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Ecommerce Full Stack Site Using Recommendation System

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ABSTRACT: The technological development in the devices and services provided via the Internet and the availability of modern devices and their advanced applications, for most people, have led to an increase in the expansion and a trend towards electronic commerce. The large number and variety of goods offered on e-commerce websites sometimes make the customers feel overwhelmed and sometimes make it difficult to find the right product. These factors increase the amount of competition between global commercial sites, which increases the need to work efficiently to increase financial profits. The recommendation systems aim to improve the e-commerce systems performance by facilitating the customers to find the appropriate products according to their preferences. There are lots of recommendation system algorithms that are implemented for this purpose. However, most of these algorithms suffer from several problems, including: cold start, sparsity of user-item matrix, scalability, and changes in user interest. This paper aims to develop a recommendation system to solve the problems mentioned before and to achieve high realistic prediction results this is done by building the system based on the customers' behavior and cooperating with the statistical analysis to support decision making, to be employed on an e-commerce site and increasing its performance. The project contribution can be shown by the experimental results using precision, recall, F-function, mean absolute error (MAE), and root mean square error (RMSE) metrics, which are used to evaluate system performance. The experimental results showed that using statistical methods improves the decision-making that is employed to increase the accuracy of recommendation lists suggested to the customers.

KEYWORDS: E-Commerce Site, Recommendation System.

I. INTRODUCTION

E-commerce systems (EC) have witnessed a significant increase in the volume of sales in recent years, especially with the great technological progress and progress in the services provided by the Internet . This fact led to the appearance of many large companies and the increase in competition between these companies to attract the largest possible number of customers and achieve the highest financial revenues. This competition is represented in the increasing the number of offered goods, providing offers and discounts, facilitating payment processes, as well as facilitating the process of searching for goods for each customer according to their directions.

One of the ways to facilitate the shopping for the customers is to provide a list that suggests the customer-specific goods based on the customer's trends, which is known as the recommendation system. In this field, many studies have appeared that suggest different ways to build recommendation systems that increase the efficiency of commercial sites. A recommender system, often known as a recommendation system (RS), is a type of information filtering system that attempts to anticipate a customer's "rating" or "preference" for an item. Playlist generators for video and music services, product recommenders for online retailers, content recommenders for social media platforms, and open web content recommenders are all example.

II. RESEARCH METHODOLOGY

There are five main modules in the web application: Login, Admin, Patient, Doctor, and Agent. In the Login module, new user registration and new doctor registration can be done. All users will be able to login with their unique login credentials. Forget password option will be available for users to change their password. Users can also view the home

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page. In the Admin module, the admin can VIEW/ADD/UPDATE/DELETE the Agent, VIEW/UPDATE/DELETE the records of the Patient, VIEW/UPDATE/DELETE the records of Diagnostic Services, VIEW the Health Report, ADD the questionnaire, ADD a report for any service, ADD/VIEW/UPDATE/DELETE the Commission for any services, ADD/VIEW the commission to Agent. In the Patient module, the patient can VIEW the Notification (if there is any), make an appointment, check whether the Appointment is approved or not, view the Test report uploaded by the doctor, and also give feedback. Next is the Doctor module where the doctor can check the Appointment Notification, approve, or cancel/UPDATE/VIEW the Appointment requests, ADD/UPDATE/DELETE Treatment Report, ADD/UPDATE/DELETE the Test Report and VIEW the feedback reports. The last module is the Agent where they can ADD/VIEW/UPDATE/DELETE Appointment, ADD/UPDATE/DELETE Treatment Report, view the commission report, and view the input

III. SYSTEM STRUCTURE

MVC Architecture:

This system first is a hierarchical catalog contains general and specific classes. Each class is a combination of products that are hierarchically organized. Members of a specific class, inherit general class to properties. All classes in the catalog associated with the transaction. Any product that has sold at least is one member of classes of catalogue [7].
As mentioned, e-commerce customers want to have accurate and useful metrics that they just have not made aware of certain models and brands, but also they will explore models available on then market .

Then, this system performs product recommendation in three phases:

- Identify the needs of users (search criteria).

Search among the items in the catalogue and find the product that is the closest match.

Tools and technologies used along with MVC

1.PYTHON MYSQL:

Python MySQL Connector is a Python driver that helps to integrate Python and MySQL. This Python MySQL library allows the conversion between Python and MySQL data types. MySQL Connector API is implemented using pure Python and does not require any third-party library.

2.DJANGO:

Django is a full-stack Python web framework that helps in developing a maintainable and secure application in an easy way and in a shorter time. It is a free and open-source framework and also has an active community to maintain regularly. It focuses on automation and follows the DRY (Don't Repeat Yourself) principle.
Django can be used to solve the problems like connectivity with databases, other server problems, SEO solutions, etc. One can import the facilities it provides based on the requirement of the application or project. This helps the developer to focus on the unique features of the website rather than dealing with all the backend problems.

3.Cloudianry:

Cloudinary provides an API for uploading images, videos, and any other kind of file to the cloud. Files uploaded to Cloudinary are stored safely in the cloud with secure backups and revision history. Cloudinary's APIs allow secure uploading from your servers, directly from your visitors' browsers or mobile applications, or fetched via remote public URLs

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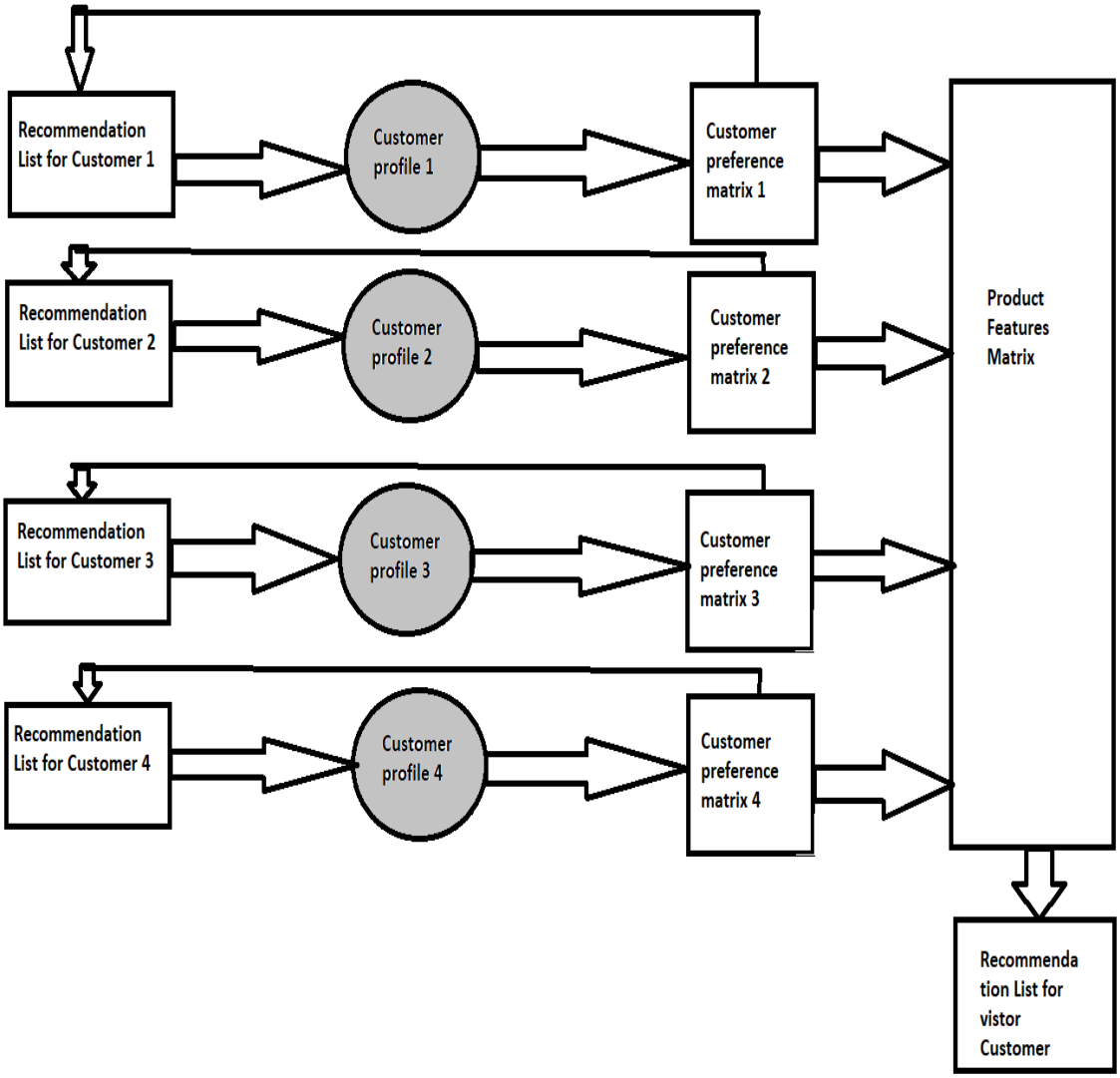

Figure 1: System Flow Chart

Positive and Negative Of Each PRS:

PRS	Advantages	disadvantages
Social Recommender Mechanism	• More attention to the recommendation trust. • Ranking recommender Based on the success of previous recommendations. • Ability of customer to choose the recommender with high level of trust. • Increase the effectiveness of the customer's personal decision with increase the accuracy of recommendation.	• rely on the opinions of Customer's family members and friends in social networks to anticipate customer's needs. • If does not correct understand of customers in the social networks, identifying needs will not be accurate. • Lack of attention to the characteristics of the products. • New customer problem

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Associative Classification-Based Recommendation System	• Carefully collect the customer's criteria • Remove the new customer problem whit collecting purchasing criteria through explicit	- Exist noise and insufficient data in presented information by the customer can reduce the accuracy of the system.
Preference-Based Clustering Reviews	- Focus on customer and reviewer comments that priorities and criteria are similar to each other. -Use cluster of reviewer and other comments customer comments for new customers as guidance in product selection	• Do not use the features of the products • Do not advise the associated products with customer's desired product.
Product Recommendation With Temporal Dynamics	-It's very good For customers who constantly go to the store to buy. - Assess customer needs at different stages of his life cycle.	• Lack of purchase history for customer's that first purchase from a store • To increase the volume of customers will be faced with the problem of computational overhead.
Mining User- Contributed Photos For Personalized Product Recommendation (Huim)	• Use the Customer's Picture Profile for identification. • Better understanding of the customer gives accurate users personalized recommendations.	- If sufficient knowledge of user is unavailable or if the user's first visit to the System, This system may not be provide accurate and effective advice to users.
Combining Implicit Rating-Based Collaborative Filtering And Sequential Pattern Analysis (HOPE)	• Combination of cooperation filter and sequential patterns. • Choose customers who have a lot of near shopping behavior • Investigation products Sequential patterns	- The problem of noise in the data that predicts explicit rating collaborative filtering using the user's mental ID and determine customer needs from this ID
Highly Adaptive Recommender System	• Differentiate products with high involvement (high risk selection) and low involvement products (choose low risk). • Care on the product features • Overcome to new customer problem	• assign it to the C2C stores • Lack of system development -High computational complexity for products with high involvement and probability of confuse customers during the long process of determines criteria research.

Data validation:

Techniques are designed to identify errors in data at a lower degree of detail. In almost every region where the client has the potential to input errors, information approvals have been implemented into the framework. Invalid data will not be detected by the framework. Data type validation, range, and constraint validation, code and cross-reference validation, and structured validation are the types of validation. When invalid information is entered, the framework prompts the client, and the client must re-enter the information, which the framework will acknowledge if the information is correct. Wherever possible, validations have been incorporated. The system is intended to be simple to use. Pop-up menus are built into the system

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IV. IMPLEMENTATION AND TESTING

Black-Box Testing:
Black Box Testing, also referred to as Behavioral Testing, is a software testing approach in which the tester is unaware of the item's internal structure, design, or implementation. These tests might be functional or non-functional, however, functional tests are more common. This can be done in the following way:

1. Input interfacing
2. Processing
3. Output interfacing

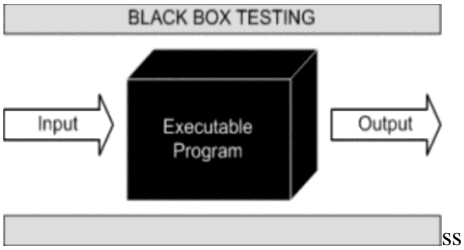

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Figure 2: Black box testing

This method gets its name from the fact that the software programmer seems to the tester to be a black box, with nothing visible inside. This method attempts to find errors in the following categories: Interface errors, Errors in data structures or external database access, Behavior or performance errors, Initialization and termination errors.

White-Box Testing:
White Box Testing, also referred to as Clear Box Testing, Open Box Testing, Glass Box Testing, Transparent Box Testing, Code-Based Testing, or Structural Testing, is a software testing approach in which the tester is aware of the internal structure, design, and implementation of the object under test. The tester selects inputs from which to exercise code routes and finds appropriate outputs. Programming skills and understanding of how to put them into practice are required. Beyond the user interface, white box testing examines the inner workings of a system. This method is named after the fact that the software programmer appears to the tester as a white/transparent box within which one can see what is within.

Feasibility:
Since this assignment will be completed on a computer, we need first to determine whether the technology is technically feasible. Computer involvement with any employment has grown commonplace in recent years, and as a result of the increased use of computers, PCs now come with a wide range of hardware. Any type of hardware demand can be met by vendors. The entire project is built utilizing specialized tools or languages and databases that are available in a variety of formats. A preliminary investigation of a system looks into the viability of a system that can be valuable to a company. It is the starting phase of the system development process. As a result, the system is put through three tests: operating, technical, and economic. Any project is beneficial if and only if it meets the needs of the organization. Any new system setup just has to communicate and collaborate with other supporting systems. Any new system setup just has to communicate and collaborate with other supporting systems. Because it sends the correct information to the right user at the right time, the new system meets all existing operations. The technique is simple to use for a Normal man. Technical feasibility determines if the required technology is available and, if so, whether it is viable to complete all project operations. A system's technical requirements include:

1. The facility to produce outputs in a given time.
2. Ability to process large numbers of transactions at a particular speed.
3. Giving responses to users under certain conditions.

Our system requires the most recent versions of browsers as well as any operating system. These advances are available, and they aid in the execution of the framework. The economic feasibility of a framework examines if funds are available for implementing the new framework and whether the money invested is recoverable. The cost is related to the design and development of a good investment for the company. As a result, the proposed system's hardware requirements are quite conventional. Furthermore, utilizing the proposed approach to complete work quickly will boost

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and save an organization's important time. Finance is necessary for the installation of the software in the suggested system, which can be recovered by constructing a better system.

V. CONCLUSION

PRSs are one of a method that adoption to deal with the problem of information overload in e- commerce. The purpose of PRS is providing buy recommendations to help electronic stores customers to avoid wasting time and confusion among many products available in store. Provide accurate recommendations will cause to Careful selection of the product by the customer.

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