Louis Savinien Dupuis Journal of Multidisciplinary Research, 2025: V(4) 22–24
DOI: 10.21839/lsdjmr.2025.v4.231

Research Article

SHOPWISE AI: REAL-TIME MULTI-PLATFORM PRICE COMPARISON & BEST DEAL FINDER

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(Received: 09-04-2025; Accepted 08-06-2025; Published Online 03-11-2025)

Abstract

With the rapid growth of e-commerce platforms in India, consumers face challenges in comparing product prices across multiple websites due to inconsistent data, dynamic pricing, and lack of centralized systems. This research proposes a system called ShopWise-AI, which provides real-time price comparison using artificial intelligence techniques. The system aggregates data from various e-commerce platforms, performs normalization and deduplication of products, and presents accurate comparisons along with historical price trends. It also offers smart alerts for price drops and an intuitive user interface. The proposed system achieves high accuracy in product matching and fast search response, making it a reliable solution for smart shopping.

Keywords - Price Comparison, Artificial Intelligence, E-commerce, Data Normalization, Machine Learning, Web Application

Introduction

In today's digital era, online shopping has become an essential part of everyday life. Multiple e-commerce platforms such as Amazon, Flipkart, and Myntra offer a wide variety of products with different prices, discounts, and offers. However, consumers often face difficulty in comparing prices across these platforms due to inconsistent product listings and rapidly changing prices.Traditional price comparison methods are time-consuming and inefficient. To overcome these challenges, this research introduces ShopWise-AI, a web-based system that provides real-time price comparison and intelligent insights. The system helps users make better purchasing decisions by offering accurate comparisons, price history, and personalized alerts.

SYSTEM ARCHITECTURE

The proposed system follows a modular architecture consisting of multiple layers:

- Data Ingestion Layer: Collects product data from various e-commerce platforms using APIs and web scraping tools.
- Processing Layer: Performs data normalization and deduplication using rule-based and AI techniques.
- Storage Layer: Stores product and price history data using PostgreSQL and TimescaleDB.
- API Layer: Handles communication between backend and frontend using REST APIs.
- Presentation Layer: Provides a user-friendly interface using React.

This architecture ensures scalability, efficiency, and real-time performance**.**

WORKING METHODOLOGY

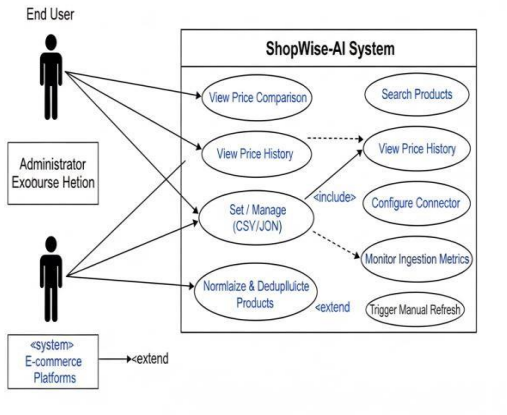
The working methodology of ShopWise-AI involves multiple stages to ensure accurate and reliable results. Initially, product data is collected from different sources and preprocessed to remove inconsistencies such as variations in naming and formatting. The system then applies normalization techniques to standardize product attributes like brand, size, and specifications.After normalization, deduplication is performed using intelligent matching techniques to identify similar products listed across different platforms. The system stores these unified records and maintains a history of price changes over time. When a user searches for a product, the system retrieves relevant results, compares prices, and displays them along with additional information such as price trends. Users can also set alerts to receive notifications when prices drop below a specified value.

IMPLEMENTATION

The implementation of ShopWise-AI is carried out using modern web technologies and database systems. The frontend is developed using React, which provides a responsive and interactive user interface. The backend is built using Node.js and Express, which handle data processing and API communication.The system uses PostgreSQL as the primary database, along with TimescaleDB for managing time-series data such as price history. Redis is used for caching frequently accessed data, improving performance and reducing response time. Search functionality is implemented using Elasticsearch,

enabling fast and efficient retrieval of results. These technologies work together to ensure the system is scalable, reliable, and capable of handling real-time data updates.

ROLE OF ARTIFICIAL INTELLIGENCE



Artificial intelligence plays a significant role in enhancing the functionality of the ShopWise-AI system. It is used to improve the accuracy of product matching by identifying similarities between product listings, even when there are variations in names or descriptions. AI techniques also assist in analyzing large volumes of data efficiently and identifying patterns in price changes.

By automating data processing and improving decision-making, artificial intelligence reduces the need for manual comparison and ensures more reliable results. This makes the system more efficient and user-friendly.

ADVANTAGES

The ShopWise-AI system offers several advantages that improve the overall shopping experience. It provides real-time price comparison across multiple platforms, ensuring users get the most accurate and up-to-date information. The system reduces the time and effort required to compare products manually and helps users make informed decisions. Its user-friendly interface makes it accessible to a wide range of users, and its scalable design allows it to handle increasing amounts of data efficiently. ShopWise-AI offers several advantages that make it a valuable tool for online shoppers. It provides real-time price comparison across multiple platforms, ensuring that users have access to the most accurate and up-to-date information. The system reduces the time and effort required for manual comparison and improves decision-making.Its user-friendly interface makes it accessible to a wide range of users, and its scalable design allows it to handle large volumes of data efficiently. The inclusion of price history and alerts further enhances its usefulness.

APPLICATIONS

The system has wide-ranging applications in different domains. It can be used by consumers to find the best deals and save money while shopping online. Businesses can use it to analyze competitor pricing and adjust their strategies accordingly. Researchers can utilize the system to study market trends and consumer behavior. The system can also be integrated into other applications, such as mobile apps and e-commerce platforms, to enhance their functionality.

FUTURE ENHANCEMENTS

Future improvements to the ShopWise-AI system may include the development of a mobile application to increase accessibility. The system can also incorporate advanced recommendation systems that provide personalized suggestions based on user preferences.

Integration with more e-commerce platforms and support for multiple languages can further expand its reach. Additionally, the use of advanced AI techniques such as deep learning can improve product matching and price prediction accuracy.

CONCLUSION

ShopWise-AI presents an effective and intelligent solution to the challenges of price comparison in the e-commerce domain. By leveraging artificial intelligence and modern web technologies, the system provides accurate, real-time information that enhances user decision-making.It simplifies the process of comparing products across multiple platforms and improves the overall efficiency of online shopping. With continuous

Improvements and technological advancements, the system has the potential to become an essential tool for consumers and businesses alike.

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