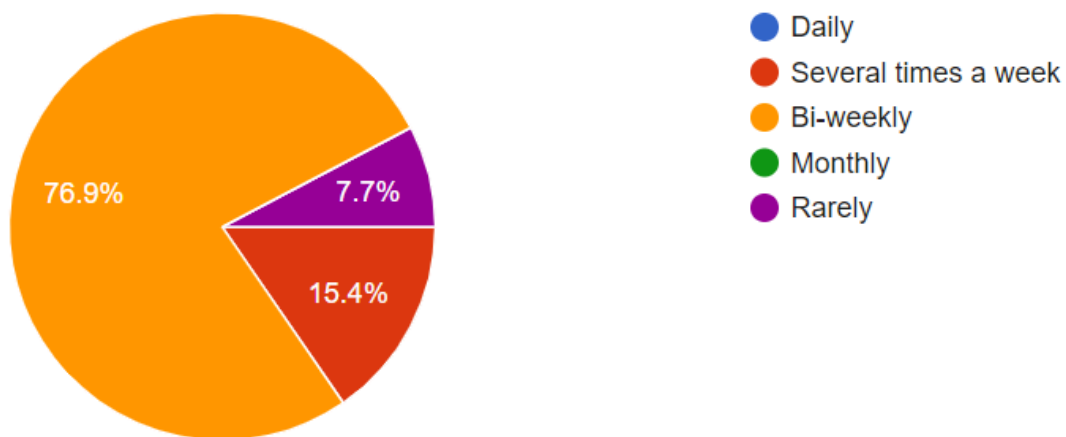


Figure 2: Shopping frequency of participants

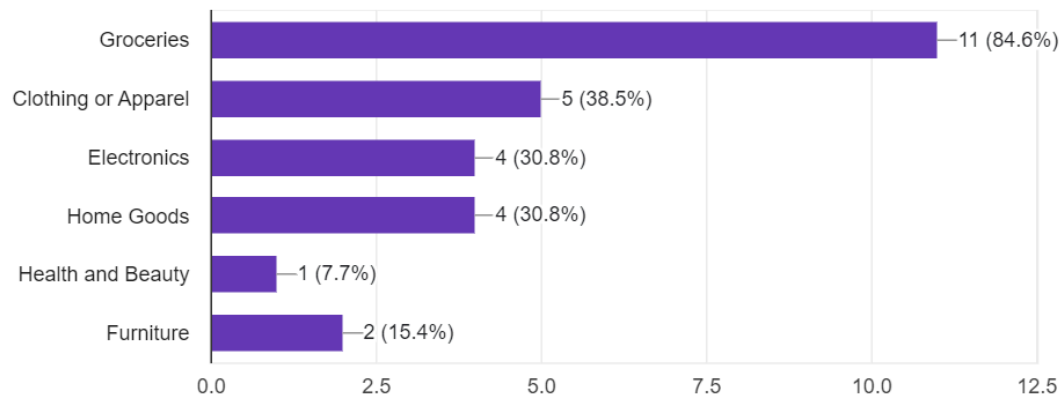


Figure 3: Types of products users intend to consume

When asked about estimated spending, participants spent over 100\$ or more per month on shopping. This highlights the potential for significant savings and providing better incentives for users to adopt our platform. There is also keen interest in bridging the gap between centralized digital solutions like Discount Finder and independent commercial platforms. Users want to receive a better-streamlined process of gathering the majority of deals from various sources in their particular preset locations. [See appendix for survey results]. Our survey also indicated that receiving real-time alerts for discounts and promotions are important and effective feature for user engagement, When asked about any preferred features most of them indicated that location-based discounts were the most appealing feature.

The data from the surveys indicated Discount Finder has the potential to meet the real-world needs and preferences of its target users. Moreover, the inclination toward location-based services and real-time alerts can guide the further development of the platform. Overall these insights helped us tailor our platform to user preferences, thereby increasing user experience and further adoption of the platform.













Discussions

Discount Finder emerges as a particular digital platform relevant at the present scenario of economic uncertainties in Canada due to factors such as the COVID-19 pandemic and geopolitical tensions. The decline of hard-copy flyers and inadequate digital alternatives have created a niche for having a centralized, user-friendly platform that Discount Finder aims to fill. By tailoring deals and presenting them on a single digital platform, Discount Finder responds to critical consumer needs for a more streamlined and efficient way to bargain hunting.

With contrast to existing solutions such as Honey, Reebee, or Groupon, Discount Finder is designed to overcome the limitations of poor user interface design and lack of navigation ease. We emphasize on minimalistic UI and personalized deal offerings that align with the Technology Acceptance Model[4]. Technical risks associated with centralizing data from retail data sources could impact system performances, and cause high user traffic. Security and privacy concerns of handling personal data from users about their shopping habits and location is also important.

User Journey

Discount Finder User Journey Map

Stages of the Journey	Motivation	Discount Finder Website				Browsing
ACTIVITIES	Where do I get discounted products from? 	Checks stores at near by location 	Sees a list of stores 	Sees a list of products 	Compare and picks a product 	Frequently checks on ongoing deals and promotions 
Feelings Satisfied Confused Somewhat Satisfied Not Satisfied						
EXPERIENCES	Worried about rising cost of products	-Somewhat happy to see many options. -Frustrated about which one to choose	Happy to see stores nearby Not sure if they have products I want	Happy to see discounted products	Suprised and happy to see the product is available and ready to be picked up from the store	Frustrated about not being able to see deals everytime
CUSTOMER EXPECTATIONS	Easy ways to obtain discounted products	More user friendly search engine	Well-labeled and marked list	High quality products	Pick-up timings and contacts of in store assistance	More discounts and promotions at a specific locality

Conclusion

The research conducted confirms the hypothesis that shoppers currently rely on multiple methods to find sales and discounts indicating the need for a consolidated platform. Moreover, there is discontent with the time commitment required to search up and make a list of deals prior to going shopping. Providing users with offers tailored to their shopping habits and preferences through a single web platform not only allows them to keep more money in their wallets but most importantly saves them the time and the hassle of searching through multiple websites and flyers. Supplying users with location-based offers and real-time notifications are features that shoppers find even more enticing to using DiscountFinder.

DiscountFinder currently only supports Quebec stores, it would be helpful to expand the availability to other provinces and countries to help grow the user base in the future. Moving forward, it would also be useful to implement a user-satisfaction survey on the website itself to gather feedback about the platform and what users want.

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Github

<https://github.com/ryandela44/soen357Project>

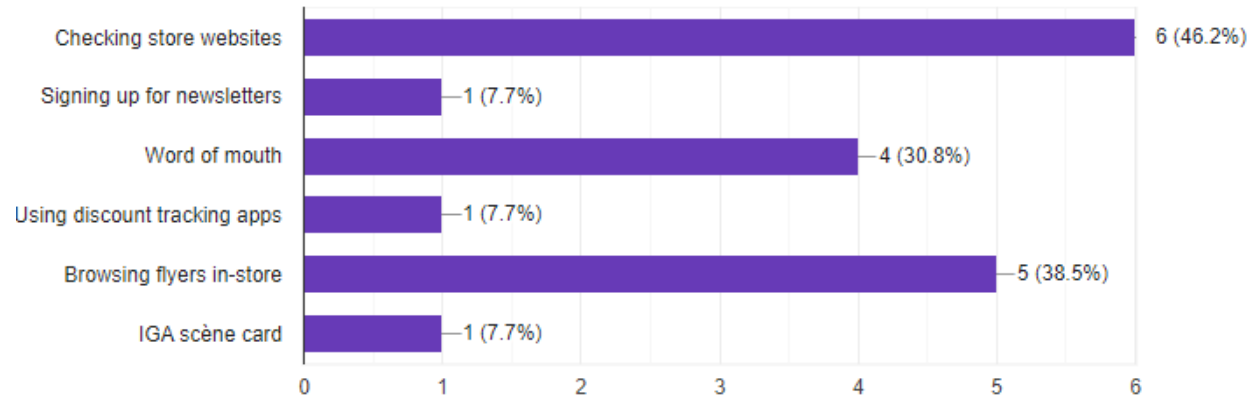
Image Dataset Sources:

<https://www.walmart.com/>

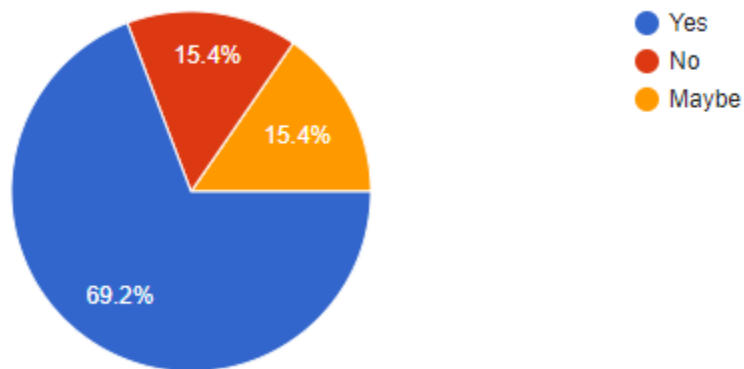
<https://www.iga.net/en>

Appendix

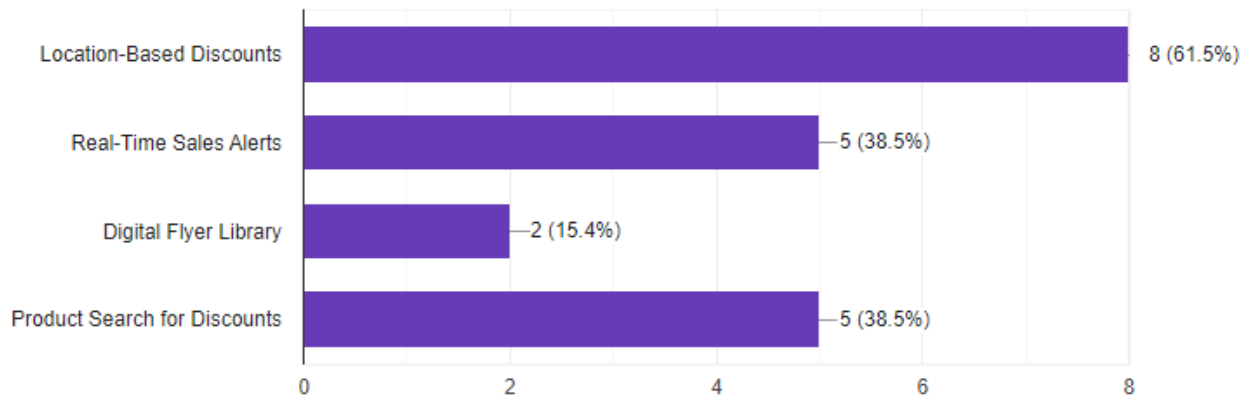
1. How do you currently find out about discounts and sales?



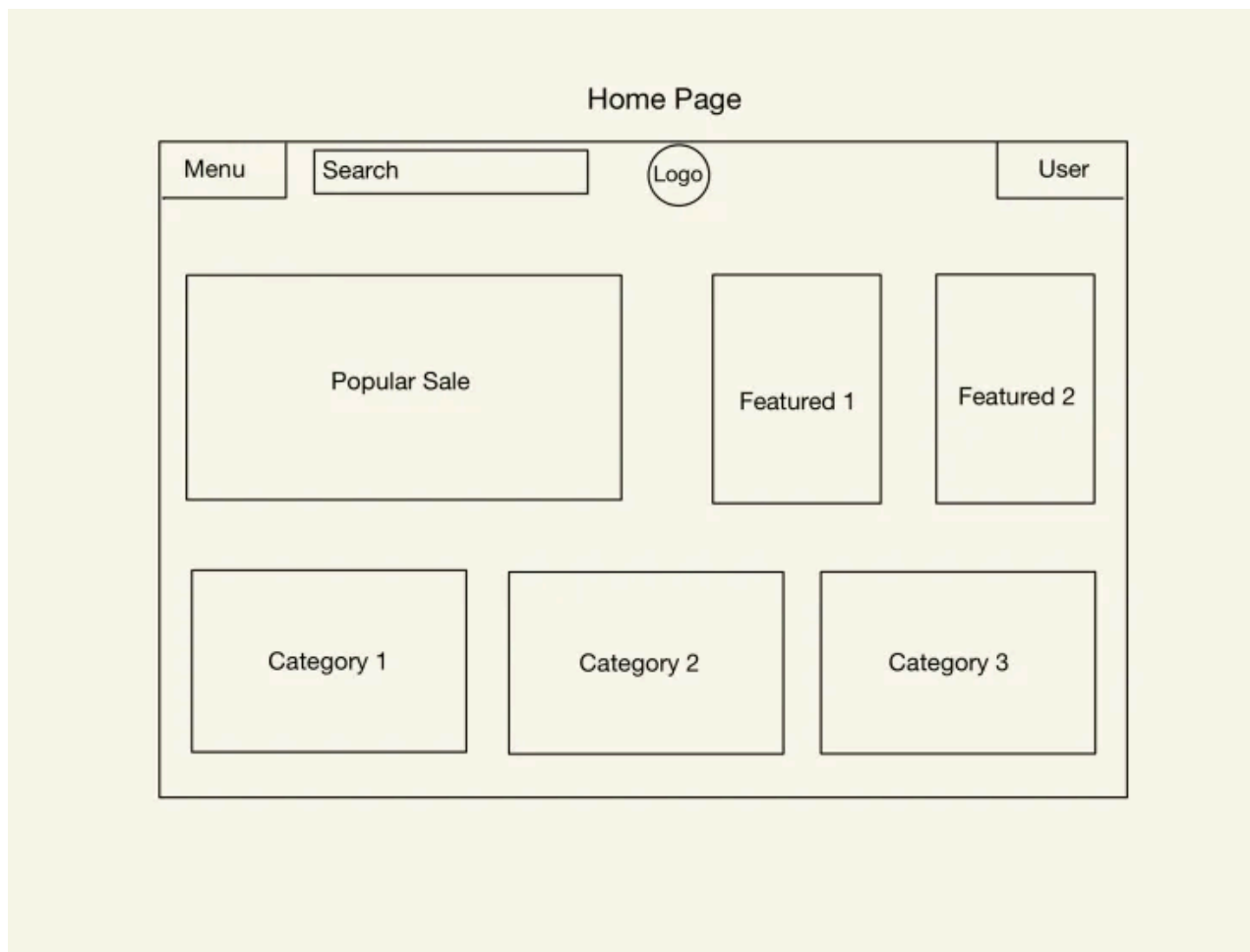
2. Are you interested in receiving real-time alerts for discounts and promotions at your preferred stores?



3. What features of a grocery shopping website would be most appealing to you?



4. Initial Sketches



For You Page

Menu	Search	Logo	User
Customized Offer 1		Customized Offer 2	
Customized Offer 3		Customized Offer 4	

Store Page

Menu	Search	Logo	User
Store Logo			
Store Offer 1		Store Offer 2	
Store Offer 3		Store Offer 4	

Settings

Menu

Search

Logo

User

Account

Security

Change Email

Submit

Change Password

Submit

Logo

Already Have an Account? Login

Sign Up

Enter Email

Enter Password

Confirm Password

Sign Up Button

5. Prototype Screenshots



Don't have an account?

[Sign Up](#)

Login

Email address

Password

Login

[Forgot Password?](#)



Already have an account?

[Log In](#)

Sign Up

Email Address

Password

Confirm Password

Sign Up

Exclusive Deals

Limited Time Offer



Special discount
Huggies Diapers
~~\$19.99~~ \$15.99

Discounts



2 for 1 Sale
Margarine Tub
~~\$11.98~~ \$5.99

Clearances



Clearance Sale
Samsung S8+ Phone
~~\$499.99~~ \$299.99

Categories

Electronics



Macbook Pro 13 inch
~~\$1399.99~~ \$1199.99

Cosmetics



Super Lustrous Lipstick
~~\$9.99~~ \$7.99

Fresh Produce



Fresh Oranges
~~\$4.99~~ \$4.49

Over 30% Off at IGA



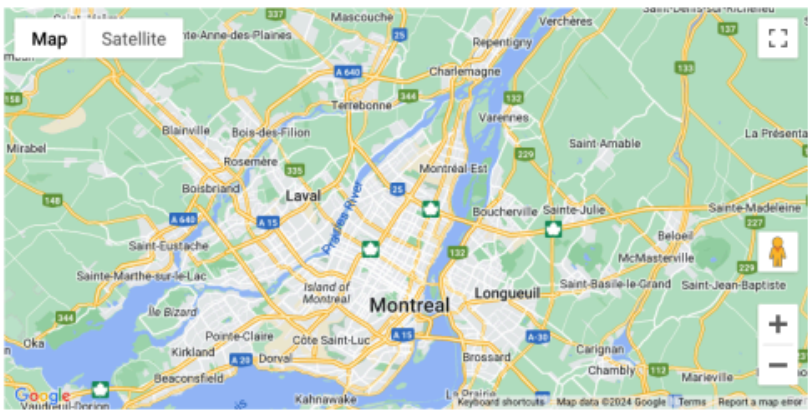
Save Now
Butter Substitute
\$2.99 \$1.99



Fresh Offer
Fresh Broccoli
\$1.49 \$0.99



Discount Deal
Heinz Ketchup
\$3.99 \$2.99



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Enter a product

Home Shops Discounts Blog Contact

Welcome, Username



Settings

Account

Notification

Privacy

Account

Account Settings

Store Search Radius (meters):

Update Radius

Email Address:

Password: