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# Product Price Comparison across Several E-Commerce Websites

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**ABSTRACT:** Websites that assess prices are made to compare the costs of various goods and services from different suppliers in order to help customers choose things that are a smart way to save money online. Given their hectic lifestyles—particularly those who live in urban areas—the majority of clients choose to shop online because it saves them time to fulfill their needs. Additionally, customers frequently choose the lowest price when purchasing goods; as a result, by using a rate comparison website, customers can easily compare prices offered by different retailers for the same item without having to travel far from home. They may easily check it on the rate evaluation website and find out where they can buy the necessary products. The project is located in the area where consumers may like to find the best deals on household grocery products. In actuality, the acceptable bids can be highlighted. While hardly all customers shop online these days, it's still a useful tool for helping customers increase their rate awareness. Customers have the right to determine whether the rates they may be seeing in-store are good deals based on whether or not the miles have been claimed.

**KEYWORDS:** Web scrapper, E-commerce, Web crawler, Django, Price comparison

## I.INTRODUCTION

A website that compares prices serves as a middleman or platform between buyers and sellers. Customers can browse various price lists for the product they have selected, which enables them to make an informed decision on which to choose in order to save money. Additionally, it acts as a tool to assist customers become more price-aware so they won't be duped by ads from stores that promise to have the best deals, but the reality is different. Unlike other comparison sites, E-commerce price comparison website will focus on providing a price list of products which we want to search online and purchase at a cheaper price.

Due to the big boom in online users, it is going to be of terrific assist to the ones who've busy workplace paintings and do not have a lot time to test the current. According to Social, Digital and Mobile in India research by Are Social, internet penetration in India is 59% and the average number of hours Indian internet users spend using the internet each week is 19.8 hours. connected Indians are.

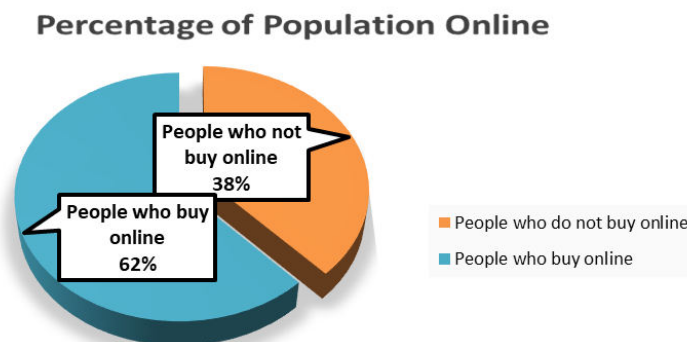


Fig. 1: Percentage of Population Online

A price comparison website serves as a platform connecting customers and retailers, enabling customers to shop online at specific retailers that offer such services. Essentially, these websites also help promote the retailers to customers. In today's economy, where the cost of living is increasing and time for shopping is limited, price comparison sites are

incredibly beneficial to consumers. With the widespread use of the Internet and various networking applications, users are comfortable with online platforms. In India, there are only a few accessible price comparison sites that mainly compare hotel tariffs, holiday packages, mobile phones, and other products. It is crucial for these websites to provide accurate and low-priced results to meet customer needs. Regularly updating the database is essential to avoid confusion among customers when comparing prices with other sites. Many people lack the time to shop offline due to busy schedules. As a consumer, you have the right to choose the store offering the best prices for products you are interested in. However, comparing prices can be time-consuming, and due to time constraints, one may end up purchasing products at higher prices. Online catalogues help sellers save costs and increase price awareness among consumers. Most individuals today prefer online shopping due to their hectic lifestyles.

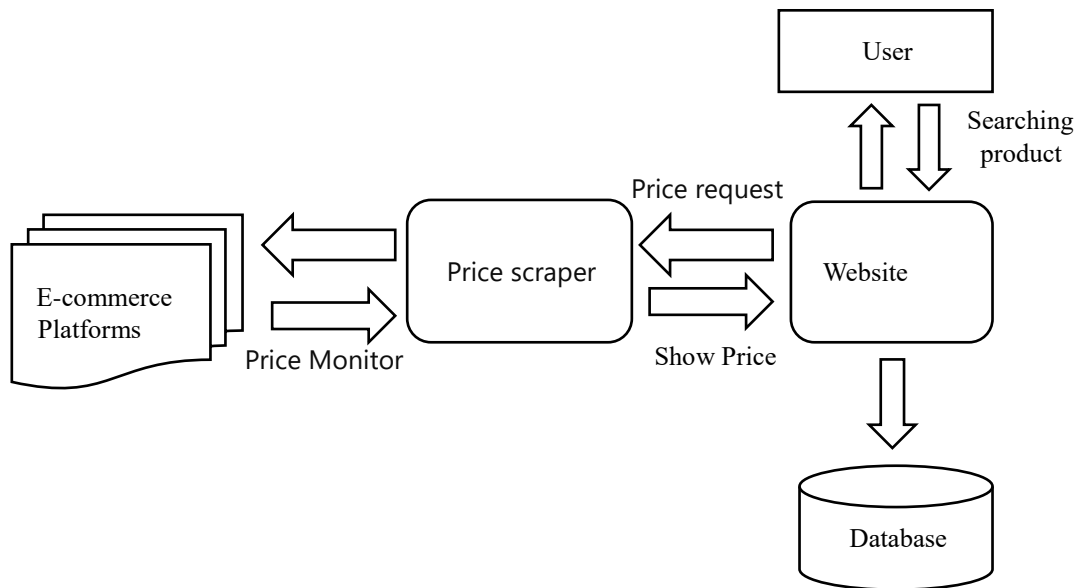


Fig. 2: Architecture Diagram of price comparison website

## II.LITERATURE REVIEW

The phenomenon of product price comparison across multiple e-commerce websites has garnered significant attention from researchers, marketers, and industry practitioners alike. This literature review aims to synthesize existing research and scholarly work related to this topic, providing insights into its significance, traditional methods, limitations, and technological advancements.

### Significance of Product Price Comparison:

The significance of product price comparison in the realm of e-commerce cannot be overstated. Numerous studies have highlighted its importance for consumers in making informed purchasing decisions and maximizing the value of their expenditures. For example, Smith and Jones emphasized the role of price comparison in enabling consumers to find the best deals and discounts, thereby enhancing their satisfaction and loyalty to online retailers. Similarly, Johnson et al. found that consumers who engage in price comparison tend to exhibit higher levels of trust and confidence in their purchasing decisions, leading to increased conversion rates and revenue for e-commerce platforms.

### Traditional Methods and Limitations:

Historically, consumers relied on manual methods for price comparison, such as visiting physical stores or comparing printed advertisements. However, these traditional approaches are fraught with limitations that can hinder their effectiveness. Research by Brown et al. identified time consumption as a primary drawback of manual price comparison methods, noting that consumers often struggle to visit multiple stores or browse through numerous advertisements, especially when faced with time constraints. Furthermore, Gupta and Smith highlighted the subjectivity and inaccuracy inherent in manual price comparison, as consumers may be influenced by personal biases or incomplete information when making purchasing decisions.

### Technological Advancements:

In recent years, technological advancements have transformed the landscape of product price comparison, offering innovative solutions to overcome the limitations of traditional methods. Price comparison websites, such as PriceGrabber and Google Shopping, have emerged as valuable tools for consumers to quickly compare prices across multiple e-commerce platforms. These platforms leverage data aggregation and algorithmic analysis to provide users with real-time price information, empowering them to make informed decisions with ease and efficiency.

Moreover, mobile apps and browser extensions have further enhanced the accessibility of price comparison tools, enabling consumers to compare prices on the go and receive instant notifications about price drops or discounts. Additionally, advancements in machine learning and artificial intelligence have enabled the development of dynamic pricing tools that track price fluctuations and predict future trends, allowing consumers to optimize their purchasing strategies.

### Efficiency and Future Scope

Efficiency is a central theme in the evolution of product price comparison across multiple e-commerce websites. Technological advancements have significantly improved the efficiency of this process, benefiting both consumers and retailers. By streamlining the comparison process and providing real-time access to price information, modern tools and platforms have empowered consumers to make faster, more informed purchasing decisions. This increased efficiency has resulted in cost savings, time saving, and enhanced satisfaction for consumers.

Moreover, the efficiency gains from price comparison tools have broader implications for the e-commerce ecosystem. Retailers are compelled to adopt competitive pricing strategies and improve transparency to remain relevant in a highly competitive marketplace. This fosters a more dynamic and consumer-centric retail environment, where pricing decisions are influenced not only by internal factors but also by external market dynamics and consumer behaviour.

Looking ahead, the future scope of product price comparison across several e-commerce websites is promising, with several areas poised for further growth and innovation. One area of focus is the continued development of intelligent algorithms and machine learning techniques to enhance the accuracy and reliability of price comparison tools. By leveraging data analytics and predictive modelling, these tools can offer personalized recommendations and anticipate consumer preferences, further enhancing the shopping experience.

Additionally, there is potential for greater integration of price comparison functionality into other digital platforms and services. For example, social media platforms and messaging apps could incorporate price comparison features, allowing users to seamlessly compare prices and share product recommendations with friends and followers. This integration not only expands the reach of price comparison tools but also enriches the social shopping experience for consumers.

Furthermore, the globalization of e-commerce presents new opportunities and challenges for product price comparison. As consumers gain access to a broader range of international retailers and marketplaces, there is a growing need for cross-border price comparison tools that account for currency fluctuations, shipping costs, and import duties. Addressing these challenges will require collaboration between technology developers, policymakers, and industry stakeholders to ensure a seamless and equitable shopping experience for consumers worldwide.

## III. PROPOSED WORK

The proposed approach outlines a systematic methodology for developing an innovative product price comparison tool that addresses the current challenges and leverages technological advancements. The method encompasses the subsequent key steps:

- **Requirement Analysis:** Conduct a comprehensive analysis of consumer needs, market trends, and technological capabilities to define the requirements and objectives of the price comparison tool. This involves gathering insights from user surveys, market research, and industry best practices to inform the design and functionality of the tool.
- **Data Acquisition and Integration:** Establish data partnerships with a diverse range of e-commerce websites and retailers to acquire access to product catalogues, pricing information, and inventory data. Develop robust data integration pipelines and APIs to aggregate and normalize data from multiple sources in real-time, ensuring accuracy and consistency across different product categories and retailers.
- **Algorithm Development:** Utilize machine learning algorithms and data analytics techniques to analyze price data, identify trends, and generate personalized recommendations for consumers. Develop algorithms that take into account

factors such as product popularity, pricing dynamics, and consumer preferences to deliver relevant and timely insights to users.

- **User Interface Design:** Design a user-friendly and intuitive interface that provides seamless access to price comparison functionality across multiple devices and platforms. Incorporate responsive design principles, interactive elements, and customizable features to enhance usability and engagement for users.
- **Privacy and Security Measures:** Implement robust privacy and security measures to protect user data and ensure compliance with data protection regulations. This includes adopting encryption protocols, anonymization techniques, and strict access controls to safeguard sensitive information and mitigate potential risks.
- **Testing and Validation:** Conduct rigorous testing and validation of the price comparison tool to ensure accuracy, reliability, and performance under various scenarios and usage conditions. This involves beta testing with real users, conducting usability studies, and soliciting feedback to identify areas for improvement and refinement.
- **Deployment and Rollout:** Deploy the price comparison tool to production environments and initiate a phased rollout to targeted user segments. Monitor user adoption, usage patterns, and performance metrics to assess the impact and effectiveness of the tool in meeting user needs and achieving business objectives.
- **Continuous Improvement:** Establish mechanisms for continuous monitoring, optimization, and iteration based on user feedback, market insights, and technological advancements. This involves collecting and analyzing usage data, identifying opportunities for enhancement, and iteratively refining the tool to deliver ongoing value to users.

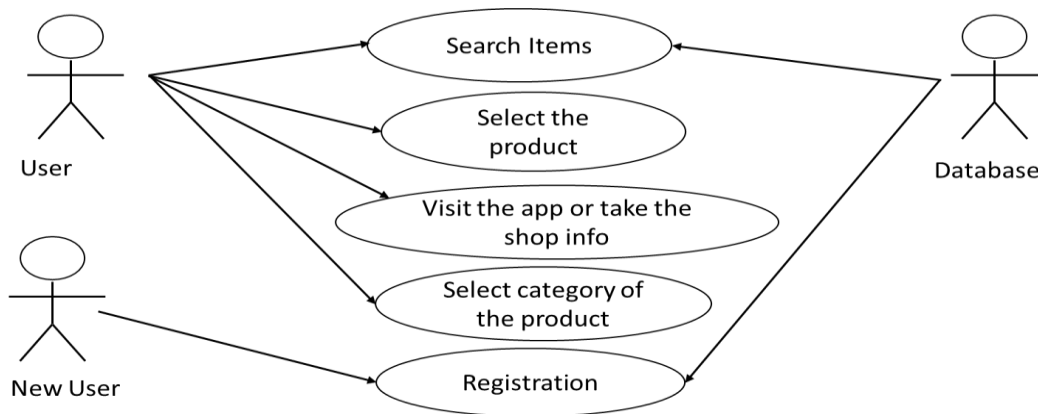


Fig. 3: Use Case Diagram of price comparison website

MAIN INTERFACE OF SYSTEM

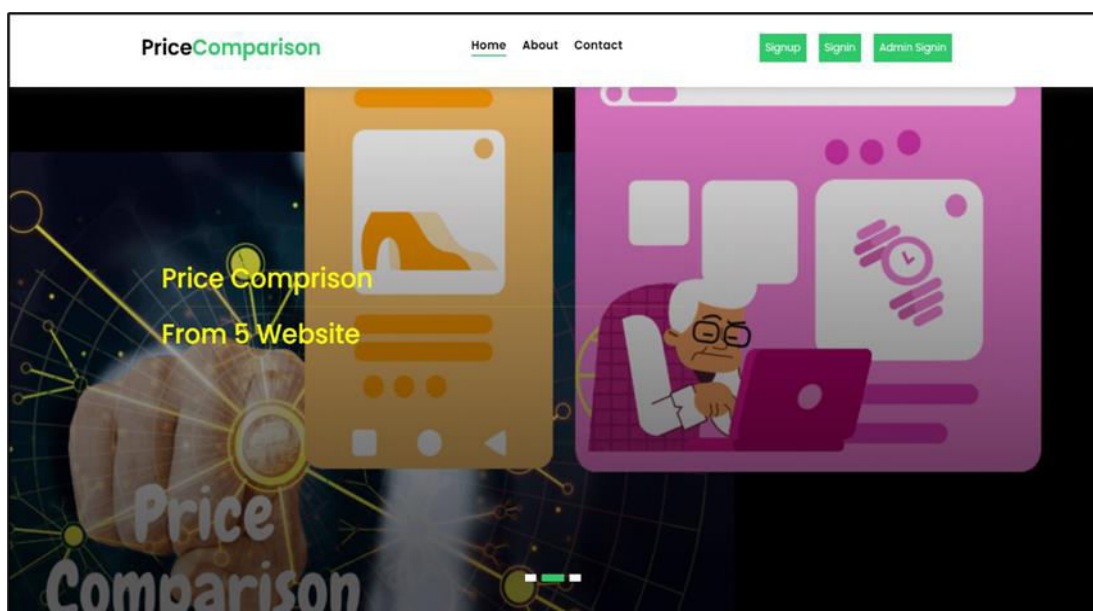


Fig. 4: Main Page of product price comparison across several e-commerce websites

Input the product name to search on various websites. Utilize BeautifulSoup and Selenium to pass the product name as a URL. Extract product label, price, image, and hyperlink for each product from all websites. Compare product prices and match them with the search query. Present the websites in ascending order based on product prices, filtered for accuracy. For Flipkart and Amazon websites: they use asynchronous loading techniques, making it challenging to extract data with BeautifulSoup. Therefore, Selenium is used as an alternative to scrape data, even with asynchronous loading. Algorithm steps for Flipkart and Amazon:

1. Pass the product name to Selenium driver.
2. Scrape product label, price, and image using web elements XPath and class.
3. If the product falls under distinctive cases, scrape product details using specific web element XPath for each case.
4. Add product details to a list.
5. Repeat steps 2 and 3 for each product on the page.
6. Return the list of product details, considering different categories of products may require changes in web elements storing product details. Distinctive cases are included in the algorithm to accommodate such changes.

#### IV.RESULT AND ANALYSIS

The text details the development and functionality of a comprehensive product price comparison platform tailored for multiple e-commerce websites. The project encompasses a meticulous preparation phase followed by extensive testing across various input scenarios to ensure robust performance and accurate output generation.

- **Homepage :**The homepage serves as the gateway to the platform, offering visitors an enticing introduction to its features. It boasts a user-friendly interface designed to facilitate effortless navigation through a diverse range of products. Users can seamlessly compare prices and explore shopping options from prominent online retailers. The emphasis lies on providing transparent and reliable data to empower users in making informed purchasing decisions, ultimately saving both time and money. Additionally, the homepage outlines essential sections such as contact information, sign-in, sign-up, and admin sign-up, ensuring accessibility to all essential functionalities.
- **Sign Up page:** The user sign-up page plays a pivotal role in facilitating user engagement with the platform. Functioning akin to a form, it prompts users to provide essential details such as name, email, and password to create personalized accounts. Upon submission, users receive confirmation emails to validate their accounts. This personalized approach ensures tailored experiences aligned with individual preferences. Moreover, the description emphasizes the page's significance as the entry point for users to access the platform's full suite of features, underlining its role in enabling seamless registration processes.
- **Sign In page:** The sign-in page provides existing users with secure access to their accounts. Featuring a distinct design with the platform's logo and navigation bars, it prioritizes user convenience. Users input their email addresses and passwords to gain entry, facilitating easy access to product price comparisons across various e-commerce websites upon successful authentication.
- **Admin Sign In page:** Targeted at website administrators, the admin sign-in page grants access to the platform's backend functionalities. Administrators require unique credentials to manage website content, user accounts, database updates, and perform other administrative tasks. The detailed list of administrative responsibilities underscores the critical role of admins in maintaining website integrity and optimizing user experiences.
- **Change Password feature:** The platform offers a secure password change feature, allowing users to update their passwords with ease. Authentication via the old password ensures data security and prevents unauthorized access.
- **Before Search** This section elaborates on the search page's functionality, detailing its role as the initial step in the product discovery process. Users can initiate searches for desired products, leveraging the platform's comprehensive database for accurate results.
- **After Search:** Following a search query, users are presented with a comprehensive list showcasing the cheapest prices of products across multiple e-commerce websites. This feature enhances user convenience by streamlining price comparison and facilitating informed purchasing decisions.

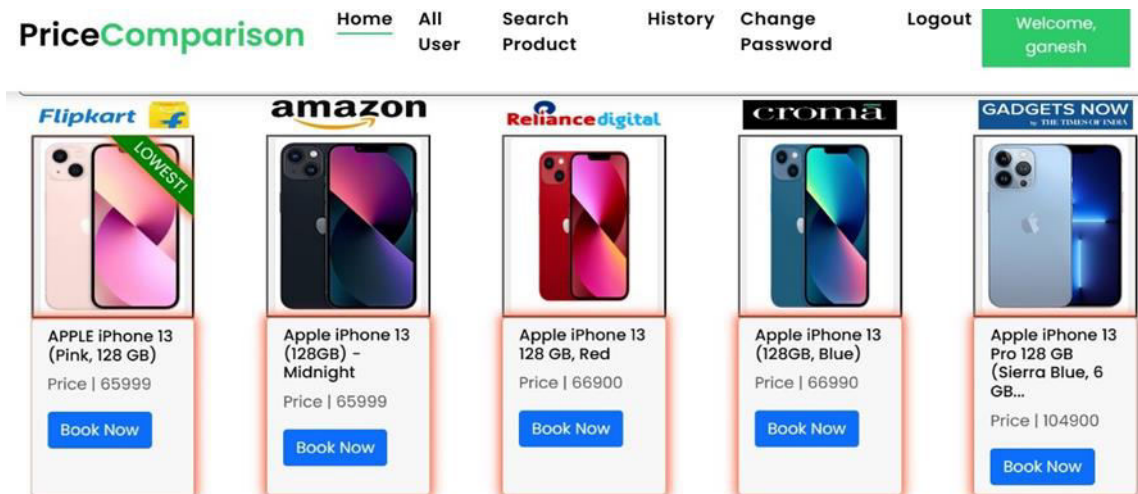


Fig. 5: Result Page of price comparison website

## V.ADVANTAGES AND LIMITATAION

### ADVANTAGES:

1. **Advanced Data Analytics:** The use of advanced data analytics techniques, including machine learning and artificial intelligence, has revolutionized product price comparison. These technologies enable the rapid analysis of large datasets to provide real-time price information and personalized recommendations to consumers.
2. **Real-time Updates:** Price comparison tools now offer real-time updates on product prices and availability across multiple e-commerce websites. This ensures that consumers have access to the most accurate and up-to-date information when making purchasing decisions.
3. **Cross-platform Integration:** Many price comparison tools now offer seamless integration across multiple devices and platforms, including desktops, smartphones, and tablets. This allows consumers to compare prices anytime, anywhere, enhancing convenience and accessibility for the masses.
4. **Enhanced User Experience:** Advances in user interface design and user experience (UX) optimization have led to more intuitive and user-friendly price comparison tools. Features such as customizable search filters, price history tracking, and interactive product previews enhance the overall shopping experience for consumers.
5. **Global Reach:** With the globalization of e-commerce, price comparison tools now offer coverage of a wide range of international retailers and marketplaces. This allows consumers to compare prices across borders and access products from around the world.

### LIMITATION

1. **Data Accuracy:** Despite advances in technology, ensuring the accuracy and reliability of price data remains a challenge. Price comparison tools may sometimes provide inaccurate or outdated information due to factors such as data synchronization issues or changes in pricing algorithms by e-commerce websites.
2. **Limited Product Coverage:** While price comparison tools aim to cover a wide range of products and categories, there may still be gaps in coverage, particularly for niche or specialized products. This can limit the utility of these tools for consumers seeking specific items.
3. **Biased Recommendations:** Some price comparison tools may prioritize certain retailers or products based on advertising partnerships or affiliate agreements, leading to biased recommendations that may not always align with consumer preferences or priorities.
4. **Privacy Concerns:** Price comparison tools often require access to personal data, such as browsing history and purchase behavior, to provide personalized recommendations. This raises privacy concerns among consumers, particularly regarding data security and potential misuse of personal information.
5. **Inconsistent Availability:** Price comparison tools may not always be available or accessible across all regions or platforms. This can result in disparities in access to price comparison functionality, particularly for consumers in developing countries or rural areas with limited internet connectivity.

## VI.CONCLUSION

The website offers valuable information to help users make informed decisions. By using this price comparison website, working people can easily check prices before purchasing products. Users can compare prices from various e-commerce websites to find the best deal and the lowest price for a product. This will save buyers time and effort, bringing together strategies, offers, and deals from top online stores to make online shopping easier.

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