Price Comparison of GeM Products with other e-Marketplaces

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Abstract. This project aims to develop an automated price comparison tool that addresses the inefficiencies of the current manual system used to compare prices between the Government e-Marketplace (GeM), Amazon, and Flipkart. In the existing process, users must visit each platform individually to compare prices, a time-consuming and error-prone method that often leads to missed opportunities for better deals. This project proposes a solution by creating a user- friendly tool capable of aggregating and displaying real-time product pricing from multiple e-commerce platforms in one interface. The tool will enable users—whether government procurement officials or individual buyers—to quickly identify the most cost-effective option for their purchase by providing instant price comparisons. In addition to price, the system will consider other relevant factors like product availability, shipping times, and user reviews, ensuring a comprehensive evaluation. By integrating this information into a single platform, the project aims to streamline procurement processes, reduce manual effort, and foster more informed purchasing decisions. This solution holds significant potential for public sector efficiency, allowing government bodies to optimize their procurement strategies and reduce costs. In the private sector, it offers individual consumers and businesses a reliable method to identify the best deals across platforms, contributing to smarter, more economical purchasing.

Keywords. GeM, e-commerce, price comparison, procurement, digital marketplace.

I INTRODUCTION

In recent years, digital procurement platforms have revolutionized the sourcing of goods and services across various sectors, with the government sector witnessing some of the most profound changes. The Government e- Marketplace (GeM), launched by the Indian government, stands as a pivotal example of this transformation. Designed to streamline government procurement processes, GeM has quickly emerged as a critical tool, offering transparency, enhanced efficiency, and competitive pricing. However, as e-commerce giants like Amazon and Flipkart continue to dominate the retail landscape, it has become increasingly important to assess and compare prices across these platforms. This comparison is crucial for identifying cost savings, enhancing procurement efficiency, and ensuring the best value for taxpayer money. Consequently, this research explores the current challenge of selecting the most cost- effective platform for government and public sector procurement.

One of the primary objectives of this study is to evaluate pricing trends and differences between GeM and other leading e-commerce platforms, providing a comprehensive analysis that can guide procurement decisions in the public sector. By examining pricing data and various product attributes on each platform, the study seeks to identify areas where GeM offers distinct advantages over commercial platforms—or vice versa. In doing so, it can provide government bodies, agencies, and organizations within the public sector with key insights into selecting the optimal procurement channel based on price, product availability, and other critical factors.

The importance of this research extends beyond price comparison alone. While cost- effectiveness is undoubtedly a central consideration, other variables—such as product availability, shipping times, and customer service—play significant roles in determining the suitability of a platform for procurement. For instance, certain goods may be readily available on Amazon or Flipkart, but not on GeM, or vice versa. Similarly, while Amazon and Flipkart may offer expedited shipping options in certain regions, GeM's delivery timelines could vary based on the vendor and location. By comparing these factors alongside price, the study aims to provide a nuanced understanding of how different platforms cater to various stakeholders, ranging from government professionals responsible for large-scale purchases to individual customers or trainees seeking affordable electronics for personal or educational use.

Additionally, the study considers the unique needs of diverse groups of users, including professional staff, students, trainees, vendors, donors, and other stakeholders. Each of these groups has distinct procurement needs that are influenced by budgetary constraints, product requirements, and logistical considerations. For example, government employees may need bulk quantities of office supplies, while students may be more concerned with finding affordable electronics and study materials. Vendors, on the other hand, might be interested in identifying opportunities for partnership and expanding their reach in public sector procurement. By systematically comparing the attributes of GeM and other commercial platforms, this study aims to provide insights that cater to these varied user needs, ensuring that each group is well-informed about where they can achieve the best value for their money.

One key component of the research involves analyzing product availability and selection on each platform. GeM, as a government-run marketplace, is primarily intended to fulfill the needs of public sector entities, and as such, it may not have as broad a product selection as commercial platforms. However, GeM offers specialized products that are tailored to government requirements, including laboratory equipment, office furnishings, and technical machinery that may not be available on Amazon or Flipkart. By analyzing the breadth and specificity of products on GeM versus commercial platforms, this research will help identify which platform offers the most comprehensive and relevant selection for different categories of users.

Another critical factor in the comparison is customer service. Platforms like Amazon and Flipkart are well-known for their customer- centric policies, including easy returns, refunds, and around-the-clock customer support. In contrast, GeM's customer service model may differ, especially since it primarily serves institutional buyers rather than individual consumers. For professional staff managing public sector budgets, reliable customer service is essential to ensure that procurement processes run smoothly and that any issues are promptly resolved. This aspect of the study will assess the ease of communication and problem resolution on each platform, providing insights into which marketplace offers a superior experience for users with diverse requirements.

Furthermore, this research addresses shipping times and logistics, which are especially important for public sector projects with strict deadlines. Commercial platforms often offer same-day or next-day delivery for a range of products, especially in urban areas. However, the government marketplace's shipping timelines may vary depending on the region, the vendor, and the nature of the product being procured. This comparison will help stakeholders identify which platform offers the most reliable and efficient delivery options, allowing them to make well-informed decisions based on their operational needs.

In conclusion, this study provides a systematic comparison of products available on the Government e-Marketplace (GeM) and those listed on leading e-commerce platforms such as Amazon and Flipkart. By evaluating not only price but also factors like product availability, shipping times, and customer service, the research aims to offer valuable insights that can guide procurement decisions within the public sector. For a range of users—including government staff, students, trainees, and vendors—this study serves as a resource for making informed choices based on the unique offerings and advantages of each platform. Ultimately, by presenting a detailed analysis of these platforms, this research contributes to a more transparent and effective procurement process, ensuring that public funds are allocated in ways that yield the greatest value and benefit for all stakeholders.

II. LITERATURE SURVEY

The concept of automated price comparison has garnered significant interest in recent years, especially as e-commerce has become more central to both individual and organizational purchasing practices. A review of existing literature reveals that digital procurement and price comparison tools are pivotal in improving decision-making efficiency, reducing costs, and increasing transparency. This literature survey examines studies on automated price comparison systems, digital procurement platforms, and their applications within the public sector, specifically in the context of government procurement processes.

2.1. Government e-Marketplace (GeM)

The GeM platform was established to ensure transparency, streamline procurement processes, and reduce overall costs for government bodies in India. A study by Kumar et al. [1] demonstrated that GeM leads to significant savings in procurement costs, with an estimated 15% reduction in administrative expenses. This research highlights GeM's role in minimizing middlemen and enabling direct purchasing, thus offering a standardized procurement approach for the public sector. Additionally, Sharma et al. [2] found that GeM's centralized system enhances supplier diversity, offering competitive pricing due to increased supplier participation.

2.2. Price Dynamics in E-Commerce Platforms

Commercial platforms such as Amazon and Flipkart leverage dynamic pricing algorithms that adjust prices based on real-time market conditions, consumer demand, and competitor actions [3]. This pricing strategy enables flexibility that attracts both retail and bulk buyers, including B2B clients. Research conducted by Gupta et al. [4] explores the seasonal and demand-driven price variations on these platforms, demonstrating the influence of user behavior on pricing algorithms. The dynamic nature of e-commerce pricing underscores the necessity for accurate and real- time data collection when conducting price comparisons.

2.3. Automation in Price Comparison

Automated tools like Selenium and web scraping are increasingly used for gathering and comparing prices across e-marketplaces. Singh and Roy [5] examined the use of web scraping combined with Natural Language Processing (NLP) to effectively collect and categorize product data. These tools allow for real-time data extraction and categorization, making it feasible to conduct comprehensive price comparisons on a large scale. Furthermore, the study by Chen and Wang [6] on machine learning applications in price comparison systems suggests that artificial intelligence (AI) can enhance accuracy and reduce errors by learning patterns in product specifications and attributes.

2.4. Cross-Platform Comparison Challenges

Cross-platform comparisons between GeM and commercial e-marketplaces face several challenges, particularly regarding product standardization and taxonomy. The categorization of products on GeM often differs from that on platforms like Amazon, which complicates direct comparisons. Patil and Joshi [7] identified the difficulties in aligning product taxonomies across platforms, noting that inconsistent product descriptions can lead to mismatches in automated comparisons. Additionally, Menon et al. [8] discussed limitations in accessing government e- marketplace APIs, a restriction that hinders efficient data extraction and comparison. These challenges suggest a need for improved algorithms capable of standardizing and matching products across diverse taxonomies.

2.5. Comparative Studies on Procurement Efficiency

In comparing government and commercial marketplaces, research shows that GeM generally provides a cost advantage for public procurement, while commercial platforms may offer more pricing flexibility for consumer- oriented products. The study highlights the complementary roles of both types of marketplaces and stratergies.

III. PROPOSED METHODOLOGY

The purpose of this project is to develop an automated price comparison tool that simplifies the procurement process by comparing prices across the Government e-Marketplace (GeM), Amazon, and Flipkart. This tool will enhance procurement efficiency by providing real-time data, enabling users to identify the best deals with minimal effort. It aims to improve transparency in government and private-sector purchasing, reduce time spent on manual comparison, and promote smarter, data-driven decisions. Ultimately, the project seeks to optimize the procurement process, helping users save both time and money across multiple platforms.

3.1. Problem Identification and Scope

Definition: The initial phase involves identifying the inefficiencies in the current manual process used by government officials and individual buyers to compare prices across platforms. This step clarifies the need for a solution that automates and simplifies price comparison, saving time and improving accuracy. The scope of the project is defined to include GeM, Amazon, and Flipkart, covering essential product categories relevant to both public and individual purchasing needs.

3.2. Requirement Gathering and Analysis

Through analysis, the project identifies specific requirements: real-time data retrieval, price and product

availability display, and integration of factors like shipping time and reviews. Requirements are collected based on target user needs, such as ease of use for non-technical government officials, students, and private-sector users. This phase establishes the functionalities necessary for the project to meet user expectations.

3.3. Tool and Technology Selection

The project requires a combination of web scraping, data aggregation, and front-end display technologies. Python is selected for backend data processing, with Selenium as the web-scraping tool to extract product details and pricing information in real-time. Flask will serve as the framework for the web application, and HTML/CSS will be used to create a simple, intuitive user interface.

3.4. Data Collection Process

Real-time data will be collected from each platform using customized web scraping scripts developed in Python with Selenium. GeM's product titles (identified by the classname 'like-h3') and prices (classname 'm-w') will be targeted, as well as similar elements on Amazon and Flipkart. Additionally, each platform's search functionality and categorization structure will be analyzed to standardize the data aggregation process. Collected data will be structured to include product title, price, availability, shipping options, and user reviews.

3.5. Development of the Price Comparison Tool

The tool will be developed as a web application with a simple user interface. The frontend will allow users to enter specific product details or categories. The backend will then use the web scraping module to retrieve current product details from each platform. The collected data will be formatted into a comparable table that highlights differences in price and availability and indicates the most cost-effective option.

3.6. Testing and Validation

The tool will undergo testing to ensure data accuracy, functionality, and usability. Testing will focus on verifying that product details (price, title, and availability) are correctly displayed from each platform in real-time. Usability tests will be conducted to assess ease of navigation for non-technical users, while system tests will ensure that data is updated consistently with minimal lag.

3.7. Data Analysis

Once validated, the tool's output will be analyzed to identify trends in pricing across the platforms. This analysis will involve studying price variations for similar products on GeM, Amazon, and Flipkart, allowing for insights into the factors influencing these differences. The analysis will provide a basis for understanding platform-specific advantages and limitations.

3.8. Evaluation of Public Sector Benefits

The final phase will involve evaluating the impact of the tool in a public sector context. The evaluation will focus on assessing cost savings, time reduction, and user satisfaction among government procurement officials and other users. Success will be measured by the tool's effectiveness in identifying the most economical options and reducing the time spent on price comparison.

IV. IMPLEMENTATION SCENARIO

The interfaces created are:

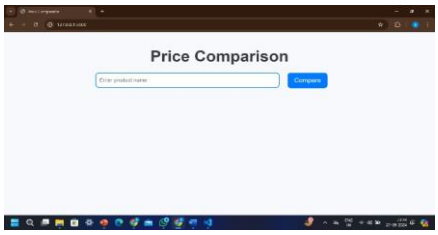

FIGURE 1. User interface of the Price Comparison Tool, allowing users to input a product name for real-time price comparison across platforms like GeM, Amazon, and Flipkart.

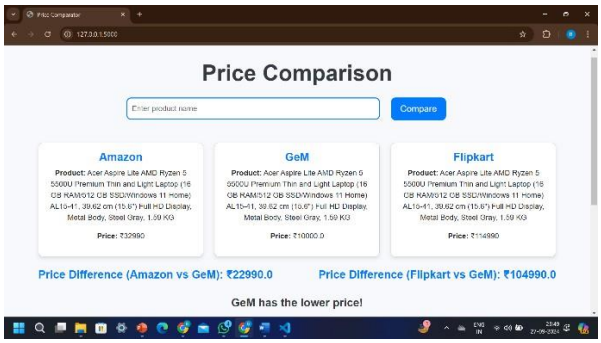

FIGURE 2. This is the results page of the Price Comparison Tool, displaying product prices from different platforms along with the best price highlighted for easier decision-making.

FIGURE 3. This is the bar chart representation of price comparisons across different platforms, visually illustrating the price variations for the entered product, making it easier for users to analyze and choose the best option.

V. CONCLUSION

In conclusion, this project on price comparison between the Government e-Marketplace (GeM) and commercial platforms like Amazon and Flipkart highlights the growing importance of digital procurement in both public and private sectors. The comparison tool developed aims to streamline procurement processes by providing users with real-time data on product prices, availability, and other relevant factors. By offering a transparent, user-friendly interface, the tool empowers government agencies, businesses, and individual consumers to make more informed and cost-effective purchasing decisions.

The tool's ability to integrate multiple platforms ensures that users can identify the best deals, maximizing savings and procurement efficiency. Additionally, the inclusion of other factors such as shipping time, customer service, and product availability ensures a comprehensive evaluation beyond just price.

Ultimately, this project contributes to improving procurement transparency, fostering competitive pricing, and encouraging smarter purchasing decisions. As digital platforms continue to grow, tools like this will become increasingly valuable for ensuring that public sector procurement is as efficient and cost- effective as possible. Moreover, by facilitating price comparisons between government and commercial platforms, this project has the potential to drive more accountability in public spending and create significant savings for

taxpayers.

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