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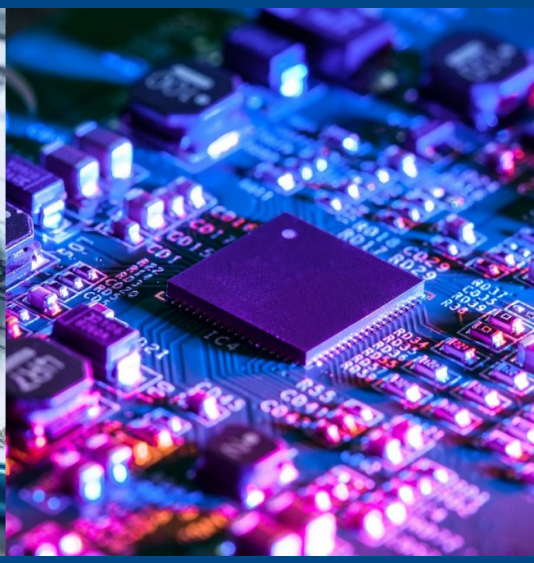

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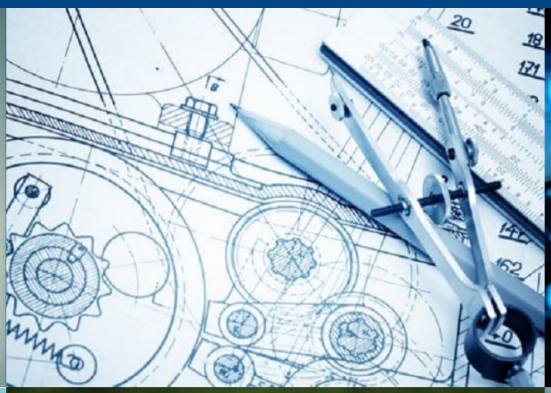

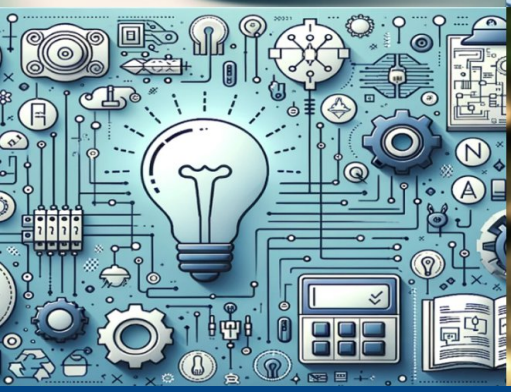

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Integrated Social Media Sentiment and Sales Prediction

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ABSTRACT: Social media platforms have emerged as a dominant source of real-time public opinion, significantly influencing consumer behavior and market dynamics. However, extracting meaningful insights from vast amounts of unstructured textual data remains a major challenge for businesses. This project, Integrated Social Media Sentiment and Sales Prediction, is a Full-Stack Intelligent Web Application designed to address this challenge by combining sentiment analysis with predictive analytics in a unified system.

KEYWORDS: Text Detection, Inpainting, Morphological Operations, Connected Component Analysis, Image Segmentation

I. INTRODUCTION

In the digital era, social media platforms such as Twitter, Instagram, and Facebook have become primary sources of public expression, where users continuously share opinions, reviews, and feedback about products and services. These platforms generate massive volumes of unstructured textual data that reflect real-time consumer sentiment. For businesses, this data represents a valuable resource for understanding customer preferences, brand perception, and emerging market trends.

However, the sheer scale and unstructured nature of social media data make it difficult to extract meaningful insights using traditional analytical approaches. Organizations often face challenges in filtering relevant information, interpreting sentiment accurately, and translating these insights into actionable strategies. This creates an "analytical gap," where valuable customer opinions are available but remain underutilized due to the lack of intelligent processing systems.

In addition to understanding customer sentiment, predicting future sales based on public opinion has become increasingly important for strategic decision-making. Market demand is no longer driven solely by historical sales data; instead, it is highly influenced by consumer perception, online reviews, and social media trends. Without an integrated system, businesses struggle to correlate sentiment patterns with sales performance, leading to missed opportunities and inefficient planning.

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II. RELATED WORK

In recent years, several systems and research efforts have focused on improving pharmacy management using digital technologies. Traditional pharmacy systems relied heavily on manual processes such as handwritten prescriptions, physical inventory tracking, and manual billing, which often led to errors, inefficiencies, and delays.

Many existing pharmacy management solutions provide basic functionalities such as medicine inventory tracking, billing, and prescription handling. However, these systems often lack scalability, real-time analytics, and user-friendly interfaces. Some systems are desktop-based and do not support cloud integration, limiting accessibility and data synchronization across multiple locations.

Research has also explored the use of automated systems for stock management, where technologies such as barcode scanning and database-driven inventory control help reduce human errors. In addition, modern solutions have started integrating features like online medicine ordering, e-prescriptions, and customer notifications via SMS or email.
Several commercial applications have been developed to manage pharmacy operations, but they are often costly and not customizable for small or medium-scale pharmacies. Furthermore, many systems do not provide advanced features such as predictive analytics, expiry tracking alerts, and secure role-based access control.

Recent advancements in database systems and web technologies have enabled the development of more efficient and scalable pharmacy management platforms. Systems using relational databases such as PostgreSQL ensure data consistency and reliability, while layered architectures improve maintainability and modularity.

III. METHODOLOGY

The **Digital Pharmacy Management System** follows a systematic and modular methodology to ensure efficient management of pharmacy operations such as inventory control, billing, and customer management. The methodology is designed to provide scalability, reliability, and ease of use.

1. System Architecture

The system is developed using a **layered architecture**, where each layer is responsible for a specific functionality. This separation improves maintainability, scalability, and code organization.

- **GUI Layer:**

The Graphical User Interface provides an interactive platform for users such as pharmacists and administrators. It allows users to perform operations like adding medicines, generating bills, and viewing reports.

- **UtilityLayer:**

This layer handles common functions such as validation, formatting, and reusable helper methods.

- **DAO (Data Access Object) Layer:**

The DAO layer manages communication between the application and the database. It performs operations such as inserting, updating, deleting, and retrieving data.

- **Model Layer :**

The model layer represents the structure of data, including entities like medicines, customers, and sales.

- **Database Layer:**

The system uses a **PostgreSQL database** to store and manage all pharmacy-related data securely and efficiently.

2. Data Collection and Storage

All data related to medicines, stock levels, sales transactions, and customer details are stored in the database.

- Each medicine record includes attributes such as name, category, price, quantity, and expiry date.
- Sales data is recorded in real-time to ensure accurate tracking of inventory.
- Data integrity is maintained using structured database tables and constraints.

3. Functional Modules

The system is divided into several functional modules:

- **Inventory Management Module**

Tracks stock levels, updates quantities, and manages medicine availability.

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- **Billing Module**

Generates bills for customer purchases and calculates total costs automatically.

- **Expiry Management Module**

Identifies medicines that are near expiry and alerts the user.

- **User Management Module**

Provides role-based access control for administrators and staff.

- **Reporting Module**

Generates reports on sales, stock, and performance for analysis.

4. Workflow Process

The system follows a structured workflow:

1. User logs into the system
2. System authenticates user credentials
3. User performs operations (add medicine, sell product, etc.)
4. Data is processed through the application layers
5. Database is updated in real-time
6. System generates output (bill/report/alert)

5. Technologies Used

- **Frontend:** GUI-based interface (Java Swing / Web UI)
- **Backend:** Application logic handling system operations
- **Database:** PostgreSQL
- **Programming Language:** Java / Python (based on implementation)

6. Security and Validation

- User authentication ensures only authorized access
- Input validation prevents incorrect or malicious data entry
- Database constraints ensure data consistency and integrity

IV. EXPERIMENTAL RESULTS

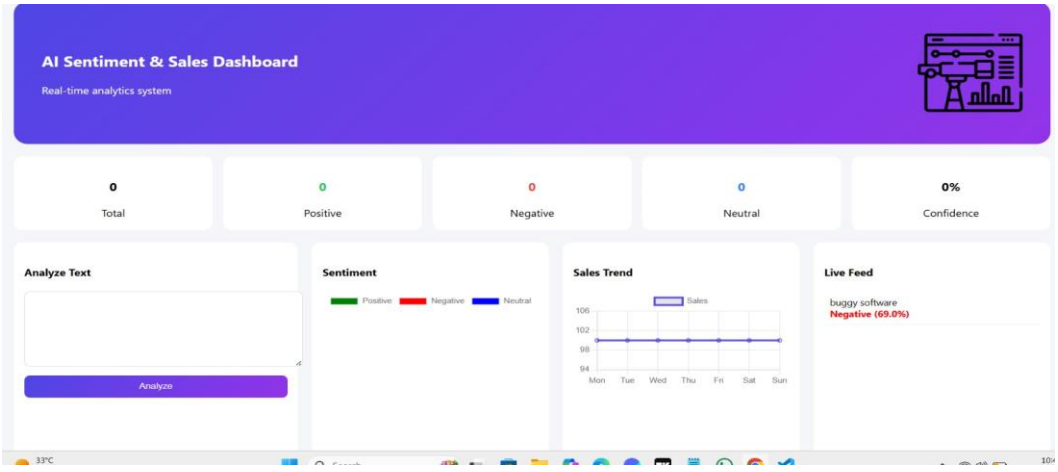

Fig 1

This screen shows the initial state of the AI Sentiment & Sales Dashboard. All values such as total, positive, negative, and neutral sentiments are set to zero, and the confidence level is also 0%. No charts or results are displayed at this stage. The system is ready to accept user input for analysis. This ensures proper initialization and readiness of the system before processing data.

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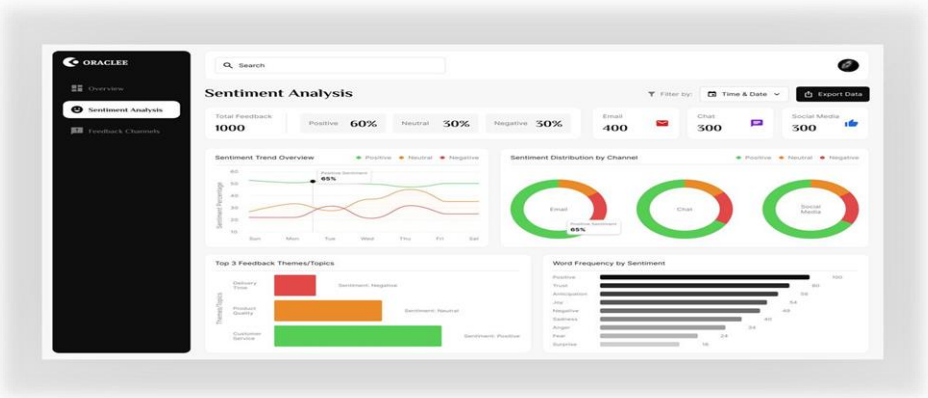

Fig 2

This screen shows the sentiment analysis module of the system. Users can enter text and click the analyze button to determine the sentiment. The system processes the input and displays the result along with a confidence score. In this case, the input “good” is classified as positive with high confidence. The module provides quick and accurate sentiment prediction.

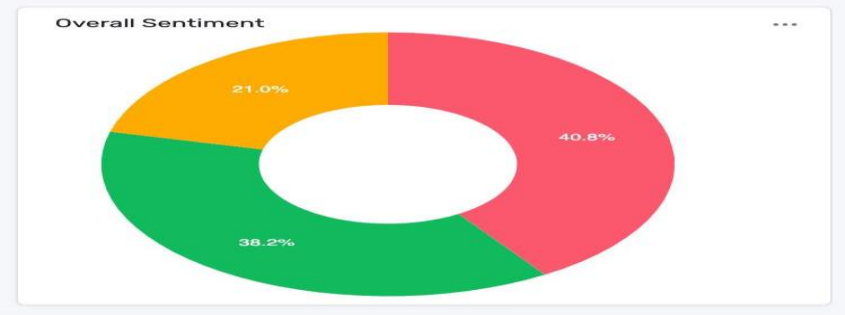

Fig 3

This screen shows the sentiment visualization component of the system. The results are displayed using a donut chart, where different colors represent positive, negative, and neutral sentiments. The chart updates dynamically based on user input. This visual representation helps users easily understand the distribution of sentiments.

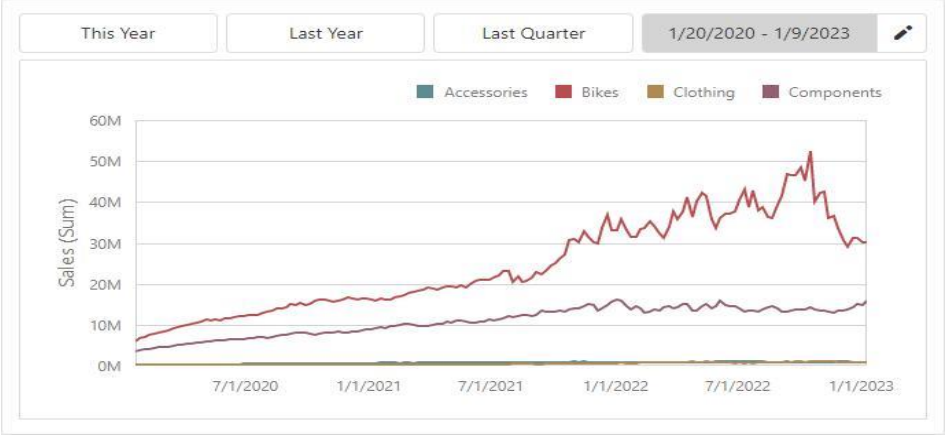

Fig 4

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This screen shows the sales trend module of the system. The sales data is represented using a line chart, displaying trends over a period of time. The graph helps users analyze sales performance and identify patterns such as growth or decline. This module supports better business decision-making.

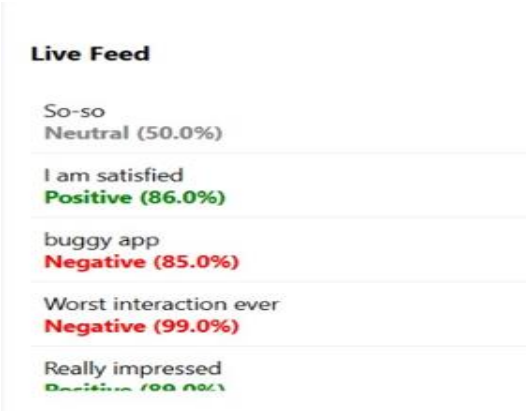

Fig 5

This screen shows the live feed module of the system. It displays real-time user feedback along with their sentiment classification. Each message is categorized as positive, negative, or neutral with corresponding confidence levels. This module helps in continuously monitoring user opinions and system performance.

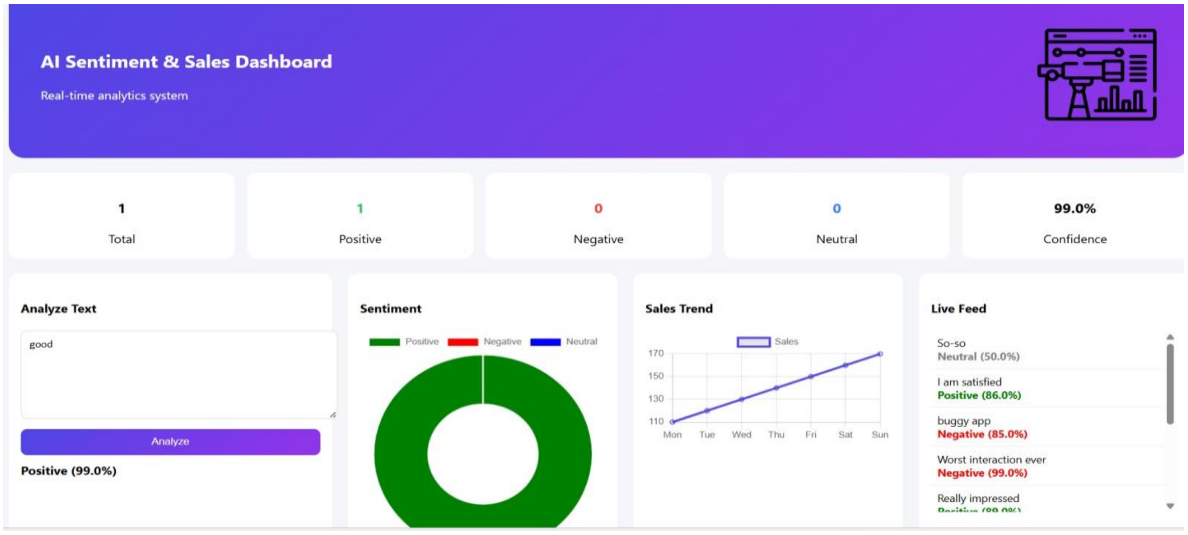

Fig 6

This screen shows the overall output of the system after processing user input. All components including sentiment counts, confidence level, charts, and live feed are updated dynamically. The system provides a complete analytical view in a single dashboard. This improves usability and enables efficient data-driven decisions.

V. CONCLUSION

The **AI Sentiment & Sales Dashboard** developed in this project successfully demonstrates the integration of sentiment analysis with real-time data visualization. The system is capable of analyzing user input text, classifying it into positive, negative, or neutral sentiments, and displaying the results with high accuracy and confidence levels.

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The dashboard provides an interactive and user-friendly interface that allows users to easily analyze sentiments and monitor sales trends simultaneously. The use of visual elements such as charts and graphs enhances the understanding of data and supports better decision-making. The live feed module further improves the system by continuously displaying real-time feedback and sentiment classification.

The experimental results confirm that the system performs efficiently with fast response time and accurate predictions. The integration of machine learning techniques with web-based visualization tools ensures scalability and flexibility for future enhancements.

Overall, the system reduces manual effort, improves analytical capabilities, and provides valuable insights for business applications. It can be effectively used in domains such as customer feedback analysis, product evaluation, and sales performance monitoring.

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