

First Glance: A Smart Price Comparison and Alert System

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Abstract: *The First Glance project is a web-based price comparison platform created to make online shopping for electronic products easier and more efficient. The main goal of this system is to save users time and effort by avoiding the need to check prices on many different e-commerce websites. It allows users to search and compare products from various platforms in one place, so they do not have to open multiple tabs or switch between sites. Along with comparison features, the system also includes a target price alert option, where users can set a price they want and get notified when the product reaches that price. The system is built using a full-stack approach, combining frontend and backend technologies with proper data integration methods. It includes important features like product search, price comparison, user account handling, and automatic notifications. By bringing all price details together and adding smart features to help users decide, the platform makes shopping easier, reduces confusion, and helps users buy products faster. First Glance helps improve e-commerce technology by solving common problems in existing tools, such as lack of real-time updates and limited personalization options. This solution helps users make better and quicker buying choices while also encouraging fair pricing and competition in online markets. The project shows how a well-designed system can improve daily shopping habits and make the overall online shopping experience better.*

Keywords: First Glance, Price Comparison, E-commerce, Target PriceNotification, Web Application, Real-Time Data Integration

I. INTRODUCTION

The growth of e-commerce has made products easily available everywhere, but it has also created a big problem which is making decisions. When a user wants to buy an electronic item, they usually have to visit many websites, compare prices by themselves, and keep checking again and again to see if prices changed. In a perfect situation, all price details would be in one place, updated all the time, and easy to use. But in reality, people spend a lot of time comparing, and sometimes still end up making not so good buying choices. This study looks at the gap between what should be there and what actually exists. Some price comparison tools and browser extensions already exist and they do help a little by showing prices from different sites or discounts. But most of them are not very dynamic and users still need to manually check again and again. Also, they don't really support personal needs properly, like letting a user set a price they want and then act when the price actually reaches that point. Because of this, users either pay more than needed or wait too long hoping the price will drop, which may or may not happen. Earlier research has talked about how people search for prices and how transparency works, and also about recommendation systems in online shopping. But not much work is done on combining real-time price comparison with user-set price alerts in one single system. To solve this issue, this research introduces First Glance, which is a simple platform that brings price comparison and price alerts together. The system is made to reduce the effort of searching and help users take better and faster decisions while buying. It is based on ideas like limited human thinking ability and making information easy to use. This paper first explains why price comparison is important in online shopping and then shows a system that tries to solve this problem. After this, the paper will talk about related work, how the system is designed, the method used, and the final results.



II. LITERATURE SURVEY

Sr. No.	Author(s) and Year	Project Title	Key Findings	Limitations	Relevance to Proposed System
1	Malhotra (2025)	E-Commerce Price Comparison System	Improves user decision-making via comparison tools	Limited real-time capabilities	Supports unified comparison approach
2	Nagaraj et al. (2023)	Automated Price Comparison Using Web Scraping	Efficient data extraction from multiple sites	Scraping reliability issues	Basis for scraping module in system
3	Sakhare et al. (2023)	Price Monitoring Using Sentiment Analysis	Combines pricing with user feedback insights	Focus less on real-time comparison	Suggests future enhancement features
4	IJRPR (2024)	Price Comparison Using Web Crawling	Automates product price aggregation	Lacks personalization features	Supports automated comparison design
5	Takakubo et al. (2024)	Blockchain-Based Price Auditing System	Ensures transparency and price validation	Complex implementation	Highlights importance of trust and accuracy
6	Semwal et al. (2024)	ML for Dynamic Pricing Strategies	ML improves pricing predictions	Not user-focused systems	Supports future predictive features
7	Gao (2022)	Price Discrimination in E-commerce	Identifies pricing inconsistencies across platforms	No direct consumer tool	Justifies need for comparison systems

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III. SYSTEM ARCHITECTURE

System Architecture

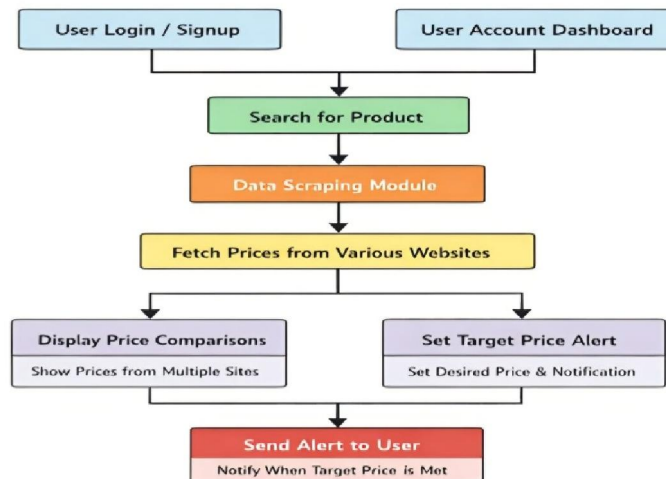


Fig.1. System architecture flowchart



The system begins when a user opens the website and either signs up for a new account or logs into an existing one, after which they are directed to the main dashboard. From there, the user searches for an electronic product, and this request is sent to the backend, which activates the scraping module to collect price data from multiple e-commerce websites. Since different websites present data in different formats, the system processes and organizes the information so that similar products are matched correctly. The cleaned data is then displayed in a clear comparison format, allowing the user to view prices from different platforms in one place without switching tabs. Additionally, the user can set a target price for a product, which is stored in the database, and the system continues to check prices in the background at regular intervals. When the product price drops to the specified value, the system sends a notification to the user, helping them make a timely purchase. Overall, the flow moves from login to search, data collection, comparison, and finally to price tracking and alerts, making the entire buying process more efficient and convenient.

IV. METHODOLOGY

The methodology adopted for the First Glance system follows a structured, full-stack development approach, processing, and user-centric design to deliver a seamless price comparison experience. The system is built to ensure real-time responsiveness, and ease of interaction for end users. Functional requirements such as user authentication, product search, price aggregation, and target price alerts are defined alongside non-functional requirements like performance, scalability, and usability. This phase ensures that the system is aligned with both user needs and technical feasibility. The platform follows a client-server architecture, where the frontend provides an interactive user interface and the backend handles business logic, data processing, and communication with external sources. The database is designed to store user credentials, search history, and target price preferences securely. Special attention is given to modular design, allowing components such as the scraping module and notification system to function independently. A critical component of the methodology is the data collection process, achieved through web scraping techniques. When a user searches for a product, the system triggers the scraping module, which extracts relevant pricing data from multiple e-commerce websites. This data is then cleaned, filtered, and standardized to ensure consistency. Since different platforms may present product details in varying formats, preprocessing steps are necessary to match similar items accurately and remove irrelevant or duplicate entries. Following data acquisition, the data processing and comparison module organizes the extracted information into a structured format. Prices, product names, and source links are aligned and displayed in a comparative layout. The system prioritizes clarity, enabling users to quickly identify the best available option without additional effort. Another key methodological element is the target price notification system. Users can set a desired price for a specific product, which is stored in the database. The system periodically checks updated prices through scheduled scraping or API calls. When the product price meets or falls below the user-defined threshold, a notification is triggered. This feature transforms the platform from a passive comparison tool into an active decision-support system. The frontend is designed for responsiveness and ease of navigation, while the backend ensures secure authentication and efficient handling of requests. Technologies such as server-side scripting, database management systems, and asynchronous data fetching are utilized to maintain performance and scalability. Finally, the system undergoes testing and evaluation, including functional testing, performance testing, and user testing. Functional testing verifies that all features—login, search, comparison, and alerts—operate as intended. Performance testing ensures the system can handle multiple requests without significant delays. User testing provides insights into usability and helps refine the interface for better user experience. Overall, the methodology emphasizes a balance between technical robustness and user-centric design. By integrating real-time data extraction with personalized notification features, the First Glance system aims to create a more efficient and intelligent approach to online price comparison.

V. PROPOSED SYSTEM

The proposed system, First Glance, is designed as a web-based platform that simplifies the process of comparing product prices across multiple e-commerce websites while introducing a proactive decision-support mechanism. At its



core, the system aims to reduce user effort, improve price transparency, and enable timely purchasing decisions through intelligent integration of data aggregation and personalized alerts. The system begins with a user authentication module, where users can register and log in securely. This ensures that individual preferences—such as search history and target price settings—are stored and managed efficiently. Once authenticated, users are directed to a dashboard that serves as the central interface for interacting with the platform. The primary functionality is driven by the product search and comparison module. When a user searches for an electronic item, the system activates the scraping engine, which collects real-time pricing data from multiple e-commerce platforms. This data is then processed to remove inconsistencies, normalize product information, and align similar listings. The processed results are presented in a structured comparison format, allowing users to view prices, sources, and relevant details in a single interface. This eliminates the need for switching between tabs and significantly reduces the time required for decision-making. A distinguishing feature of the proposed system is the target price notification module. Users can define a desired price for any product they are interested in. The system continuously monitors price changes by periodically re-fetching data from source websites. When the product price meets or drops below the specified threshold, the system automatically sends a notification to the user. This transforms the platform from a static comparison tool into a dynamic assistant that actively supports purchasing decisions. The scraping module operates as an independent component responsible for extracting and updating price data. It ensures that the system remains up-to-date. To maintain efficiency and scalability, asynchronous processing and scheduled tasks are used for continuous data updates and alert checks. The proposed system improves upon existing solutions by combining three key aspects: real-time multi-platform price comparison, personalized user interaction, and automated decision support. Unlike traditional tools that require repeated manual checks, First Glance enables users to act at the right moment with minimal effort. In essence, the system is not just a comparison platform but a smart intermediary between users and the dynamic pricing environment of e-commerce. By addressing both informational and temporal inefficiencies, it offers a more complete and practical solution to modern online shopping challenges.

VI. FUTURE ENHANCEMENT

While First Glance provides a functional and efficient solution for real-time price comparison, there remains considerable scope for expansion. The system currently relies on web scraping. The system could be enhanced by integrating official APIs from e-commerce platforms where available. This would increase reliability, reduce latency, and minimize the risk of data inconsistencies caused by changes in website structures. Another promising enhancement lies in the incorporation of machine learning techniques for price prediction. Rather than only notifying users when a target price is reached, the system could analyse historical price trends and forecast potential price drops. This would allow users to make more strategic decisions—whether to buy immediately or wait for a better deal. In a similar vein, adding price history visualization through graphs would provide users with deeper insights into market behaviour over time. The platform could also evolve toward a more comprehensive decision-support system by integrating product reviews, ratings, and sentiment analysis. Price alone does not determine value; users often weigh quality, reliability, and user feedback before making purchases. Including these dimensions would make the system more holistic and user-centric. From a usability perspective, future versions could introduce mobile application support and real-time push notifications, ensuring that users receive alerts instantly regardless of their device. Personalization can also be extended further through recommendation systems that suggest products based on user preferences, browsing history, and budget patterns. Lastly, scalability and performance can be improved by adding more choice of than only electronics. This would allow the system to handle larger volumes of users and data efficiently, making it suitable for broader deployment across different product categories beyond electronics.

VII. CONCLUSION

This study presented First Glance, a unified price comparison platform designed to address the inefficiencies with online purchasing decisions. By integrating real-time price aggregation with a user-defined target price notification



system, the proposed solution reduces the need for repeated manual comparisons and enables users to act at the most favourable moment. The system moves beyond traditional comparison tools by introducing a more active and personalized approach to decision-making. It brings all scattered price information into one place and turns it into useful insights based on what each user likes.

In doing so, it addresses both the informational and temporal challenges that characterize modern e-commerce environments. From an academic standpoint, the work contributes to the ongoing discussion on reducing search costs and improving digital decision-support systems. Practically, it demonstrates how relatively simple technologies when thoughtfully designed can significantly enhance user experience and efficiency. In its current form, First Glance establishes a strong foundation for intelligent shopping assistance. With further enhancements such as predictive analytics and deeper personalization, the system has the potential to evolve into a comprehensive platform that reshapes how consumers interact with online markets.

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