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Smart Local Shopping System

Rohan Padaya
Department of Information Technology Engineering,
Vidyalankar Institute of Technology Mumbai, India
rohan.padaya.rh@gmail.com

Sumeet Suvarna
Department of Information Technology Engineering,
Vidyalankar Institute of Technology Mumbai, India,
sumeetsuvarna5@gmail.com

Ankit Channe
Department of Information Technology Engineering,
Vidyalankar Institute of Technology Mumbai, India,
ankit.channe001@gmail.com

Chintan Shah
Assistant Professor, Dept. of Information Technology
Vidyalankar Institute of Technology
chintan.shah1@vit.edu.in

***Abstract*— With ever increasing need for buying commodities, it has become very essential that the delivery speed is up to the mark. More and more products are sold via e-commerce because the ease of access and efficiency of Internet has made trading very popular. Youth are trying to order most of their daily necessities online, but surely till now, this hasn't affected the sales of day to day commodities. These shopkeepers, who are willing to enter the online arena are overwhelmed by all the technological ideologies and technical nomenclatures. They want to market themselves online with very little technical knowledge involved in the process. The proposed solution is a platform for shopkeepers to market their commodities and services to an average consumer. This solution is a middleware between shopkeepers and consumers which acts as a recommendation system. We are trying to bridge this gap where consumers are more technology-oriented and shopkeepers lie at another end of the spectrum. In turn, the shopkeeper can also benefit by getting a data feed about most searched commodity in their vicinity. The consumers, on the other hand, get to choose which shops to visit or get their product delivered from. This would reduce the monopoly caused by the e-commerce giants like Amazon, Flipkart in the market. Also, the consumer enjoys instant knowledge about the availability of the product.**

Keywords*— *E-commerce, Recommendation system

I. INTRODUCTION

A significant amount of demographic is choosing online shopping – which is comfortable – over legacy schemes like window shopping. This has made people aware of the benefits that e-commerce holds over regular commerce. This generation, who has made online shopping as their default way of buying lifestyle commodities is yet to harness a similar way of shopping for day-to-day commodities.

E-commerce giants like Amazon, Flipkart have cemented a market of their own as they provide smallest of the household item to huge luxurious items at the fingertips of the customers [4]. Variety of items are available online on these e-commerce sites. This has created instability in the market as local shops are lagging behind in the online scenario. Due to attractive incentives and wide varieties provided by e-stores, there is an adverse effect of online shopping on the fixed shop retailers. This has provoked the fear of uncertainty and helplessness into the mind of shopkeepers [5]. Local shops lack exposure to the current online trade which in turn affect the economy of local markets and create a prejudice among the local shops against online websites. On the other hand, online system cannot provide instant delivery of daily necessity products to their customers.

Competition in the market is beneficial for the average consumers as this tends to increase the quality of products and chance of decrease in the cost of the product. If the local vendors are given an opportunity to enter the online shopping system, then it would be a great opportunity for them to increase their sales and widen their business in the midst of such healthy competition.

In online shopping systems, users come across millions of products to choose from. So it becomes difficult for them to shop from the vast array of products. This consumes a lot of time and efforts of consumers in searching for the desired product at an optimal cost [9]. This lead to the idea of the recommender system. A recommender system acts as a personal assistant that helps you in choosing from a comprehensible list of items, thus saving time and energy. Recommender system simplifies the job of users to fetch the desired item by recommending the related item which the user may like [6], [11]. This recommendation is based on user's previous search history and previously purchased items. So this system uses recommender to prioritize the item based on user preferences.

A. Usefulness of web vendors

- Save business projects from collapsing and increasing profits.
- Curtail expenditures spent on manpower
- Opportunity to serve both local and foreign customers

- Promote their products and create noticeable online shops
- Provide excellent customer experience by launching fast functioning and accessible web stores

In the rest of the paper, we first review the related work of the online shopping system and recommender systems in the Section II. Then we state the Aim and Objective of this system in Section III. The Section IV describes the current situation of market from customers as well as shopkeeper's point of view. Then we describe the proposed system in Section V. The next section, Section VI talks about the scope of the system followed by the detailed methodology used for the system in the Section VII. Finally, we draw conclusion and give references.

II. RELATED WORK

Previous work has been referred which proposes a lot of challenges related to the online shopping system and recommendation system.

In the year 2003, Junzhong Ji et al [1] proposed a paper on an online recommendation based on customer shopping model. In this paper, he introduced the idea of using the Bayesian network for building a customer shopping model which helps in identifying the customer's shopping behavior.

In 2016, Supriya Jaiswal et al [2] has written a paper where the author analyzes the user's search history based on recommender system. Recommender systems are based on information about a user's past patterns and consumption patterns in general and recommend new items to the user.

Using genetic algorithm combined with K nearest neighbor, Hong-Wei-Yang et al [6] developed a method that selects the appropriate products for customers based on their demands and personal preferences.

As per Gediminas Adomavicius et al [3], recommender systems are classified into following categories based on how recommendations are made

- Content-Based Recommender System: The user will be recommended items similar to the ones the user preferred in the past
- Collaborative Recommender System: The user will be recommended items that people with similar tastes and preferences liked in the past [7].
- Hybrid Recommender System: Combination of both content-based and collaborative recommender systems. Kavinkumar.V et al [12] also put forth the same idea of hybrid recommendation with the additional feedback analysis feature in which customers were provided with better suggestions depending upon user based and item based collaborative filtering.

Badrul Sarwar et al [8] has compared collaborative filtering with other recommender system algorithms and concluded that collaborating filtering is the most successful recommender system algorithm on the web.

Pooja Vashisth et al [10] provided insights on Interest Based Recommendation agents which are used to generate interesting recommendations. The agents are evolving in nature which uses feedback from the users for improving future recommendations for them. The feedback includes user's behavior on the web, user preference, and user profile.

III. AIM AND OBJECTIVE

A. Aim:

The important aim of this project is to bring the concept of online shopping into local market thereby giving an opportunity to the local shops to widen their business.

The proposed system also aims at providing a platform which allows users to get information about the availability of desired product in their respective local shops at optimal cost and distance.

B. Objective:

The following are objectives of Smart Local Shopping System:

- To minimize the time and human efforts of users required to find a particular product.
- To provide the statistics of the demand for items in a particular locality to the shopkeeper thereby helping them to maintain the supply of commodities.
- To encourage healthy competition in the local market and avoid monopoly.
- To provide appropriate recommendations to users based on their search history.

IV. PROBLEM STATEMENT

In today's era of internet, a variety of products are available through online shopping to the customers at their doorstep which in turn makes them prefer online shopping over local shops. Hence, there is a significant dip in sales of the local shops.

Also, there is lack of the credible source in the shopping domain which provides the statistics regarding the demand of commodities to the shopkeeper in their locality. The shopkeepers need to rely on the indirect sources of information such as the advertisement, sales of similar products in neighboring shops and the profit margin of a particular product to understand the demand in their vicinity. On the other hand, in online shopping, the customers have to wait for at least a day to get their product delivered.

This delay in delivery of a product is not feasible for daily need commodities. To overcome these problems, we have proposed Smart local shopping system which provides information about user's desired product at their fingertips.

V. PROPOSED SYSTEM

The Smart Local shopping system is an e-commerce based recommender system that provides a platform

independent application which can run on both Android and IOS.
The system will keep the track of the most searched items in a locality. This statistic will be updated on weekly basis.

The application will show the statistical data to shopkeeper in a visual format like pie charts. The system includes an inbuilt barcode scanner which allows the shopkeeper to scan new products and to register it in the shopkeeper's database.

VI. SCOPE

The Smart Local Shopping system has extensive scope in the trade market to help the shopkeepers to maintain the demand and supply of commodities. The system will process the historical data of user's search history and items purchased. A hybrid algorithm will be developed which will notify users. The data will be analyzed and tuned to optimize accuracy and diversity.

- Our Platform will reduce human effort and time required to know the location of the local shops where required item is available.
- Shopkeepers will be provided with the statistics regarding the demand in the market.
- Through our application, Customers will get customized notification on weekly basis based on their preferences.
- Shopkeepers can post advertisements about new products introduced in the market according to his leisure.

VII. METHODOLOGY

The Smart Local Shopping System consist of three different modules:

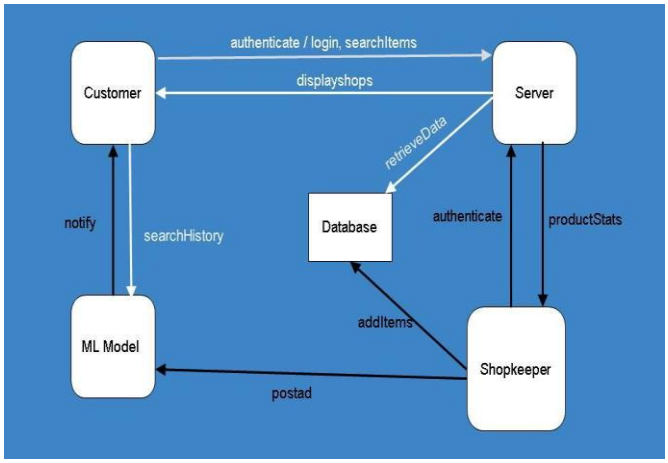

Fig. 1. *Block diagram of Smart Local Shopping System*

This System will contain a Centralized database which involves the details of the product and the information of the shops in different tables. ML engine is used for customized notifications for customers depending on the customer's previous search history and advertisements posted by shopkeepers. Customer and shopkeeper communicate with server for authentication. During the authentication of shops, the location of the shop will be taken. Once the customer is authenticated he can search for the product. Customer's runtime location will be taken by the server and then by matching the location of the customers and shops, the server will retrieve the list of shops which are nearer to the customer. Depending upon the most searched and purchased product in the market, Shopkeeper will be provided with the statistics which will help them to know the demand in the market.

A. Customer module

The user has to download a phone application which will be used for all further interactions with the server. Every user will be validated by making sure that they register with server before interacting with the application. Once successfully registered, the user is prompted to enable location services or he/she can enter their address accordingly. User is provided with a search bar to enter desired product. He is then provided with search results based on his location. User can filter his searches according to prices, accessibility and credibility of the shop.

B. Machine Learning Module

Based on user's search histories and collective purchase results, a Machine Learning module will recommend products which the users are most likely to consume. This module will also target potential audience for a new product.

C. Shopkeeper Module

The shopkeeper has to provide their shop location while registering in the application. After signing up, the shopkeeper needs to register all his products using the barcode scanner provided by the application. Based on search history in that locality the shopkeeper is presented with statistics of most searched items.

VIII. CONCLUSION

Our solution targets shopkeepers who are technologically less advanced. This comes with an expectation for an extra layer of simplicity. Currently, the solution comes with simple but feature-rich UI for shopkeepers. Since the solution broadens the local reach of the shopkeeper, it will result in determining trending commodities. Accurate predictions will further expand local businesses and will enable newcomers with potential to have an equal share in the economy. The customers are likely to experience increased consumption of goods because of simplicity in their availability. With more people moving online for simple purchases, the shop centers are likely to experience few rush hours. Less time spent in shopping queues will result in fewer frustrating shopping experience

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