

IIT Capstone Project

Creating an AI/ML powered personalised recommendation system.

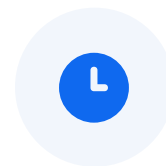
Precos.ai is a chrome extension that allows users to drive their own unique shopping recommendations with complete data transparency.



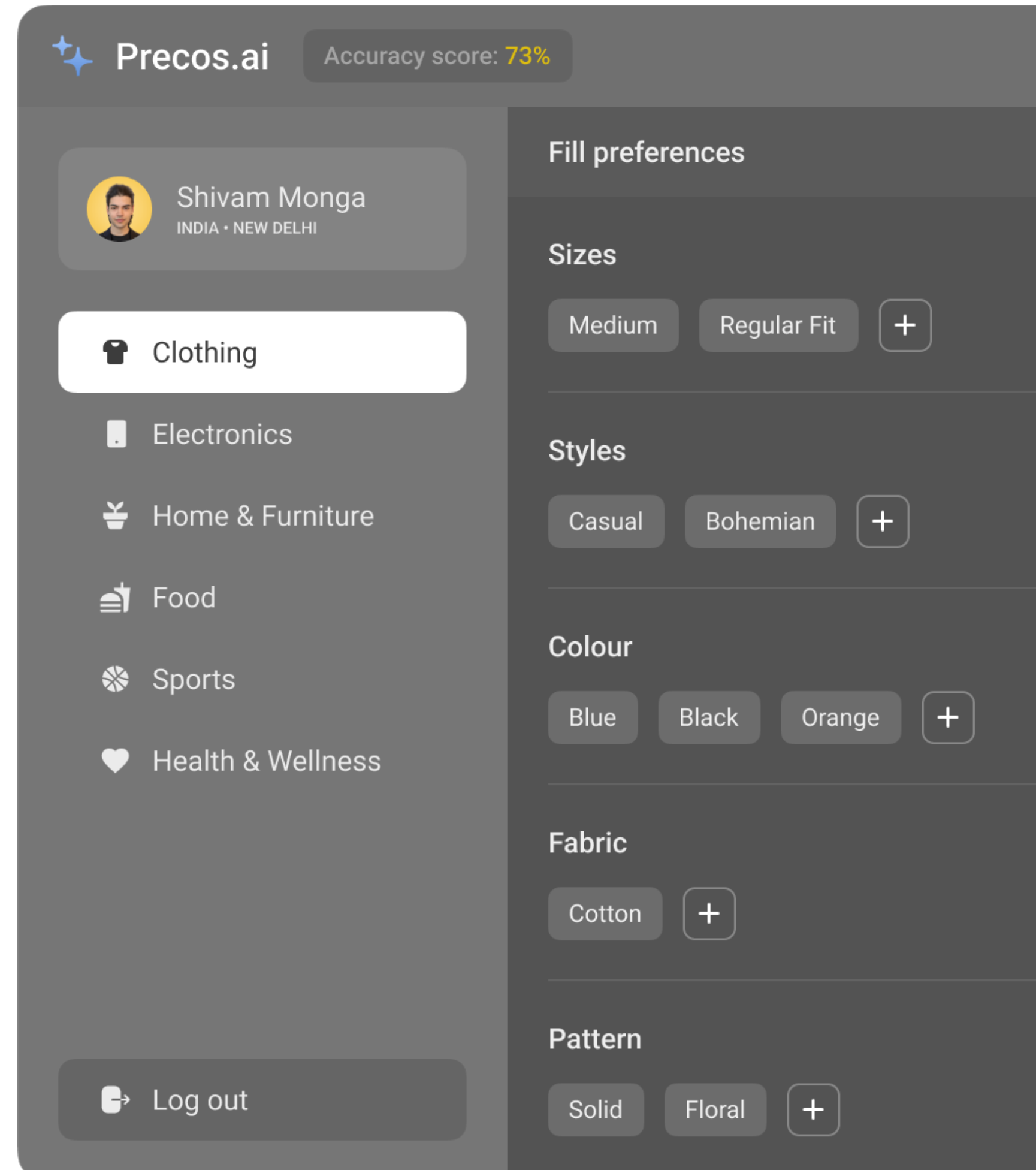
Project type
Extension



Platform
Precos.ai



Timeline
8 Weeks





About Precos.ai

An AI/ML powered chrome extension that allows users to drive their own unique shopping recommendations. It allows users to create their own data tags and categories that allows AI/ML model to understand user preferences better. Users can manually adjust the priority between the categories in order to refine their recommendations.



Why Precos.ai

After analysing existing recommendation systems, we found that these system often lack data transparency and fail to offer meaningful shopping recommendations to the users. Whereas, Precos.ai considers multiple factors like user's region, medical conditions and preferences to provide personalised and accurate recommendations.

Products fit for you



Cantabil



Regular Fit Overshirt

₹ 750

Why is this product recommended?



- This product is made of 100% cotton
- Product material is good for the region you live in
- Your body has no allergic reaction to this material

Matching preferences

Regular Fit

Casual

Orange

Cotton

Solid

Product performance

25K Orders

★ 4.2



The Problem

Existing recommendation systems often lack complete data transparency and fail to offer meaningful shopping recommendations to the users. These systems track multiple user's website data and searches to recommend products which often leads to data privacy concerns. The current recommendation systems usually do not take user's medical conditions, preferences and climatic condition into account while recommending the products.

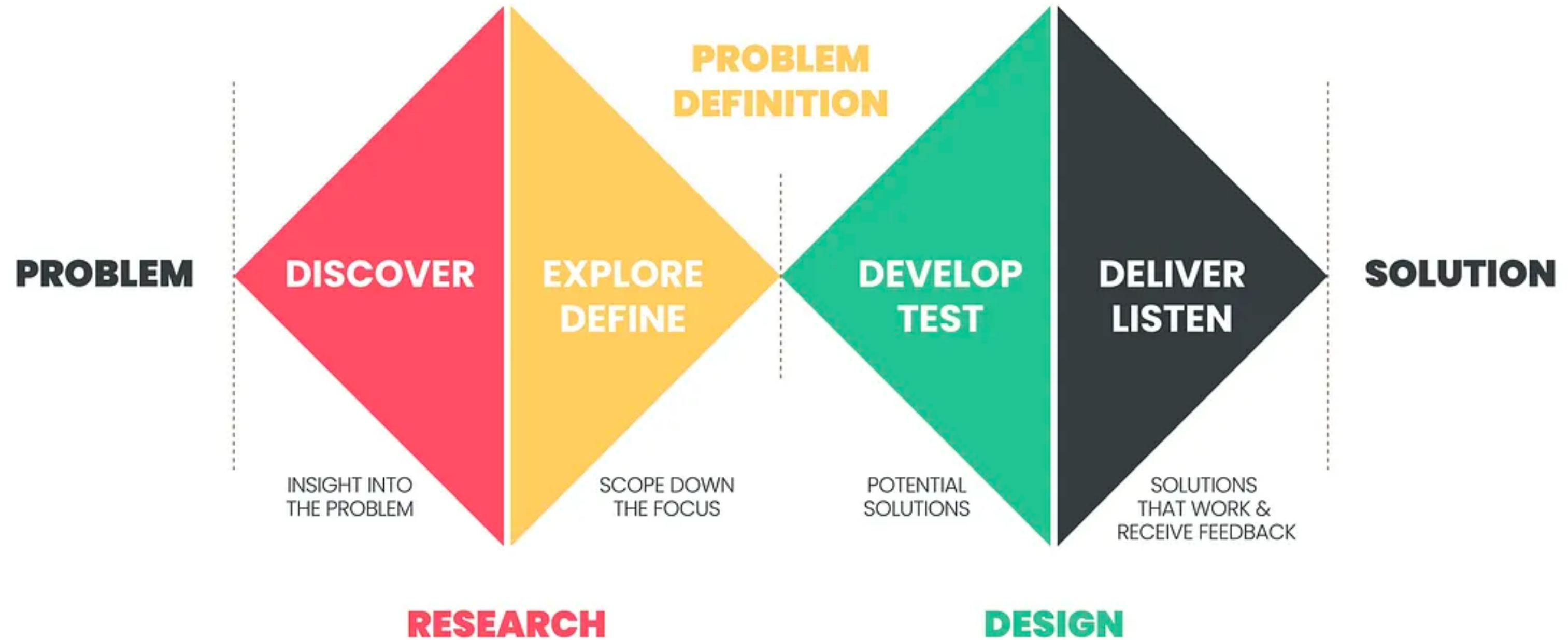


Project Goal

Creating and AI/ML powered personalised recommendation system that will allow users to drive their own shopping recommendations with complete data transparency.

Process We Followed

We followed the Double Diamond Analogy throughout the journey.





In the Discovery phase, we wanted to learn more about the problem and it's importance. For that, we ran primary and secondary research.

Secondary Research

For secondary research, we focused on existing data regarding the issue. We looked for that information on platforms like:

- Quora
- Medium
- Muvi One
- Website's blog pages
- Analytic Steps

What is the biggest unresolved problem for recommender systems?



Quora Session with Joseph Konstan · [Follow](#)

Answered by Joseph Konstan · May 14, 2016

I don't think there's a single answer here, but there is certainly a theme. Many of the biggest unresolved problems in recommender systems relate to matching what algorithms can deliver to what users actually find helpful. We can see lots of examples:

- The whole space of context-sensitive recommendations is not well recognized and addressed. The context being requested or delivered.

7. Privacy concerns

The more the algorithm knows about the customer, the better it can recommend. However, many customers are hesitant to hand over their profile data. In recent years, there have been several high-profile cases of customer data leaks. If a recommendation engine cannot function effectively, then the key to success for customers is key.

Many businesses are thriving thanks to recommendation systems. However, it is vital to be aware of the many challenges. We would not recommend anything less than a robust system.

* To learn more about deep learning-based recommendation systems, see the following link.

Lack of Data

The availability of abundant data is what a recommender system needs. When a user interacts with a recommendation system, user data is used to make a recommendation. Even if it does, the chances are that the system will not have enough data to learn the user behavior.

New Item Introduction

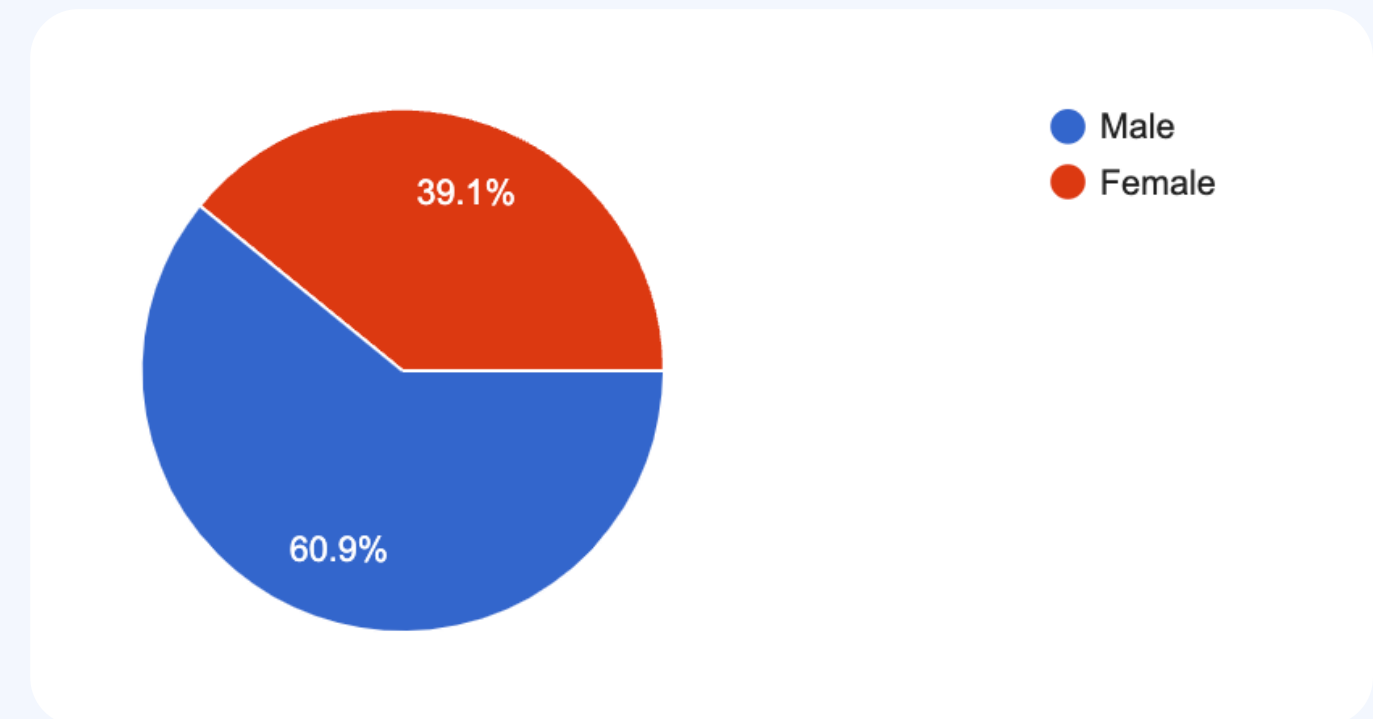
When a new item is introduced on a website that recommends items, it is often difficult to recommend it until and unless a user buys it. This is often referred to as the "cold start" problem.

Primary Research

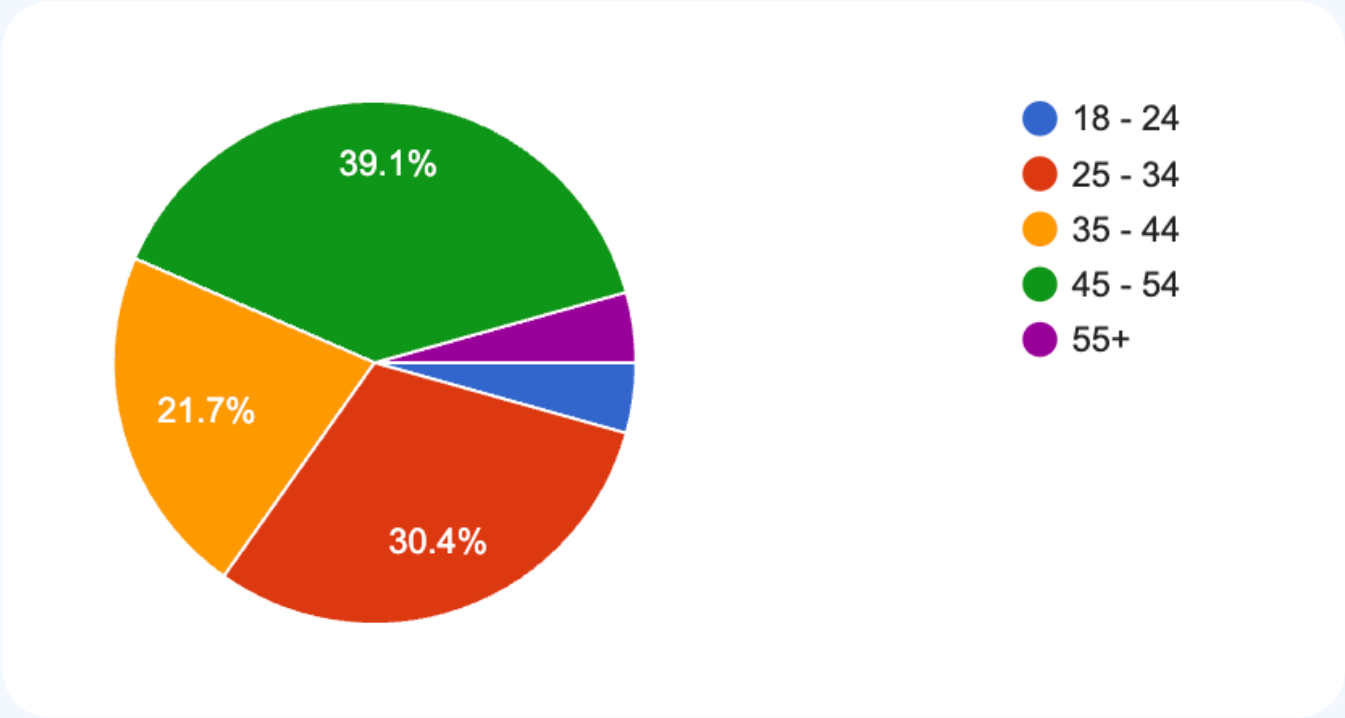
We broke down this part into 2 steps, survey, and user interview.

Survey

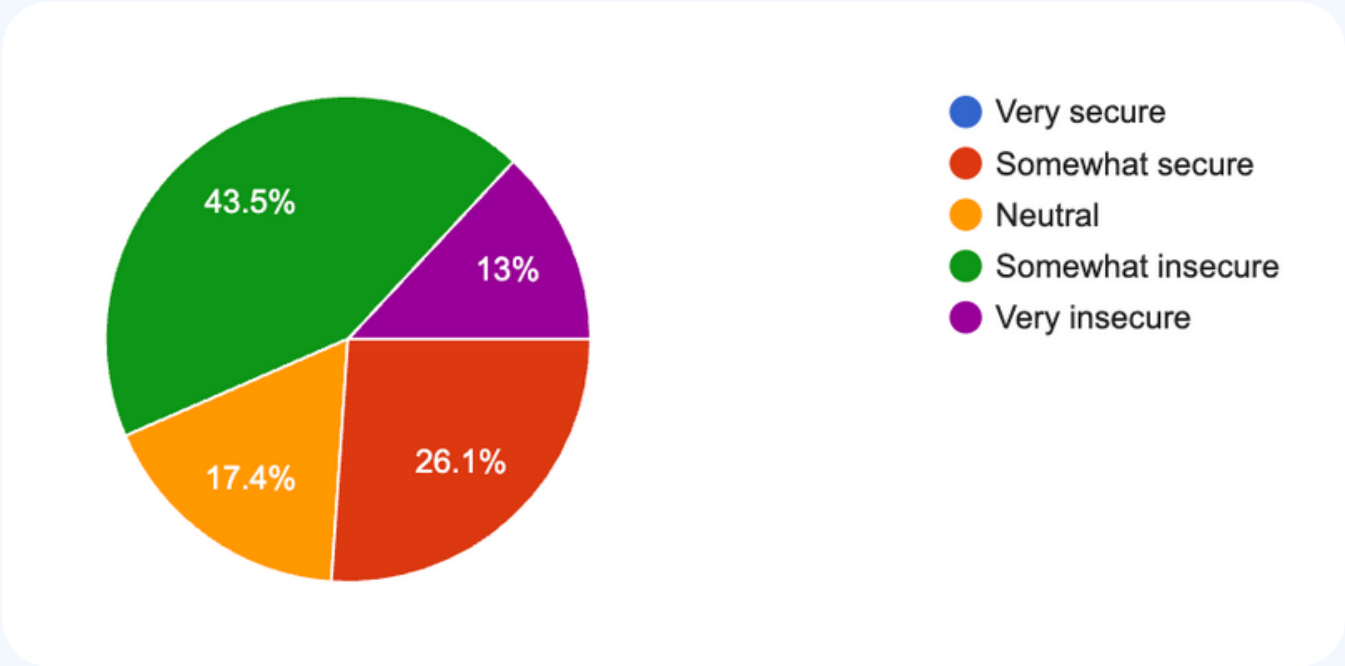
Q1 - What is your gender?



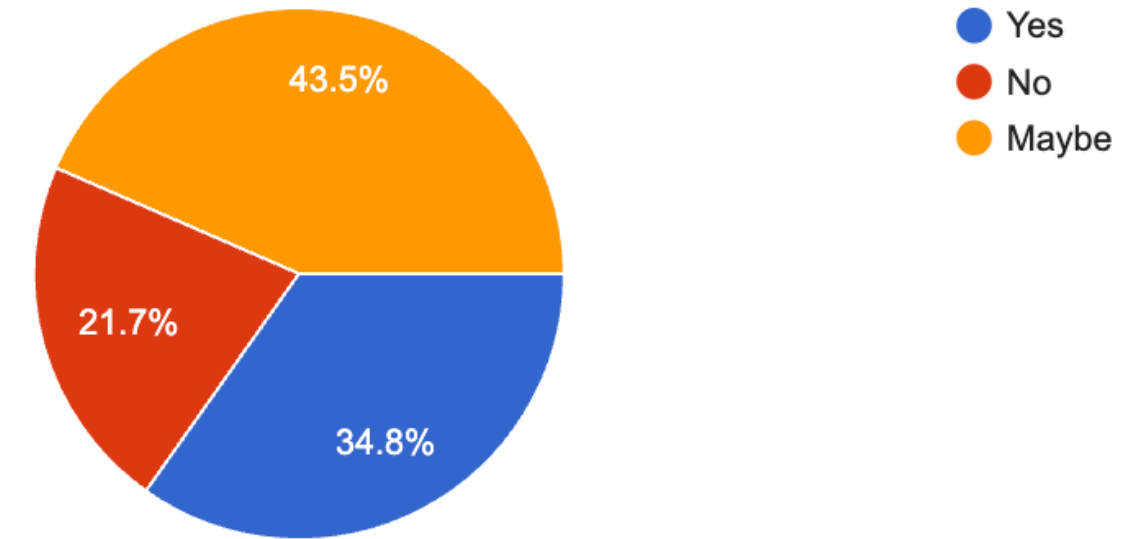
Q2 - What is your age range?



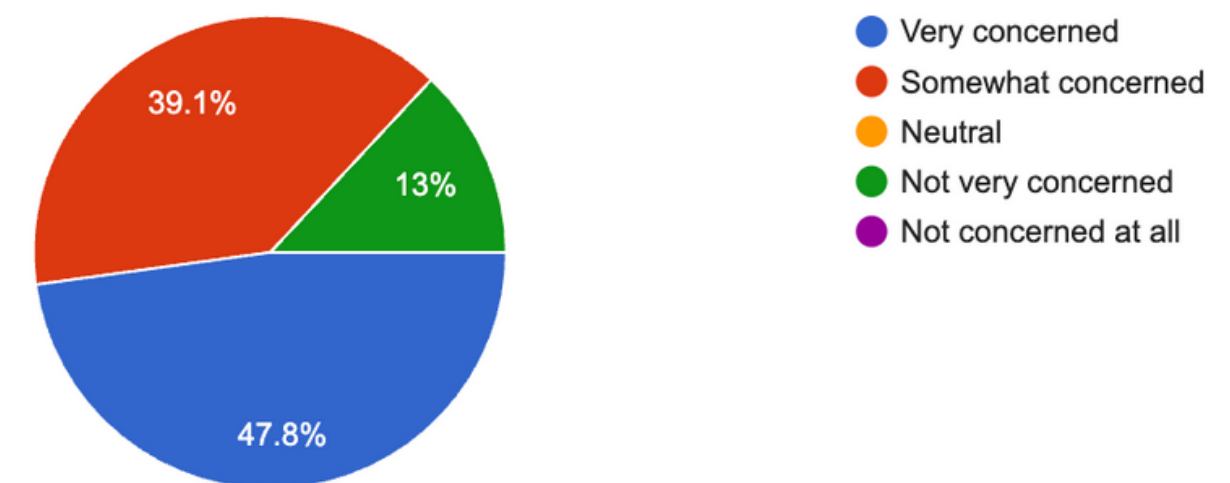
Q3 - When shopping applications provide personalized recommendations based on your browsing history, how secure do you feel about the handling of your personal information?



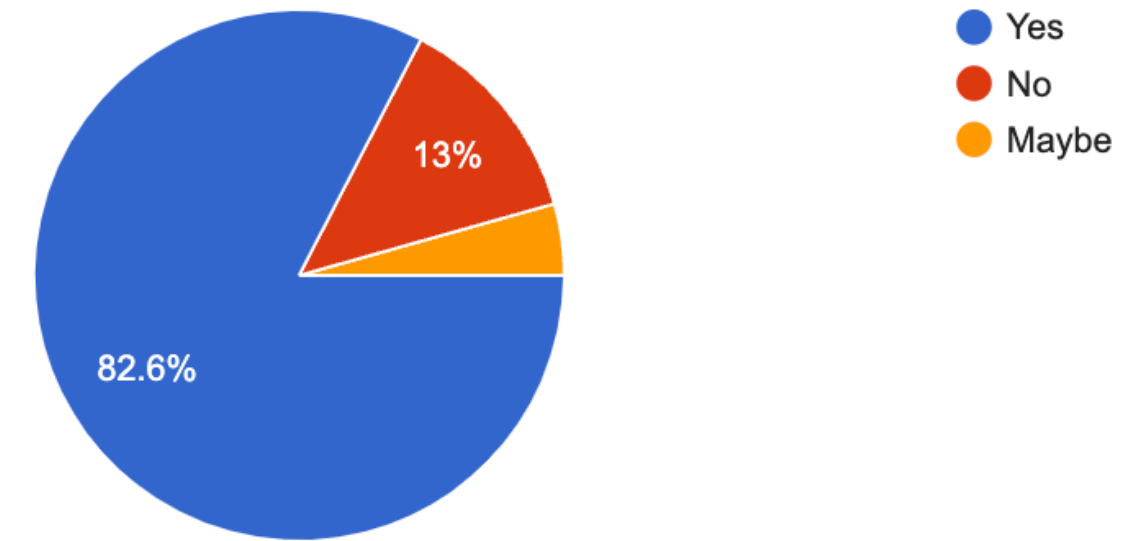
Q4 - Do you appreciate when shopping applications provide personalized product recommendations based on your browsing history and preferences?



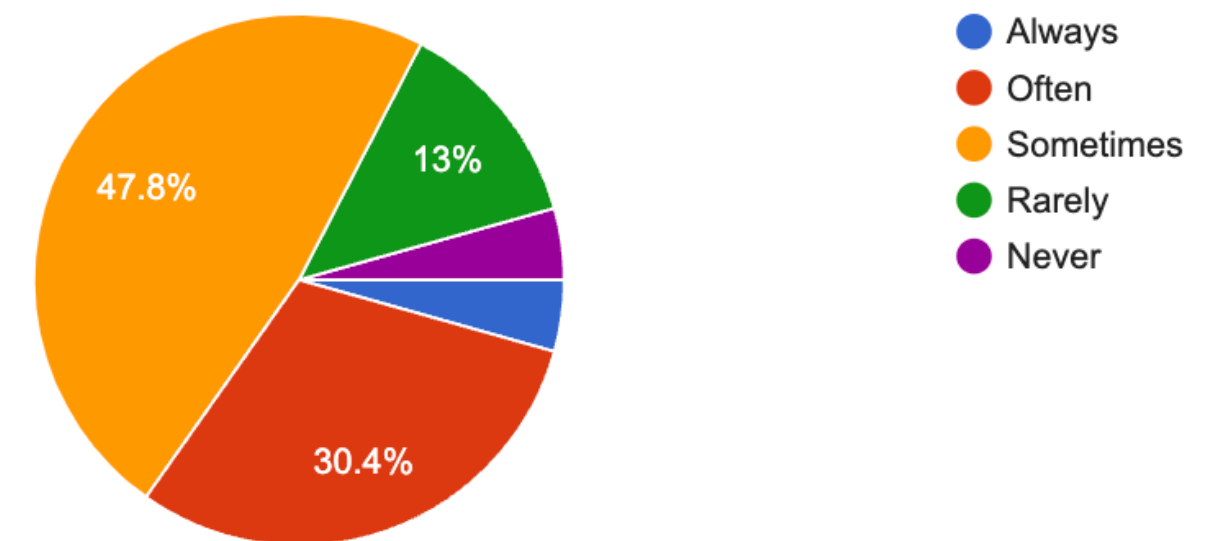
Q5 - Are you concerned about the privacy of your browsing data being used to generate personalized recommendations?



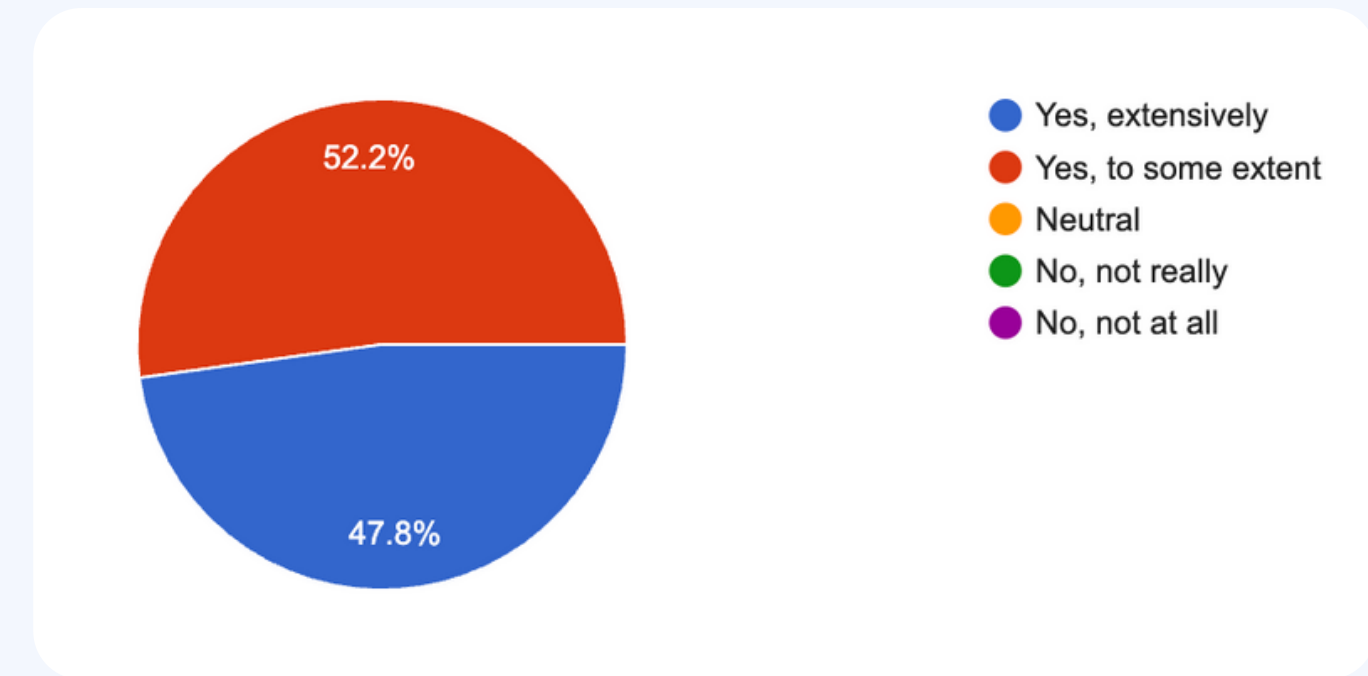
Q6 - Do you prefer shopping applications to be transparent about how they use your data for personalization?



Q7 - How often do you feel that the products displayed on shopping applications are relevant to your needs and preferences?

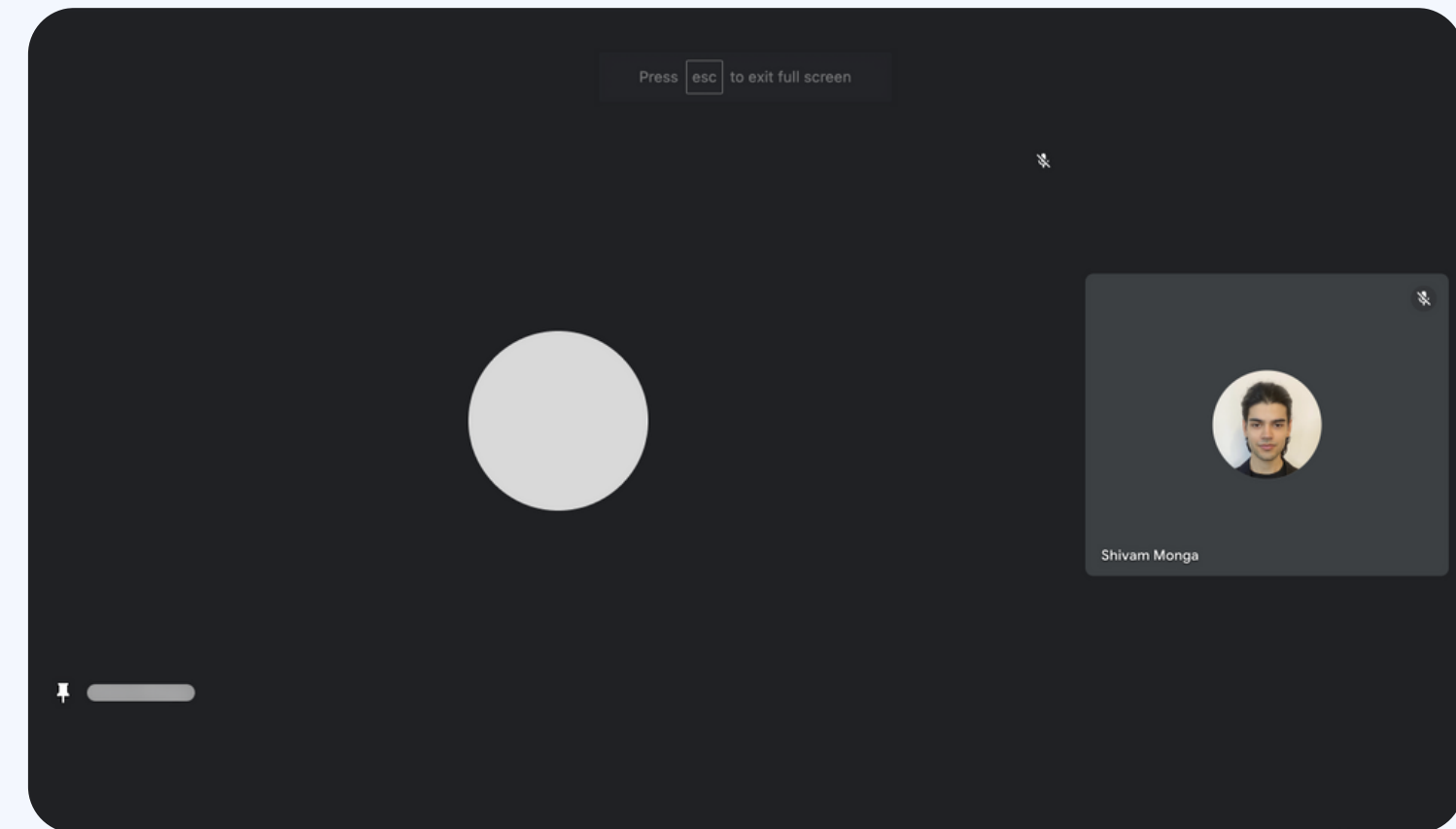
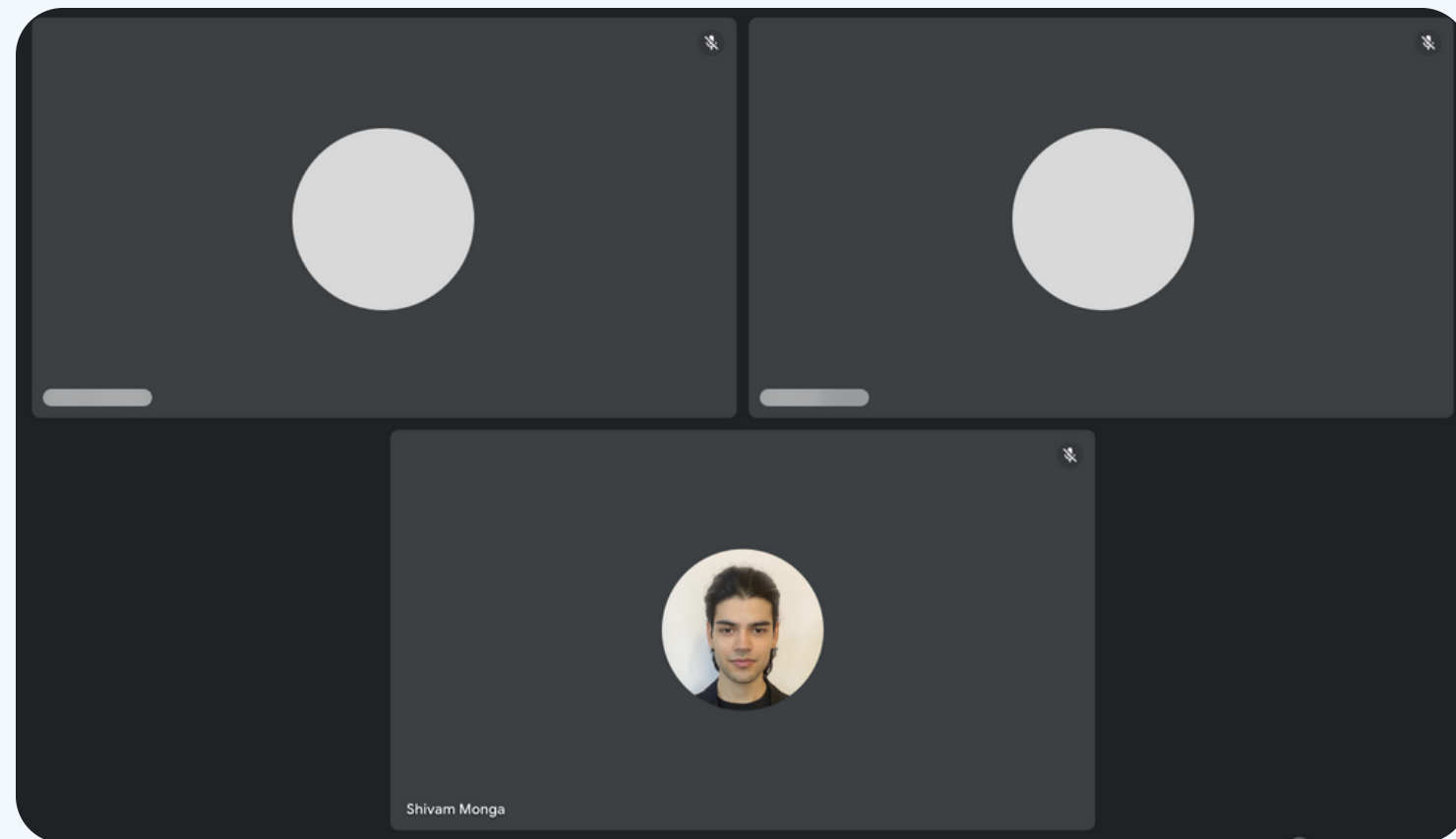


Q8 - Would you appreciate having the option to customize the level of personalization in your recommendations?



User Interviews

We conducted four interviews to understand participants thoughts and feelings about recommendation systems in general. Simple questions were asked during the interviews. Interviews took place in an online setting using Google Meet.



Questions we asked during the interviews:

- When shopping applications provide personalized recommendations based on your browsing history, how secure do you feel about the handling of your personal information?
- Do you appreciate when shopping applications provide personalized product recommendations based on your browsing history and preferences?
- Would you appreciate having the option to customize the level of personalization in your recommendations? etc.

✦ Define

In this phase, we defined the actual problem, discover the possible opportunity areas, create user persona and empathy map canvas.

User Persona



Demographics

Name: Aman Kapoor

Age: 28

Location: New Delhi

Education: Graduate

Job Title: Project Manager

Marital Status: Single

Context

Aman Kapoor is a CS engineering graduate. He lives in a shared rental accommodation in New Delhi, India. He is a tech savvy and loves reading and singing in his free time.

Goals

He seeks personalised recommendations that cater to his unique preferences. He prefers systems that seamlessly integrate into the platforms he already uses.

Pain Points

Given his background in engineering, Aman is concerned about data privacy. He needs transparency and control over the information he shares with systems.

Motivations

The desire to find recommendations that understand his individual preferences. Respect for his data privacy is a must.

Empathy Map Canvas

Says

"I get frustrated when recommendation systems bombard me with irrelevant suggestions."

Thinks

"I want a recommendation system that understands my preferences and respects my data privacy."

Does

Provides feedback on recommendations to improve the accuracy of systems.

Feels

Frustrated because of irrelevant recommendations. Not interested in seeing what other people are purchasing.

Opportunity Areas

Creating a recommendation system that allows users to enter their preferences.

Adding a feature to collect user's feedback and improve the system accuracy.

Creating system in form of an extension so that it's easily accessible from any app.

Allowing system to recommend products considering the user's medical conditions.

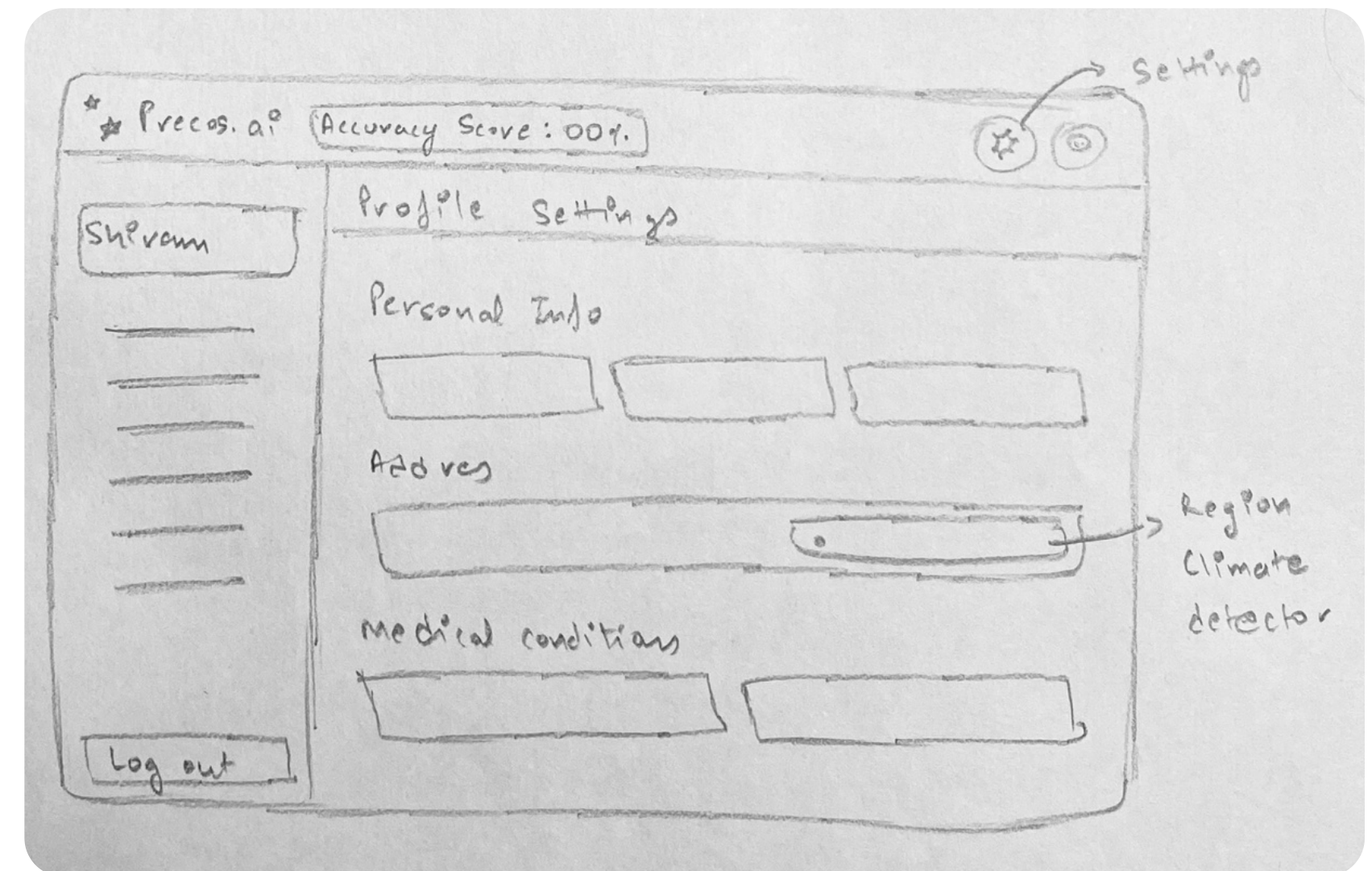
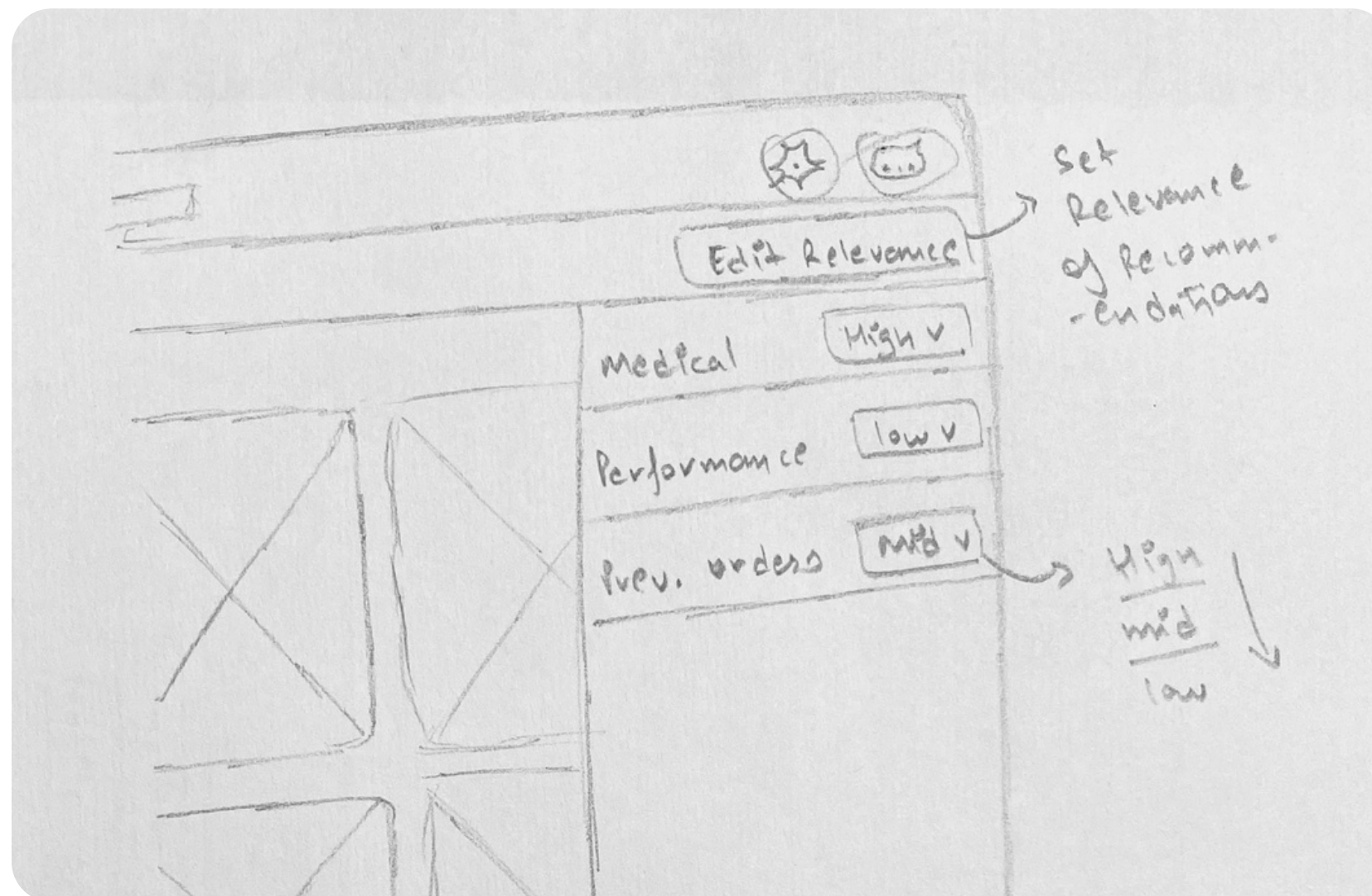
Allowing users to adjust the priority between the provided preferences.

Adding an accuracy indicator allowing them to manually adjust the data tags.

✦✦ Develop

In this phase, we created paper prototypes and user flows on the basis of our primary and secondary research.

Paper Prototype



Accuracy: 73%

☆ ⚙

+ Add category Edit Priority

C1 50%

C2 50%

Cancel Save

Annotations:

- Add custom categories
- Assign weightages to categories
- weightages will adjust themselves
- Adjustment factor!

☆☆ Precus.ai Accuracy Score: 73%

Profile

Category 1

Category 2

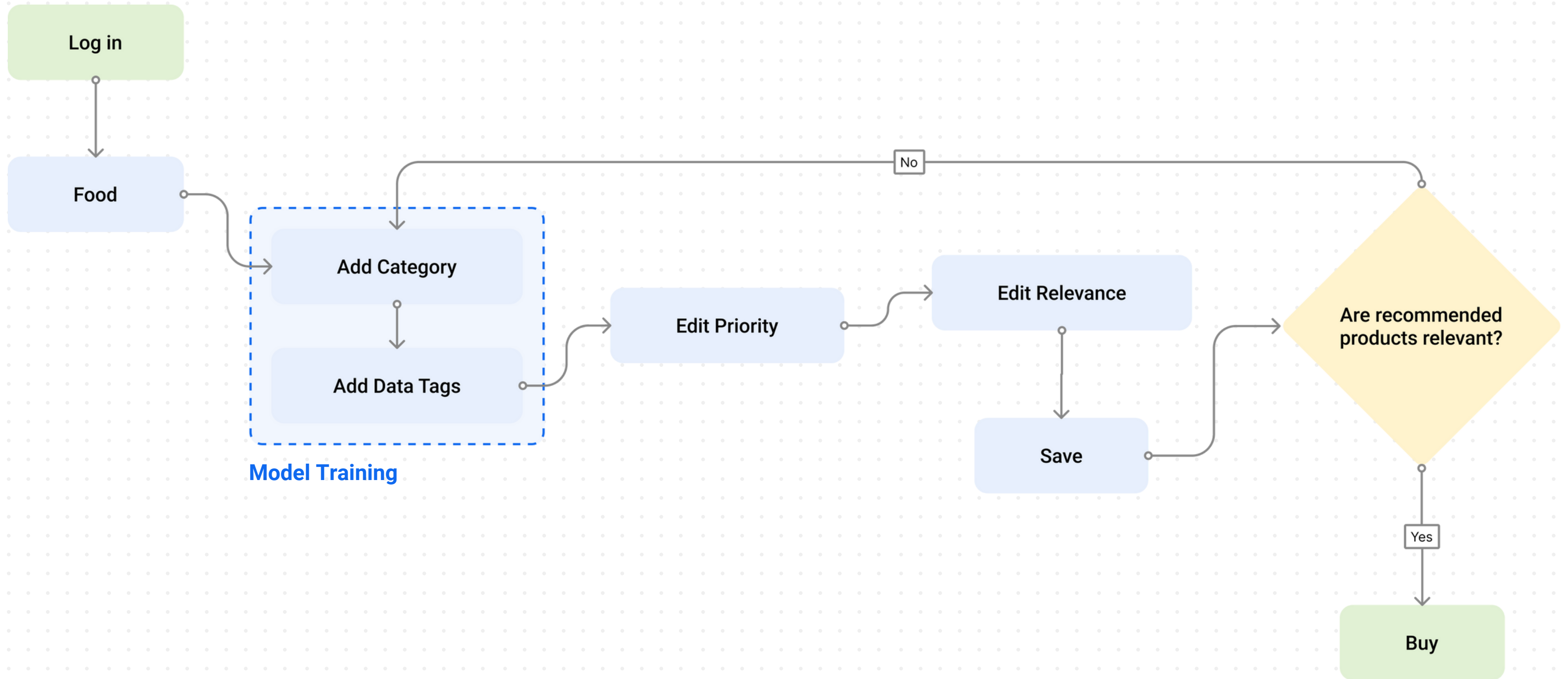
Data Tags

Shopping categories

Log out

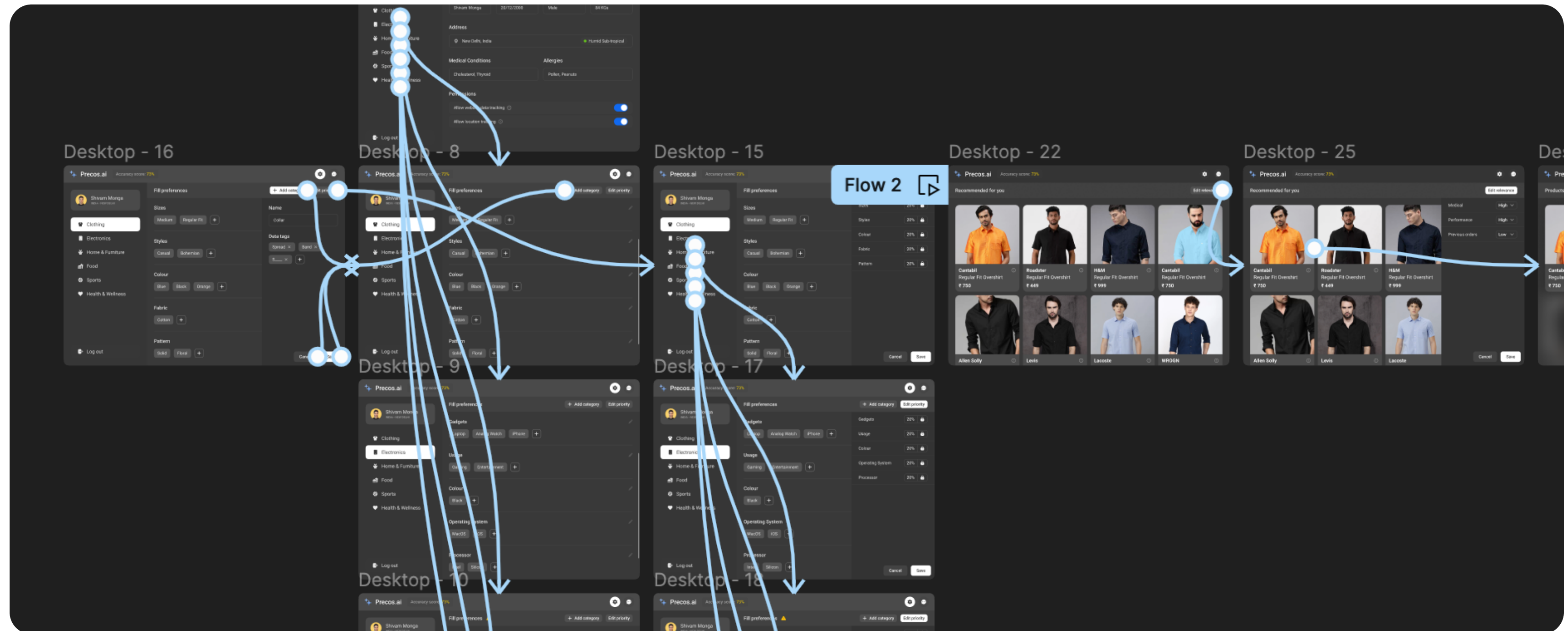
User Flow

(Usecase: Food)





We implemented our ideas into prototypes and made those ready for testing. We analysed the data and finalised a solution by iterating it.





Shivam Monga

INDIA • NEW DELHI



Clothing



Electronics



Home & Furniture



Food



Sports



Health & Wellness

Fill preferences

+ Add category

Edit priority

Sizes

Medium

Regular Fit



Styles

Casual

Bohemian



Colour

Blue

Black

Orange



Fabric

Cotton





Usability testing

We conducted a usability testing session in order to ensure that our product's functions, features, and overall purpose align with what users want. We created a pool of 10 testers consisted of adults aged between 21-55 years old. The testers comprised an equal distribution of 50% male and 50% female participants and 70% of testers were familiar with recommendation systems. Professionally, these testers came from a variety of career backgrounds that fell into Precos.ai's target demographic.

We gave some tasks to the testers and analysed that:

- All of the testers were able to create new categories.
- 70% of the testers were able to edit the priority of categories.
- 20% of the testers found it difficult to edit the relevance.
- None of the testers were able to edit the categories after creating it.



Iteration

After conducting the usability testing, we were able to gather valuable insights and we used those to iterate and gradually come up with the final solution.



Key Takeaway

We faced some challenges and learnt a lot from them along the way. We hope it will help us in overcoming our weakness and enhancing our performance moving forward in the product design journey.

Precos.ai

Accuracy score: 73%

Shivam Monga

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Clothing

Electronics

Home & Furniture

Food

Sports

Health & Wellness

Log out

Profile settings

Personal Information

Shivam Monga

20/12/2000

Male

84 KGs

Address

New Delhi, India

Humid Sub-tropical

Medical Conditions

Cholesterol, Thyroid

Allergies

Pollen, Peanuts

Permissions

Allow website data tracking ⓘ

Allow location tracking ⓘ

Precos.ai recommend products keeping your personal information in mind. It includes:

- Personal Info
- Medical Conditions
- Allergies
- Geolocation

and recommends you the products that are good fit for your body.

Precos.ai

Accuracy score: 73%

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Clothing

Electronics

Home & Furniture

Food

Sports

Health & Wellness

Log out

Fill preferences ⚠️

+ Add category

Edit priority

Diet

Gluten - free

Non - Vegetarian

+

Cuisines

Italian

Mexican

+

Cooking Style

Spicy

Home cooked

+

Beverages

Hot

Belgian

Frappe

Ice Tea

+

⚠️ Create 5 categories for better data accuracy

By adding the preferences into the six default shopping categories, the accuracy of the extension increases. The more effectively you generate data tags, the more improved your recommendations will become.

Precos.ai

Accuracy score: 73%

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Clothing

Electronics

Home & Furniture

Food

Sports

Health & Wellness

Log out

Fill preferences ⚠️

+ Add category

Edit priority

Diet

Gluten - freeNon - Vegetarian+

Cuisines

ItalianMexican+

Cooking Style

SpicyHome cooked+

Beverages

HotBelgianFrappeIce Tea+

Diet

25%🔒

Cuisines

25%🔒

Cooking Style

25%🔒

Beverages

25%🔒

Cancel

Save

After adding the data tags into your categories, you can customise the priority between the categories. This will help the system understand your preferences better.



Recommended for you

Edit relevance



Oven Story
 Meatburst mac n cheese
 ₹ 350



BBQ
 Lemon prawns
 ₹ 800



Cafeteria Co.
 Alfredo pasta
 ₹ 299



Louis Burgers



Slyce Pizza



Fish Factory

Medical

High

Performance

High

Previous orders

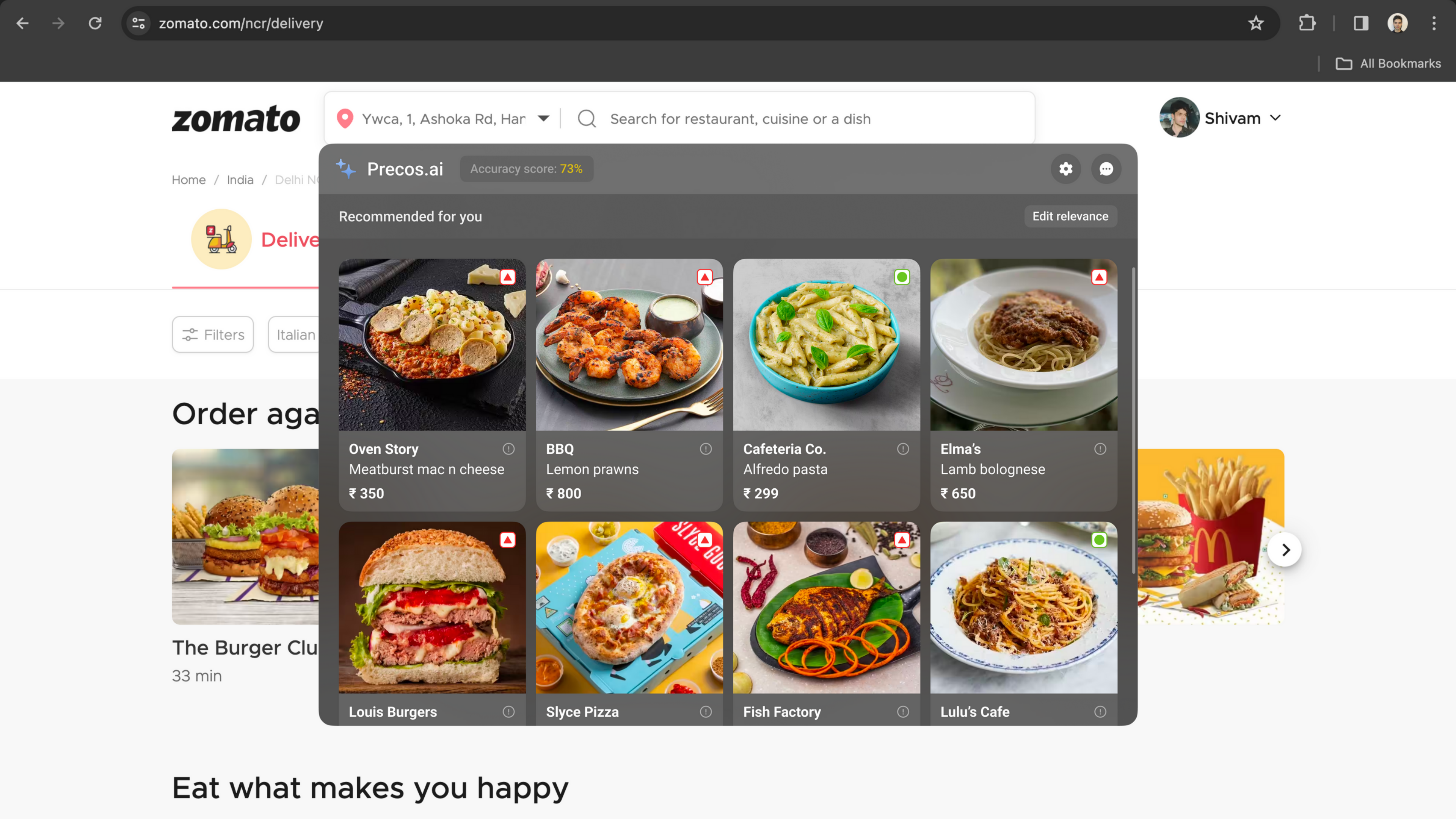
Low

Cancel

Save

You have the ability to adjust your recommendations by adjusting the relevance.

You can adjust how the recommendations align with your medical conditions, product performance, and past orders.



zomato

Home / India / Delhi NCR



Deliver to

Filters

Italian

Order again



The Burger Club

33 min

Ywca, 1, Ashoka Rd, Har

Search for restaurant, cuisine or a dish



Shivam

Precos.ai

Accuracy score: 73%



Recommended for you

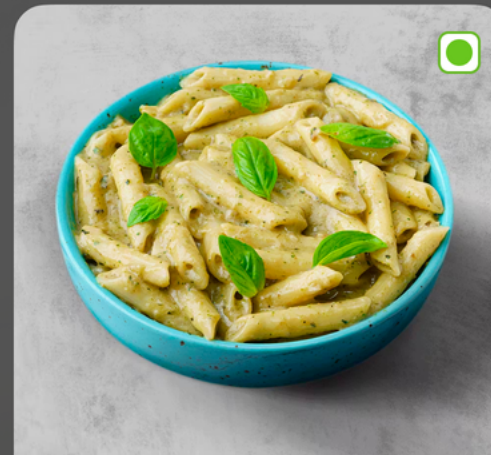
Edit relevance



Oven Story
Meatburst mac n cheese
₹ 350



BBQ
Lemon prawns
₹ 800



Cafeteria Co.
Alfredo pasta
₹ 299



Elma's
Lamb bolognese
₹ 650



Louis Burgers



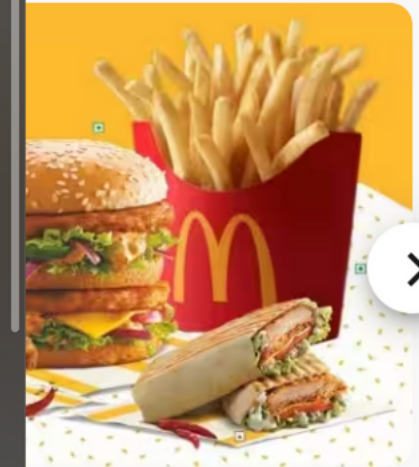
Slyce Pizza



Fish Factory



Lulu's Cafe



Thank you for your time!

This project was made with a great sense of joy and freedom.

Shivam Monga