**PurTreeClust: A Clustering Algorithm for Customer Segmentation from Massive Customer Transaction Data**

**Alternative Title: - Transaction Based E-Commerce Recommendation using Collaborative filtering**

**Aim:**

The Main aim of this Project is to provide the Recommendation to the user based on User Preference and User life Style. And to Cluster the Customer Group based on the Transaction data processed by the Customer.

**Synopsis**:

 Clustering of customer transaction data is an important procedure to analyze customer behavior in retail and e-commerce companies. Analyzing Customer behavior is important in order to provide the best product that suite the particular customer and to identify the customer POI .And recommended that product to the user.

 In the existing methodologies of E-commerce shopping Websites there is a chance of promoting the products which are more famous in the market. Thus increase in recommendation to the popular products obviously makes major products remain unsold that is said to be cold products. In-order to recommend these cold items into market we propose a novel recommendation algorithm termed innovator based Collaborative Filtering.

**Existing System:**

Identify the Customer POI in retail and E-Commerce companies is became a challenging for Companies, So most of the E-Commerce Companies will asked the user POI when they login or Recommended the Product that is not in the wish list of the particular customer. And the Product that Companies will Recommended would be based on the number of positive rating to any particular product, so that many product in the E-Commerce website would became a Cold Items (The Product that are not Sold for quite Long Duration). Companies will not recommended any cold rated product to any user until the number of rating to the particular product would increase that would make the cold rated product will be in stock for long time, and moreover the product that are recommended might not comes in user life style .

**Problem Definition:**

* Identify the User POI based on the User Transaction Data.
* Recommended the cold product to the user.
* Recommended the product that suit user life style.

**Proposed System:**

We Proposed a Customer Clustering Algorithm; customer will be segmented based on the transaction that they perform. Based on the Customer transaction detail will generate the Customer purchased tree and Product tree the leaf node product in the purchased tree would the product that the user has purchased, and compare that tree with the product tree to identify the user point of interest in the E-commerce application.

 When the User Come in application then based on the purchased tree and product tree the product will be recommended to the user. The Recommended Product is the most popular product in the E-Commerce application.

 In Order to Promote Code Item (The Product with less Popularity) among the user, Customer is Categorize into two categories as Normal user and Innovator (Who found that type of Cold Product). The Normal user would became innovator based on the behavior in the E-Commerce Application their Activeness and the number of product they view and time spend for any leaf node based on these category the innovator are found . Once Innovator found any cold product in the Application and found that item to will be useful then that product will be promoted to the Group of Customer whose purchased tree are close the to product tree that the innovator found.

**Modules:**

* **Admin Preprocessing & User Registration.**
* **Account Creation.**
* **Finding Innovator in Customer Group.**
* **Recommend Product to Customer.**

**Admin Preprocessing & User Registration:**

 For accessing the E-Commerce Website a new user has to register with the respective Website. During new user registration we need to give the basic details like user email-id, password, mobile number, address, etc. All these details will be saved into the database through Server. Then the registered user can sign in to the login page with appropriate credentials. After user sign-in got successful we have to move on for preprocess.

**Account Creation:**

The Authenticated user now can use the E-Commerce Application to purchase desired products, but prior to that the user need to create their own Banking Account in order to show the transaction data. The user needs to create his account with our developed Bank Application. Here the user can deposit the initial amount to the bank after basic registration with bank got completed. These banking transactions data will be stored in Bank Database separately.

Whenever any purchase is made this transaction data will get updated as the Bank Application will be running in the background as Web Service.

**Product Purchase:**

 If the user login then based on the user transaction data system would identify the user lifestyle, interest and recommended the product based on that criteria. The recommendation would be based on the product ranking. As the result the high moving product will be recommended first and the other cold product (less moving product) will remain in the stock. In Order to promote the cold product in the market, User need to segment in two group normal user and innovators. Innovator are the one who spending lot of time in the E-Commerce website and the time in particular leaf node then that user would became a innovator. Normal user who spends lots of time in E-Commerce website will consider as innovators.

**Recommend Product to Customer:**

 The recommendation should be based on the user lifestyle and user point of interest for this the user transaction data would be consider the input from which the user interest and lifestyle would be identified. Then the product would be recommended based on the product ranking and the product count that would be generated based on innovators. The Combination of these product lists will be given as recommendation to the user.

**Software Requirements:**

* Windows 7 and above
* JDK 1.8
* Tomcat 7
* MySQL 5

**Hardware Requirements:**

* Hard Disk : 500GB and Above
* RAM : 4GB and Above
* Processor : I3and Above

**Technology Used:**

* JAVA
* JSP, Servelet
* Web service

**Algorithm Used:**

* Collaborative filtering algorithm
* Clustering Algorithm

**Architecture:**

 Admin

Add new Product

Pre Processing the Product

User Register

 User Login

If New User

 Product List

 Buy New Product

Product Based On

Transfer Data

Recommend Product Based On transaction Data

Bank Application