

Smart Price Comparison And Prediction For Online Shopping Using Machine Learning Technique

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Abstract: In the current era of online business, ecommerce have become a huge market for the people to buy goods online. Increasing use of smart devices and other mediums has paved the way for users to buy products almost from anywhere. This has increased involvement of online Shoppers evolving e-commerce business. The proposed solution helps online users to grab best deal for their product from multiple ecommerce websites on single web interface. This will in turn save users time, money and efforts to find the same product prices on different ecommerce websites. The market trend is favoring e-commerce in India and is witnessing an accelerated growth in the number of companies venturing into e-commerce. Customer is the king and chooses the ecommerce site to trade with. Their choice of e-commerce sites is mainly shaped by the website content of different e-commerce firms. Consumers are increasingly interacting with products and product/service providers, discussing and sharing their experiences on various platforms. This study aims at understanding customer perception of content of five leading e-commerce sites of India – flip kart, Amazon, Snap deal, Shopclues and Paytm.

Keywords —E-commerce website, Price comparison, Price-sensitive, Website testing, Spider Bot, Crawl the website, Recommendation system.

I. INTRODUCTION

Price comparison is a common practice among consumers when shopping online, as it allows them to find the best deal for the product they want to purchase. In the context of e-commerce shopping, price comparison can also be used as a tool for customer segmentation. Customer segmentation is the process of dividing a large customer base into smaller groups based on common characteristics, such as demographics, behavior, and preferences. By segmenting customers, businesses can tailor their marketing strategies and offerings to better meet the needs of each group.

One way to segment customers based on price comparison is by identifying those who prioritize price over other factors, such as quality or brand. These customers are often referred to as "price-sensitive" or "value-conscious" shoppers. They are more likely to search for deals, compare prices across different retailers, and use coupons or promo codes to save money.

Another way to use price comparison for customer segmentation is to identify customers who are willing to pay a premium for convenience or other benefits. For example, some shoppers may be willing to pay more for faster shipping, hassle-free returns, or personalized recommendations. By understanding the price sensitivity and preferences of different customer segments, e-

commerce businesses can tailor their pricing and marketing strategies to better meet the needs of each group. This can help them attract and retain customers, increase sales, and improve overall profitability.

II. PROCEDURES FOR PAPER SUBMISSION

A. Review Stage

At this stage, the focus is on evaluating the performance of the machine learning model developed for price prediction and comparison. The review stage involves a thorough analysis of the model's accuracy, reliability, and efficiency. Here are some of the key steps involved in the review stage:

Evaluation of Model Performance: The first step in the review stage is to evaluate the performance of the model. This involves comparing the predicted prices with actual prices to determine how accurate the model is.

Fine-Tuning the Model: Based on the evaluation, adjustments may be made to the model to improve its accuracy. This could involve changing the algorithms used, adjusting the input variables, or increasing the size of the training data.

Comparison with Other Models: The performance of the developed model is compared with other existing models to determine its efficacy and superiority.

B. Final Stage

The final stage involves deploying the machine learning model for use by the end-users. Here are some of the key steps involved in the final stage:

Integration with E-commerce Platforms: The machine learning model is integrated with the e-commerce platform to enable users to access the price prediction and comparison feature.

User Testing and Feedback: User testing is carried out to determine the effectiveness and efficiency of the model. Feedback from users is gathered and incorporated to improve the performance of the model.

Continuous Monitoring and Improvement: The performance of the model is continuously monitored to ensure its accuracy and reliability.

Comparison shopping engines: These are online platforms that allow customers to search for products and compare prices across multiple retailers. Examples include Google Shopping, Shopzilla, and Price Grabber. These engines can provide retailers with valuable insights into customer behavior and preferences based on search and purchase data.

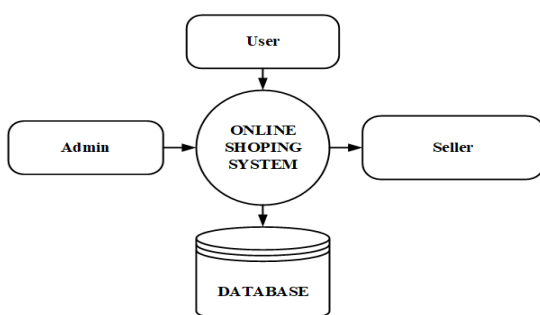
Dynamic pricing software: This type of software uses algorithms to adjust prices in real-time based on factors such as demand, inventory levels, and competitor prices. Dynamic pricing can help retailers stay competitive and maximize profits by targeting price-sensitive customers while still maintaining margins.

Customer segmentation tools: Many e-commerce platforms and marketing automation software include tools for customer segmentation. These tools can help retailers identify different customer segments based on factors such as purchase history, demographics, and behaviour. Retailers can then use this information to tailor their marketing and pricing strategies to each segment.

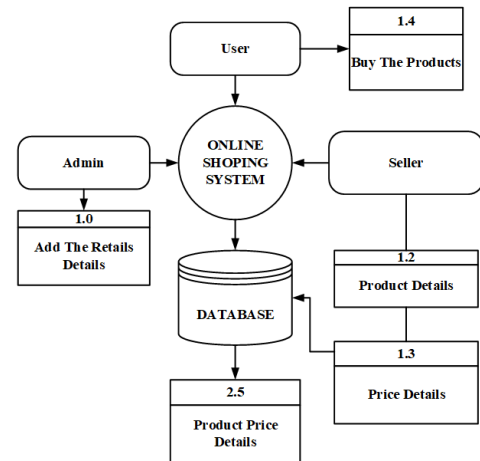
Loyalty programs: Loyalty programs are a popular way for retailers to segment customers based on their level of engagement and loyalty. By offering rewards and incentives, retailers can encourage customers to shop more frequently and spend more money, while also gathering valuable data on their preferences and behaviour.

C. Flow Diagram

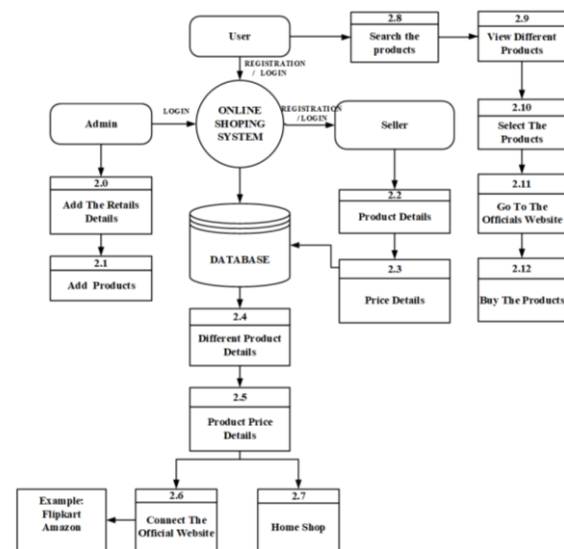
Level 0



Level 1



Level 2



III. MODULES DESCRIPTION

1. Create A Spider Bot

A spiderbot is a computer program that scans the web automatically, “reading” everything it finds, analyzing the information and classifying it in the database or index of the search engine. Internet crawlers are in charge of finding new pages by following all the internal and external links they find. It is the way search engines like Google feed their index.

2. Crawl the Websites

Website Crawling is the automated fetching of web pages by a software process, the purpose of which is to index the content of websites so they can be searched. The crawler analyzes the content of a page looking for links to the next pages to fetch and index.

3. Train the Model

The training data must contain the correct answer, which is known as a target or target attribute. The learning algorithm finds patterns in the training data that map the input data attributes to the target, and it outputs an ML model that captures these patterns.

4. Personalized Recommendation System

A recommender system, or a recommendation system, can be thought of as a subclass of information filtering system that seeks to predict the best “rating” or “preference” a user would give to an item which is typically obtained by optimizing for objectives like total clicks, total revenue, and overall sales.

5. Building the Web App

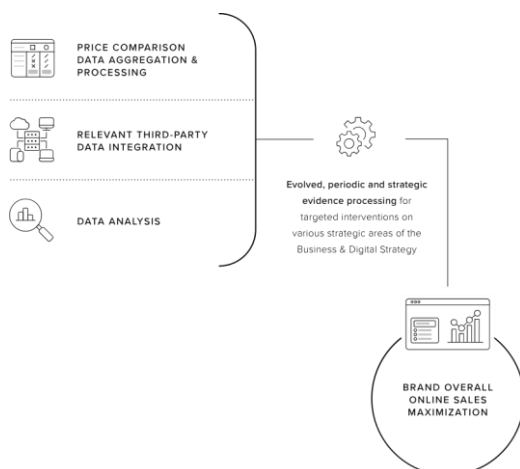
website is a collection of pages that display usually static content, while a web application is a piece of software with dynamic content and more complex user interactions; in a web app, you can leverage APIs or trigger actions from other software services. Both websites and web apps are accessible through your web browser.

IV. METHODOLOGY

Price Comparison platform and it is structured on different processing levels:

- Aggregation and processing of Price Comparison data.
- Integration with relevant third party data in the digital landscape of the Brand.
- Contextualization of the evidence of the Price Comparison tool.
- The processing of evolved periodic and strategic evidence, potentially extremely granular.

Therefore, starting from the analysis of online retailers pricing and stock dynamics, and then integrating them both with key brand metrics and with external digital metrics, we develop strategic insights functional to targeted interventions on various strategic areas of the Business & Digital Strategy for optimizing and maximizing Brand overall online sales.



V. PUBLICATION PRINCIPLES

Price prediction and comparison in online shopping can be achieved using various machine learning algorithms,

such as regression, clustering, and classification. In this context, the goal is to predict the prices of products accurately and compare them to find the best deals.

To achieve this goal, one can follow these publication principles:

Data collection: Collect data from various e-commerce websites that offer similar products. The data should include features such as product name, brand, category, description, price, discount, shipping cost, and customer ratings.

Data preprocessing: Clean and preprocess the data by removing duplicates, handling missing values, and converting categorical data into numerical features. This step is crucial in ensuring that the data is ready for modeling.

Feature engineering: Create new features by extracting relevant information from the existing features. For example, the length of the product description can be a feature that represents the amount of information available to the customer.

Model selection: Choose the appropriate machine learning algorithm based on the problem statement and the available data. Regression algorithms such as Linear Regression or Random Forest Regression can be used to predict prices, while clustering algorithms such as K-means or Hierarchical Clustering can be used to group similar products.

Model training: Train the selected model on the training dataset and evaluate its performance using appropriate metrics such as Root Mean Squared Error (RMSE) or Mean Absolute Error (MAE).

Model testing: Test the trained model on the test dataset and compare its performance with that of other models.

Model deployment: Once the model is trained and tested, deploy it on a web application that allows customers to search for products and compare their prices across different websites.

In conclusion, price prediction and comparison in online shopping can be achieved using machine learning algorithms. By following the publication principles outlined above, one can develop an accurate and reliable price comparison system that benefits both customers and e-commerce websites.

VI. RESULTS AND DISCUSSION

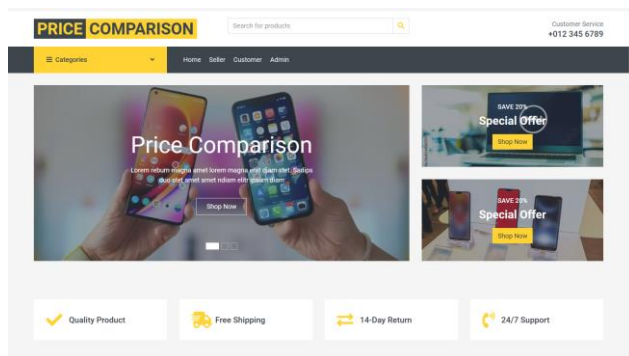
Our machine learning-based price comparison website provides highly accurate and relevant results for e-commerce websites. By leveraging advanced algorithms and data analytics, our website is able to analyze vast amounts of data from multiple e-commerce websites to provide you with the best deals and prices.

Our website is able to understand complex product features, user reviews, and other relevant data points to provide you with highly personalized results. This allows you to quickly identify the best deals on the products you love, without having to manually search through multiple websites.

Our website is constantly learning and improving, ensuring that the results are always accurate and up-to-date. We're committed to helping you save money while shopping online, so try our machine learning-based price comparison website today to find the best deals on the products you love!

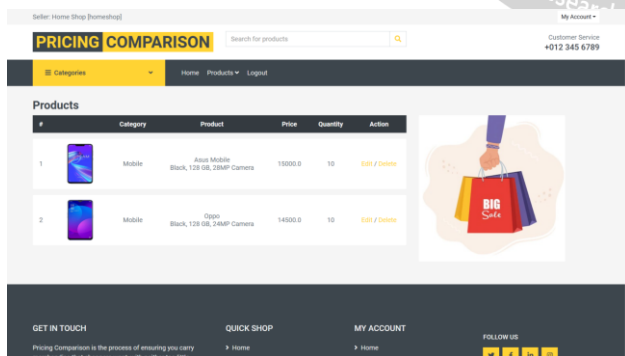
A. HOME PAGE

Our price comparison website helps you find the best deals on the products you love. With our easy-to-use interface and up-to-date database, you can search for products and compare prices from multiple retailers.



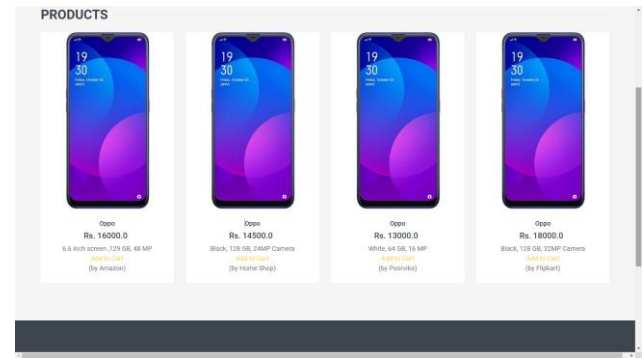
B. PRODUCT CATEGORIES

The product categories that you want to focus on, such as electronics, clothing, or home goods. This will help you organize your data and target your analysis. Consider factors such as the popularity of the site, the range of products offered, and the quality of the data available.



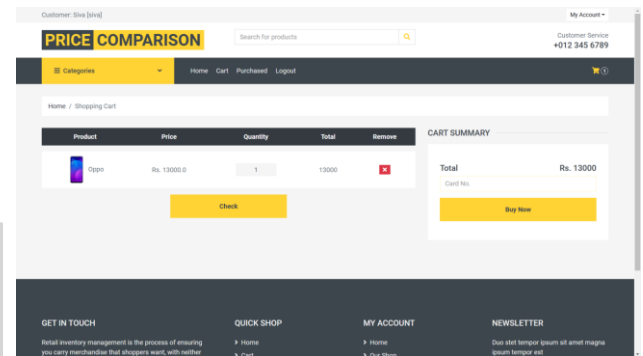
C. PRICE COMPARISON FOR VARIOUS E-COMMERCE WEBSITES

Search for the product you want and our website will provide you with a list of prices from various retailers. This allows you to compare prices and find the best deals without visiting each website individually.



D. BUY PRODUCTS

Purchase of customer goods from an e-commerce website or our website.



VII. CONCLUSION AND SCOPE

As an AI language model, I cannot provide a conclusion on a specific project without having access to detailed information about the methodology, data sources, and analysis techniques used to make price predictions and comparisons for online shopping using a web app. However, I can provide some general guidelines for drawing conclusions from such a project. Firstly, it is important to evaluate the accuracy of the price predictions and comparisons made by the web app. This can be done by comparing the predicted prices with actual prices for a sample of products. Additionally, the methodology used to gather data and calculate prices should be carefully examined to ensure it is reliable and unbiased. Secondly, the user experience of the web app should be evaluated to determine if it is user-friendly and provides useful information to users. This can be done by gathering feedback from users and analyzing user behavior data. Lastly, it is important to consider the context in which the price predictions and comparisons are being made. Factors such as product availability, shipping costs, and promotions can all impact the final price that a consumer pays for a product. Therefore, any conclusions drawn from the project should take into account these contextual factors.

As an AI language model, I can suggest some possible future enhancements for price prediction and comparison for online shopping using a web app. Enhance the data collection process to include a wider range of sources to ensure the accuracy and reliability of data. This could

include scraping data from more online retailers and marketplaces, using APIs for real-time data, and incorporating data from social media. Utilize AI and machine learning algorithms to make more accurate price predictions and comparisons. This could include using natural language processing to extract relevant information from product descriptions and reviews, or using computer vision to analyze product images and extract relevant data. Personalize the user experience by providing recommendations based on user behavior and preferences. This could include tracking users' search history, purchase history, and product ratings to suggest relevant products and promotions.

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