

**Flipkart**



**GRID 3.0**

## **Smart Bag Creator Challenge**

**Team Name : Zerone Girls**

**Institute Name: IIITDM Kancheepuram**

# Team members details

Team Name	Zerone Girls		
Institute Name	IIITDM Kancheepuram		
Team Members >	1 (Leader)	2	3
Name	M Swetha	PK Arul Lakshmi	SJ Harini
Batch	2022	2022	2022

# 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

# Instructions (You Can Delete this Slide)

Dear Team,

Congratulations on reaching this stage - We look forward to some amazing & innovative solutions.

Please find some important instructions before you begin to prepare your submission decks.

Slide Limit : 10 Slides of Content **post (after)** this Slide

Saving Format : Save the file as a PDF to ensure your formatting remains intact

Submission Guide: Only the '**Team Leader**' will be able to submit the Deck.

Only the latest submission will be considered as final

(You can keep updating your deck within the deadline)

Wishing you all the very best !

**Team Flipkart GRiD**

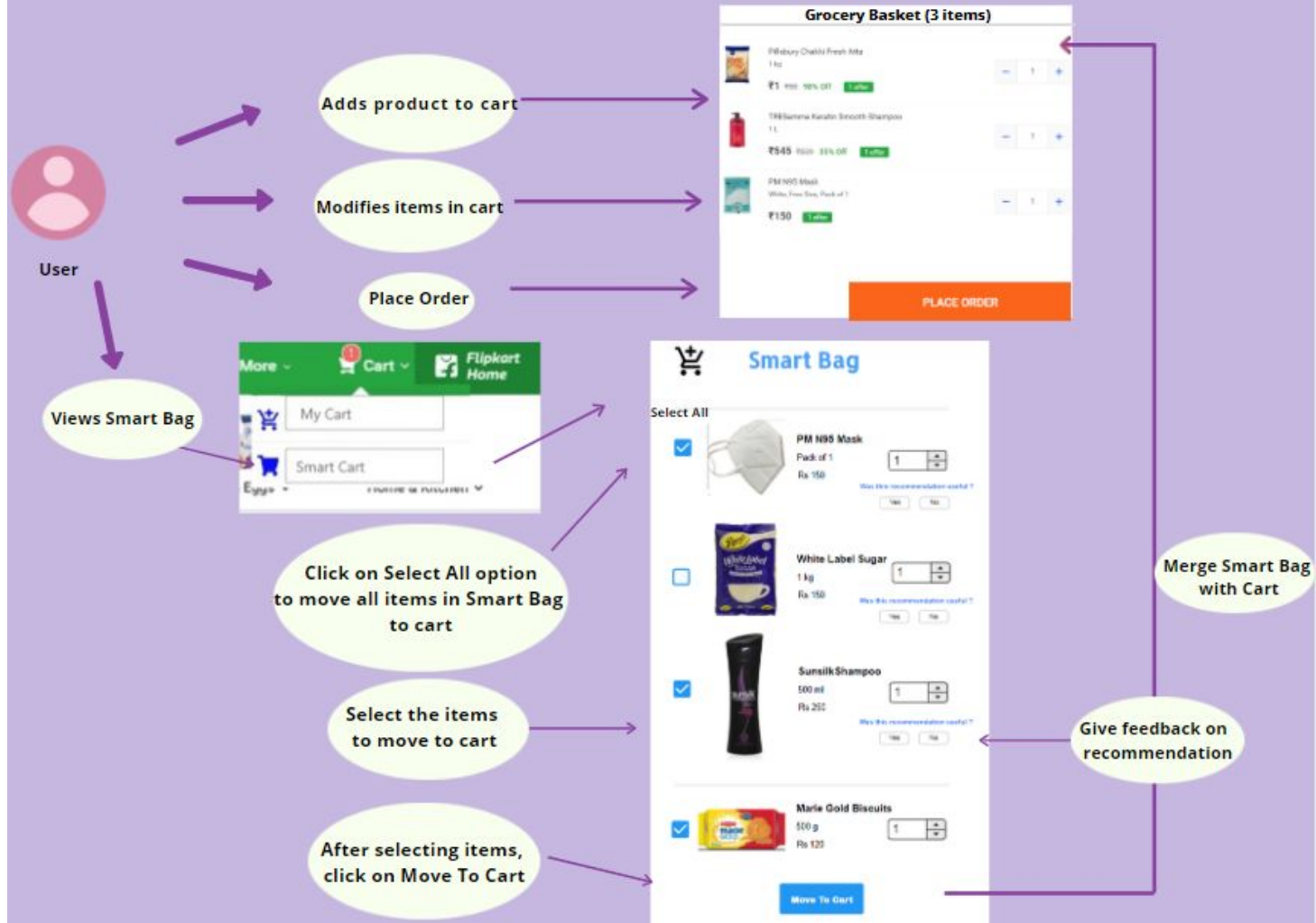
# Use-cases

## Types of Users -

- Frequent Users
- Rare Customers
- New Customers.

**Corner Case** - If purchased and logged in immediately, missing items only should be displayed in the smart cart.

## Use Case Diagram



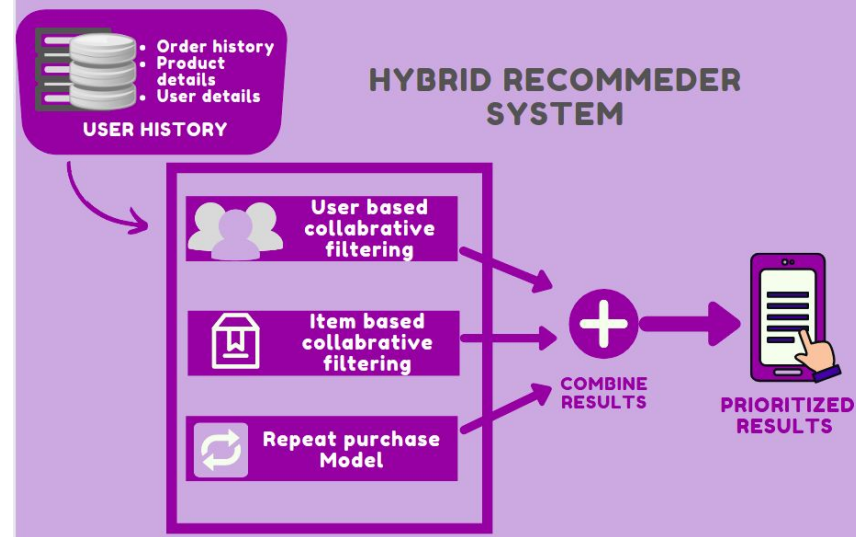
# Solution statement/ Proposed approach

Smart basket feature employs Machine Learning algorithms to comprehend the customer's preference towards buying certain items, which in turn enhances the overall purchasing experience of the customer.

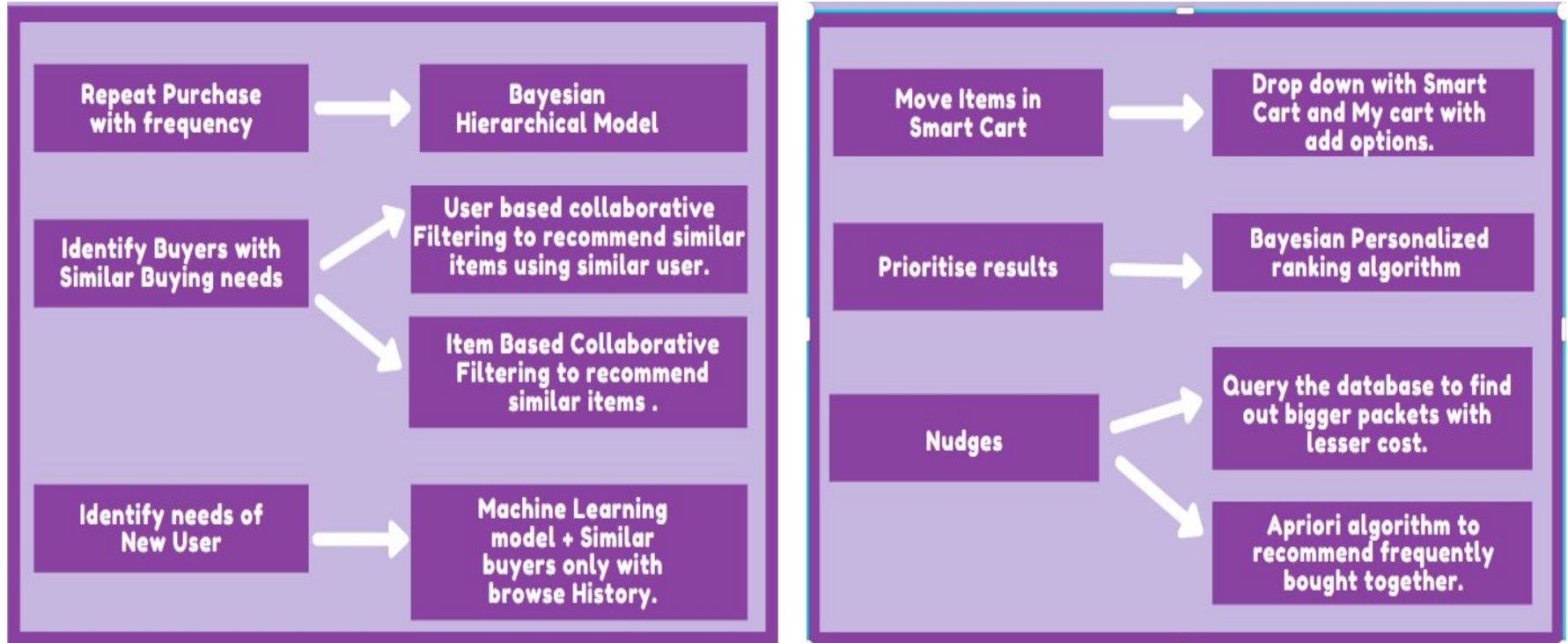
The system analyzes previous purchases, shopping behaviour, and understands repetition of items in grocery and subcategories. The algorithm then helps in curating a list of items that the customer is expected to add to the shopping cart.

## Goal :

To create a hybrid model that will help the customer to determine their next order based on their previous ordering history. The model would determine the product, the interval after which the product will be ordered and the quantity of the products to be ordered.

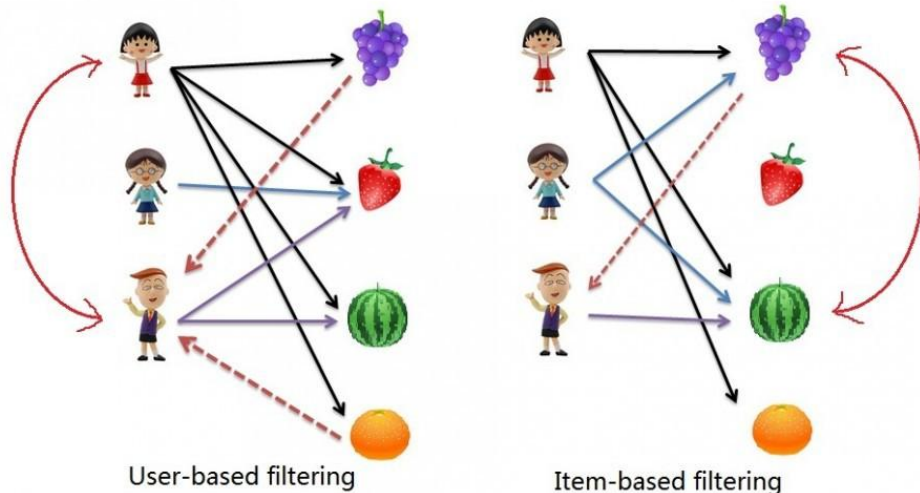


# Algorithms for each subproblems



# Collaborative filtering

Collaborative filtering uses implicit feedback (includes purchase history, browsing history, search patterns, or even mouse movements) of the users for recommending similar items. The steps are common for User based and Item based where item-based uses similarity between items and user-based uses similarity between users.



**Recommending items using the items that are most similar to the missing.**

$$\hat{p}_{ui} = \sum_{j:r_{uj}>0} s_{ij}^u c_{uj}$$

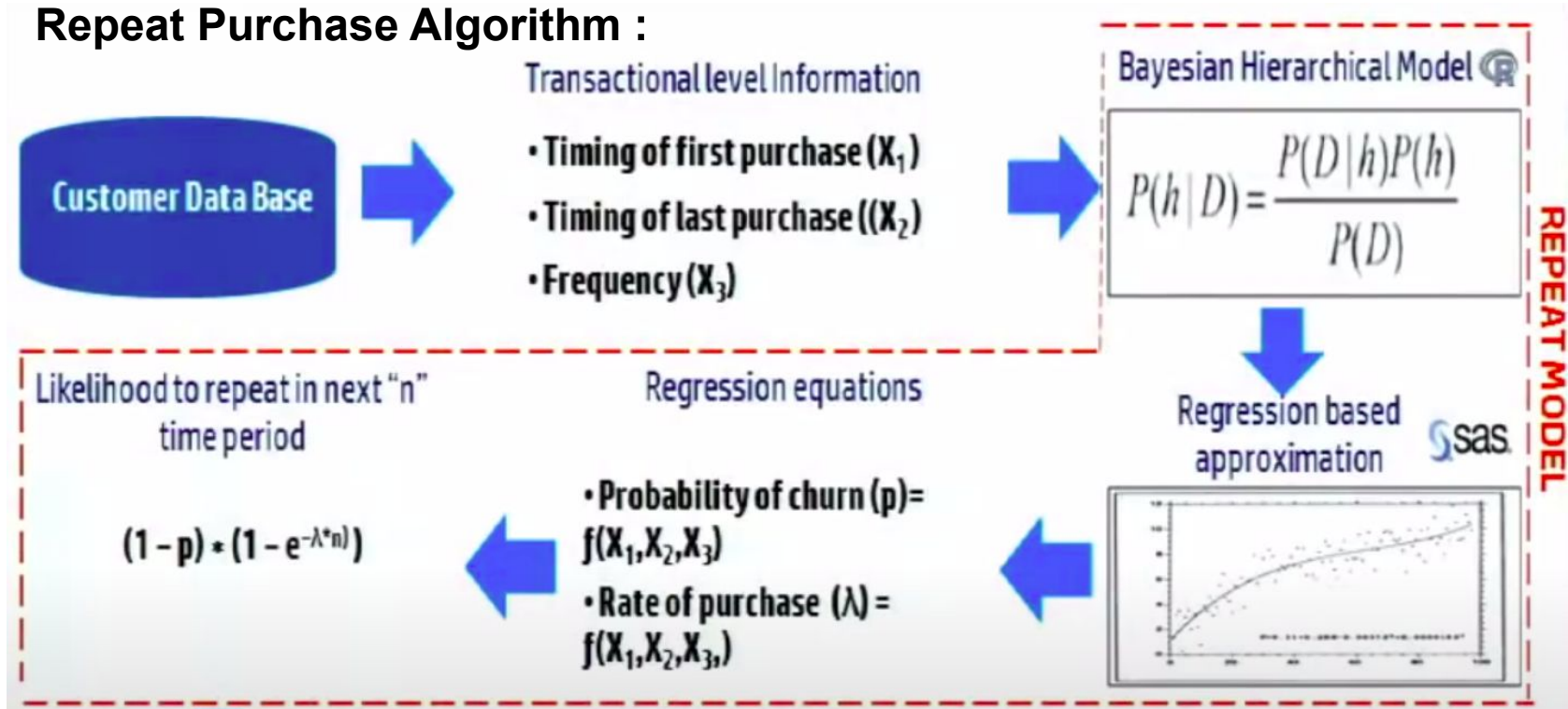
The weighted similarity between items  $i$  and  $j$  from  $u$ 's viewpoint is denoted by

$$\overline{rank} = \frac{\sum_{u,i} r_{ui}^t rank_{ui}}{\sum_{u,i} r_{ui}^t}$$

We denote by  $rank_{ui}$ , the percentile-ranking of an item  $i$  within the ordered list of all the items prepared for the user  $u$ . This way,  $rank_{ui} = 0\%$  would mean that item  $i$  is predicted to be the most desirable for user  $u$ , thus preceding all the other items in the list.



## Repeat Purchase Algorithm :

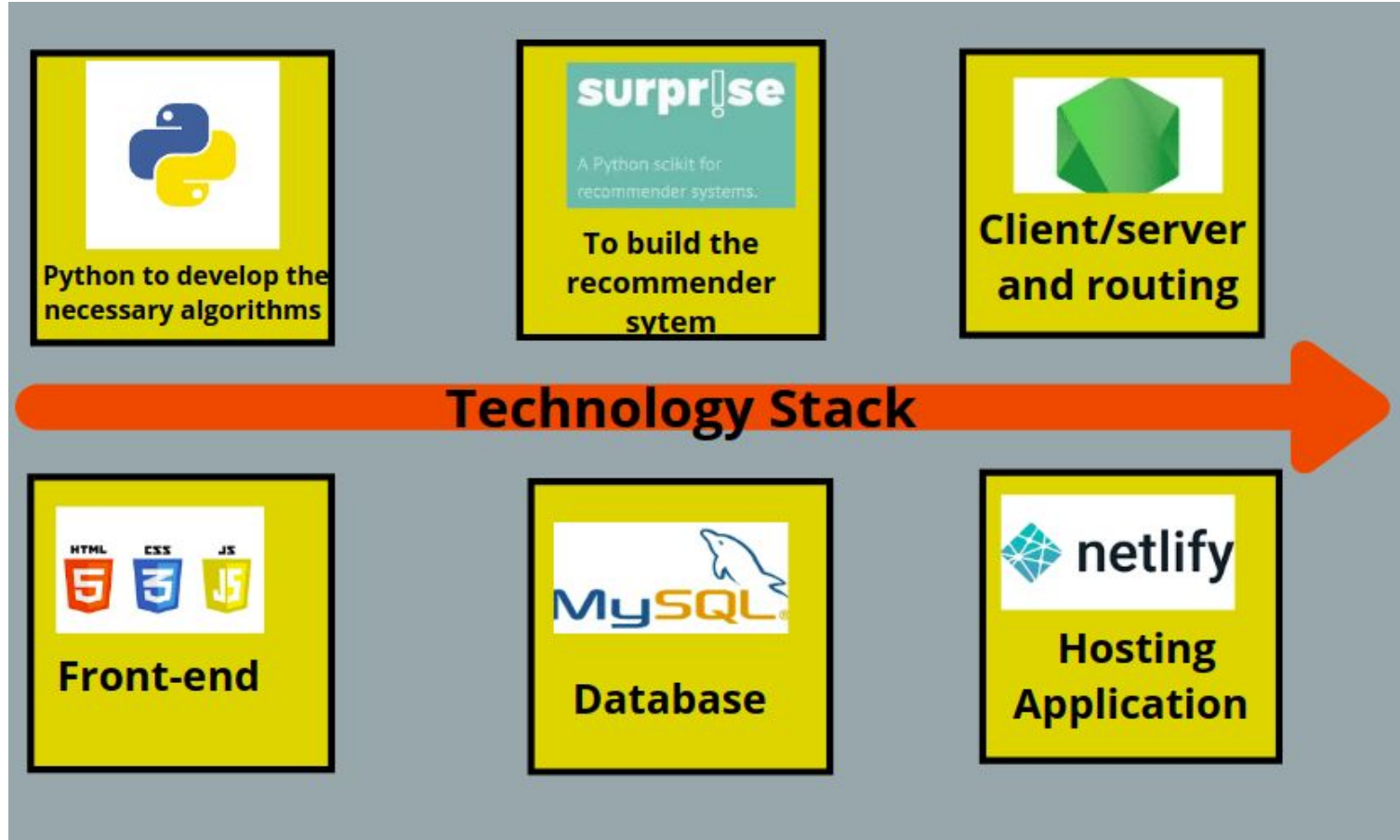


Repeat Purchase model predicts the specific time or approximate time by which a customer will have purchased a specific product. This algorithm uses factors like the number of times a customer repeat purchased a product, purchase history and day statistics in order to predict the future date.

# Limitations

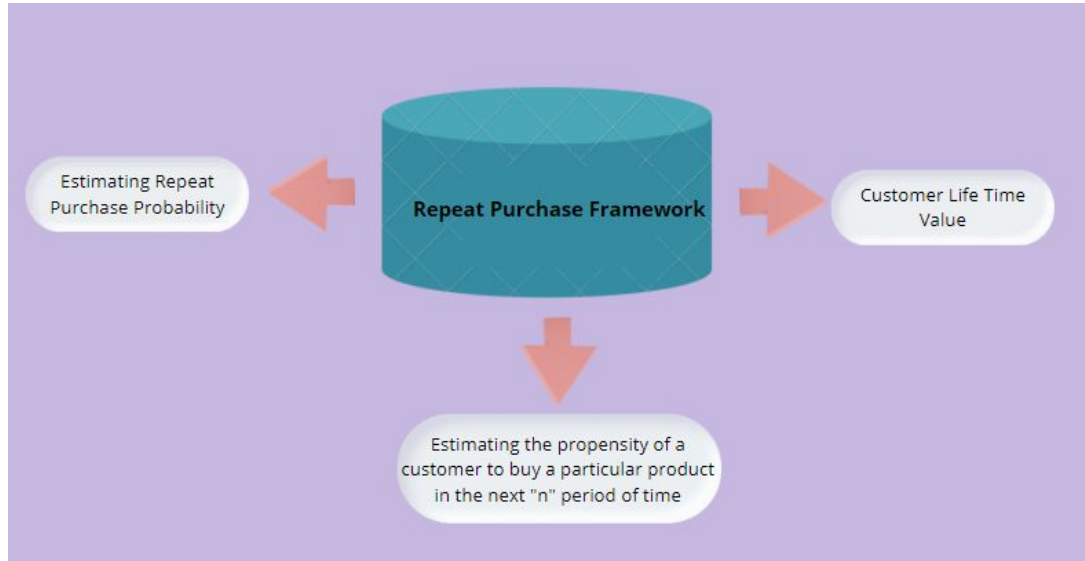
- Use of multiple Machine Learning techniques and algorithms increase the complexity of the solution
- Since the algorithm requires the purchase history, user details and browse history of the user to give recommendations, recommendations for a “new user” will not be “personalized” results.
- Smart Bag feature may be useful only for frequent buyers.
- Smart Bag should only contain a short list of products that the user may have missed to add to cart. So, we need to set a threshold for the number of items in Smart Bag. Top k relevant items (based on ranking) will only be added to Smart Bag.
- Bayesian Hierarchical Model for Repeat Purchase is not scalable.

# Tech Stack



# Future Scope

- An improved feedback system where, when a different brand of the same product is added to cart, we can find out why a different brand was chosen.
- Feedback collected on item recommendation can be used as an input in the repeat purchase model.
- When an item in smart cart is added accidentally to my carts, we can notify the buyer that the item is already in smart cart.
- Can compute Customer lifetime value using the Repeat Purchase Framework using which we can identify high valued customers. Using CLV, we can better understand the different personas among the customers, and is a key step towards effective targeting and personalization. We can narrow the focus to the VIP customers by sending them special offers, in order to retain these customers.
- Dynamic addition or deletion of products in smart bag when new items are added to the cart.



# References

- [Collaborative filtering using implicit feedback](#)
- [Bayesian Personalised Ranking](#)
- [Apriori Algorithm](#)