

Sales Viesta-AI: An Intelligent AI-Driven Sales Analytics and Decision Support System

Chinmayee Kale¹, Pranali Godase², Ajay Chawda³

¹Diploma Student, Department of Computer Engineering, Thakur Polytechnic, Mumbai, India

³Assistant Professor, Department of Computer Engineering, Thakur Polytechnic, Mumbai, India

Abstract -

Sales Viesta-AI is an intelligent sales management platform designed to improve business decision-making through data analysis and artificial intelligence. Modern businesses generate large volumes of sales, customer, and revenue data, making manual analysis difficult and time-consuming. The proposed system provides a centralized platform for sales tracking, data visualization, predictive analysis, and automated reporting.

The platform integrates AI-based recommendations, scenario simulation, and incident reporting to support strategic planning and risk analysis. It analyzes historical data to identify trends and generate predictive insights for future business growth. The system also includes location-based analysis and automated report generation to enhance business intelligence and operational efficiency.

Overall, Sales Viesta-AI transforms traditional sales data into a smart and data-driven decision support system, helping businesses optimize performance and improve planning through intelligent analytics.

Keywords: Sales Analytics, Artificial Intelligence, Predictive Analysis, Business Intelligence, Decision Support System, Data Visualization.

1. INTRODUCTION

In today's digital era, businesses generate a large volume of sales data from customers, products, transactions, and revenue activities. Managing and analyzing this data manually is complex and time-consuming, making it difficult for organizations to make accurate and timely business decisions. Traditional sales management systems mainly focus on storing data but lack intelligent analysis and predictive capabilities.

To address this challenge, artificial intelligence and data analytics technologies are being integrated into business platforms to provide automated insights, forecasting, and decision support. AI-based systems can analyze historical data, identify trends, predict future sales performance, and provide strategic recommendations to improve business growth and operational efficiency.

Sales Viesta-AI is developed as an intelligent sales management and analytics platform that integrates data visualization, predictive analysis, scenario simulation, and AI-driven recommendations into a single system. The platform helps businesses track sales performance, identify risks, generate automated reports, and make data-driven decisions efficiently.

The main contribution of this research is the development of a centralized AI-driven sales intelligence platform that combines predictive analytics, location-based analysis, incident reporting, and scenario simulation to enhance business decision-making and reduce manual effort in sales management.

2. OBJECTIVE

The main objective of Sales Viesta-AI is to develop an intelligent sales analytics platform that improves business decision-making through artificial intelligence and data analysis.

- To develop a centralized platform for sales management, analytics, and reporting.
- To design real-time dashboards for monitoring sales performance and trends.
- To implement AI-based predictive models for sales forecasting and business analysis.
- To integrate scenario simulation and incident reporting for risk assessment and decision support.
- To provide location-based and data-driven insights for business growth and strategy planning.

3. LITERATURE REVIEW

Recent research has focused on integrating artificial intelligence into business intelligence platforms. Sharma et al. (2021) proposed an AI-based sales forecasting system using machine learning techniques to improve business decision-making. Kumar and Singh (2022) developed a predictive analytics framework for retail sales optimization using data mining and regression models. Zhang et al. (2023) introduced an intelligent CRM system that integrates real-time analytics and automated reporting for business growth. However, these systems lack scenario simulation, incident reporting, and integrated AI Co-Pilot

support in a unified platform. Sales Viesta-AI addresses these limitations by providing a comprehensive AI-driven sales intelligence system.

4. SYSTEM ARCHITECTURE

Sales Viesta-AI follows a layered system architecture that integrates frontend, backend, AI modules, and database components to provide intelligent sales analysis and business insights.

The system consists of the following modules:

- User Management Module for authentication and role-based access
- Sales Management Module for tracking and storing sales data
- Analysis Module for generating charts and predictive insights
- Reporting Module for automated PDF reports
- AI Module for recommendations and forecasting

The system flow begins with user input through the frontend interface, which sends data to the backend server. The backend processes the data using AI models and stores it in the database. The processed data is then visualized through dashboards and reports, providing actionable business insights.

4.1 User Interface (Front-End)

The frontend of Sales Viesta-AI is developed using React and TypeScript to create a responsive and interactive user interface. It provides dashboards, charts, and navigation components that allow users to upload data, view analytics, and access AI-based insights easily. React is used for the main user interface, while Streamlit is used for analytical dashboards and visualization.

4.2 Backend Processing Layer

The backend layer is responsible for handling the core logic and processing operations of the application. It is implemented using Python and utilizes several libraries to perform data processing and predictive analysis. Libraries such as Pandas and NumPy are used for data manipulation and numerical computations, while Scikit-learn supports machine learning models for predictive sales analysis.

4.3 Database and Data Management Layer

The Sales Viesta-AI system uses a centralized data storage mechanism to manage the sales data efficiently and securely without any alteration. It stores user information, sales records, product

details, reports, and analytical data and stores it using databases such as Firebase or MongoDB. It also stores information in the form of CSV based files. This helps business for reliable data storage, easy retrieval, and efficient management of their data. It stores and analysis the data in such a way that can be used for analysis, reporting, insights and AI-based predictions.

4.4 External Technology Integration

To enhance system functionality, the platform integrates several external technologies and services. In addition, **Google Generative AI** is integrated to provide chatbotbased assistance, enabling users to obtain guidance, AI-driven recommendations, or to access risk and its solution. The combination of these external services improves the scalability and reliability of the platform while enabling realtime decision-making. Also for the location-based analysis it is implemented using mapping libraries such as Folium/PyDeck along with Geopy for geolocation processing and GeoJSON data for regional visualization.

5. FEATURES OF Sales Viesta-AI

The Sales Viesta-AI platform delivers many functionalities which aims to improve the sales management, data analysis, and decision-making. The system facilitates users to manage sales data efficiently, analyze sales performance, and provide visual insights. The key modules are **Sales Management, Analytics, Reporting, AI-growth intelligence, and Data Import**. These features allow users to track sales activities, monitor trends, and enhance sales performance. By integrating these capabilities, the application assists users make correct decisions, optimize sales strategies, and improve overall business efficiency. The platform ensures that users can access important insights quickly, respond to market changes effectively, and maintain better control over their sales operations. The location-based analysis it has been implemented by mapping libraries such as Folium/PyDeck along with Geopy for geolocation processing and GeoJSON data for regional visualization.

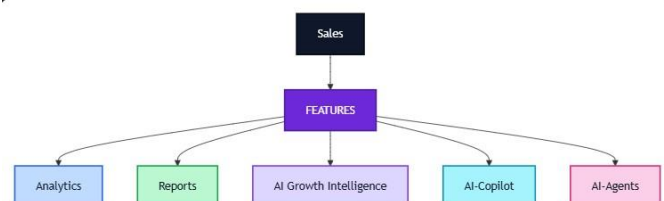


Fig 2 shows the system architecture of Sales Viesta-AI.

5.1 AI-Growth intelligence

The AI-Growth intelligence feature provides real-time data filtering from (1M to MAX). The sales graph in this feature toggles between parameters such as Price and PE Ratios, etc to highlight the shifts in the sales, rating, customer behaviour, retention, revenue growth etc. It also allows to zoom and view the exact values or the growth retention matrix at which the sales dropped. It converts basic data into actionable visual insight. It includes following features:

- **Dynamic Time-Range Filtering:** Fully functional 1M, 3M, 6M, 10M, MAX buttons that transforms the data to show specific historical history based on the selected period.
- **Toggling:** Easily switch between Revenue and Profit trends
- views while maintaining consistent trend line overlays.
- **Trend Tracking:** Real-time calculation and rendering of 50-day and 200-day Moving averages. This feature uses a polynomial regression technique. It categorizes the data into risks, strengths, strategic recommendations, and explains how risk factors impact performance of the product or sales. This feature helps the stakeholders to make quick and accurate decisions without manual calculations.

5.2 AI Co-Pilot

The AI Co-Pilot feature in Sales Viesta-AI acts as an intelligent assistant that helps users make better business decisions. It analyzes historical sales data and provides smart suggestions, such as identifying top-performing products, predicting future sales trends, and recommending pricing strategies. This feature simplifies complex data analysis by presenting insights in an easy-to-understand format. It also helps users by answering queries, highlighting important patterns, and guiding users in optimizing sales performance, thereby improving efficiency and decisionmaking. Here an important feature that is location-based analysis it has been implemented by mapping libraries such as Folium/PyDeck along with Geopy for geolocation processing and GeoJSON data for regional visualization, it shows which area is performing well and which is not. It also shows area wise growth.

5.3 Data Import

The Data Import feature allows users to upload sales data primarily in CSV format. After uploading, user can view data analysis results. It also generates the report. It combines real-time analytics with AI-generated insights to provide a combined view of sales performance, including revenue trends, conversion rates, and churn analysis. The system supports secure report generation and structured

data storage to maintain data integrity and reliability. This feature simplifies reporting, saves time, and helps businesses make decisions efficiently

5.4 Incident Reporting

The Incident Reporting feature in Sales Viesta-AI helps businesses identify and manage unexpected events that may affect sales performance or operations, such as sudden sales drops, product shortages, pricing issues, or regional performance decline. This feature allows users to record incidents by selecting relevant parameters like product category, location, and time period, enabling structured tracking of business issues.

Once an incident is reported, the system analyzes historical and current sales data to identify possible causes and patterns. It also provides AI-based recommendations and risk analysis to support faster and more accurate decision making. The platform displays incident trends and severity levels through dashboards and reports, helping businesses monitor problems and take corrective actions in a timely manner.

Overall, the Incident Reporting module improves risk management by providing a systematic and data-driven approach to identifying and resolving business challenges, ensuring better operational control and strategic planning.

5.5 Information

The Information module in Sales Viesta-AI provides users with structured resources and business insights to stay informed, prepared, and proactive in managing sales operations and decision-making. It organizes important sales data, product details, performance metrics, and business insights in a centralized platform, allowing users to easily access relevant information and monitor overall business growth. The module ensures transparency, improves understanding of business performance, and supports efficient decision-making by presenting data in a clear and structured manner. The module includes several key components:

- **Sales Information:** Provides detailed insights about sales performance, including product-wise revenue, profit, and growth trends, helping users monitor business performance effectively.
- **Product Information:** Displays product-related details such as category, pricing, demand, and performance, enabling users to identify top-performing and low-performing products.
- **Customer and Revenue Insights:** Presents structured data on customer behavior, revenue generation, and market trends, allowing businesses to understand their target audience and improve strategies.

- **Reports and Analytics Information:** Offers summarized reports, charts, and visual dashboards that convert complex sales data into understandable insights, supporting faster and accurate decision-making.
- **System Updates and Feedback:** Allows users to review system-generated insights and provide feedback or updates, ensuring continuous improvement and better platform performance.

6. TECHNOLOGIES USED

6.1 Programming and Framework

The backend of Sales Viesta-AI is implemented using Node.js and Express.js for API handling and system communication, while Python is used for AI processing and data analysis modules.

React and TypeScript: Used to design a responsive and interactive user interface, enabling smooth navigation and efficient front-end development.

Node.js and Express.js: Handle backend operations, API routing, and server-side logic to ensure seamless communication between the client and system. **Streamlit:** Used to build interactive dashboards and visual analytics for better understanding of sales data and insights.

6.2 Database and Security

The Sales Viesta-AI platform uses a centralized database system to store user information, sales records, product data, and analytical reports in a secure and organized manner. Technologies such as MongoDB or Firebase are used for efficient data storage and retrieval, while CSV-based storage supports structured data analysis and reporting. The system includes secure authentication and role-based access control to protect user accounts and ensure authorized access to the platform. Proper data handling and security mechanisms are implemented to maintain data privacy, reliability, and overall system integrity.

6.3 System Utilities

The Sales Viesta-AI platform uses various system utilities to support data processing, visualization, and overall system performance. Mapping and geolocation utilities such as Folium, PyDeck, and Geopy are used to provide locationbased sales analysis and regional visualization. Reporting utilities are used to generate PDF reports and analytical summaries for better decision-making. Additional libraries and tools support data visualization, chart generation, and system integration, ensuring smooth functioning of the platform and efficient handling of analytical and operational tasks.

6.4 Data Processing and Analysis

The Sales Viesta-AI platform uses data processing and analysis techniques to transform raw sales data into meaningful insights. Libraries such as Pandas and NumPy are used for data cleaning, preprocessing, and numerical computations, while Scikit-learn supports predictive analysis and trend identification. The system analyzes historical sales data to detect patterns, calculate growth metrics, and generate forecasts, enabling businesses to make informed and data-driven decisions. This processing ensures accurate analysis, efficient handling of large datasets, and reliable business intelligence outputs.

6.5 AI and External Integration

The Sales Viesta-AI platform integrates artificial intelligence and external technologies to enhance decision-making and system intelligence. Google Generative AI is used to provide AI Co-Pilot assistance, enabling users to receive automated insights, recommendations, and query-based responses related to sales data and business performance. Predictive analysis models analyze historical data to identify trends and generate forecasts, while scenario simulation helps users evaluate risk, profit, and estimated revenue before implementing business decisions. The integration of these AI and external technologies improves system efficiency, supports real-time decision-making, and provides intelligent business guidance through automated analysis and recommendations.

“This integration ensures scalability, intelligent automation, and enhanced business intelligence capabilities within the Sales Viesta-AI platform.”

7. METHODOLOGY

7.1 Data Collection

The Sales Viesta-AI system begins with data collection, where users upload sales datasets in CSV format or enter business-related data into the platform. The collected data includes product details, pricing, revenue, category, location, and performance metrics. This data is stored in a centralized database and used for further analysis and processing. The structured data collection process ensures accuracy, consistency, and efficient handling of business information for intelligent decision-making.

7.2 Data Preprocessing

After data collection, the system performs data preprocessing to prepare the dataset for analysis. This step includes data cleaning, handling missing values, formatting, and organizing the data into a structured form. Libraries such as Pandas and NumPy are used to transform raw sales data into meaningful and usable information. Proper preprocessing ensures that the data is reliable and ready for predictive analysis and visualization.

7.3 Data Analysis and Prediction

In this stage, the system analyzes historical sales data to identify trends and patterns. Techniques such as polynomial regression and moving average calculations are used to forecast future sales performance and detect growth or decline in product trends. The analysis helps in identifying risks, strengths, and business opportunities, enabling users to make data-driven decisions and improve overall sales strategies.

7.4 AI Co-Pilot and Recommendation Engine

The AI Co-Pilot module provides intelligent recommendations and automated insights based on analyzed data. It uses AI-based models and Google Generative AI to understand user queries and generate meaningful business suggestions. The system provides recommendations such as pricing strategies, product performance insights, and sales improvement strategies, helping businesses make faster and more accurate decisions.

7.5 Scenario Simulation and Incident Analysis

The methodology also includes scenario simulation and incident analysis to evaluate business risks and unexpected events. Users can test different business conditions to estimate profit, revenue, and potential risks before implementing strategies. The incident analysis feature identifies unusual sales patterns or performance drops and provides recommendations to resolve them, ensuring better risk management and operational stability.

7.6 Visualization and Report Generation

Finally, the system presents the analyzed data through dashboards, charts, graphs, and PDF reports. Visualization tools help users easily understand sales performance, trends, and predictions. The generated reports provide clear and actionable insights that support business planning and decision-making. This step ensures that complex data is converted into simple and understandable information for effective management.

8. IMPLEMENTATION

8.1 Frontend Implementation

The frontend of Sales Viesta-AI is developed using React and TypeScript to create a responsive and user-friendly interface. The system includes various UI components such as dashboards, navigation bars, feature sections, and data visualization panels that allow users to interact with the platform easily. The frontend is designed to provide smooth navigation, clear data presentation, and interactive charts, ensuring that users can upload data, view analytics, and access AI-based insights efficiently. Modern styling frameworks and component-based architecture are used

to enhance user experience and maintain system consistency.

8.2 Backend Implementation

The backend of Sales Viesta-AI is developed using Node.js and Express.js to manage server-side operations and system functionality. It handles API routing, data processing, user authentication, and communication between the frontend and database. The backend ensures secure data transfer, efficient request handling, and smooth system performance. It also manages data storage, report generation, and integration with AI modules, enabling real-time analysis and reliable system operations.

8.3 AI Module Implementation

The AI module of Sales Viesta-AI is implemented using Python and machine learning libraries to provide intelligent analysis and predictive insights. Libraries such as Pandas and NumPy are used for data processing, while Scikit-learn supports predictive modeling and trend analysis. The system applies polynomial regression and moving average techniques to forecast sales performance and identify patterns in historical data. Google Generative AI is integrated to enable AI Co-Pilot functionality, which provides automated recommendations, business insights, and query-based assistance, enhancing decision-making and system intelligence.

8.4 Database Implementation

The database of Sales Viesta-AI is designed to store and manage sales data, user information, product details, and analytical reports in a secure and structured manner. Technologies such as MongoDB or Firebase are used for centralized data storage and efficient data retrieval, while CSV-based storage supports dataset upload and processing for analysis. The database ensures proper organization of business data, secure access control, and reliable storage, allowing the system to perform accurate analysis and generate meaningful insights.

8.5 System Integration and Deployment

The Sales Viesta-AI platform integrates frontend, backend, AI modules, and database components to create a unified and efficient system. The frontend communicates with the backend through API requests, while the backend processes data and interacts with AI modules and the database to generate insights and reports. External technologies such as Google Generative AI, Streamlit dashboards, and mapping utilities are integrated to enhance system functionality. The complete system is designed to ensure smooth deployment, scalability, and efficient performance, enabling users to access real-time analytics, AI recommendations, and business insights through a single platform.

9 Advantages of Sales Viesta-AI

Sales Viesta-AI provides multiple advantages that help businesses improve their sales performance and decision-making. It uses **AI-based decision making** to analyze data and guide smarter business strategies, while **real-time sales analysis** allows continuous monitoring of sales activities. The system supports **scenario simulation** to predict future outcomes and includes **incident reporting** to quickly detect and resolve issues. With **centralized data management**, all sales information is stored in one place, and **location-based analysis** helps understand regional performance. It also offers **automated reporting** to reduce manual work and a **user-friendly interface** for easy operation. Overall, Sales Viesta-AI enhances **business intelligence** by providing clear insights that support growth and better planning.

Advantages of Sales Viesta-AI

-  AI-based Decision Making
-  Real-time Sales Analysis
-  Scenario Simulation
-  Incident Reporting
-  Centralized Data Management
-  Location-based Analysis
-  Automated Reporting
-  User-friendly Interface
-  Improved Business Intelligence

10. RESULTS AND DISCUSSION

10.1 System Output Overview

The Sales Viesta-AI platform was successfully developed and tested to analyze sales data and generate business insights. The system processes uploaded datasets and provides analytical outputs such as sales trends, predictive analysis, scenario simulation, and incident reporting. The integration of frontend, backend, AI modules, and database ensures smooth functionality and reliable data processing. The results show that the platform can transform raw

sales data into useful business intelligence and support decision-making.

10.2 Dashboard and Visualization Results

The dashboard provides basic visualization of sales data through charts and graphical representations. Users can view product performance, sales trends, and dataset summaries after uploading data into the system. The visualization helps in understanding overall business performance and identifying important patterns in sales data. Although the current dashboard includes essential visual components, further improvements can be made by adding advanced analytics and real-time monitoring features.

10.3 AI Growth Intelligence Results

The AI Growth Intelligence module analyzes historical sales data and generates predictive insights for future performance. The system uses machine learning techniques to estimate growth trends and provide recommendations for improving sales strategies. The results indicate that AI-based analysis helps users understand market behavior, identify growth opportunities, and make better business decisions. The AI Co-Pilot feature also assists users by providing automated suggestions and insights based on the data.

10.4 Scenario Simulation Results

The scenario simulation module allows users to test different business conditions and analyze possible outcomes. By adjusting parameters such as product demand, pricing, and investment, the system estimates profit, revenue, and risk levels. The results show that this module helps in evaluating business strategies before implementation and supports strategic planning.

10.5 Incident Reporting Results

The incident reporting module identifies performance issues such as sudden sales drops or operational risks in the dataset. The system generates alerts and analytical summaries to help users take corrective actions. The results demonstrate that incident monitoring improves system awareness and supports better business management.

10.6 Performance and System Evaluation

The performance of Sales Viesta-AI was evaluated based on functionality, usability, and analytical capability. The system provides efficient data processing, simple user interaction, and reliable analytical output. The integration of AI and data analysis improves business intelligence and reduces manual effort in sales analysis. Overall, the system performs effectively in providing insights and supporting business decision-making.

11. LIMITATIONS OF THE SYSTEM

The Sales Viesta-AI platform provides useful analytical and AI-based business insights; however, the current version of the system has certain limitations that need to be addressed in future development. The system mainly depends on the quality and accuracy of the uploaded dataset, and incorrect or incomplete data may lead to inaccurate analysis and predictions. The dashboard and visualization features are currently basic and do not support advanced real-time monitoring or dynamic filtering.

The AI prediction model is based on limited machine learning techniques and may not provide highly accurate forecasts for complex or large-scale business environments. The system also requires internet connectivity and proper system resources to run smoothly, which may affect performance on low-end devices. Additionally, the platform is still in the prototype stage and does not support full enterprise-level scalability or integration with live business databases and APIs.

Despite these limitations, the system provides a strong foundation for AI-based sales analysis and can be improved further through advanced AI models, real-time data integration, and enhanced user interface features.

12. FUTURE SCOPE

The Sales Viesta-AI platform provides a strong foundation for intelligent sales analysis and business decision-making; however, several enhancements can be implemented in the future to improve its performance and scalability. The system can be upgraded by integrating advanced machine learning and deep learning models to provide more accurate sales forecasting and predictive analysis. Real-time data integration with external APIs and live business databases can be added to enable continuous monitoring of sales performance and market trends.

In the future, the platform can be deployed on cloud infrastructure to improve scalability, security, and accessibility for large-scale business environments. A mobile application version of Sales Viesta-AI can also be developed to allow users to monitor sales and analytics on smartphones and tablets. Additionally, advanced dashboard features such as dynamic filters, automated reporting, and real-time alerts can enhance user experience and decision-making capabilities.

The system can also be expanded by integrating advanced AI chatbots, automated marketing recommendations, and business strategy generators to support organizations in planning and execution. Overall, future improvements will focus on making the platform more intelligent, scalable, and efficient, transforming it into a complete AI-driven business intelligence solution.

13. CONCLUSION

The Sales Viesta-AI platform was developed to provide an intelligent and efficient solution for sales management,

data analysis, and business decision-making. The system successfully integrates data processing, visualization, AI-based analysis, and reporting features to transform raw sales data into meaningful insights. It helps businesses monitor performance, identify growth opportunities, analyze risks, and make strategic decisions with reduced manual effort.

The platform demonstrates how artificial intelligence and data analytics can improve traditional sales management systems by providing predictive insights, scenario simulation, and automated recommendations. Although the current system has some limitations, it provides a strong foundation for future improvements such as real-time analytics, advanced AI models, and cloud-based deployment. Overall, Sales Viesta-AI proves to be a useful and scalable solution for modern business intelligence and sales analytics, supporting organizations in achieving better performance and data-driven decision-making.

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