Flipkart GRID 3.0

Smart Bag Creator Challenge

Team Name: Crypto Titans

Institute Name: Indian Institute of Technology Mandi

Team members details

Team Name	Crypto Titans		
Institute Name	Indian Institute of Technology Mandi		
Team Members >	**1 (Leader)**	**2**	**3**
Name	Anooshka Bajaj	Lily Rawat	Shreya Aggarwal
Batch	2024	2023	2023

Deliverables/Expectations for Level 2 (Idea Submission)

Deliverable 1:

A scalable algorithm/approach with block diagram and detailed explanation to achieve the below:
Given a set of users and their order history:

1. Identify repeat purchase products for all users along with the frequency with which they are repeating
2. Identify groups of users who showcase similar buying needs
3. Create a smart basket for every user based on the following inputs:
    a. Time of Visit
    b. Past Purchases
    c. Relevant products purchased by similar users
4. Building for New users with no purchase history would be given extra points

Assume that user browse history and order history would be available to you from Flipkart's platform

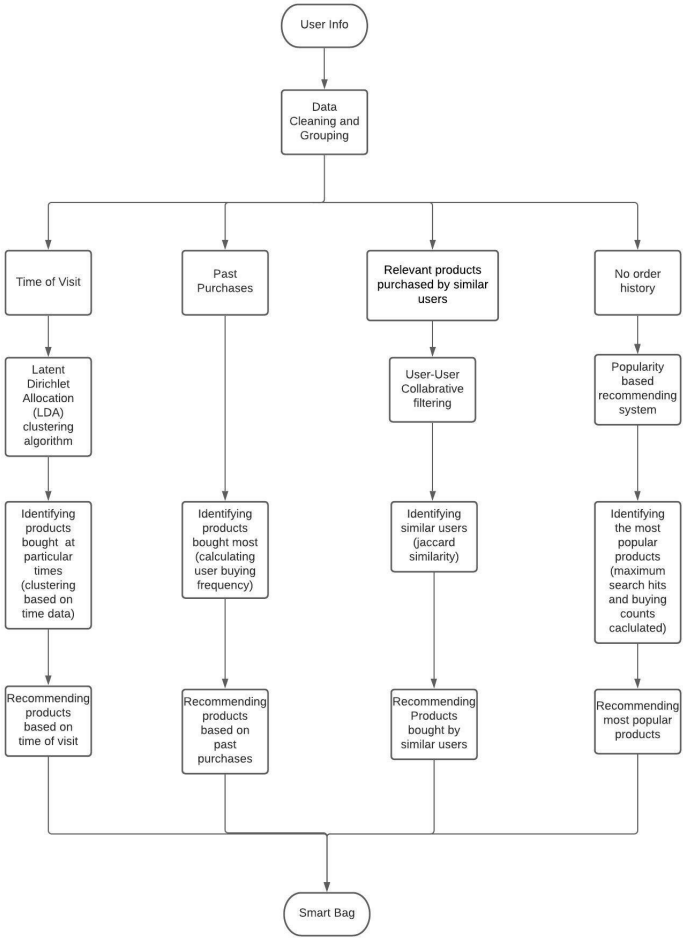
Deliverable 2:
Design a robust, responsive and performant Progressive Web Application to showcase the list of products (Smart Bag) derived from Deliverable #1 with the following capabilities:

1. User must be able to move items from Smart bag to the Cart in an easy manner
2. Ranking of these products should be dependent on the relevance of the product to the user.
3. [Optional] Nudges to add additional products
    b. Bigger Pack Sizes
    c. Free Sponsored Products

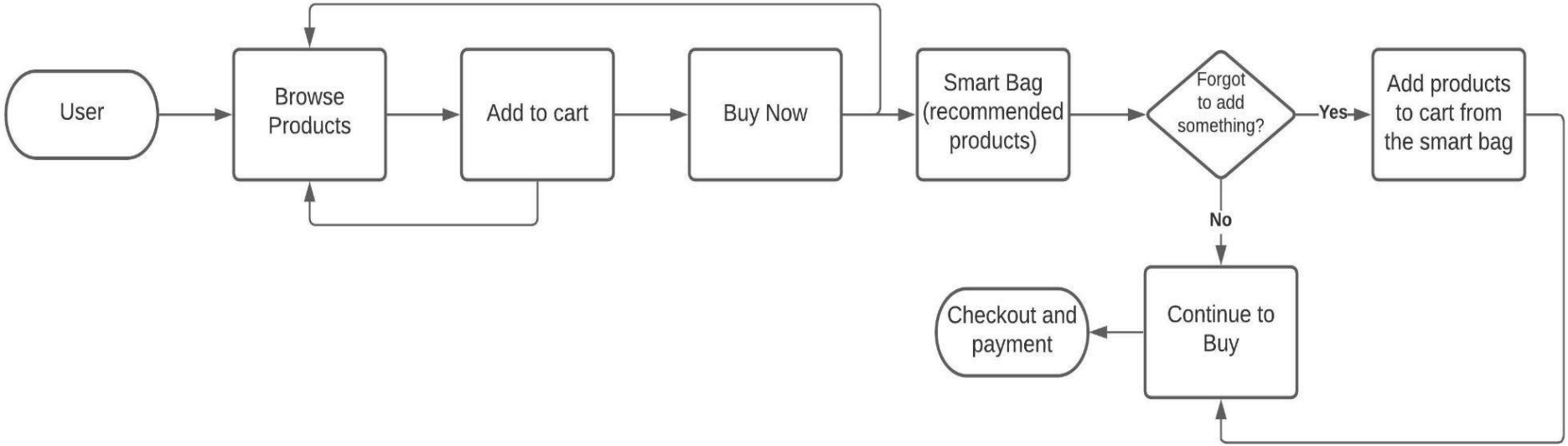
Block Diagram

View the complete block diagram via this link:

https://drive.google.com/file/d/1fdtc3xjnALO5t2lh9iHKMBGGh3iyOjOw/view?usp=sharing



Use-cases


User
Browse Products
Add to cart
Buy Now
Smart Bag (recommended products)
Forgot to add something?
Yes
Add products to cart from the smart bag
No
Continue to Buy
Checkout and payment

Solution statement/ Proposed approach

We will solve the problem by breaking it into 4 subproblems as given below and then train data for each models. And each model will then recommend the products.

Breaking the problem into 4 subproblems:

1. Recommending products for every user based on time of visit.
2. Recommending products for every user based on past purchases.
3. Recommending products for every user based on relevant products purchased by similar users.
4. Recommending products for new users with no purchase history.

1. Recommending products for every user based on time of visit.

Solution: The smart bag would recommend products based on the time series data that is on the basis of opening time of app it will recommend products.

Idea: The main idea is to use the LDA (Latent Dirichlet Allocation) clustering algorithm for grouping up users and products based on time data that is when user is most likely to use the app and which products are mostly purchased at that time.

Method:

Step 1: Clustering users based on the time of opening/visiting of app.

Step 2: Predicting how each user is associated with each group based on data.

Step 3 : Clustering products based on time when they are mostly bought.

Step 4: Mapping of users buying products at a particular time with the products bought at that time.

2. Recommending products for every user based on past purchases

Solution:
The smart bag would contain products based on the past order history of the user.

Idea:
If a user buys certain items repeatedly, the system would recognise the items and frequency with which they are bought and would recommend them to the user accordingly.

Method:
Identify the products which are bought repeatedly by calculating the frequency available by the dataset of browse history and order history of the user.
Recommend the frequently bought products to the user.

3. Recommending products for every user based on relevant products purchased by similar users

Solution:
Collaborative filtering.

Idea:
If a person A likes item 1, 2, 3 and B like 2,3,4 then they have similar interests and A should like item 4 and B should like item 1.
Here, we will be using user-user Collaborative filtering.

Method:
Step 1: Identify groups of users who showcase similar buying needs.
We can find similar users using jaccard similarity and using some minimum threshold based on the dataset provided, we can consider them in a group.
Step 2: Then recommend the products to the user which are bought by similar users.

4. Recommending products for new users with no purchase history

Solution:
Product popularity based recommendation system.

All the users will have same recommendation based on the most popular choices. There is no personalization involved.

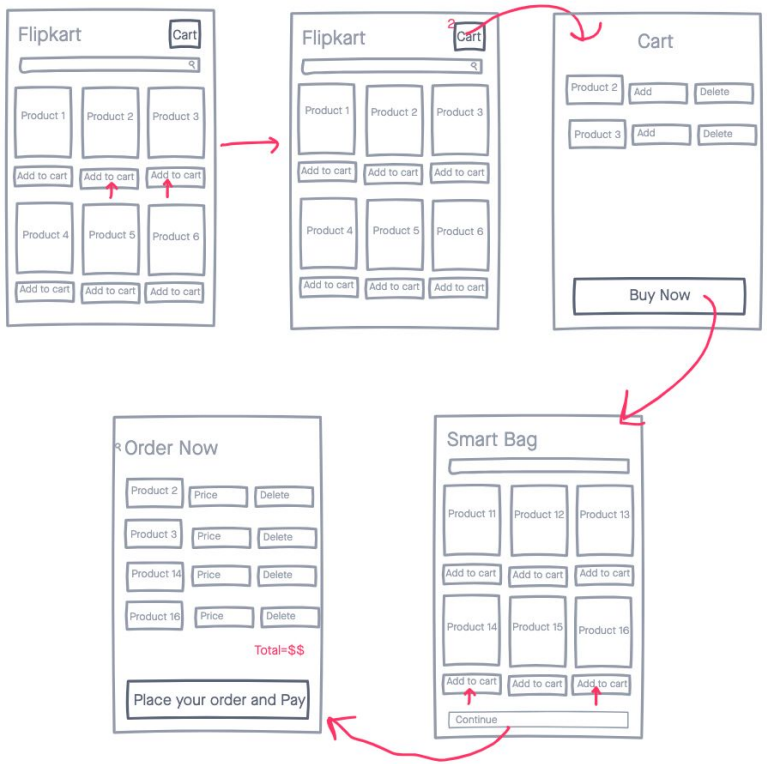
Idea:
If a product is often purchased by most people then the system will get to know that that product is most popular, so the system will recommend that product to a new user.

Method:
User browse history and order history is available**.**

Based on that, a dataset is created which includes the product name and description and the buying count of each product. Data is arranged in decreasing order of buying count. A threshold value is set for the number of products to be recommended.

The products having the most buying counts would be recommended.

Deliverable 2: Application Interface



View the complete image via this link:

https://drive.google.com/file/d/1oCRXS-sDosHThcxETJHkdQZ_pSas66kJ/view?usp=sharing

Limitations

1. Lack of Data: Our proposed design for smart bag uses only user browse history and order history. For efficient recommendations, a large data set is required. Also product ratings given by various users make the recommendations better. As we don’t have the data of product ratings, our smart bag would be less accurate.

2. Changing user preferences: User may not like the same thing which he/she did few days back. The preferences of a user can always be changed. Our solution does not take this into account.

3. Items already added on cart can also be recommended which will be of no use to the user.

4. Identifying similar groups users will be very difficult with millions of users.

Future Scope

1. In case of very large amount of data, we can make use of the location of the user and recommend similar users present near the that user.
2. The items already present in the cart would not be present in the smart bag.
3. For new users, similar groups can be formed on the basis of the products added in cart. And hence recommending him/her the products that similar user bought.
4. For the new users, we can recommend similar items present in their cart.
5. For better recommendation, we can make use of ratings and items present in the cart.