

A Product Price Comparison

Neha P¹, Vijayalakshmi M M², Vijaya Nirmala³, Ruthika H G⁴, Rukmini Prakash Kalasad⁵, Gurunath D R⁶
^{1,2,3,4,5,6}Dept. of Computer Science, AMC Engineering College (Affiliated to VTU), Bengaluru, India.

Emails: pnehasai2004@gmail.com¹, vijaya.lakshmi@amceducation.in², vijaya.nirmala@amceducation.in³, ruthikahg0804@gmail.com⁴, rukminikalasad30@gmail.com⁵, gurunathdr1432@gmail.com⁶

Abstract

In the era of digital commerce, consumers are increasingly reliant on online platforms to instruct consumer decisions. However, the vast number of online shopping websites and dynamic pricing strategies often make it challenging to identify the best deals. This project presents a product price comparison system that leverages web scraping techniques to extract real-time price information from multiple online retailers such as Amazon, Flipkart, and Croma. The system aggregates and analyzes this data to provide users with a unified view of product prices, enabling efficient comparison and cost-effective decision-making. The solution is to be built using technologies such as SQL, PHP, HTML, CSS, JS with scraping logic designed to handle both static and dynamic web content. The backend stores historical price data, allowing for trend analysis and alert generation when prices drop below user-defined thresholds. Visualization tools and a user-friendly interface further enhance the usability of the system. This project not only simplifies customer experience but also offers insights into market behavior, pricing strategies, and competitive dynamics. It demonstrates the potential of data-driven approaches in optimizing e-commerce interactions and highlights the role of automation in modern retail analytics.

Keywords: SQL, CSS, HTML, JS, API (Application point interface) Web scraping, XAMPP, PHP, MariaDB, MongoDB, Django Web Framework, E-commerce platform, Cloud Computing, Artificial intelligence.

1. Introduction

Nowadays, E-commerce has become an integral part of consumers' daily lives, offering convenience, variety, and competitive pricing. However, with an overwhelming number of retailers and constantly fluctuating prices, consumers often find it challenging to identify the best deals. A single product might be priced differently across various platforms due to factors such as promotions, regional pricing, shipping fees, and taxes. This complexity in pricing can lead to confusion and potentially missed opportunities for savings. This tool allows consumers to compare the prices of the same product from multiple online retailers, providing them with an easy way to identify the best price, including all additional costs such as delivery charges and taxes. By offering real-time comparisons, historical price trends, and tailored alerts for price drops, the tool enables users to make a shrewd purchase and maximize their savings. The need for such a tool has grown as ecommerce platforms expand globally and product prices become more dynamic. For

consumers, this tool eliminates the need for time-consuming manual searches across multiple sites and ensures they get the most driven price available. This product price comparison tool seeks to simplify the shopping experience by consolidating essential price information, enhancing transparency, and ultimately supporting customers in making smarter financial decisions. In today's digital marketplace, consumers are empowered with more choices than ever before—but with that abundance comes the challenge of finding the best value. Product price comparison tools and platforms play a vital role in helping buyers make calculated decisions by analyzing prices across multiple retailers. This project aims to simplify that process by aggregating and comparing product prices from leading e-commerce platforms such as Amazon and Flipkart. By leveraging web scraping techniques and backend technologies like PHP, CSS, HTML, SQL, and JS, this system provides real-time insights into pricing trends, discounts, and availability. The goal is not just to save money, but to foster

transparency and smarter consumption in an increasingly competitive retail landscape [1].

2. Literature Review

- Neelam Singh (2023) - Price comparison using web Scrapping. This work aims to create a robust and user-friendly web scraping-based price comparison system tailored for e-commerce websites. By leveraging advanced web scraping techniques, the system extracts and processes product prices from various platforms. It employs data analysis methods to uncover patterns and trends, enabling users to make well informed decisions when searching for the most competitive deals across multiple e-commerce platforms. Through its intuitive interface and visualization capabilities, the system empowers users to effortlessly navigate the vast online market and discover the best prices for their desired A Product Price Comparison of 7 products [2].
- Harikirshan.K (2023) - Intelligent Online Shopping using ML-based Product Comparison Engine. A relatively recent technique for gathering data online is known as scraping. The automated process involves the exploration of ecommerce websites and obtaining certain data, such as pricing, reviews, quality features, etc. Sentiment analysis of product attributes on e-commerce platforms, such as pricing, reviews, quality, etc., can substantially increase user satisfaction in the ecommerce industry. It continues to be difficult to envision precise opinion mining. This research work summarizes the product comparison website that implements intelligent web scraping. The website has a processing model that uses the Machine Learning (ML)-based product comparison engine.
- Nagaraj p (2023) - Automated E-Commerce Price Comparison Website using PHP, XAMPP, MongoDB, Django, and Web Scrapping. Every online user wants a detailed review about the product they buy or the things they are interested in. Buyer's research various websites on the internet to outperform offers on their desired products. Purpose: We need a model which can give us the details of the things from different websites. Method: In this paper, we are trying to utilize PHP, XAMPP, and MongoDB to build a website to get the prices of any desired product from Amazon and Flipkart. Result: laboratory evolution showed that this proposed website shows the prices of the desired product from Amazon and Flipkart with an accuracy of 96% [3].
- Anand Magar (2024) – Shop Savvy Online Price Comparison with AI Integration for Customers. This paper presents an innovative e-commerce platform designed to empower local vendors by providing a space to sell products and groceries online. The platform incorporates two key features aimed at enhancing customer experience and promoting local businesses. The first feature leverages a price comparison tool, allowing users to compare the prices of local products across various vendors, thus promoting competitive pricing. The second feature utilizes AI (via ChatGPT API) to generate food recipes based on user input and recommend the ingredients required for each dish. Users can acquire from the platform, fostering seamless shopping experience. The system is developed using PHP, MySQL, and XAMPP, with AI integration via the ChatGPT API. The platform aims to link between urban and rural markets by offering localized solutions for online shopping, benefiting both vendors and consumers. This paper discusses the platform's design, functionality, and potential impact on hyper-local e-commerce and grocery retail.
- Dr. Kavita. A. Sultanpure (2024) - Product Price Comparison & Sentiment Analysis. In the present situation, it is difficult to figure out whether the price for any product displayed on the website is the best possible price or not, and surfing on different sites for the same product to get a reasonable price is

a tedious job. To overcome this problem, we put forward this system. This research study presents a system developed by the authors, which integrates web harvesting and opinion mining, aimed at enhancing consumer decision-making. Utilizing Python and libraries such as BeautifulSoup and Requests, product details were gathered from Amazon and Flipkart. Selenium handles dynamic content, ensuring comprehensive data retrieval for accurate price comparison. Discount percentages are calculated to aid in price assessment, while opinion mining is performed using a Support Vector Machine (SVM) model that will be trained upon the Amazon Reviews dataset from Kaggle. Data pre-processing steps include cleaning, tokenization, and transforming text into quantitative data using TF-IDF. The SVM model is then experienced on A Product Price Comparison labelled review data, to make it able to classify sentiments as positive, negative, or neutral. To ensure proper sentiment classification, the capableness of the model is evaluated using parameters including accuracy, precision, recall, and F1-score. Cross-validation techniques further enhance the model's robustness. An average sentiment score is also calculated to provide an overall sentiment perspective. The linking of web scraping and sentiment analysis functionalities is achieved through a Flask-based web application. This natural user interface allows users to browse, compare prices, and view sentiment analysis results. Upon entering a product name or keyword, the application scrapes data from Amazon and Flipkart, retrieves product details and prices, and performs sentiment analysis on user reviews, presenting the results in an accessible format [4].

- Md Danish Raza (2024) - Consumer Preferences Towards Online Shopping of Electronic Products. In today's environment, consumers are more probability to make purchases that are well-informed and

intelligent, which calls for inventive marketing strategies. Internet marketing strategies are undergoing a transformation because they are more expedient and convenient than traditional marketing techniques when it comes to reaching out to target customers. Electronic things have been chosen for this inquiry. The major purpose is to explore the link between consumer preferences and demographics. Specifically, the study will focus on customer preferences regarding preferred electronic items, preferred payment methods, and preferred online merchants for the purchase of electronic products. The sample size consisted of four hundred Indian customers who had purchased electronic goods from online shops. During this inquiry, both primary and secondary sources of information were used. For analysis, many methods were used, including judgment sampling, chi square, and cross tabulation. According to the findings of the Chi Square analysis, there is a significant association between the choice of customers for purchasing electrical devices online and their demographic classifications. The link between consumer preferences and demographics is the subject of this study, which is one of the few studies dealing with the topic. To secure themselves from scam, customers will profit from the finding. Furthermore, it will be of assistance to organizations that engage in e-commerce in better comprehending the preferences of their customers and designing their pricing plans.

- Aditi Bansal (2024) - Laptop Bargains Unleashed: Exploring the authority of Price Comparison Websites. Purchasing a laptop can be difficult during days of endless online shopping options and wide price fluctuation. This paper suggests the solution of creating a specific website to make laptop price comparison easier. The website collects real-time pricing data for a variety of laptop models from major retailers by utilizing web

scraping techniques. This allows customers to spend as little money as possible when buying a laptop. To guide the offers available online, the website provides standard price comparison. Could be platform that simplifies the entire buying process and lowers the uncertainty involved in obtaining a new laptop. The paper plans further developmental paths such as improving data accuracy guaranteeing best-in-class display on multiple devices and putting user experience first via continuous feedback integration. By handling for enhancement, the proposed website has the potential to grow into a useful resource for buyers looking to make informed laptop purchases. It will also be able to stay relevant in the constantly changing field of web data extraction and analysis, helping users to successfully navigate the challenges of online laptop shopping [5].

- Anand Magar (2024) – Shop Savvy - Empowering Local Commerce Through Online Price Comparison with AI Integration for Customers. This paper presents an innovative e-commerce platform designed to empower local vendors by providing a space to sell products and groceries online. The platform incorporates two key features aimed at enhancing customer experience and promoting local businesses. The first feature leverages a price comparison tool, allowing users to compare the prices of local products across various vendors, thus promoting competitive pricing. The second feature utilizes AI (via ChatGPT API) to generate food recipes based on user input and recommend the ingredients required for each dish. Users can acquire these ingredients straight from the platform, fostering a seamless shopping experience. The system is developed using PHP, MySQL, and XAMPP, with AI integration via the ChatGPT API. The platform aims to connect between urban and rural markets by offering localized solutions for online shopping, benefiting both

vendors and consumers. This paper discusses the platform's design, functionality, and potential impact on hyper-local e-commerce and grocery retail [6].

2.1. System Architecture

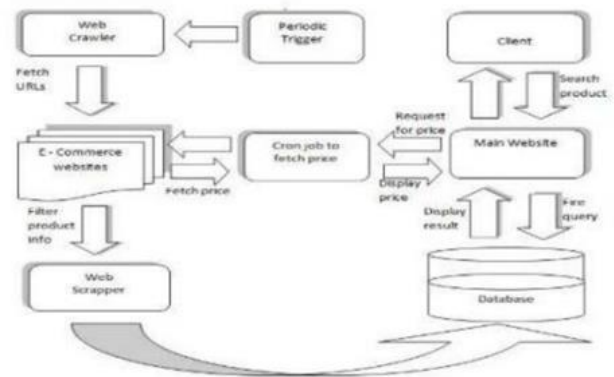


Figure 1 Architecture Diagram

- **Web Crawler:** A bot that systematically browses the web to collect URLs or page content. Periodically fetches product page URLs from e-commerce sites for further scraping Shown in Figure 1.
- **E-Commerce Websites:** Online platforms where products are listed and sold (e.g., Amazon, Flipkart). Serve as data sources for product prices and details [7].
- **Web Scraper:** A tool or script that extracts specific data from web pages. Filters and extracts product information (e.g., name, price, availability) from fetched URLs.
- **Cron Job to Fetch Price:** A scheduled task that runs at fixed intervals to automate processes. Triggers the crawler and scraper periodically to keep price data up to date.
- **Main Website:** The user-facing platform that displays aggregated price data. Presents price comparisons and handles user queries/searches.
- **Client:** The end user interacts with the system via the main website. Searches for products and views real-time price comparisons.
- **Database:** A structured data storage system

(e.g., MongoDB, MySQL). Stores product details, historical prices, and user queries for fast retrieval Shown in Figure 2.

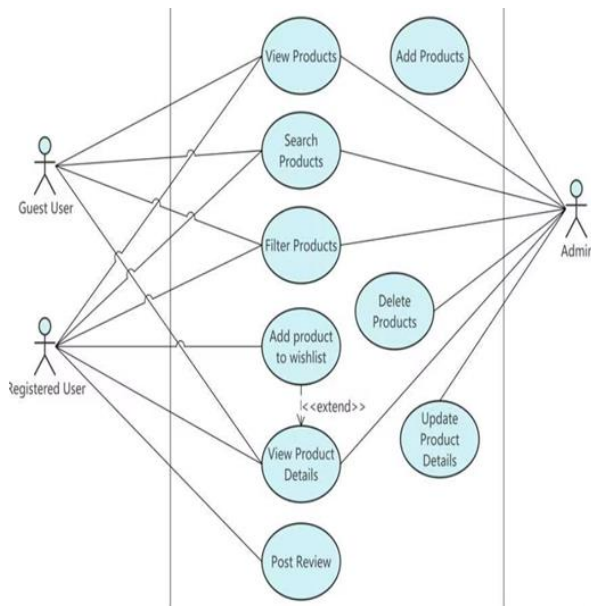


Figure 2 Use case Diagram

- **Guest User:** A visitor who accesses the system without logging in or creating an account. I can browse and search products but cannot interact beyond viewing.
- **Registered User:** A user who has signed up and logged into the system. Gains access to personalized features like wish lists and reviews.
- **Admin:** A privileged user responsible for managing the system's content and operations. You can add, update, or delete products and oversee platform functionality.
- **View Products:** Display a list of available products.
- **Search Products:** Find products using keywords or filters.
- **Filter Products:** Narrow down product listings based on attributes (e.g., price, category).
- **View Product Details:** Access detailed information about a specific product.
- **Add Product to Wishlist:** Save a product for future reference or purchase. (extends View

Product Details)

- **Post Review:** Submit feedback or ratings for a product.
- **Add Products:** Upload new product listings to the system.
- **Delete Products:** Remove existing product listings.
- **Product Details:** Modify information about existing products.

3. Methodology

A product price comparison is a way to evaluate the prices of similar or identical products across multiple channels or platforms. It helps businesses improve their pricing models in deal hunting. Online tools and websites automate this process, providing real-time price tracking, competitor analysis, and insights into market trends. Prices vary across platforms like Amazon, Flipkart, and Paytm, influenced by demand and competition. Some tools offer alerts for price drops, allowing users to purchase just in time. Businesses use comparison shopping to adjust strategies and remain competitive. Understanding pricing patterns over time helps in making informed decisions. Many platforms include customer feedback, helping buyers assess product quality. Comparison sites highlight ongoing discounts and offer, making shopping more cost-effective. Most tools are simple and user-friendly, ensuring a smooth experience. Reliable platforms update prices frequently to maintain accuracy. Users can sort according to the results preferences, such as brand or price range. Many services offer smartphone applications for easy access. Performing price comparisons saves time and money for shoppers. Ultimately, price analysis tools enable consumers and businesses to make smarter purchasing decisions.

3.1. Product Selection Criteria

- Choose popular or trending products within a category (e.g., smartphones, skincare, fashion, etc.).
- Ensure products are identical across platforms (same model, size, quantity, etc.).

3.2. Retailers/Platforms Compared

- Include top retailers or marketplaces (e.g., Amazon, Walmart, Target, brand websites).

- List the platforms you're comparing clearly in the repost.

3.3. Price Capturing Process

- Check prices on the same day or within a 24-hour window to ensure fairness.
- Include any applied discounts, promo codes, or shipping fees that would affect total price.

3.4. Currency & Region

- Specify the currency and region (e.g., USD – U.S. prices only).
- If prices vary by region, mention that regional pricing may differ.

3.5. Data Sources

Capture prices directly from:

- Official retailer websites
- Verified marketplace listings
- Mobile apps (if app-only deals exist)

3.6. Update Frequency

- Indicate when the data was last updated (e.g., "Prices as of April 15, 2025").
- For repost formats, it's key to show the date clearly to maintain credibility.

3.7. Presentation Format

Use a visual-friendly format for reports:

- Carousel images (platform + price)
- Simple charts or tables.

Highlight the lowest price visually Optional:

- Add a "Best Deal" badge or emoji
- Shown in Figure 3.

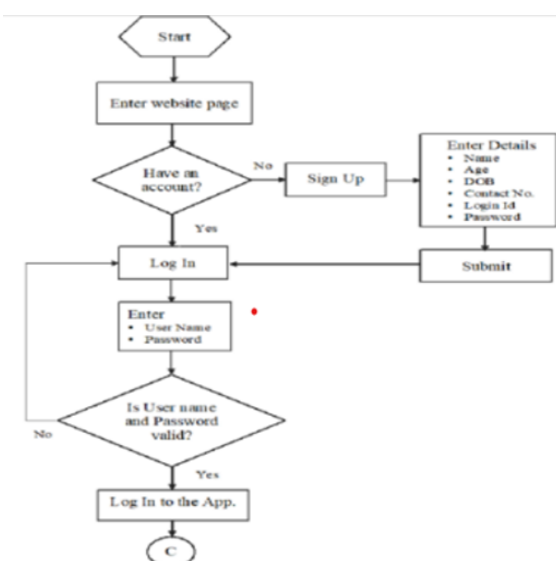


Figure 3 Flowchart

Here are the Procedure in the login process as illustrated in the flowchart:

- Start – The user begins the login process.
- Enter Website Page – The user navigates to the login or sign-up page.
- Account Check – The system verifies if the user already has an account.
- If no, the user proceeds to Sign Up by entering personal details (Name, Age, DOB, Contact No., Login ID, Password) and submits the form.
- If yes, the user proceeds directly to the login process.
- Enter Username and Password – The user inputs their credentials.
- Validation Check – The system verifies if the provided username and password are correct.
- If no, the user is redirected back to enter their credentials again.
- If yes, they successfully log in to the app.
- End – The login process is completed.

4. Results And Discussion

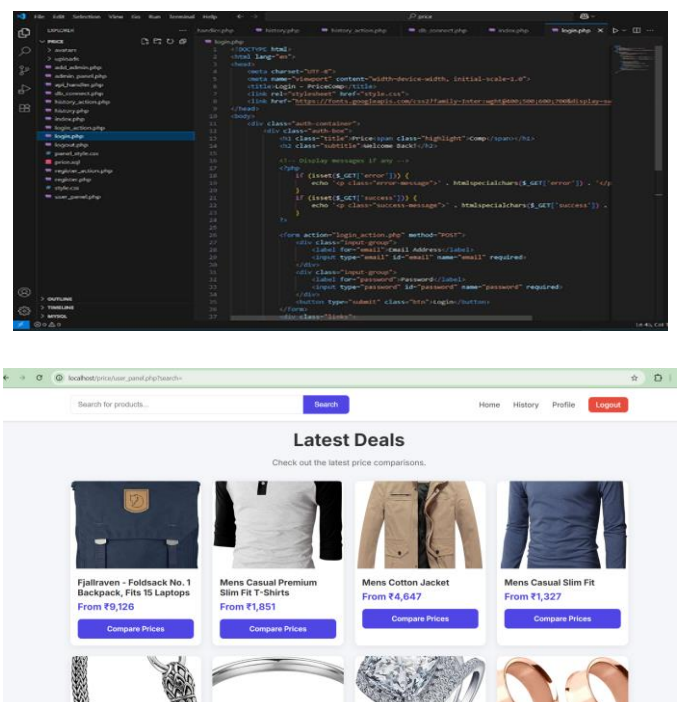


Figure 4 Output

These platforms dynamically pull prices from multiple e-commerce sites and present them in a structured format, helping you spot the good buy instantly. You can also enable notifications for price drops, so you never miss a bargain. A product price comparison output presents a consolidated view of the same item being sold by different vendors, highlighting variations in pricing, availability, and sometimes additional details like shipping costs or discounts. This output typically includes the product name, image, and a list of prices sourced from multiple e-commerce platforms. The goal is to help users quickly identify the most cost-effective option without manually browsing each site. By displaying a “Compare Prices” button or similar call-to-action, the interface allows users to dive deeper into vendor-specific offers. Behind the scenes, this output is generated through data collection methods like web scraping or APIs, followed by standardization to assure consistency across listings. Ultimately, it allows users to make conversationally earn opinions by offering transparency and convenience in one streamlined view Shown in Figure 4.

Conclusion

The improvement of a product price comparison system addresses a critical need in today’s fast-paced e-commerce landscape: empowering users with transparent, timely, and data-driven insights to make informed purchasing decisions. By integrating technologies such as web scraping, RESTful APIs, semantic matching, and cloud-based architecture, the system efficiently aggregates pricing multiple sources of data platforms and presents it in a user-friendly format. Beyond convenience, this solution promotes ethical commerce by detecting fake discounts, supporting accessibility through mobile-first and voice-enabled interfaces, and enabling scalability for global and cross-border comparisons. As digital marketplaces continue to evolve, such intelligent tools will play a vital role in enhancing consumer trust, optimizing business strategies, and fostering a more competitive and transparent online economy.

Acknowledgment

We'd like to say a big thank you to our project guide.

They gave us much help, cheering, & strong backing all through our work. We're so glad to our short group & place of study. They gave us what we required. This lets us do our work well. Big thanks to our friends & work pals too. They gave smart tips & help. We are thrilled for the help from our side. They kept us up. This let us fill our work with drive. We also tip our hats to the book & study folks. Their work sets the base for our study & check. Finally, we thank all who gave us a hand as we did our work well.

References

- [1].Neelam Singh (2023)- Price comparison using web Scrapping
- [2].Harikirshan.K (2023) - Intelligent Online Shopping using ML-based Product Comparison Engine.
- [3].Nagaraj p (2023) - Automated E-Commerce Price Comparison Website using PHP, XAMPP, MongoDB, Django, and Web Scrapping.
- [4].Anand Magar (2024) – Shop Savvy Online Price Comparison with AI Integration for Customers.
- [5].Dr. Kavita. A. Sultanpure (2024) - Product Price Comparison & Sentiment Analysis. Md Danish Raza (2024) - buyers alternative towards online Shopping of Electronic Products.
- [6].Aditi Bansal (2024) - Laptop Bargains Unleashed: Exploring the leverage of Price Comparison Websites.
- [7].AnandMagar (2024) – Shop Savvy - Empowering Local Commerce Through online price comparison with AI Integration for Customers.