

# ProductPulse

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## ABSTRACT

*The rapid evolution of Information Technology in recent years has profoundly transformed our world, and one of the most remarkable outcomes of this transformation is E-commerce. E-commerce, the practice of buying and selling products through the Internet and electronic devices, has revolutionized the way we engage in commerce. It has disrupted traditional brick-and-mortar retail chains and has become a dominant force in the market, all powered by the vast capabilities of the Internet. In the realm of E-commerce, customers access online stores, browse through products, and place orders with unprecedented convenience. The intricate web of transactions begins with the customer's order, which is relayed back and forth between their web browser and the server hosting the E-commerce website. This data journey leads to a central order manager, which then connects to various databases for inventory management, merchant systems for payment processing (such as PayPal), and banks for financial transactions. This complex web ensures that store inventory and customer funds are sufficient for processing the order. Once the order is validated, the order manager notifies the store's web server, displaying a message that the order has been successfully processed. It then communicates with the warehouse or behavior department to prepare for product dispatch or service activation. E-commerce handles both tangible and digital products, making it a versatile platform for businesses to reach customers.*

**Keyword:** - ProductPulse.

## 1. OVERVIEW

Information Technology has developed rapidly in the past few years. The impact can be observed as we can figure out various technologies surrounding us. One of the remarkable technologies is E-commerce. E-commerce is the buying and selling of products by the means of Internet and electronic devices. E-commerce has boosted the market in such a way that it has broken down the chain of shops. E-commerce is powered by the Internet. Customers access an online store to browse through and place orders for products or services via their own devices. As the order is placed, the customer's web browser will communicate back and forth with the server hosting the E-commerce website. Data about the order will be relayed to a central computer known as the order manager. It will then be forwarded to databases that manage inventory levels; a merchant system that manages payment information, using applications such as PayPal; and a bank computer. Finally, it will circle back to the order manager. This is to make sure that store inventory and customer funds are sufficient for the order to be processed.[1]

After the order is validated, the order manager will notify the store's web server. It will display a message notifying the customer that their order has been successfully processed. The order manager will then send order data to the warehouse or behavior department, letting it know the product or service can be dispatched

to the customer. At this point, tangible or digital products may be shipped to a customer, or access to a service may be granted. [1]

### Using ProductPulse Has Many Benefits which in turn can make life ease

- **Availability:** Aside from outages and scheduled maintenance, E-commerce sites are available 24/7, enabling visitors to browse and shop at any time. Brick-and-mortar businesses tend to open for a fixed number of hours and may even close entirely on certain days. [1]
- **Speed of access:** While shoppers in a physical store can be slowed by crowds, E-commerce sites run quickly, which is determined by compute and bandwidth considerations on both the consumer device and the E-commerce site. Product and shopping cart pages load in a few seconds or less. An E-commerce transaction can comprise a few clicks and take less than five minutes. [1]
- **Wide availability:** Amazon's first slogan was "Earth's Biggest Bookstore." It could make this claim because it was an E-commerce site and not a physical store that had to stock each book on its shelves. E-commerce enables brands to make a wide array of products available, which are then shipped from a warehouse or various warehouses after a purchase is made. Customers will likely have more success finding what they want. [1]
- **Easy accessibility:** Customers shopping in physical stores may have difficulty locating a particular product. Website visitors can browse product category pages in real time and use the site's search feature to find the product immediately. [1]

## 2. INTRODUCTION

Introduction related to ProductPulse as it describes the user need and placing their choice in an optimized way, where it gives a comparison between products, analyzes the statistics, and accordingly gives the best out of search, ProductPulse analysis takes place by reviewing the previous data insights and accordingly it gives the recommendation, review and the price which it hits at the lowest and the highest.

### 2.1 OBJECTIVE

- **Developing an Intuitive User Interface for Product Sorting and Analysis** The first objective is to design and implement a user-friendly interface and the main objective of the product review system is to develop new products that are more competitive than what is already available on the market. This can be achieved by providing better value to customers, or by solving problems more efficiently than current alternative products. Often, a unique selling point will also help a product stand out from the crowd.
- **Implementing Real-Time Product** The objective is to establish a real-time product that continuously collects and analyzes online data. This involves setting up data collection agents, data management features, and real-time analysis modules. Users can filter by product and Sort by any of the products to get insights and a clear review of the product they are trying to buy with the previously existing data. Additionally, it should provide historical trend analysis for long-term product buying optimization.
- **Enhance Product Management Analysis** In response to the growing importance of data information, a pivotal objective of the data analysis Project is to bolster the product review system by analyzing the products and their capabilities by integrating previous user experience features. This feature will proactively list down malicious purposes that pose 3 potential threats to the system's review analysis and data management.
- **Efficient product analysis and review at the user end** the goal of this objective is to enhance data management within the ProductPulse Project. It enables users to seamlessly analyze product review data in formats like CSV and TXT for further suggestions/review while supporting data-based products for historical analysis.

## . PROBLEM STATEMENT

ProductPulse is a data analyzer at the user end and performs operations accordingly. It should consistently analyze and verify to ensure the efficiency of the product review. The project addresses the challenges of product management performance, review system and data analysis, and troubleshooting user issues. It also focuses on auditing data fetched by API and Showing correct results with available data at online shopping websites. Frequent dis-managements disrupt business analysis operations, and the lack of real-time visibility into product review performance leads to delayed issue identification and resolution.

Identifying and addressing product review bottlenecks affecting data analysis is a pressing concern. Furthermore, frequent analyzing breaches occur due to insufficient data availability at the user end, and the dis-management increases the number of fake reviews presenting a low significant challenge. It is crucial to maximize the genuineness and performance through resolution, scheduled upgrades, and optimized configurations at the user end. Efficiently designing and implementing ProductPulse at the user level can enhance efficiency and lead to the growth of genuineness, while monitoring product data analytics and figuring out product temperament will help identify good suggestions at the user end. The project aims to address these challenges by troubleshooting analyzing issues, identifying their root causes, and developing effective resolution plans. In addition, the project will focus on enhancing the review up-time to meet the demands of a growing user base and expanding services. By tackling these issues, we aim to ensure consistent genuine review system quality and strengthen our ProductPulse's reliability and data analysis.

## 4. PROJECT REQUIREMENT SPECIFICATION

### 4.1 SOFTWARE REQUIREMENT:-

- **Operating System:** Windows, Android, and IOS.
- **Browser:** Chrome (above 106), Edge (107, 108), Safari (above 15.6), Firefox (above 106), and Opera (92).

### 4.2 HARDWARE REQUIREMENT: -

- **Processor:** i3 or Higher version.
- **RAM:** 2 GB or Higher.

## 5. SYSTEM IMPLEMENTATION

**ProductPulse:-** The system is typically implemented as a web application, and it can follow a typical three-tier architecture:

### 1. Presentation Layer:

- The front end of the application is responsible for the user interface and user interactions.
- Technologies such as Flutter and Dart are used.
- The front end communicates with the back end through RESTful API calls.

### 2. Application Layer (Back-End):

- The back end of the application manages the core business logic and interacts with the database and external services.
- Technologies include a back-end framework - Java Spring Boot, Python's NLTK Package.
- Authentication and authorization mechanisms are implemented in the back end By using JWT(JSON Web Token).
- It communicates with the database for data retrieval and storage.
- External services, such as payment gateways and authentication providers, are integrated here.

### 3. Data Layer (Database):

- The database stores information about products, user details, reviews, and other application data.
- Depending on the application's needs, we are using a relational database MySQL for data storage.

#### 4. Software Required For Development

Requirements for Frontend and Backend:-

- Flutter
- Dart
- Java (Spring Framework)
- Python
- Vs code
- Postman API
- Rest API java(Backend)
- Firebase for authentication if required
- Emulators
- Jira software for project management (Atlassian)
- Libraries:- Python's NLTK Package

#### 6. KEY COMPONENTS AND THEIR FEATURES

1. **User Authentication:** Implement user authentication using JWT(JSON Web Token) to secure user data and features.
2. **Product Management:** Allow users to search for products based on keywords. Enable product sorting by price and category. Provide product details, including descriptions, images, and user reviews.
3. **User Reviews:** Allow users to write and post reviews for products. Implement a rating system to rate products.
4. **Search and Filtering:** Implement a search engine or filtering system to enable users to find products efficiently. - Security: Implement security best practices to protect user data and the application from common vulnerabilities.
5. **API Integration:** Integrate external APIs, such as payment gateways and authentication services.

#### 7. METHODOLOGY

##### 7.1 AGILE SOFTWARE DEVELOPMENT:

Agile methodologies such as Scrum or Kanban can be used to facilitate iterative and incremental development. These methodologies promote collaboration, adaptability, and customer feedback.

##### 7.2 REQUIREMENTS GATHERING:

Start with a detailed analysis of requirements to understand the project scope, user needs, and business goals.

##### 7.3 DESIGN AND PLANNING:

Create a detailed project plan that includes system architecture, database design, and user interface (UI/UX) design.

##### 7.4 VERSION CONTROL:

Use a version control system like Git to manage and track changes to the source code.

##### 7.5 CONTINUOUS INTEGRATION AND CONTINUOUS DELIVERY (CI/CD):

Implement CI/CD pipelines to automate the building, testing, and deployment processes. This ensures that code changes can be quickly and reliably deployed to production.

##### 7.6 CODING STANDARDS:

Adhere to coding standards and best practices to maintain code quality and consistency.

##### 7.7 TESTING:

Implement a comprehensive testing strategy, including unit testing, integration testing, and end-to-end testing. Automated testing helps catch bugs early in the development process.

##### 7.8 CODE REVIEWS:

Conduct code reviews to ensure code quality and promote knowledge sharing within the development team.

**7.9 SECURITY CONSIDERATIONS:**

Integrate security practices into the development process to protect against common vulnerabilities such as SQL injection, cross-site scripting (XSS), and data breaches.

**7.10 DOCUMENTATION:**

Create and maintain thorough documentation for the project, including user manuals, API documentation, and internal code documentation.

**7.11 PROJECT MANAGEMENT:**

Utilise project management tools and methodologies Jira to track progress, assign tasks, and manage project timelines.

**7.12 USER FEEDBACK:**

Gather user feedback through surveys, user testing, or beta testing to continuously improve the application based on user needs and preferences.

**7.13 SCALABILITY AND PERFORMANCE:**

Consider scalability and performance requirements to ensure the application can handle increased user loads and maintain optimal performance.

**7.14 DEVOPS PRACTICES:**

Embrace DevOps practices to foster collaboration between development and operations teams, automate deployment, and monitor application performance.

**7.15 RELEASE MANAGEMENT:**

Establish a release management process to plan and coordinate software releases, including versioning and release notes.

**7.16 ERROR MONITORING AND LOGGING:**

Implement error monitoring and logging to track and analyze application errors and exceptions in real time.

**7.17 USER TRAINING AND SUPPORT:**

Provide user training and support resources to assist users in understanding and using the application effectively.

**7.18 ACCESSIBILITY:**

Ensure the application is accessible to individuals with disabilities by following accessibility guidelines (e.g., WCAG).

**7.19 COMPLIANCE AND DATA PROTECTION:**

Comply with legal and regulatory requirements, especially regarding data protection and privacy (e.g., GDPR).

**7.20 CHANGE MANAGEMENT:**

Implement a change management process to handle updates and changes to the application while minimizing disruption.

### 8. ARCHITECTURE

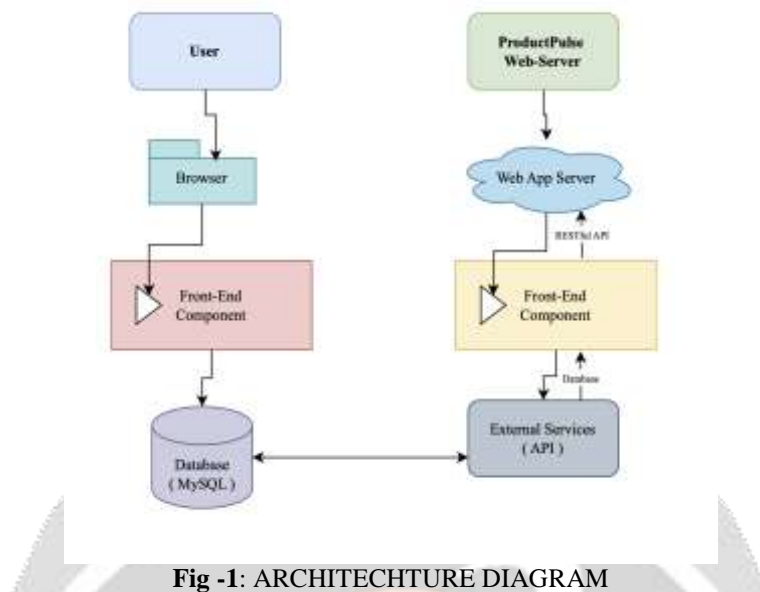


Fig -1: ARCHITECHTURE DIAGRAM

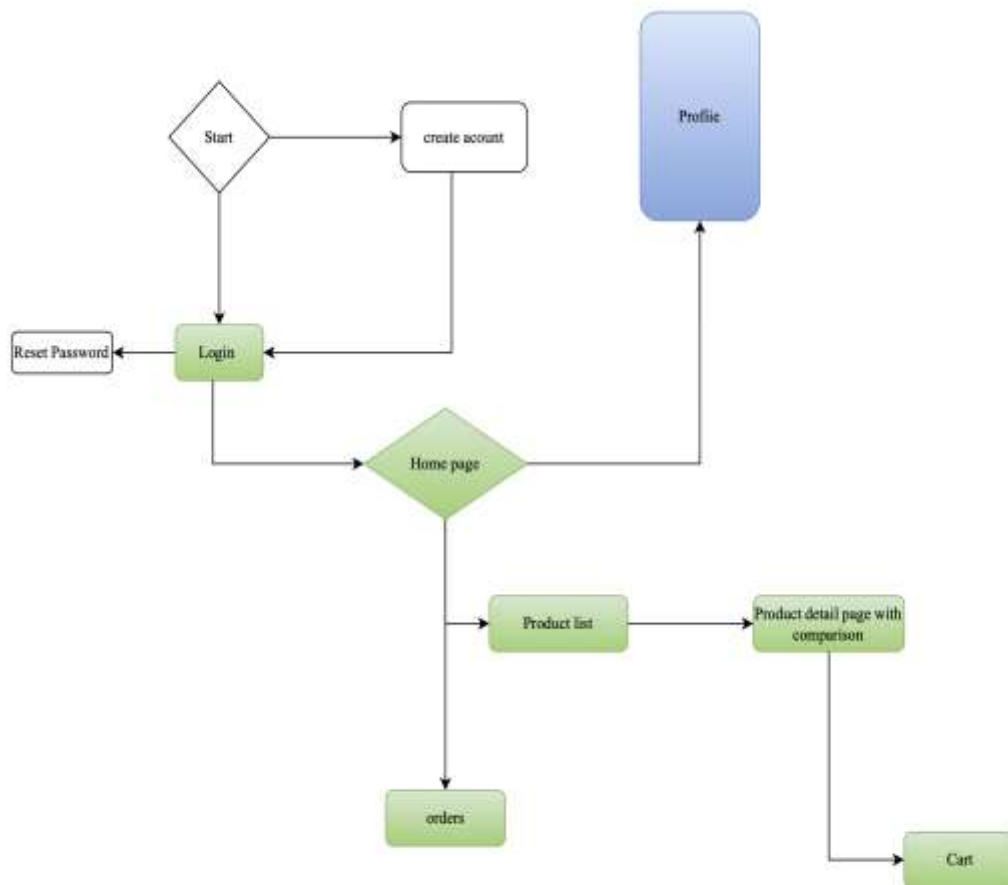


Fig -2: ACTIVITY DIAGRAM

## 9. CONCLUSION

Concluding Phase 1 of "ProductPulse", It is a dynamic and feature-rich web application designed to offer users a seamless and personalized shopping experience. Over the course of this project, we have taken a concept and transformed it into a fully functional and user-friendly application.

Throughout the development process, we've embraced best practices in software engineering, including agile methodologies, continuous integration, and rigorous testing. We've worked diligently to create a product that not only meets but exceeds the needs and expectations of our users.

"ProductPulse" features robust user authentication, efficient product searching and sorting, comprehensive product details, and a review system that encourages user engagement and feedback. The application prioritizes both user experience and data security, providing a stable and secure platform for shopping and product discovery.

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