

Predicting Customer Preferences In Physical Stores

Akhil Krishna Alapati¹, Duggina Sai Chaitanya²

¹ Computer Science and Engineering, Sasi Institute of Technology and Engineering,
Tadepalligudem, Andhra Pradesh, 534101, INDIA

² Computer Science and Engineering, Sasi Institute of Technology and Engineering,
Tadepalligudem, Andhra Pradesh, 534101, INDIA

Abstract

An improved comprehension of client inclination is vital for fruitful business in actual stores. Online stores are fit for taking in client inclination from the exchange records, while retailers with actual stores actually need successful strategies to inside and out comprehend client inclinations. In this undertaking, we present a way to deal with mine client inclination in actual stores from their collaboration practices. Here we present an approach by considering the mobile numbers of the customers and sending them messages whenever offers are available on their unpreferred products. The main aim of our project is to predict the customer preferences based on their old purchases and their interaction with the retail stores, and to analyze the products which are preferred mostly by the customers on a particular area. If any offers are available on the products rather than the preferred products, interaction will be done with the customers by sending messages which is used to predict the outcome of any retail shops. By interacting with the customers and knowing their preferences, retailers can expand their business. For instance, on a particular area if some products are purchased frequently then retailers can increase their business by selling more number of preferred products.

Keywords: Customer Preference, Transaction Records, Physical Stores, Retail Stores, Customers.

1. Introduction

Online stores are capable of predicting the preferences of the customer. But if we consider physical stores they are not capable of predicting the preferences of the customer. So to predict the preferences of the customer in physical stores, customer purchases related is collected and stored in a database. Whenever a customer visits any physical stores, customer purchase related data like customer details, product details, and order details will be stored in a retailer's database.

After collecting the raw data, the collected data is pre-processed by using data pre-processing techniques. After pre-processing the data, the retailer can identify individual customer purchases and their preferences by applying the prediction algorithms on the data, the retailer can identify the frequent purchases of a particular customer, area wise total purchase outcome and frequently purchased item and product category wise outcome of a particular area can be known by the retailer which will be helpful to increase his business.

After knowing the frequent purchases of customer's like area wise, product wise, and customer wise, and frequently purchased items will be stored along with the related data of the customer.

The methodology used in this project is Apriori algorithm which is used to identify the frequent purchased item-set of an individual customer. Area wise frequently purchased item-set can be easily identified by the retailer which will be helpful for the retailer to increase his/her business. After identifying the frequently purchased item set, if there are any offers available on infrequently purchased items, messages will be sent to the customer by the retailer in order to increase his business.

Implementation of this model will be useful for predicting the preference of customer in physical stores from their interaction behaviors. Using millions of interaction behaviors we can observe the customer preference and facilitate more customers in physical stores. Also it will be useful for the retailer to increase his/her business

2. SYSTEM DESIGN

2.1 SYSTEM ARCHITECTURE

An improved comprehension of client inclination is vital for fruitful business in actual stores. Online stores are fit for taking in client inclination from the exchange records, while retailers with actual stores actually need successful strategies to inside and out comprehend client inclinations. In this undertaking, we present a way to deal with mine client inclination in actual stores from their collaboration practices.

We are presenting an approach to mine customer preferences in physical stores by using some of the data mining algorithms like Apriori algorithm, Naïve-Bayes algorithm and Market Basket Analysis.

Whenever customer visits any physical stores, customer related information is stored in the retailer’s database and the stored data is analyzed by the retailer and it will be preprocessed by using data mining algorithms and frequent item sets are analyzed. After analyzing the frequent item sets, customer preferences can be predicted. After predicting the preferences of customer, retailers can send mails to the customers whenever offers to available on infrequent item sets.

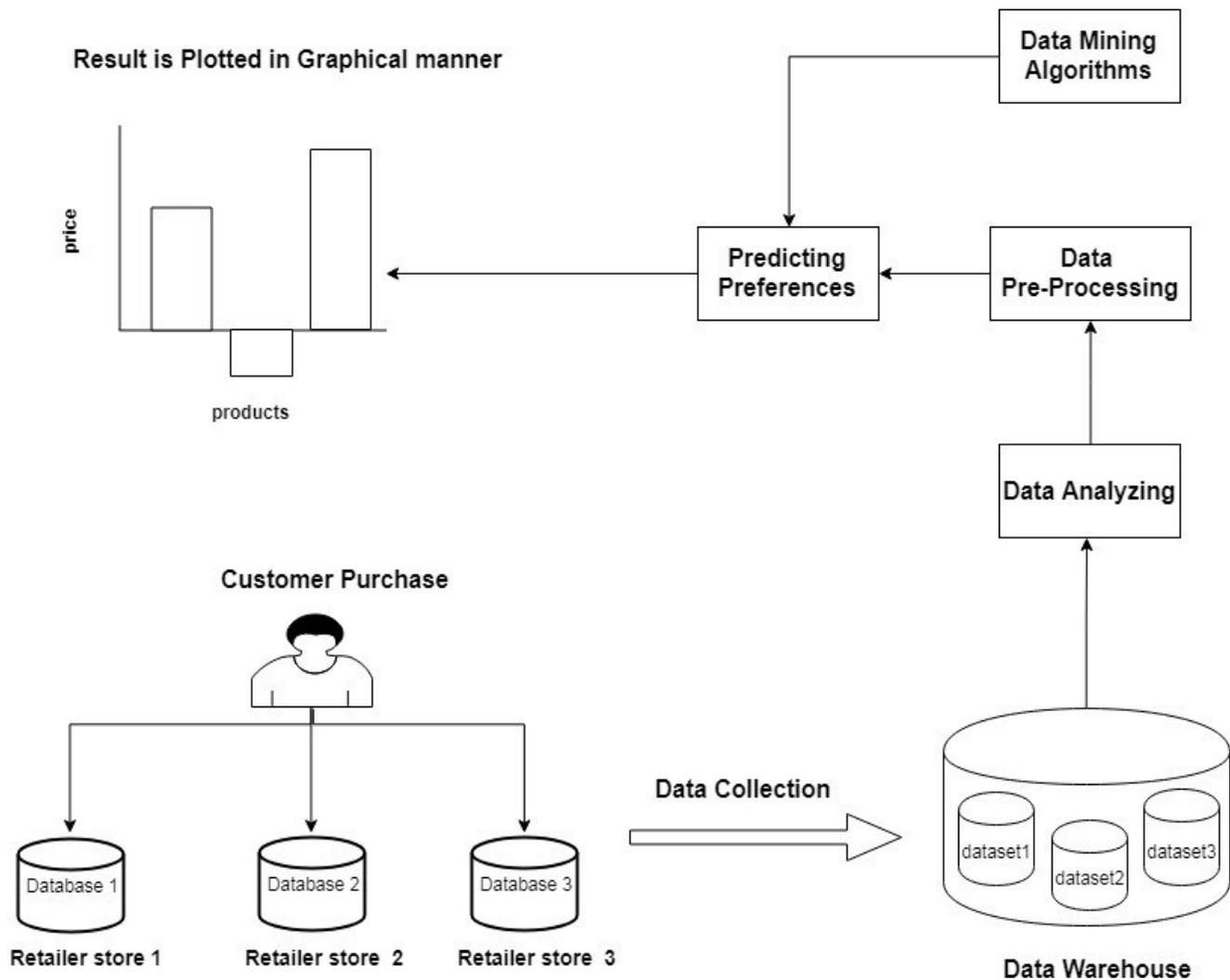


Fig 1 System Architecture

2.2 SEQUENCE DIAGRAM

A grouping graph shows object associations masterminded in time arrangement. It portrays the items and classes associated with the situation and the succession of messages traded between the articles expected to complete the usefulness of the situation

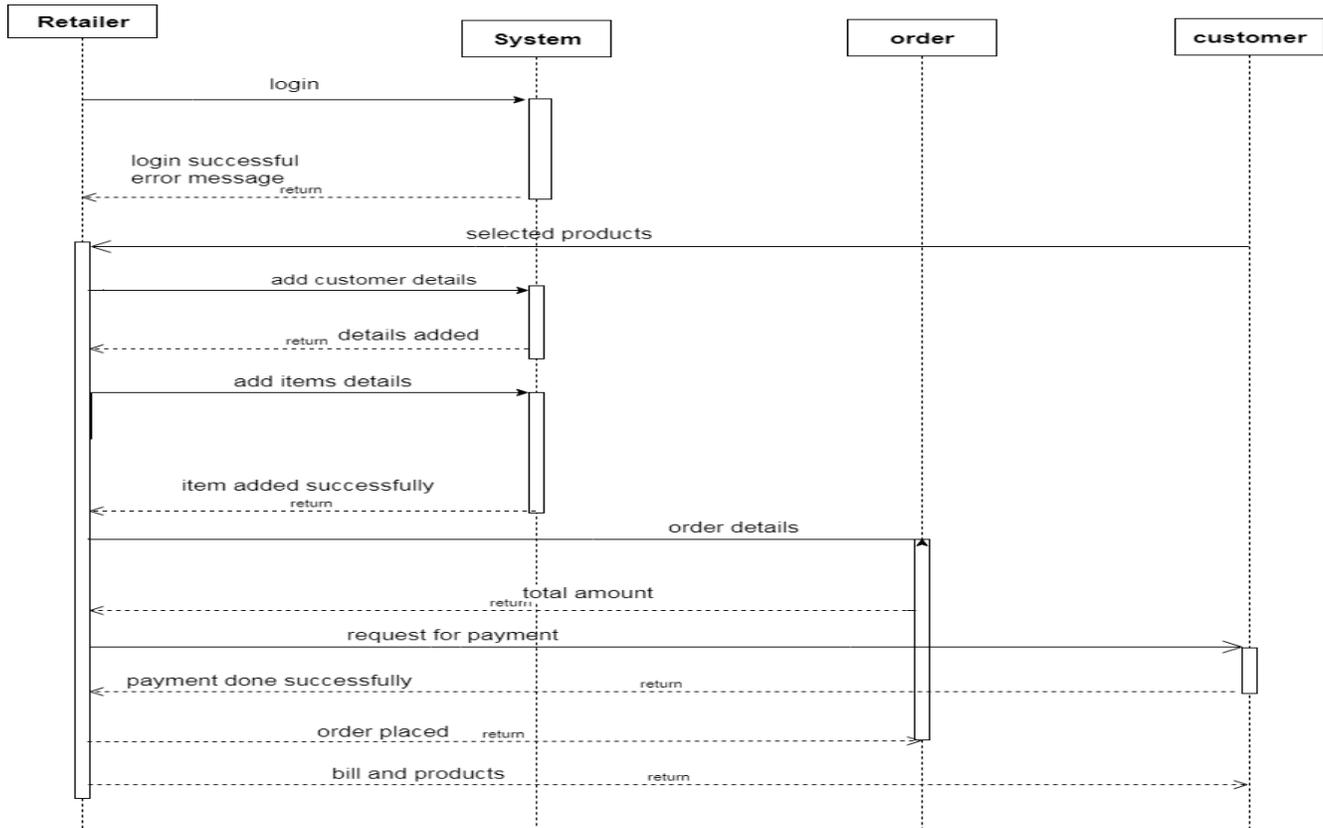


Fig 2 Sequence Diagram

3. Algorithm

3.1 Decision Trees for Classification

A Decision Tree is a prescient model that, as its name infers, can be seen as a tree. In particular, each part of the tree is a grouping question and the leaves of the tree are allotments of the dataset (information base table/document) with their order. In the above arrangement, four gatherings are grouped i.e Bad, Good, Average and Excellent. At any second the client would fall into any of the gathering.

3.2 Regression

Relapse is the most seasoned and most notable Statistical strategy that the Data Mining people group uses. Relapse takes a mathematical dataset and fosters a numerical equation (E.g: $y=a+x$ box, here y is the reliant variable and x is the free factor) that fits the information. At the point when you're prepared to utilize the outcomes to anticipate future conduct, you just take your new information, plug it into the created equation and you have a forecast. The significant restriction of this strategy is that it just functions admirably with consistent quantitative information (like weight, speed or age). On the off chance that

the information is downright, where a request isn't critical (like tone, name or sex) then, at that point it is in an ideal situation picking another procedure.

3.3 Apriori Algorithm

Apriori calculation, an exemplary calculation, is helpful in mining continuous itemsets and pertinent affiliation rules. Ordinarily, you work this calculation on a data set containing an enormous number of exchanges. One such model is the things clients purchase at a general store.

It helps the clients purchase their things effortlessly, and upgrades the business execution of the departmental store.

This calculation has utility in the field of medical services as it can help in recognizing unfavorable medication responses (ADR) by delivering affiliation rules to demonstrate the blend of prescriptions and patient attributes that could prompt ADRs.

3.3.1 Algorithm:

Step 1

Make a recurrence table of the relative multitude of things that happen in every one of the exchanges. Presently, prune the recurrence table to incorporate just those things having an edge support level more than half.

Step 2

Make pairs of items such as i1, i2, i3, i4, i5, i6.

Step 3

Apply the same threshold support of 50% and consider the items that exceed 50% Thus, you are left with i1, i2, i4, and i6,

Step 4

Search for a bunch of three things that the clients purchase together. Along these lines we get this blend.

i1 and i2 gives i1i2

i4 and i6 gives i4i6

Step 5

Determine the frequency of these two item sets. You get this frequency table.

If you apply the threshold assumption, you can deduce that the set of two items frequently purchased by the customers is i1i2.

3.4 REPORT GENERATION

Generally plotting is used to represent the results graphically like bar graphs or pie charts and plots etc..., by using R code to represent the result efficiently.

After getting the result by applying the algorithm on the stored dataset, the results are represented in a plotted manner as follows

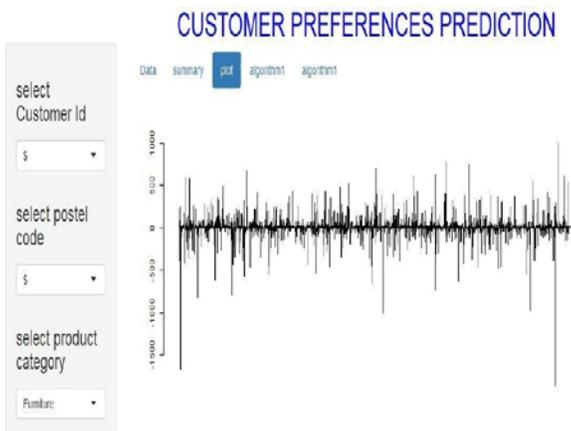


Fig 3 Report Generation representation

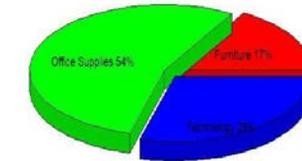
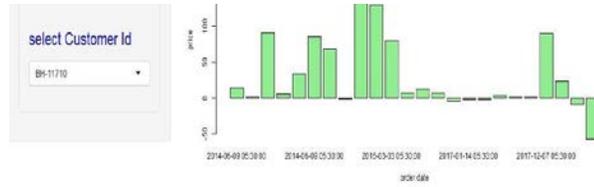


Fig 4 Customer wise frequent purchases

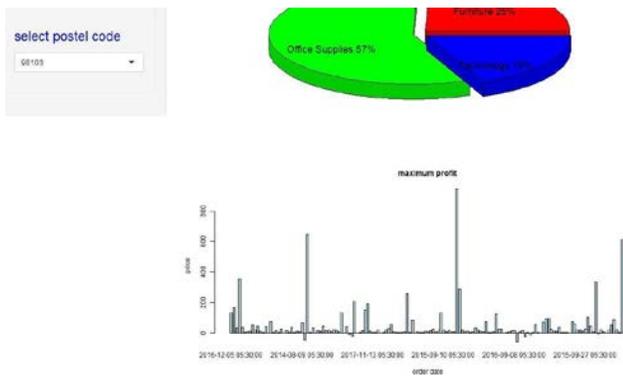


Fig 5 Area wise profit or loss representation

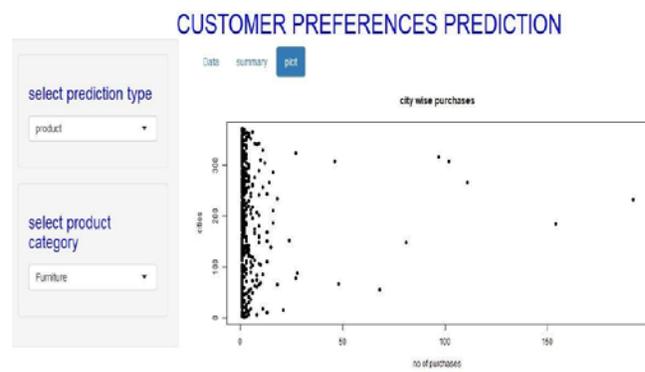


Fig 6 Product wise total outcome representation

4. Conclusions

This model aimed at predicting the preference of customer in physical stores using their interaction behaviors. Based on the customer previous purchases the frequent purchases can be predicted area wise, product wise and customer wise are stored in a file. It also helps retailers to increase their business

Appendix

If we consider customer id which is unique for each customer, customer related purchases can be predicted by selecting the customer id in the select input field, the customer old purchases can be retrieved and plotting can be done by considering the profit loss on the purchases of that particular customer as follows

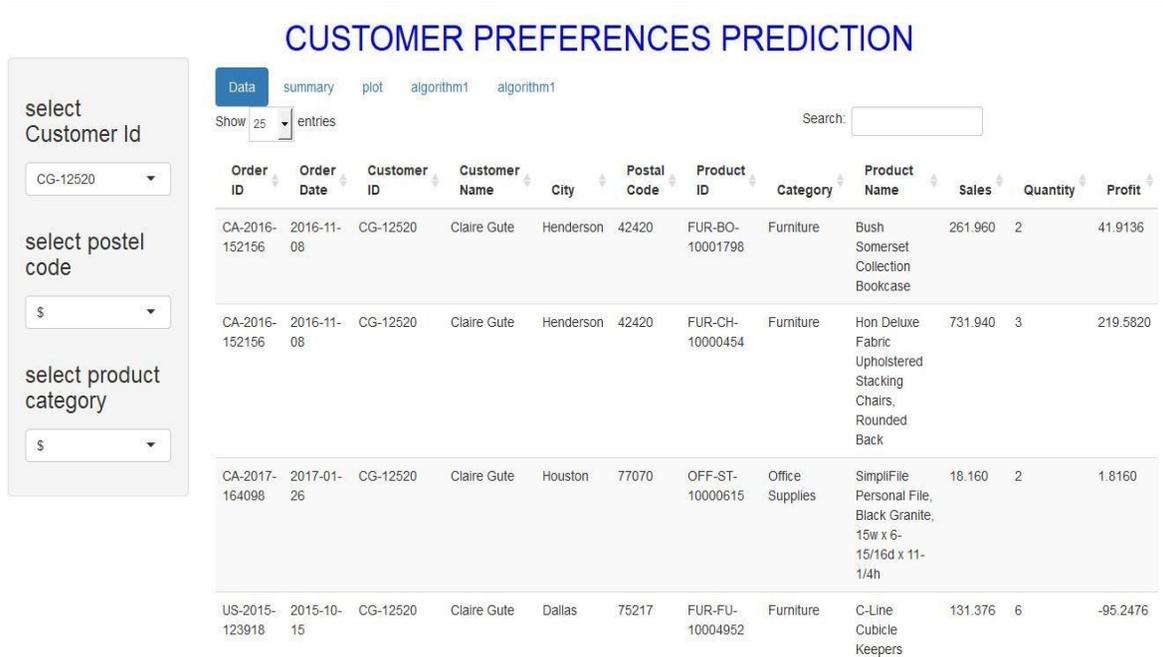


Fig 7 Customer wise Prediction

If we consider postal code which is unique for area, area related purchases can be predicted by selecting the postal code in the select input field, and the rest two fields should be "\$".the area wise old purchases can be retrieved and plotting can be done by considering the profit loss on the purchases of that particular customer as follows



Fig 8 Area wise Prediction

If we consider product category, related purchases can be predicted by selecting the product category in the select input field, and the rest two fields should be "\$".the product category wise old purchases can be retrieved and plotting can be done by considering the profit loss on the purchases of that particular customer as follows

CUSTOMER PREFERENCES PREDICTION

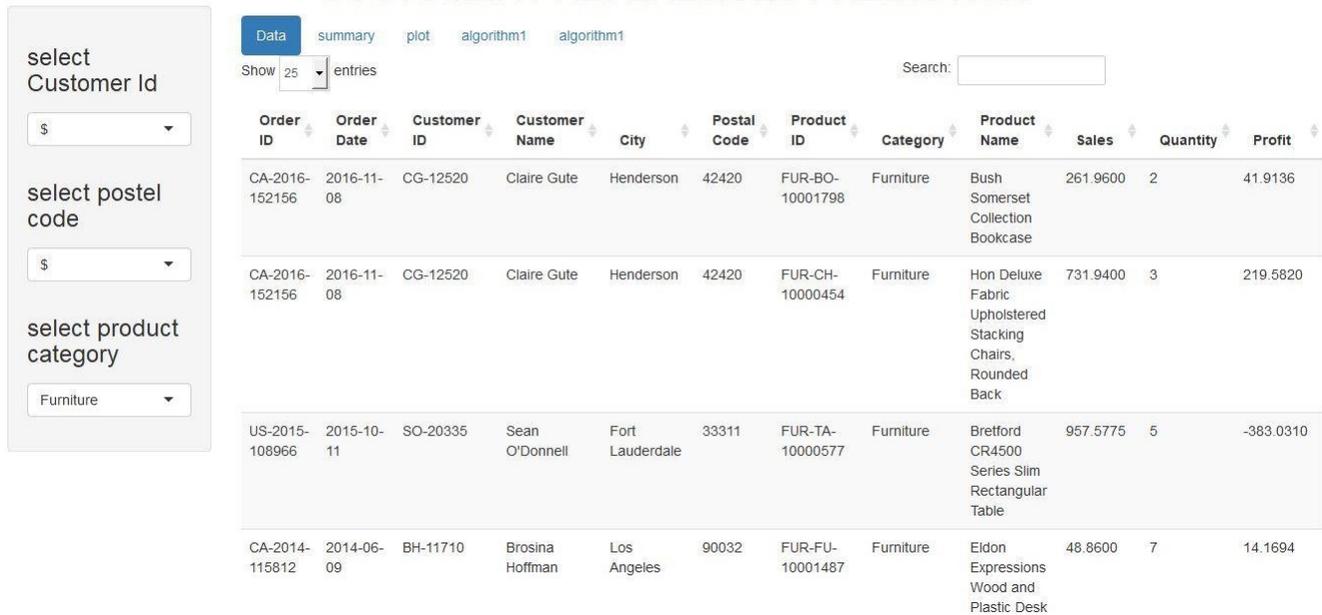


Fig 9 product-wise Prediction

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