Sale's AI

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ABSTRACT
In an ever-evolving business landscape, "Sale's AI" stands as a pioneering mobile application dedicated to revolutionizing customer relationship management through the application of Artificial Intelligence (AI) and Machine Learning (ML). This powerful software is designed to empower businesses with intelligent decision-making capabilities, providing a seamless and personalized experience for customers.
The primary objective of "Sale's AI" is to enhance customer satisfaction by harnessing AI and ML algorithms to gain profound insights into customer behavior, preferences, and purchase patterns. By doing so, it enables businesses to build stronger, lasting customer relationships.
This project represents a remarkable stride towards operational efficiency, cost-effectiveness, and customer-centric operations. Its intuitive user interface is tailored for businesses of all sizes, providing ease of use and a competitive edge in the market.
"Sale's AI" is a testament to the synergy between cutting-edge technology and the demands of modern business. With the potential to empower companies to stay competitive and deliver exceptional customer experiences, it embodies the future of customer relat   ionship management software.

Keyword:- Customer Relationship Management,Artificial Intelligence,Machine Learning,User Interface,Stock Management System etc.

1.INTRODUCTION:

In the ever-evolving landscape of modern business, small and mid-sized enterprises (SMEs) face the ongoing challenge of maintaining efficiency, accuracy, and competitiveness. These enterprises often grapple with resource constraints, relying on antiquated, manual methods to manage their stock, generate bills, and maintain records. This not only consumes valuable time but also introduces the risk of human error into crucial business operations. Enter "Sale's AI," a project that stands at the intersection of innovation and necessity. It is a pioneering application meticulously designed to cater to the unique demands of middle-level shops and businesses. "Sale's AI" aims to revolutionize the way these enterprises handle their inventory, streamline billing processes, and manage records. This introduction provides a comprehensive perspective on the project, uniting its historical context, its significance, and its core objectives into a cohesive narrative. Background and Significance: The genesis of "Sale's AI" lies in recognizing the pressing need for automation and efficiency in SMEs. Traditional manual methods for inventory management involve constant physical checks, leading to inefficiency and, at times, critical stock-related issues. Moreover, these businesses often lack access to the valuable insights offered by modern data analytics tools. Consequently, they may struggle to make informed decisions about product offerings, pricing, and marketing strategies. Additionally, maintaining strong customer relationships proves challenging without centralized customer data.

2. LITERATURE SURVEY:

Sahari, Tinggi and Kadri (2012)
Empirically analysed the relationship between inventory management and firm performance along with capital intensity. For the purpose they took a sample of 82 construction firms in Malaysia for the period 2006–2010. Using the regression and correlation analysis methods, they deduced that inventorymanagement is positively correlated with firm performance. In addition, the results indicate that there is a positive link between inventory management and capital intensity.[1]

Soni (2012)
Made an in depth study of practices followed in regard to inventory management in the engineering goods industry in Punjab. The analysis used a sample of 11 companies for a period five years, that is, 2004–2009 and was done using panel data set. The adequate and timely flow of inventory determines
the success of an industry. She concluded that size of inventory enhanced marginally over the period as compared to a hike in current assets and net working capital. Inventories constituted half of the working capital which was due to overstocking of inventory as a result of low inventory turnover especially for finished goods and raw materials. Rise in sales and favourable market conditions lead to a rise in inventory levels. It was also inferred thatsales increased more as compared to inventory.[2]

Panigrahi (2013)
Undertook an in-depth study of inventory management practices followed by Indian cement companies and its affect on working capital efficiency. The study also investigated the relationship between profitability and inventory conversion days. The study, using a sample of the top five cement companies
of India over a period of 10 years from 2001 to 2010, concluded that a considerable inverse linear relationship existed between inventory conversion period and profitability.[3]

Rich Lavely (1998) Asserts that inventory means "Piles of Money" on the shelf and the profit for the firm. However, he notices that 30% of the inventory of most retail shops is dead. Therefore, he argues that the inventory control is facilitate the shop operations by reducing rack time and thus increases profit. He also elaborates the two types of inventory calculations that determine the inventory level required for profitability. The two calculations are "cost to order" and "cost to keep". Finally, he proposes seven steps to inventory control.

Dave Piasecki (2001) He focused on inventory model for calculating the optimal order quantity that used the Economic Order Quantity method. He points out that many companies are not using EOQ model because of poor results resulted from inaccurate data input. He says that EOQ is an accounting formula that determines the point at which the combination of order costs and inventory costs are the least. He highlights that EOQ method would not conflict with the JIT approach. He further elaborates the EOQ formula that includes the parameters such as annual usage in unit, order cost and carrying cost. Finally, he proposes several steps to follow in implementing the EOQ model. The limitation of this literature is that it does not elaborate further relationship between EOQ and JIT.

Gaur, Fisher and Raman (2005) In their study examined firm-level inventory behaviour among retailing companies. They took a sample of 311 public-listed retail firms for the years 1987–2000 to examine the relationship of inventory turnover with gross margin, capital intensity and sales surprise. They observed that inventory turnover for retailing firms was positively related to capital intensity and sales surprise while inversely associated with gross margins. They also suggested models that yield an alternative metric of inventory productivity, adjusted inventory turnover that can be used in study of performance analysis and managerial decision-making.

Gaur and Bhattacharya (2011) Attempted to study the linkage between the performance of the components of inventory such as raw material, work in progress and finished goods and financial performance of Indian manufacturing firms. The study revealed that finished goods inventory as inversely associated with business performance while raw material inventory and work in progress did not have much effect on same. They emphasised that instead of focusing on total inventory, an attempt should be made to concentrate on individual components of inventory so as to adequately manage the same. They concluded that managers not paying heed to inventory performance may become weak in combating competitors.

3. PROBLEM STATEMENT:

In the modern e-commerce, the sheer abundance of product choices often leaves customers overwhelmed, resulting in difficulty in finding the right products that cater to their individual tastes and needs. Existing ecommerce platforms, although extensive, often lack the finesse required to offer personalized product recommendations. The challenge lies in delivering tailored recommendations that go beyond basic algorithms and truly understand the nuances of customer preferences. The lack of a robust recommendation system hinders the efficiency and enjoyment

of the online shopping experience, leading to reduced customer satisfaction and potentially lower conversion rates for businesses. This project addresses this critical issue by developing a dynamic recommendation system that combines the power of data-driven insights with natural language processing and deep learning to offer an interactive, intuitive, and personalized shopping experience. Our system aims to overcome the existing limitations and provide customers with precisely what they're looking for, making online shopping not only convenient but a genuine delight, thereby increasing customer satisfaction and optimizing business performance.

3.1 PROBLEM DESCRIPTION:

Objectives: 1. Develop a robust recommendation system to provide personalized product suggestions to users. 2. Utilize natural language processing (NLP) for understanding user queries and product descriptions. 3. Implement deep learning techniques to enhance recommendation accuracy. 4. Create an interactive user interface with features such as product listing, details, shopping cart, and checkout. 5. Integrate a chatbot for user interaction and query handling. 6. Continuously improve the recommendation system based on user feedback and interactions. 7. Monitor and maintain the system for performance and accuracy. 8. Enhance the online shopping experience by offering tailored and efficient product recommendations. 9. Increase customer satisfaction and business growth through improved recommendations. Components used: 1. Recommendation Engine 2. Natural Language Processing (NLP) 3. Deep Learning (TensorFlow/Keras) 4. User Interface (AngularJS) 5. Chatbot

5 REQUIREMENT SPECIFICATION:

Our organization needs to develop an Inventory Management and Customer Feedback System to efficiently track and manage our products, handle customer feedback, and improve customer satisfaction. The current manual processes are error-prone, time-consuming, and result in inventory discrepancies and unsatisfactory customer experiences.

1. *Inventory Management*:
   - We have a diverse range of products, and keeping track of stock levels, reordering, and managing stock movement is challenging.
   - We face stockouts and overstock issues, leading to lost sales and unnecessary storage costs.
   - Inefficient management of perishable goods may lead to product wastage.

2. *Customer Feedback*:
   - We lack a systematic approach to collect and analyze customer feedback on our products and services.
   - Customer complaints, suggestions, and reviews are not effectively addressed, leading to customer dissatisfaction.

3. *Product Management*:
   - Product information, such as pricing, descriptions, and specifications, is not consistently updated across systems.
   - Product data is fragmented, causing inconsistencies in marketing and sales efforts.

4. *Customer Management*:
   - Customer information is scattered across different departments, making it challenging to provide personalized services.
   - Customer preferences and purchase history are not adequately recorded and utilized.

The proposed Inventory Management and Customer Feedback System will address these issues by:
- Implementing a centralized inventory management system with automated restocking and alerts.
- Incorporating a customer feedback portal for collecting and analyzing customer comments, complaints, and reviews.
- Streamlining product information and ensuring consistency across platforms.
- Creating a unified customer database for improved customer relationship management.

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Component Are Used:
1.Customer Relationship Management
2.Artificial Intelligence
3.Machine Learning
4.User Interface
5.Stock Management System
6.User Feedback Mechanism
8. System Monitoring and Maintenance
9. Decision Making

Methodology:
Step 1: Requirements Analysis Objective: Gain a deep understanding of user requirements and business needs. Method: Conduct interviews, surveys, and workshops with stakeholders to gather detailed requirements and prioritize them based on business impact.
Step 2: System Design and Prototyping Objective: Develop a comprehensive system design and create prototypes. Method: Utilize wireframing tools and design software to create UI/UX mockups, and create detailed technical specifications for system architecture.
Step 3: Agile Development Objective: Implement iterative development based on Agile principles. Method: Divide the project into sprints with specific tasks and goals, conduct daily stand-up meetings, and continuously integrate user feedback into the development process.
Step 4: Quality Assurance and Testing Objective: Ensure the application meets quality and performance standards. Method: Develop a test plan, conduct unit testing, integration testing, system testing, user acceptance testing (UAT), and load testing. Identify and resolve defects throughout the development process.
Step 5: Deployment and User Training Objective: Deploy "Sale's AI" to production and train end-users. Method: Prepare the application for deployment, execute phased deployment, and provide training sessions for end-users and administrators.
Step 6: Ongoing Maintenance and Support Objective: Ensure long-term stability and functionality of "Sale's AI." Method: Establish a maintenance schedule, monitor system performance and security, collect user feedback, and stay informed about technological advancements.

3.2 REQUIREMENT ANALYSIS:
The Requirement Analysis for this project is a critical phase that encompasses several key elements. Firstly, it involves understanding and delineating the specific needs and expectations of the end-users, thereby ensuring that the recommendation system aligns with their preferences and shopping behaviour. Equally important is the identification of the data requirements, including the sources and formats of data, such as JSON or CSV files, which are pivotal in facilitating accurate recommendations. Functionality requirements encompass the core system features, including the recommendation algorithms, chatbot capabilities, and user interface components like product listing, details, and the checkout process. Non-functional aspects such as performance benchmarks, response times, and scalability targets are also vital for ensuring an efficient and reliable system. Additionally, technical requirements encompass the choice of technologies and frameworks, which in this case involve AngularJS, Python, TensorFlow.
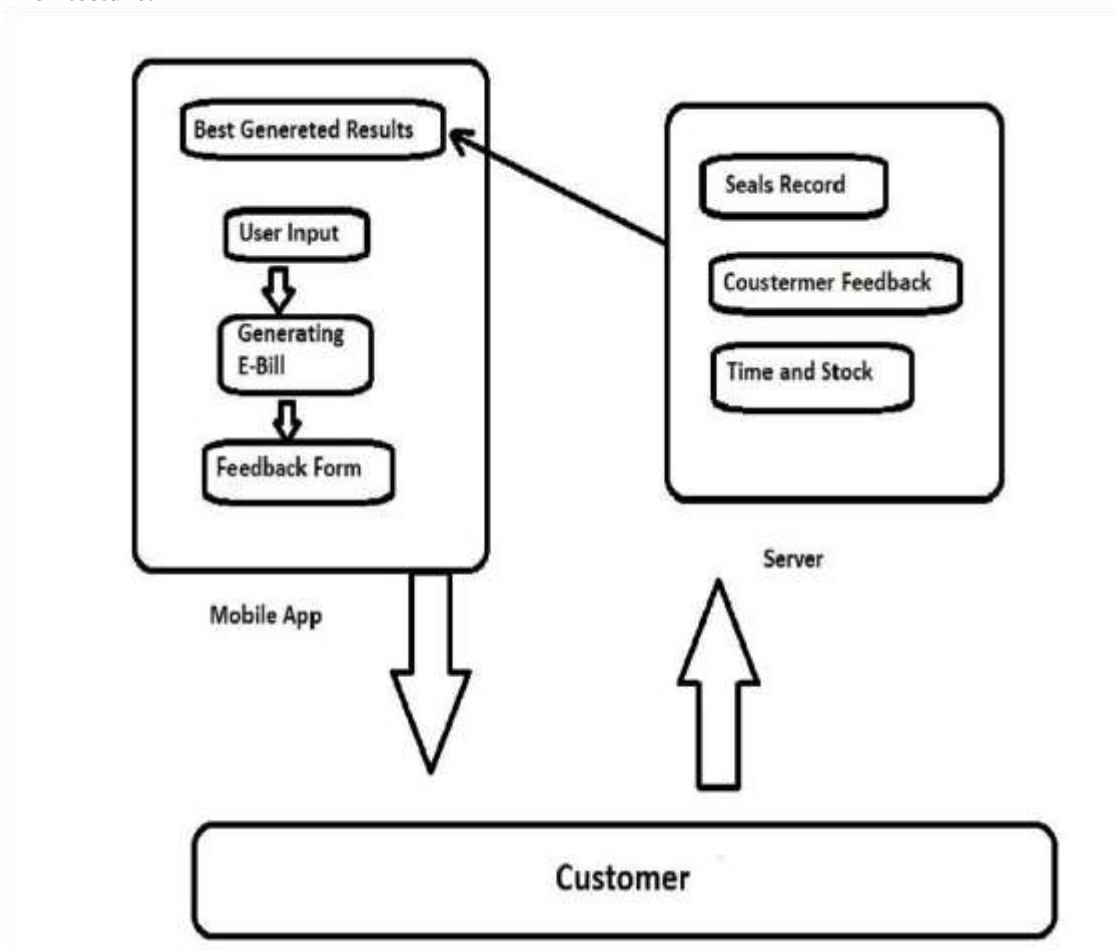
Architecture:

Fig 1 Architecture Diagram

6 CONCLUSION:

In conclusion, the Inventory Management System project successfully addresses the crucial aspects of product and customer relationship management, taking into account valuable user feedback. By implementing this system, we have streamlined inventory control, improved customer interactions, and enhanced overall operational efficiency. This project is a testament to the importance of user input in creating a more responsive and effective system.

7 REFERENCES:

Reference Books:

1.**"Software Engineering: A Practitioner's Approach"** by Roger S. Pressman • This book provides comprehensive insights into software engineering principles and methodologies, which are crucial for building robust software like "Sale's AI."

2.**"Introduction to the Theory of Computation"** by Michael Sipser • Understanding the theory of computation is essential for designing efficient algorithms and data structures, a critical component of software development.

3. Stack Overflow (stackoverflow.com) • A community-driven platform for programming and software development, where you can find answers to technical questions and solutions to coding challenges.

6.GitHub (github.com) • A code hosting platform that offers version control and collaboration tools, making it easier to manage and collaborate on your project's source code.

7. W3Schools (w3schools.com) • A valuable resource for learning web development technologies, including HTML, CSS, JavaScript, and more.

8. Udemy (udemy.com) • An online learning platform with courses on a wide range of topics, including software development, project management, and data analytics.

."Design Patterns: Elements of Reusable Object-Oriented Software" by Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides • Explore design patterns that can enhance the architecture and scalability of your software