

# Survey: Recommendation System for Web Portal using Customer Segmentation

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**Abstract:** A lot of money has been invested for predicting what the customer wants to buy next and what likely the customer is going to buy now. This opens up another branch called Customer Segmentation. Customer Segmentation is the division of customers into groups depending upon their shopping patterns and trends. Identifying different groups of customers based on several indicators like behavioural, demographic and others is the main goal of customer segmentation. This acts as a powerful tool to satisfy the unmet customer requirements. Every customer base requires a new selling strategy which depends on their buying potential. Verticals of all the industries aim at increasing their customer conversion rate. Our proposed model uses the above concepts along with the data mining algorithms. The ultimate aim of our system is to induce the customer to buy more products and also maintain accuracy in the predictions of what the customer wants to buy. The proposed model is a web based application which helps people to find and buy latest clothes and accessories. Our recommendation system facilitates them in selecting their products faster. The recommendation system is based on the concept of data mining. In this application we have two modules: Customer module and Admin module. The admin module contains the access of admin on the application. The admin can change everything in the application. He has the ability to add, delete, and update any information on the website. The customer can login into the website or can access the website without login also. He can view details of the clothes and accessories on the website. He can also add or remove products from the cart. After buying the product the customer can make payment through cash only.

**Keywords:** Customer conversion rate, potential to up sell, clustering, data mining, analytics, recommendations.

## I. INTRODUCTION

Customer segmentation forms an important part of business analytics. Business analytics gives insights about customer's shopping patterns and trends. It becomes necessary to study these trends in depth because

1. Every customer is not same.
2. Different customers have different requirements.
3. Targeting the right group of customers for selling your product.
4. Effective way of understanding your customers.
5. By increasing understanding about customers, you get opportunities for cross selling.
6. Making products customer centric.
7. Maximum revenue/profit

Companies can identify which sector of customers gives them maximum profit. This eventually helps in increasing the customer conversion rate and also the potential to up sell. It also helps in identifying which sector of customers the companies should work on to induce selling. Potentially low customers can be identified and the companies can design strategies to induce selling in such type of customers. Identifying customers provides competitive advantages. Companies can prioritize between their customers. This prioritization can help companies develop marketing campaigns and pricing strategies to extract maximum value from both high and low profit customers. Customer segmentation is used in business-to-business (B2B) and business-to-consumer (B2C) to maximize customer satisfaction.

## II. BACKGROUND

Recommendation algorithms are best known for their use on e-commerce websites, where they use input about a customer's interests to generate a list of recommended items. Many applications use only the items that customers purchase and explicitly rate to represent their interests, but they can also use other attributes, including items viewed, demographic data, subject interests, and favourite artists. We use recommendation algorithms to personalize the online store for each customer. The store radically changes based on customer interests. The click through and conversion rates — two important measures of Web-based and email advertising effectiveness — vastly exceed those of untargeted content such as banner advertisements and top-seller lists. E-commerce recommendation algorithms often operate in a challenging environment. Consider the following example;

- A large retailer might have huge amounts of data, millions of customers and millions of distinct catalog items.
- Many applications require the results set to be returned in real time, in no more than half a second, while still producing high-quality recommendations.
- New customers typically have extremely limited information, based on only a few purchases or product ratings.
- Older customers can have a glut of information, based on thousands of purchases and ratings.
- Each interaction provides valuable customer data, and the algorithm must respond immediately to new

information. The algorithm produces recommendations in real time, scales to massive data sets, and generates high quality recommendations.

### III. DESIGN

The proposed model utilizes the following strategy. Strategy:

Level 1

- Details about the customer
- Details of the product
- Transaction
- Logs

Level 2

- Aggregation of data

Level 3

- Apply the algorithm

Level 4

- Data requirements
- Viewing the clustered model
- Creating predictions
- Displaying predictions

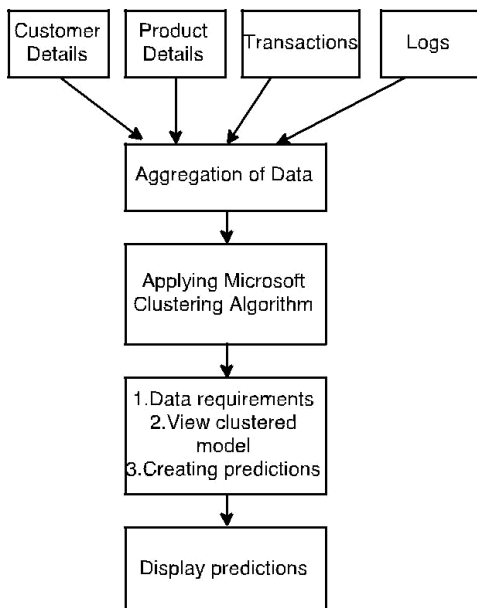


Fig.1 Strategy

The above figure describes our strategy efficiently. Depending upon the predictions of the algorithm for specific customer's recommendations will be displayed.

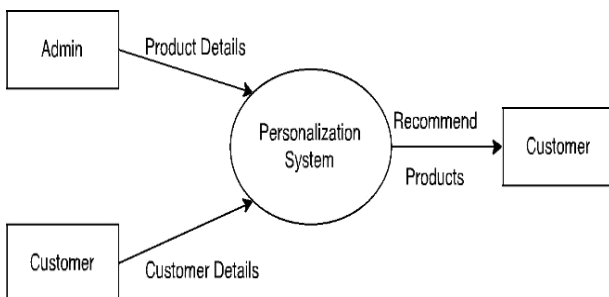


Fig. 2 Context Level DFD

Each level of processing is broken down further into sub-levels. At an intermediate level, recommendations are predicted and output is presented to the user.

This is the simplest representation of our system. This is the context level DFD. We have customer profile, the acting customer and the administrator in their roles. The personalization system will recommend the products to the customer.

### IV. IMPLEMENTATION

Recommender systems apply statistical and knowledge discovery techniques to the problem of making product recommendations during a live customer interaction. Our project is making a similar recommendation system for E-commerce portals. However the algorithms used by us are such that the same system can be used for other portals like news portals, music sites, movie sites, etc. The customer is provided recommendations if he is a new user, old customer or an anonymous user. The customers are provided recommendation based on their purchase history and also what other users had bought when they purchased a particular item. Recommendations are also provided based on the user browsing history. For this web logs that are generated are analyzed. Users are also recommended products based on their demographic attributes like age and gender.

The development of this new system contains the following activities, which develops on-line application by keeping the entire process in the view of database integration approach and using predictive analysis for developing a strong customer recommendation system.

- Secure registration and profile management facilities for customers.
- Browsing through the website to see the items that are there in each category of products like Apparels and Accessories.
- Creating a Shopping cart so that customer can Shop 'n' no. of items and checkout finally with the entire shopping cart.
- Providing customers with a strong recommendation system which will induce them to buy goods and increase add-ons.
- Secured mechanism for checking out from the Shop( Credit card verification mechanism )
- Updates to customers
- Number of Modules

The system after careful analysis has been identified to be presented with the following modules:

1. Customer.
2. Employee.
3. Admin Module.
4. Security and Authentication
5. Customer Recommendation System

The proposed system will run using a server as explained in the diagram.

## V. RESULTS

The system will study the users based on their user profiles. The system will track the user's click stream data and navigation. All the above factors are clubbed into a single factor named recommendation which displays the result.

## VI. CONCLUSION

The proposed system is a data mining tool in itself which segments the customers according to their shopping patterns and provides recommendations to the customers. The ultimate objective of the system is to accurately predict the customer needs.

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