iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 13 **Issue:** X **Month of publication:** October 2025

DOI: https://doi.org/10.22214/ijraset.2025.74489

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 13 Issue X Oct 2025- Available at www.ijraset.com

Customer Relationship Management (CRM) Using Python Full Stack (Django and MySQL)

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Abstract: ***Customer Relationship Management (CRM) plays a critical role in improving customer engagement, satisfaction, and retention. Traditional CRM systems often face inefficiencies due to manual processes, lack of integration, and poor scalability. This paper presents the design and development of a web-based CRM system using Python Full Stack technology, integrating Django for backend and MySQL for database management. The system automates customer data handling, sales tracking, feedback monitoring, and reporting through a user-friendly interface. The architecture follows the MVC pattern, ensuring scalability, security, and modularity. This study demonstrates that open-source full-stack frameworks can provide cost-effective, customizable, and efficient CRM solutions, especially for small and medium enterprises (SMEs).***
Keywords: Customer Relationship Management, Python Full Stack, Django, MySQL, Web Application, CRM Automation

I. INTRODUCTION

In the current digital era, businesses prioritize their customers as a key factor for growth and sustainability. Customer Relationship Management (CRM) systems enable organizations to maintain detailed customer information, track interactions, and strengthen relationships through effective engagement. Despite advancements in technology, many SMEs struggle to adopt CRM tools due to high costs, lack of customization, and complex integration. To address these challenges, this study proposes a full-stack web-based CRM solution using Python Django and MySQL. The system ensures automation of customer management, data handling, and performance analytics through a scalable and secure platform.

II. LITERATURE REVIEW

CRM systems are crucial for improving customer engagement, loyalty, and business performance. Previous studies focused on integrating artificial intelligence, data analytics, and automation. Sardjono and Kristin (2023) evaluated CRM systems using factor analysis, identifying success factors but lacking practical deployment. Krishnareddy et al. (2022) used fuzzy clustering for customer segmentation but did not develop a deployable interface. Rahman et al. (2018) explored CRM-ERP integration but required high infrastructure. Sharma et al. (2024) emphasized cloud-based CRM, which improved scalability but lacked advanced analytics. These studies highlight the need for a comprehensive CRM solution that integrates automation, real-time analytics, and scalability in a full-stack architecture.

III. PROBLEM STATEMENT

Many SMEs still rely on manual methods to manage customer data, resulting in inefficiencies, inconsistent records, and reduced satisfaction. Existing CRM platforms are often complex, costly, or unsuitable for small businesses. Hence, there is a need for a lightweight, affordable, and secure CRM platform built using open-source full-stack technologies. The goal is to simplify customer management, automate workflows, and deliver actionable insights to decision-makers.

IV. OBJECTIVES

1) To develop a web-based CRM application using Django and MySQL
2) To automate customer data, sales tracking, and feedback management.
3) To design interactive dashboards for real-time insights.
4) To ensure system security, scalability, and modular architecture.
5) To validate the effectiveness of full-stack implementation for SMEs.

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V. METHODOLOGY

The CRM system follows the MVC (Model-View-Controller) architecture implemented using Django. The backend is developed with Django, while MySQL serves as the database. HTML, CSS, and JavaScript handle the frontend interface. The application includes modules such as Customer Management, Lead Tracking, Feedback Monitoring, and Reporting. The workflow includes customer registration, interaction tracking, feedback collection, and visualization through dashboards. Testing was conducted using Django's built-in modules and manual validation for usability and accuracy.

VI. EXPECTED OUTCOMES

1) A fully functional CRM web application for SMEs.
2) Automation of key business processes including customer management and reporting.
3) Enhanced data consistency and real-time insights via dashboards.
4) Secure and scalable architecture using open-source technology.
5) Improved customer satisfaction through efficient engagement and tracking.

VII. FUTURE ENHANCEMENTS

1) Integration of AI and machine learning for predictive analytics and customer retention.
2) Cloud deployment for global scalability and continuous availability.
3) Mobile application development for accessibility and flexibility.
4) Integration of automated marketing campaigns (Email/SMS).

VIII. CONCLUSION

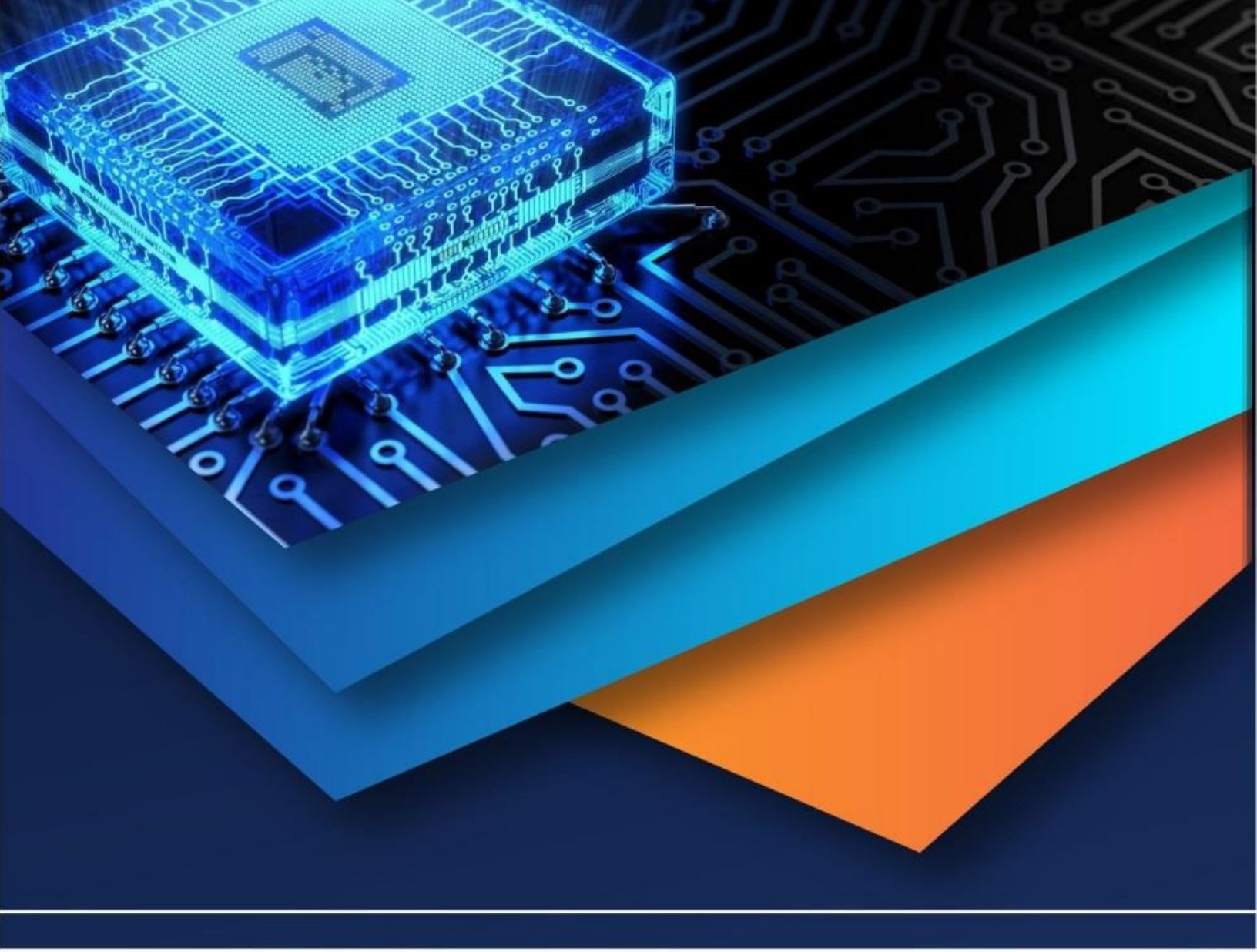
This study successfully demonstrates the implementation of a full-stack CRM system using Python Django and MySQL. The proposed system enhances automation, scalability, and usability for SMEs, providing a cost-effective and efficient alternative to existing CRM solutions. The platform ensures better customer engagement and operational efficiency through its modular design and real-time analytical capabilities.

IX. ACKNOWLEDGMENT

The authors would like to express their sincere gratitude to Dr. R. Kalai Selvi, Professor, Department of Computer Science and Engineering, Kuppam Engineering College, Andhra Pradesh, for her invaluable guidance, support, and encouragement throughout this research work. The authors also thank the management and faculty members of Kuppam Engineering College for providing the necessary resources and environment to successfully complete this project. Finally, heartfelt thanks to our friends and families for their constant motivation and moral support.

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