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E-Commerce Price Comparison System

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Abstract: *Price comparison websites are designed to compare the prices of goods and services from multiple providers, helping consumers make informed purchasing decisions. With the increasing adoption of online shopping, especially among individuals with busy lifestyles, users prefer platforms that save both time and effort. Consumers are generally inclined toward purchasing products at lower prices, making price comparison systems highly valuable.*

This paper presents an E-Commerce Price Comparison System that enables users to compare product prices across multiple online platforms in real time using web scraping techniques. The system extracts product details dynamically and highlights the best available deals. By eliminating the need to manually browse different websites, the proposed system helps users save time, effort, and money while improving the overall online shopping experience..

Keywords: Web Scraping, E-commerce, Price Comparison

I. INTRODUCTION

A price comparison website acts as a platform or medium between consumers and sellers. It allows consumers to view different price lists for the product chosen by the user and helps them make an informed decision about which option to choose in order to save money. It also serves as a tool to increase consumers' price awareness, ensuring that they are not misled by advertisements from retailers who claim to offer the lowest price when the reality may be different. Unlike other comparison sites, the **E-commerce Price Comparison Website** (the name of this project) focuses on providing a price list of products that users want to search for online and purchase at a cheaper price.

Due to the rapid growth of internet usage, such systems are especially useful for people with busy work schedules who do not have enough time to check product prices across multiple online platforms. According to recent digital reports, India had **about 1.03 billion internet users by the end of 2025, representing approximately 70% internet penetration**. Additionally, India has **over 1.06 billion mobile connections and around 500 million social media users**, showing the widespread adoption of digital technologies among the population.

This rapid digital growth indicates that consumers are increasingly relying on the internet for information, communication, entertainment, and online shopping. As a result, price comparison platforms can significantly help users identify the best deals available online. These websites also act as promotional channels for retailers, stores, supermarkets, and other businesses by directing customers to their platforms.

In today's economy, where the cost of living continues to rise and people have limited time for traditional shopping, price comparison systems become extremely valuable. Most working individuals do not have enough time to visit multiple stores or browse several online platforms to compare product prices manually. Therefore, a centralized platform that compares prices from different sellers can save both **time and money** for consumers while increasing price transparency in the market.

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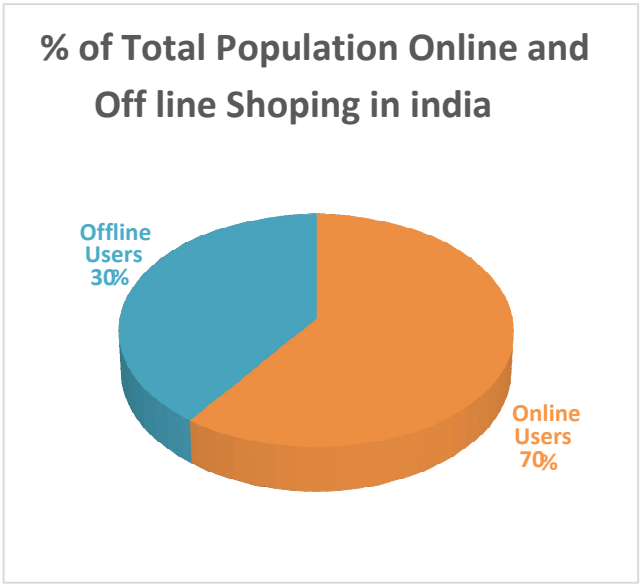

Total Population of India

(Data according to 2026)

II. LITERATURE SURVEY

The literature review is a critical component of any research study as it provides an overview and synthesis of existing work in the domain of web scraping and e-commerce price comparison systems. It helps in identifying existing methodologies, tools, and research gaps while supporting the proposed system design.

The study in [1] discusses the use of web scraping for computer parts price comparison, enabling users to analyze prices across multiple platforms efficiently. An overview of various web scraping techniques and tools is presented in [2], highlighting their applicability in data extraction from different web sources. The work in [3] focuses on extracting unstructured web data and converting it into usable formats for analysis.

A framework combining tag and value similarity for improved data extraction accuracy is introduced in [4]. The research in [5] explores web crawlers, including their taxonomy, challenges, and performance issues in large-scale data collection. A semantic scraping model for extracting meaningful web resources is proposed in [6], enhancing data interpretation.

The system presented in [7] extracts topics and terms from unstructured data, which is useful for analyzing large datasets obtained through scraping. Development of web and mobile applications for comparing e-commerce products is discussed in [8], focusing on improving accessibility and user experience. A novel web scraping approach is introduced in [9], improving efficiency and reliability in data extraction.

The work in [10] highlights how web scraping can facilitate economical decision-making by comparing prices across platforms. Market-level analysis of digital comparison tools and their effectiveness is presented in [11], providing insights into competition and user benefits. Pricing strategies and platform fee regulations are analyzed in [12], which are relevant for understanding e-commerce pricing behavior.

Comparison websites and their role in modern online shopping ecosystems are discussed in [13] and [14]. Context-based web content extraction techniques are explored in [15], improving the accuracy of retrieved data. The integration of e-commerce networks with price comparison systems is examined in [16], showing enhanced decision-making capabilities for users.

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The study in [17] investigates pricing discrimination strategies using big data technologies in e-commerce platforms. Supply chain pricing models and service-level agreements are analyzed in [18], which influence product pricing across platforms. Finally, economic models related to advertising and pricing strategies are discussed in [19], providing theoretical support for price comparison mechanisms.

Overall, the literature survey indicates significant progress in web scraping technologies and price comparison systems. Existing studies emphasize efficient data extraction, real-time processing, and improved user decision-making. However, challenges such as handling dynamic websites, ensuring data accuracy, and reducing latency still exist. The proposed system aims to address these challenges by implementing a real-time web scraping-based price comparison platform without relying on stored databases, thereby ensuring up-to-date and reliable information for users.

III. SYSTEM ARCHITECTURE

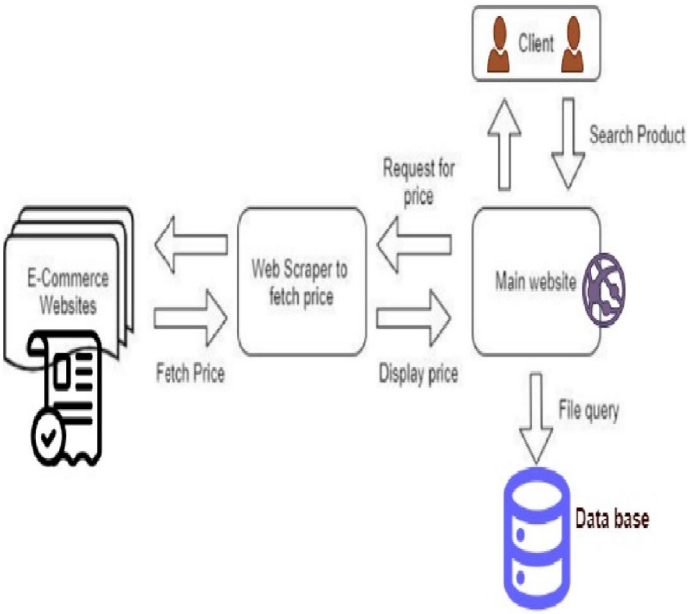
The system architecture of the proposed price comparison system is designed to enable real-time data retrieval and efficient interaction between system components. The architecture consists of two main components: the frontend interface and the backend processing unit.

The frontend is developed using React and provides a graphical user interface through which users can search for products. When a user enters a query, the request is sent to the backend server for processing. The backend is responsible for handling user requests and triggering the web scraping module.

The web scraping module, implemented using Selenium, extracts product information such as price, title, and product links from multiple e-commerce websites in real time. Unlike traditional systems, the proposed architecture does not rely on a local database to store product information. Instead, data is dynamically retrieved for each user request, ensuring that the displayed results are always up-to-date.

Once the data is extracted, it is processed and formatted before being sent back to the frontend. The results are then displayed in a structured format, allowing users to compare prices from different platforms in a single view. This architecture ensures improved accuracy, reduced data redundancy, and efficient real-time performance.

Figure 1: System Architecture



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IV. METHODOLOGY

The development of the proposed real-time e-commerce price comparison system is carried out through a structured methodology consisting of multiple stages, ensuring systematic design, implementation, and evaluation.

A. Project Planning (Stage 1)

In the initial stage, the problem statement is identified, focusing on the difficulty faced by users in comparing product prices across multiple e-commerce platforms. The objective of the system is defined as providing a unified platform for real-time price comparison. The scope and feasibility of the project are analyzed, considering technical constraints, available tools, and development timeline. A study of existing technologies and tools such as web scraping frameworks and automation libraries is conducted through literature review to determine the most suitable approach for implementation.

B. Data Gathering and Analysis (Stage 2)

In this stage, detailed analysis is performed to understand how e-commerce websites display product information such as price, ratings, and offers. Various websites are examined to identify patterns in HTML structure and dynamic content loading mechanisms. The study also includes analysis of existing price comparison platforms to understand their functionality and limitations. Insights gained from this stage help in designing efficient scraping logic and selecting appropriate tools such as Selenium for handling dynamic web content.

C. Study of Existing Systems (Stage 3)

A comprehensive study of existing price comparison systems and web scraping-based applications is conducted to understand their working principles. This includes analyzing how data is extracted, processed, and presented to users. The limitations of existing systems, such as dependency on stored data and lack of real-time updates, are identified. This analysis helps in defining the improvements and unique features of the proposed system.

D. System Design and Component Identification (Stage 4)

In this stage, the major components of the system are identified and designed. The system consists of a frontend interface developed using React, a backend service responsible for handling user requests, and a web scraping module implemented using Selenium. Unlike traditional systems, the proposed system does not rely on a database for storing product data; instead, it retrieves data dynamically for each user query. The user interacts with the system through a search interface, and relevant product details are displayed in a structured format.

E. System Architecture Development (Stage 5)

The overall architecture of the system is designed to ensure efficient data flow and scalability. The user sends a search request through the frontend interface, which is processed by the backend server. The backend triggers the web scraping module to fetch product data from multiple e-commerce websites in real time. The extracted data is cleaned, processed, and returned to the frontend for display. This architecture ensures real-time data retrieval, reduced storage dependency, and improved accuracy of results.

V. WEB SCRAPING MODULE

Web scraping plays a crucial role in the proposed system by enabling automatic extraction of product information from e-commerce websites. The system uses Selenium-based automation to navigate web pages, handle dynamic content, and retrieve product details such as price, title, ratings, and product links.

Unlike traditional scraping methods that rely on static HTML parsing, Selenium allows interaction with JavaScript-based websites, making it suitable for modern e-commerce platforms. The extracted data is then processed to remove inconsistencies and formatted for better readability. This approach ensures accurate and real-time data collection without manual intervention.

VI. EXPECTED OUTCOME

The expected outcome of the proposed system is a functional web-based application that allows users to compare product prices from multiple e-commerce platforms in a single interface. When a user searches for a product, the

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system retrieves relevant data from various websites and displays it in a structured and user-friendly format. This enables users to identify the best available deal quickly and efficiently.

The system also provides direct redirection links to the original product pages, allowing users to proceed with their purchase seamlessly. By leveraging web scraping and real-time data retrieval, the system eliminates the need for manually visiting multiple websites, thereby saving time and effort.

Overall, the system aims to enhance the online shopping experience by providing accurate, real-time price comparisons and simplifying the decision-making process for users.

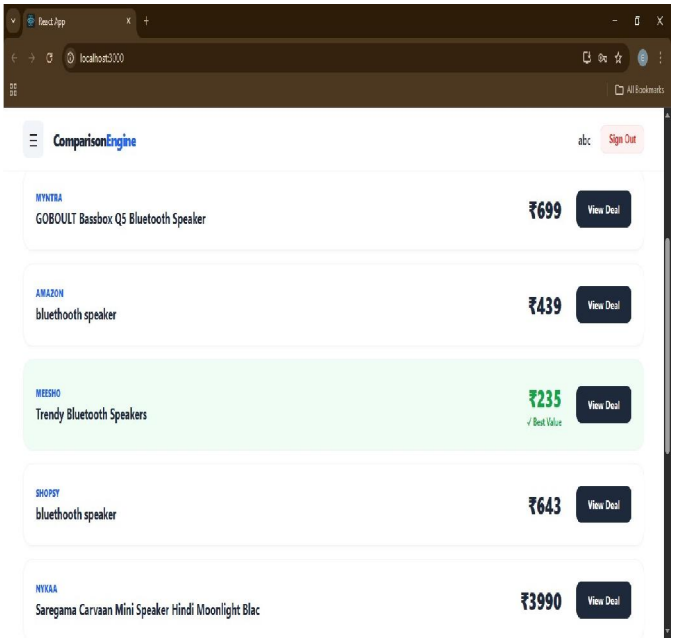

Figure 2: E-commerce Price Comparison Website Using Web Scraping

VII. PROJECT FEATURES

The proposed system is designed to provide an efficient and reliable platform for real-time price comparison across multiple e-commerce websites. One of the key features of the system is its ability to retrieve product prices dynamically in real time, ensuring that users always receive the most accurate and up-to-date information available. Unlike traditional systems that rely on stored databases, this approach eliminates outdated data and reflects live pricing directly from online platforms. The system also incorporates data cleaning and processing techniques, where extracted price values and product details are standardized, formatted, and organized to improve readability and consistency for users.

Another important feature is the multi-platform product search capability, which allows users to search for a specific product and simultaneously view results from various e-commerce platforms in a unified interface. This significantly reduces the effort required for manual comparison across different websites. The backend of the system uses automated web scraping powered by Selenium, enabling the system to navigate through web pages, extract relevant product information, and handle dynamic website elements without human intervention. Additionally, the system supports dynamic data retrieval, meaning that every user request triggers fresh data extraction instead of relying on previously stored information, thereby improving reliability.

The frontend of the application is developed using React, providing a user-friendly and interactive interface that enhances the overall user experience. The interface is designed to be simple, intuitive, and responsive, making it accessible even for non-technical users. Furthermore, cross-origin resource sharing (CORS) is implemented in the backend to ensure smooth communication between the frontend and backend components, enabling seamless data

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exchange and system integration. These combined features make the system efficient, scalable, and suitable for real-world applications.

VIII. LIMITATIONS

Despite its effectiveness, the proposed system has several limitations that must be considered. One of the major challenges is the frequent change in the structure of e-commerce websites. Since the system relies on web scraping techniques, any modification in the HTML structure, class names, or layout of the target websites can cause the scraping scripts to fail, requiring continuous monitoring and updates. This makes maintenance an ongoing and essential task for ensuring system reliability.

Another limitation is the restricted coverage of e-commerce platforms. The system can only retrieve data from websites that have been explicitly integrated into the scraping mechanism. As a result, products available on other platforms will not be included in the comparison results, limiting the comprehensiveness of the system. Additionally, many websites implement anti-scraping mechanisms such as CAPTCHA verification, bot detection systems, and request rate limiting. These security measures can block or restrict automated data extraction, thereby affecting the performance and effectiveness of the system.

Performance delay is also a notable concern, as the system retrieves data in real time for each user query. This may result in slower response times, especially when fetching data from multiple websites simultaneously or when network conditions are poor. Furthermore, there are legal and ethical considerations associated with web scraping, as some websites prohibit automated data extraction in their terms of service. This can limit the long-term scalability and deployment of the system. Lastly, the system is highly dependent on a stable internet connection, and any disruption in connectivity can prevent it from functioning properly.

IX. FUTURE WORK

The proposed system offers several opportunities for future enhancements that can significantly improve its functionality, performance, and user experience. One of the primary improvements is the integration of additional e-commerce platforms, which would expand the scope of product comparison and provide users with a wider range of options. Increasing platform coverage would enhance the usefulness and competitiveness of the system in real-world applications.

Another potential enhancement is the development of a mobile application for Android and iOS platforms. A mobile version of the system would provide greater accessibility and convenience, allowing users to compare prices on the go. Additionally, implementing a price alert notification system would enable users to track specific products and receive alerts when prices drop or when special offers become available, thereby helping them make cost-effective purchasing decisions.

The incorporation of machine learning techniques can further improve the system by enabling personalized product recommendations based on user preferences, search history, and buying behavior. This would transform the system from a simple comparison tool into an intelligent recommendation platform. Future versions can also include integration of product reviews and ratings from multiple platforms, providing users with additional insights into product quality and user satisfaction.

Another valuable enhancement is the implementation of historical price tracking, where past price data is stored and analyzed to display trends and fluctuations over time. This would help users determine the best time to purchase a product. Moreover, adopting advanced web scraping techniques or official APIs can improve data accuracy, reduce latency, and ensure better adaptability to changes in website structures. These enhancements would make the system more robust, scalable, and user-centric.

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X. CONCLUSION

In conclusion, the proposed real-time price comparison system provides an effective solution for simplifying the online shopping experience by enabling users to compare product prices across multiple e-commerce platforms in a single interface. By leveraging web scraping techniques and real-time data retrieval, the system ensures that users have access to accurate and up-to-date information, allowing them to make informed purchasing decisions. The integration of automated data extraction, dynamic processing, and a user-friendly interface significantly reduces the time and effort required for manual price comparison.

This system is particularly beneficial for individuals with limited time, such as working professionals, as it allows them to quickly evaluate product options and identify the best deals available. In addition to benefiting consumers, the platform also provides opportunities for vendors to promote their products and highlight ongoing offers. By bringing together pricing information from multiple sources, the system enhances transparency and efficiency in the online shopping process.

Overall, the project demonstrates the practical application of web scraping and real-time data processing in e-commerce. It combines technological efficiency with user convenience, making it a valuable tool for modern consumers. With further enhancements and improvements, the system has the potential to evolve into a comprehensive and intelligent shopping assistant, contributing to a more streamlined and effective online marketplace.

REFERENCES

[1] L. R. Julian and F. Natalia, "The use of web scraping in computer parts and assembly price comparison," in *Proc. 3rd Int. Conf.*, 2017.

[2] A. V. Saurkar, K. G. Pathare, and S. A. Gode, "An overview on web scraping techniques and tools," *Int. J. Future Comput. Sci. Commun. Eng.*, 2018.

[3] G. N. Chandrika, S. Ramasubbareddy, and K. Govinda, "Web scraping for unstructured data over web," in *Embedded Systems and Artificial Intelligence*, Springer, 2020.

[4] S. Swami and P. Vidap, "Web scraping framework based on combining tag and value similarity," *Int. J. Comput. Sci. Issues*, vol. 10, no. 6, pp. –, Nov. 2016.

[5] R. Nath and K. Chopra, "Web crawlers: Taxonomy, issues & challenges," *Int. J. Adv. Res. Comput. Sci. Softw. Eng.*, vol. 3, no. 4, pp. 944–948, Apr. 2017.

[6] J. I. Fernandez-Villamor, J. Blasco-Garcia, C. A. Iglesias, and M. Garijo, "A semantic scrapping model for web resources," Spain.

[7] R. K. Lomotey and R. Deters, "RSenter: Tool for topics and terms extraction from unstructured data debris," in *Proc. IEEE Int. Congr. Big Data*, 2017.

[8] A. Ambre, P. Gaikwad, K. Pawar, and V. Patil, "Web and Android application for comparison of e-commerce products," 2019.

[9] R. Dhawani, M. Shukla, P. Puvar, and B. Prajapati, "A novel approach to web scraping technology," *Int. J. Adv. Res. Comput. Sci. Softw. Eng.*, vol. 5, no. 5, May 2018.

[10] S. Saeed, M. Naqvi, and M. Memon, "E-commerce web-scraping to facilitate consumers for economical choices," *Int. J.*, 2020.

[11] CMA, "Digital comparison tools market study: Final report," 2018.

[12] R. Gomes and A. Mantovani, "Regulating platform fees under price parity," Working Paper, Univ. Toulouse, 2020.

[13] M. R. Wildenbeest, "Comparison sites," *On the Horizon*, 2014.

[14] K. B. Grant, "Which price comparison shopping is the best?," 2014.

[15] A. Pouramini and S. Nasiri, "Web content extraction using contextual rules," in *Proc. Int. Conf. Knowledge-Based Modeling and Innovation*, IEEE, 2019.

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[16] L. Beranek and R. Remes, "E-commerce network with price comparator sites," in *Proc. 9th Int. Conf. Adv. Comput. Inf. Technol. (ACIT)*, Czech Republic, 2019, pp. 401–404, doi: 10.1109/ACITT.2019.8779865.
[17] P. Wen, "Seller's pricing discrimination strategies under adoption of online big data technology," in *Proc. Int. Conf. E-Commerce and E-Management (ICECEM)*, China, 2021, pp. 201–206, doi: 10.1109/ICECEM54757.2021.00047.
[18] F. Bao, D. Chen, H. Miao, and Y. Chen, "TPL service level and pricing models in manufacturer-retailer supply chains," in *Proc. Int. Conf. Management of e-Commerce and e-Government*, China, 2010, pp. 333–337, doi: 10.1109/ICMeCG.2010.75.
[19] M. A. Arnold and L. Zhang, "The unique equilibrium in a model of sales with costly advertising," *Economics Letters*, 2014.