

Machine Learning Integrated Online Shopping Application

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Abstract: Online shopping has obtained a major role in 21st century. Most of the people are busy and wants to buy products sitting at home at their comfort zone. Most people prefer online shopping than offline shopping. So, our project ML integrated online shopping application, helps sellers, who don't have their own website for their store. This application is more applicable for sellers, than the customers. This would help the small sellers to grow their business in their locality and all over country as well. The data is stored in centralized database managed by the application developers. Machine Learning is integrated to this application to recommend products to several customers, which will help the sellers grow their business.

Keywords: E-commerce, Machine learning, online shopping, user interface.

1. Introduction

At present, online shopping has brought a lot of changes to our society. People sticks to online shopping, like Amazon, Flipkart etc. to buy daily essentials and branded products as well. People prefer to buy products online, as its time saving, and products are reached to their door steps, with less cost compared to stores outside. They have made a good user interface, where most of them finds it easy to use their services. It even allows shop owners to sell on these big e-commerce sites, where there are some regulations to follow, still helpful.

Since there are lot of advantages, disadvantages cannot be ignored. Many small-scale shop owners feel difficult to grow the business through these online services, as they may not reach to many users. So, we have come up with an idea, that would help such shop owners. They need have only basic knowledge about computers, they can make a website for their store by using this application. This application allows seller to choose their style for website, and can host it in a domain at free of cost. This application also has machine learning model embedded in it, which many e-commerce like Amazon and Flipkart and movie streaming application like Amazon prime, Netflix etc., uses to reach a product to more similar users, which will gradually increase their profits or sales.

A. Problem Statement

The problem statement is to create a shopping application at very easy steps with zero investment which has similar features as already existing application such as Amazon and Flipkart.

B. Existing System

The existing system is Shopify, which provides machine learning model in robust way. Even it is helpful, the seller needs to pay for their service, and there are no one time pay as well. The user needs to pay unless they need their services. Even they want a website, they have to pay to the developers to create one.

C. Proposed System

The proposed features to the existing system is, this application provides most features, what is required for selling products and to boost the selling online for free of cost.

D. Objectives

The objectives of this ML integrated online shopping application are to provide machine learning features of Amazon or Flipkart to normal website of the store owner. ML data are received from the customers, after their interaction with the website, like purchasing, rating etc. These data are used train ML model, that is in this case recommendation system, and provide output to the customers, that is to recommend the product that the customer may like or would purchase. It will recommend to all the customers which are having similar place of interest. This would help to sellers to develop good marketing strategies, and eventually they would end up in growing their business as before.

2. Literature Survey

A. Optimizing Search Engines using Click through Data

The paper introduced the problem of ranking documents with respect to a query using not explicit user feedback but implicit user feedback in the form of click through data. The author presented the Ranking SVM Algorithm to solve the proposed ranking problem. The paper has stimulated much follow-up research, and the Ranking SVM Algorithm has been widely

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used for many applications, as evidenced by the very large number of citations.

B. Human-centered design

Human-centered design (HCD) is a design philosophy that seeks to place the end user at the center of the design process. Human-centered design is a practical, iterative approach to arriving at innovative solutions.

The main goal of HCD is to increase the usability of the product in order to create maximum user satisfaction and increase the safety performance of the device.

C. Dynamic pricing model for electronic business

Dynamic pricing is the dynamic adjustment of prices to consumers depending upon the value these customers attribute to a product or service.

The main message of this paper is that the market is ready for dynamic pricing with different models offered.

D. Design and Implementation of Online Shopping System Based on B/S Model

B/S structure (Browser/Server) is one hidden client mode after WEB development. This kind of network structure mode unifies WEB browser as the client-side in order to integrate the core part of system function realization to the server.

The front and back functions of this system are powerful, which making online shopping more efficient, and can meet many business requirements, such as commodity management, online browsing and online purchasing. It has certain application value for establishing small-scale e-commerce websites.

E. Customer satisfaction in online shopping

Customer satisfaction is defined as a measurement that determines how happy customers are with the company's product or services.

The purpose of this study is to develop loyalty in customers so they may promote the service, and would also be a regular customer.

3. Methodology

In this section the implementation, system design, system architecture and dataflow are explained.

A. High-level design

It aims to show case the basic idea how the project would work. It explains in a brief and understanding way, what the person or organization using this service can do or should do.

The high-level design of this ML integrated online shopping application is shown in the fig. 1. At the end of system design all the major data structures, file formats, output formats, as well as the major modules in the system and their specifications are decided.

Fig. 1 shows the system architecture of ML Integrated Online Shopping Application. The user chooses the design of their website, then they become an admin, after downloading the resources from our website. Once they create the website, they can add products and stuffs, which they want to sell. They can

manage their website, payments and customers.

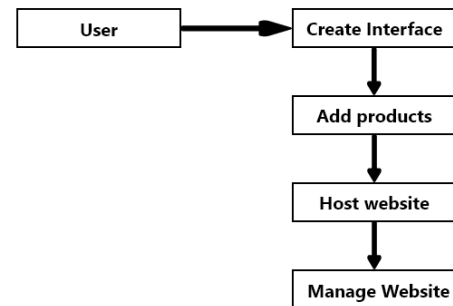


Fig. 1. High-level design

B. Data-flow diagram

Data-flow is plan that how a project will work. We can even say it as a blueprint for any project. These helped the developers and the guides to understand what basically this application would work. The data-flow diagram for ML integrated online shopping application is shown in fig. 2.

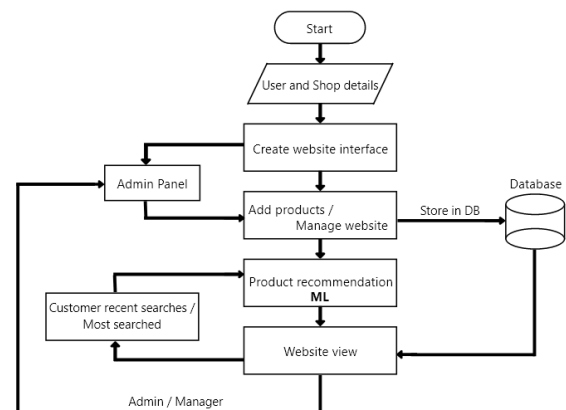


Fig. 2. Data-flow diagram

In ML Integrated Online Shopping application, seller needs to create an account in the application. After creating account, they have to choose the style for their website, and enter store details. After that, they need to deploy it, where the steps are mentioned in the application, the steps to deploy simple and DIY steps. Once the deployment is completed, the seller needs to add products to their website. At the beginning no data will be sent to ML model, as no purchasing is done. Once the website gets visitors, they do search and purchasing, these data will be sent to dataset, which is stored in database. So, these data will be used to train ML models, and give the sellers what they wanted.

4. Result

Once the application was completed, it more important to be tested. There were many tests undergone, the tests were basic and simple and it should match the objectives of the project. Table 1 shows the tests this application was gone through.

Every test has the procedure, some conditions to be followed, expected results and whether that test passes or failed.

Normally, the application should pass all the test, as that are the requirements, if it fails, those things needs to be corrected and tested again. ML integrated online application has passed all the tests that is mentioned in table 1.

Table 1
Test results

Sl. No	Test Procedure	Pre-Condition	Expected Result	Passed/ failed
1	Click sign up with Valid details	---	User account will get created	Passed
2	Click sign up with invalid details	---	Invalid signup	Passed
3	Click login with valid details	User account should exist	Successful login	Passed
4	Click login with invalid details	User account should exist	Invalid login	Passed
5	Recommend user-may-like product	User should have either searched or purchased a product before	User views the recommended product	Passed
6	Click on purchase button	User should have selected products and kept it the bag	Purchase successful	Passed

Discussing about tests, all tests received positive outcome, which were:

- To check whether the sign up was working with both the inputs, that are with valid details and invalid details
- Then to check the same for login details with both

valid and invalid details.

- Tests were conducted by doing test orders and rating the products to check whether the application was recommending the products to users. The application was successful is passing the test.
- The purchasing was working fine, the sellers used to get the orders at time of testing.

As the application has passed all tests, it is ready to used publicly, still can be improved in future.

5. Conclusion

This application was built for the purpose to encourage small scale vendors, who are facing difficulties in selling their products in their locality itself due to emergence of big e-commerce companies which provides easy and time saving shopping features. This application would be helpful to those sellers, who wish to sell products online, and have an Amazon like website for their shop at zero investment. Until now, this application is a basic application, which will be improved and have more good features added to this application.

Most of the things are covered in this paper about the application, its features, architecture, data-flow and tests and its results. Hope this paper would be helpful for future references and to add more things to this application.

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