

ONLINE SHOPPING ANALYSIS AND PRODUCT PRICE COMPARISON USING WEB

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ABSTRACT: As technology advances and e-commerce expands quickly nowadays, a variety of online shopping portals that offer door-to-door delivery to customers are now available. However, because there are so many websites, it takes a long time for a user to locate good things at a reasonable price. The provided application will include a user-based system that collects prices for the same item from several websites, giving the user the best choice, and tracking the user's purchasing history to propose goods the user is most likely to buy. Consequently, time is saved while also offering a user-friendly interface and a chatbot to respond to frequently asked questions and assist with navigation.

Keywords: application, chatbot, customers, e-commerce, websites

1.1 INTRODUCTION:

In recent years, online shopping has astonishing growth. what will happen to the internet Increasingly accessible worldwide, the number of online Shoppers and e-commerce platforms are growing rapidly. You can choose from a wide range of products Websites give users choices. We select the best prices for products available online. A lot of time and effort is spent in doing so. The products you need are available on various e-commerce sites. This post introduces a shopping platform. Uses powerful web scraping techniques, incredible Features that save users time and unnecessary tedium you have to look it up and find the best price for you product. Our system continuously checks prices Updated and offer users the best price products in real time. Adoption of notification system Notify users of price drops at any time It happens. Navigate multiple platforms. Online shopping can be counterintuitive, confusing, and cluttered time consuming. Navigation is seamless in our system Through chatbots developed with machine learning algorithm. This helps users navigate platform while providing a smooth user experience shopping. In addition, we offer personalized A recommendation system that improves shopping Experience suggesting products to users based on their products interest. Our system uses analytics tools that track provide a user's purchase history and detailed purchase history User-oriented analyticsto assist user

2. RELATED WORK :

Several methods related to product e commendations, Web scraping and chabot checked. feature Improve the usability and efficiency of your shopping platform Improve the user's shopping experience.

2.1 A personalized recommendation system

A personalized recommendation system does more than just convince provide customers through appropriate recommendations, it also helps sellers grow and improve theirsales Overall quality of the shopping platform. Other types of recommendation systems were

investigated. Content-based, rule-based, collaborative filtering recommended system. An e-commerce recommender system can be built using multi-agents with different behaviors A task called MAPRS, but the system has a special It has the drawback of being static and having security issues

2.1.1 Web mining - Web scraping and web crawling

Extracting data from web pages. These techniques are implemented by different researchers for different purposes [Four]. Scraping a web page with Python requests, nice Soup, selenium offers high accuracy with the best offerings E-commerce offers for customers from various websites

2.1.2 Google Shopping System

This system was launched by Google in December 2002 with the aim of providing a common place for all products online between different sellers. Users can enter search queries and search for individual products, browse departments, and view products on sale [6]. It ranks different products offered online on different shopping sites, then ranks them based on their relevance, including your search terms and other activity on the web. Google. Users can access regularly updated merchant product information through Google Shopping. The most powerful features of this system are

1) Powerful: [Fig:1]Google Shopping is a powerful tool that uses Google search technology to help you locate and research items from retailers. retail online throughout the site before directing you to where you can buy them.

2) All-Inclusive: You will find a wide variety of items, from everyday to rare.

3) Powerful: You'll see pictures of related items and links to other details, including the stores that sell them, almost immediately after you search. However, some aspects of this system are not always beneficial to the user. The system does indeed provide results for a wide variety of products on different websites, but the system results under the "Sponsored" label are ranked and grouped by their advertising payments to Google, according to the government their books . This can be a hindrance for users and also affect their purchasing choices.

Google Shopping System products based solely on their relevance with search. Although Google tracks products purchased by users to provide personalized product recommendations that we would like to include in our system, the Google Shopping system does not provide a means for users to Analyze and display purchase history records. Our system works to provide users with a more visual comparison of products using graphical analysis tools as well as displaying the user's purchase history in the form of user-friendly graphs user friendly.

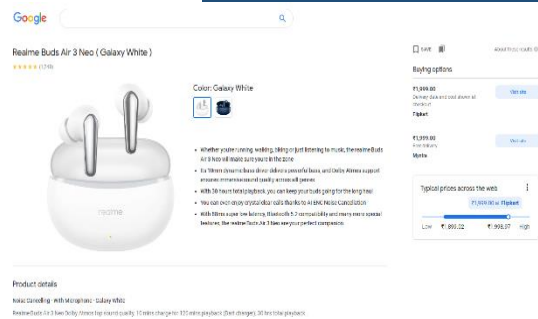


Fig 1: Google shopping

2.1.3 Pennywise System

This system has been suggested in research paper [Fig:1], which compares products on five different websites and provides results for users to make an efficient purchase. The system can provide results quickly and efficiently. The overall accuracy of the system is also accurate. Figure -2: The Pennywise system However, this system has many limitations that we try to eliminate in our system. The Pennywise system provides accurate results, but there is no way to sort and filter the displayed results. Our system implements filtering, thus providing results that are more relevant to the user's budget and choice. The Pennywise system is also a completely search-based system that does not track user preferences and purchases. Our system includes these features by including a user-based application that tracks a user's purchase records to not only provide purchase history analysis, but also recommend products by how to use machine learning recommendation system. Furthermore, our system also allows users to keep track of their products of interest and have the option of being notified when products are on sale.

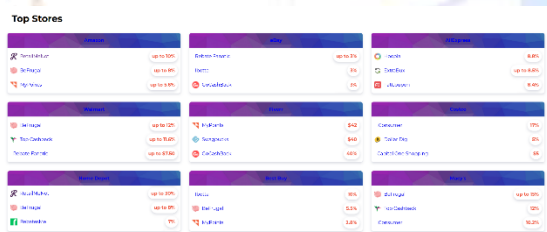


Fig 2: Pennywise System

2.1.3 GUO Yan-yan, LIU Qi-cheng, "E-commerce:

Guo Yan-yan and Liu Qi-cheng presented their work "E-commerce Personalised Recommendation System Based on Multi-Agent" at the Seventh International Conference on Fuzzy Systems and Knowledge Discovery (FSKD 2010).

The study suggests a multi-agent technology-based personalised recommendation system for online shopping. User agent, product agent, and recommendation agent are the system's three key parts. User information and comments are gathered by the user agent, product information is managed by the product agent, and personalised suggestions are created by the recommendation agent based on user preferences and product features.

In addition, a hybrid recommendation system that combines content-based filtering with collaborative filtering is suggested in the study. The system initially creates a collection of possible items using suggestions using content-based filtering.

2.1.4 Boris Galitsky, Dmitry Ilvovsky, "

Chatbot with a Discourse Structure-Driven Dialogue Management", proceeding of EACL 2017 software: Boris Galitsky and Dmitry Ilvovsky presented their work "Chatbot with a Discourse Structure-Driven Dialogue Management" at the 2017 European Chapter of the Association for Computational Linguistics (EACL) conference.

The study suggests a chatbot system that manages interaction using discourse structure. The system is predicated on the notion that conversational answers may be generated with the aid of discourse structure.

To determine a conversation's discourse structure, the system combines rule-based and machine learning methodologies. A graph is used to depict the discourse structure, with each node denoting a conversational turn and each edge denoting the link between turns. The system makes advantage of discourse structure to provide suitable replies.

2.1.5 Leo Rizky Julian, Friska Natalia, "The use of web scraping in computer parts and assembly price comparison", 2015 3rd International Conference on New Media:

Leo Rizky Julian and Friska Natalia delivered the paper "The use of web scraping in computer parts and assembly price comparison" at the 2015 3rd International Conference on New Media.

The study examines the use of web scraping methods to get information on the costs of computer assemblies and components from different online vendors. Consumers may get the cheapest prices on computer components and assembly by using a price comparison tool that was developed using the data that was gathered.

The authors explain web scraping, a technique for extracting data from webpages using automated technologies. Web scraping, they say, may be a potent tool for data collecting, but if it isn't done with the website owner's consent, it can also be unethical and illegal.

2.1.6 Shakra Mehak, Rabia Zafar, SharazAslam,Sohail Masood Bhatti, "Exploiting Filtering approach with Web Scrapping for Smart Online Shopping", 2019 international Conference on Computing, Mathematics and Engineering Technologies – iCoMET 2019.

At the 2019 International Conference on Computing, Mathematics and Engineering Technologies (iCoMET 2019), Shakra Mehak, Rabia Zafar, Sharaz Aslam, and Sohail Masood Bhatti presented their paper titled "Exploiting Filtering Approach with Web Scrapping for Smart Online Shopping." In order to create an intelligent online shopping system, the paper suggests combining a filtering approach with web scraping techniques. Users can search for products, compare prices across different online retailers, and filter results based on their preferences and other criteria using the system. The authors explain the technique of "web scraping," which entails using automated tools to extract data from websites. They clarify that web scraping can be utilized to gather product details and costs from a variety of online merchants, which can be used to give users a

2.1.7 Google shopping,

wekepedia, [https://en.wikipedia.org/wiki/Google Shopping](https://en.wikipedia.org/wiki/Google_Shopping) An overview of Google's e-commerce service may be found in the Google Shopping article in Wikipedia. Users may search for items and compare prices from various online stores using Google Shopping. The website was first introduced in 2002 under the moniker "Froogle," and it was then renamed Google Product Search in 2007 and Google Shopping in 2012. The programme gathers data on items and pricing from online shops using web crawling and data feeds. When people use Google's search engine to look for items, the information is then shown in search results. Retailers may use Google Shopping to market their goods on the Google AdWords network. Advertisements for product listings that are featured in search results can be made by retailers.

2.1.8 Julian McAuley, UCSD, "Amazon product data" 2018,

<http://jmcauley.ucsd.edu/data/amazon/links>

Julian McAuley, a professor of computer science at the University of California, San Diego, developed the reference [7]. The tool gives users access to datasets on Amazon items that may be utilised for data science, machine learning, and e-commerce-related research.

Datasets for a range of product categories sold on Amazon are included in the website's databases, together with product details, reviews, ratings, and metadata. The data is offered in a variety of forms, including JSON, SQLite, and CSV. Researchers and practitioners in the domains of e-commerce, data science, and machine learning frequently utilise and use the site as a source of data for conducting research studies and experiments. For academics, having access to such broad and varied databases is crucial.

2.1.10 Jianmo Ni, Jiacheng Li, Julian McAuley, "Justifying

recommendations using distantly-labeled reviews and fine-grained aspects", Empirical Methods in Natural Language Processing (EMNLP), 2019.

An academic article that was presented at the 2019 Empirical Methods in Natural Language Processing (EMNLP) conference is the source [8]. Jianmo Ni, Jiacheng Li, and Julian McAuley are the paper's authors. The article outlines a unique method for defending suggestions generated by a recommender system that makes use of evaluations with vague labels and fine-grained features. The suggested method makes use of NLP methods to extract fine-grained details from product evaluations and then use them to produce reasons for the system's suggestions.

The authors test their methodology on a sizable dataset of Amazon products and show that it beats current justification techniques in terms of efficacy and efficiency. Also, the report provides insights into the contributing causes through a thorough examination of the reasons that were provided.

3. SYSTEM ARCHITECTURE:

The system consists of three different components namely price comparison tools, chatbots and analyzers, meet all of our functional requirements register. The two components of price comparison and analyzer is coupled into a single module, while chatbot works as a standalone module. The database consists of a user-based database that is run online on a cloud machine accessible by firebase database. All modules have access to this database at each report their independent activities. Price comparison tool is a Simple module for extracting prices through multiple sites to offer the best price while tracking products of user interest using independent users based on wishlist database.

An online tool for comparing product prices often consists of a number of parts that work together to provide consumers the functionality they want. A simple system design for an online utility for comparing product prices is shown below

1. User Interface: The user interface is built using HTML, CSS, and JavaScript, and is powered by the Django web framework. Users can search for products, browse product listings, and view pricing information.

2. Data Acquisition: This component gathers information from e-commerce websites using web scraping techniques. Using BeautifulSoup and Scrapy are two Python modules that may be used to scrape product information from vendor websites such as Tesco, SainBury's, Morrisons

3. Data Storage:

With a relational database sql lite, the information gathered from numerous sources is kept. It is simple to communicate with the database and carry out CRUD (Create, Read, Update, Delete) activities Django's ORM (Object-Relational Mapping). you define your database schema using Python classes, called models. Each model corresponds to a table in the database, and its attributes represent columns in the table. You can define relationships between models, such as one-to-many or many-to-many relationships, using foreign keys and intermediate tables.

4. Data processing:

website collect and process data from multiple sources, such as e-commerce platforms to provide accurate and up-to-date information on product prices, availability, and features. collected data is processed to remove duplicates, correct errors, and standardize formats. This step is important to ensure that the data is consistent and accurate. website combines data from multiple sources into a single dataset. This step involves matching products based on unique identifiers, such as UPC codes. This website presents the data in a user-friendly format, such as tables, graphs, or comparison charts.

5. Price Comparison: This feature displays information to the user in an approachable way when comparing the costs of goods from various sellers. The data may be manipulated and compared using Python modules like Pandas, and dynamic HTML pages can be produced using Django's templating engine.

6. Analytics and Reporting: To enhance the operation of the system, this component gathers information about user activity and system performance using technologies like Google Analytics and produces reports.

7. Integration: To offer a comprehensive end-to-end solution, the system may need to interface with external systems like payment gateways or shipping suppliers. Payment processing may be done using Python packages like Stripe and Braintree, and shipping providers can be contacted via APIs.

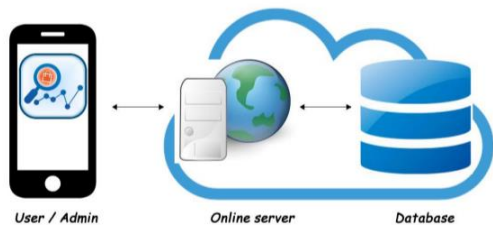
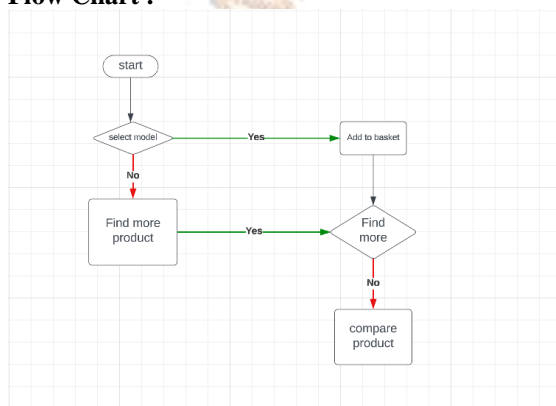


Fig 3: SYSTEM ARCHITECTURE

Flow Chart :



3.1 Analyser Module :

This module is about comparison and exploits the different prices of different products through web pages, to display to users, using web python selenium miner and nice soup module also track user preferences in the form of products type used to provide recommendations of similar products, which users are most likely to purchase based on based on user directory database [7][8]. Along with this, the the module has access to the user's purchase records, which are then used to display graphical user purchase records for better data analysis

3.2 Wishlist and History :

A wishlist is an implemented user-specific array of data use online database, store all user data products of interest as well as their websites, that then the user can navigate at any time, while product history for similarly deployed users mode to track all products purchased by the user can be analyzed using graphical tools.

1. Select a product, enter a threshold price for it, and add notification list for users.
2. Add products to notification list with threshold price and hyperlink.
3. Repeat steps 1 and 2 to add more products notification list.
4. For each product listed in the announcement, check the price use real-time hyperlinks with BeautifulSoup
5. Store retrieval prices in database for tracking price trends.
6. If the price of the product is lower than the threshold price, the user is notified by e-mail.

7. Repeat steps 3 to 6 for all users.
8. Automate the whole scenario.

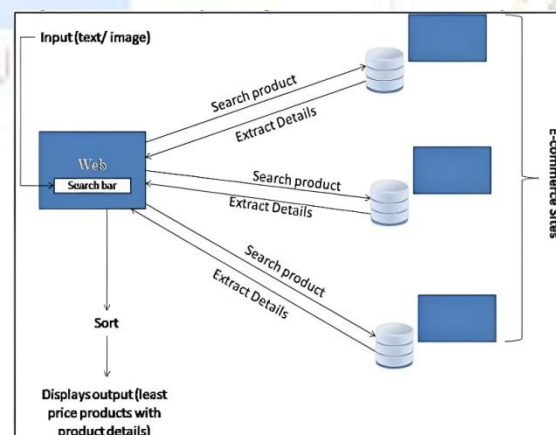
3.3. Notification :

The user will add the product to the notification list and The notification system will notify the user whe nevertheprice

Recommendation System Recommendation system based on collaborative filtering method that aggregates options information from a large number of users to predict profit per product [6]. Product benefits are based on on the basis of classification of products originating from the user's purchase history and mapped to those with similar model based on user data set [7][8]. The The nearest neighbor algorithm is used to map this relationship Introduce products to users. Algorithm 4: Suggestion System Algorithm Dataset cleaned by deleting records with Nan values and remove columns like `user id`. 2 The details of each product are then mapped to one of the seven categories and added to the dataset. 3 The data set is then shuffled and trimmed at a ratio of 80-20 to development test training of the model. K The nearest neighbor model is trained and tested on database. 5 For each user, history tables can be accessed for retrieval user product information. 6 This user report is used for prediction and production proposed products of the KNN model. 7 Results are displayed to the user.

Web Scrapping :

1. Move the name of the product to look up to Selenium driver.
2. Remove product labels, prices and images using the web XPath and class elements.
3. If the product falls under a special category, then for case by case, the product details are scraped using XPath of the respective web elements.
4. Add product details to the list.
5. Repeat Steps 2 and 3 for each product displayed on the page.
6. Return a list of product details. Products are different in the way they are displayed by their category. So to distinguish product type, product archive web element details changed. To include such change in web elements, Special cases have been made to make the algorithm function.



4. RESULT AND DISCUSSIONS

The proposed system compares and displays the prices of a product from different e-commerce sites. top search The results are displayed to the user on a single interface. The visualization of product prices helps users determine Best price for a product. The system redirects users to the original site of a particular product, in the case of a user choose to buy any product. Average time taken by users to search and It is enough to compare the price of a product on different websites high, while our system takes time to get the price of products on the same page averaging 5.8 seconds. Souses can get the best price of a product within 5 seconds. In addition, users are informed about the price reduction of a product interested in email notification systems. Thus, our application saves time and inconvenience caused for users when searching and comparing product prices online.

Product Name	Price	Quantity	Total
Apple iPhone 12 Pro Max (128GB) - 5.12.2020	11.50	1	11.50
Apple iPhone 12 Pro Max (128GB) - 5.12.2020	11.50	1	11.50
Apple iPhone 12 Pro Max (128GB) - 5.12.2020	11.50	1	11.50
Apple iPhone 12 Pro Max (128GB) - 5.12.2020	11.50	1	11.50
Apple iPhone 12 Pro Max (128GB) - 5.12.2020	11.50	1	11.50
Apple iPhone 12 Pro Max (128GB) - 5.12.2020	11.50	1	11.50
Apple iPhone 12 Pro Max (128GB) - 5.12.2020	11.50	1	11.50
Total	48.00	4	48.00

CONCLUSION

Online shopping platform that allows users to find the best available price of a product on the internet easily. EQUAL there are many e-commerce sites available with thousands of products, our system uses powerful Scrap technology and analysis to determine the best price of a product. Consistent app interface helps users to avoid unnecessary trouble to navigate through various sites while searching for the best available price. Date unify search results from different platforms at the same time single destination, it becomes extremely easy to use communication. Our built-in notification system the app provides a much more consistent and allows users to track their favorite prices for some products. User communication notification system discounts whenever it happens. From now on, reduce the inconvenience of registering for different items on the site only to be informed about the discount. online Shopping platforms not only determine the best products price but it also allows to improve personal hopping experience in recommending different products for users to use personalized recommendation system analysis track user's purchase history and offers Detailed analysis helps users maintain purchase budget and evaluate their buying habits. Browse multiple platforms while shopping Online is often not intuitive and time consuming. Hence in Our app's navigation is transparent Chatbot developed using machine learning algorithms. He supports the users in navigating the platform and providing a Smooth user experience while shopping. So our system is can reduce time and effort in finding the best price for a product from different websites. When it comes compare the price of a product, recommend a product and product price tracking, with a large number of features available in our system, it becomes a unique solution for frequent online shoppers.

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