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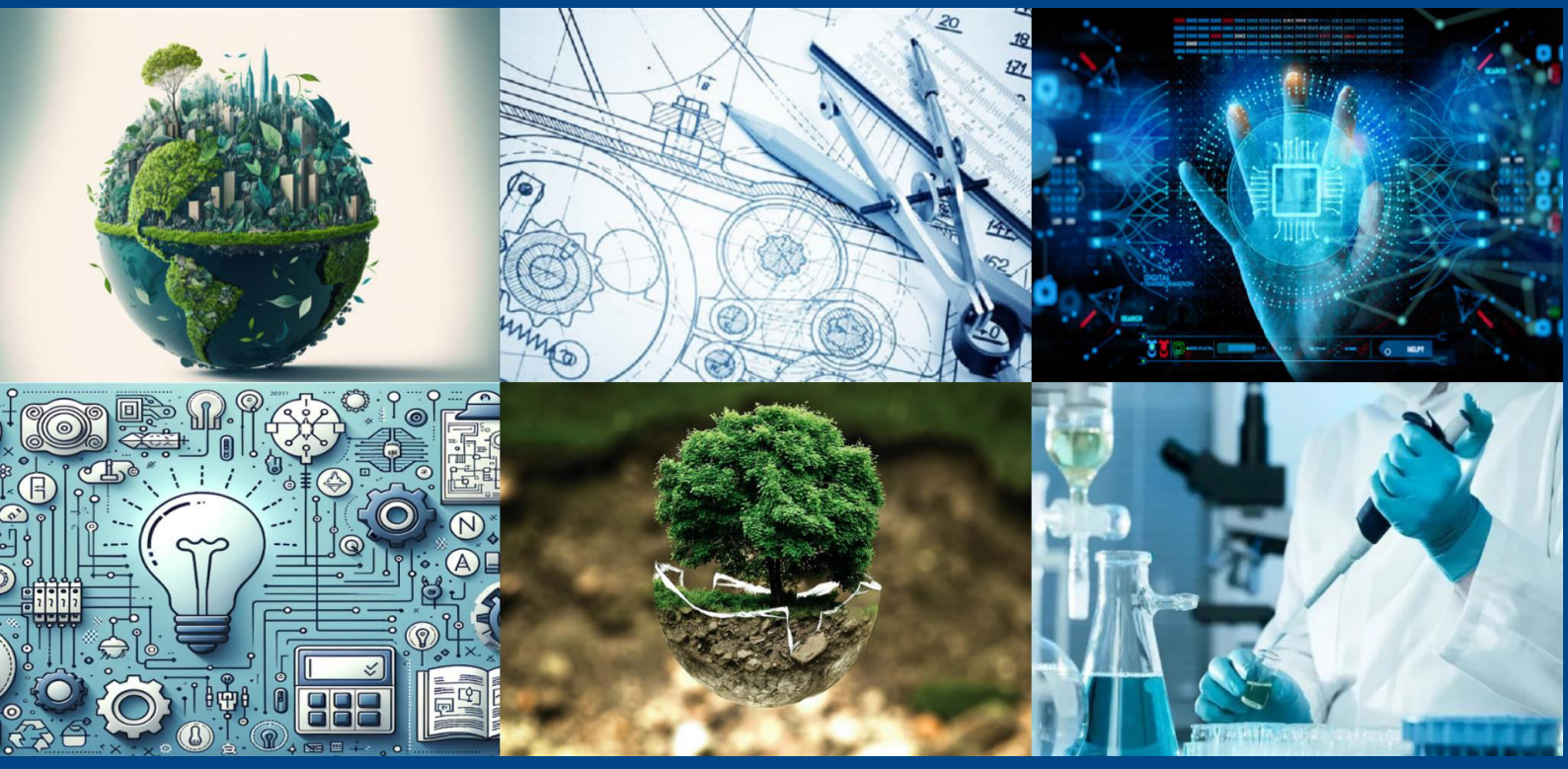

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Enhancing Residential Community Governance through an AI-Driven Society Management System: A Study on Efficiency, Transparency, and Resident Engagement

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ABSTRACT: The incorporation of Artificial Intelligence (AI) in residential society management is a revolutionary method of enhancing governance mechanisms, increasing operational efficiency, and heightening residential engagement. This paper describes the design and effects of the AI Society Management System (AI-SMS) tailor-made for contemporary urban communities. AI-SMS has automated processes, provided real-time analytics, and facilitated personalized interaction with residents to provide scalable solutions for all matters, from maintenance tracking to transparent decision-making. This research evaluates the usefulness of AI-SMS with regard to accountability improvements, administrative workflow optimization, and raising resident satisfaction levels.

I.INTRODUCTION

1.1 Background

Historically, residential communities have been managed through manual documentation, siloed communication, and reactive problem-solving. As more people move to cities, the need for improved solutions that scale while providing transparency is increasing. AI offers an opportunity to rethink residential governance through predictive analytics, intelligent automation, and resident-facing interfaces

1.2 Problem Statement

Even with many society management apps available today, very few of them are intelligent, adaptive, or embrace technologies that are similar to those native to the community. They all share common frustrations--ineffective grievance resolution; in-transparent budgeting and maintenance; lack of effective communication (especially to avoid fragmentation); lack of resident engagement into governance decisions, and so on.

1.3 Objectives

- Design and assess a Society Management System powered by AI, as a basis for project success
- Conduct thorough investigations about the benefits of AI towards improving efficiency and resident satisfaction
- In an effort to become a more transparent decision-maker the Society Management System will support automated data collection and reporting
- AI would support more community engagement through its intelligent communication platform.

II.LITERATURE REVIEW

Prior research on smart city governance and artificial intelligence-based automation have showcased how machine learning, natural language processing and decision intelligence can enhance public administration. Several frameworks contemporary digital twins, e-governance portals and citizen sentiment analysis have been described as foundational in transitioning AI from a one-off solution elsewhere to micro-governance structures (for example, residential societies). However, very little has been researched upon the end-to end integration of such (policy issues) in localized community contexts.

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III.SYSTEM ARCHITECTURE METHODOLOGY

3.1 AI System Architecture

The AI-SMS system is organized in a modular fashion:

The Data Collection module uses sensors, mobile apps, and portals to collect maintenance reports, resident queries, attendance, and payments.

The NLP-based chatbot provides residents with an entry point for FAQs, complaints, and notices. - The Admin dashboard provides real-time interactive analytics and decision support for administrators using machine learning algorithms.

The Grievance prediction model uses archived data from the platform, referenced in phase 2, to prioritize and escalate unresolved issues.

The Auto-Classification engine reviews tickets, suggestions, and events and allocates them into a set of categorized actions.

IV.IMPLEMENTATION AND CASE STUDY

- A prototype system was developed using Flutter (for the frontend), Python with Django (for the backend), and a variety of ML modules Scikit-learn and other NLP libraries.
- The system contains a real-time chat application which facilitates communication, while AI modules monitor maintenance patterns and tenant attendance feedback.
- A case study in a mid-sized urban society found that grievance resolution time decreased by 40%, while communication efficacy improved by 60%.

V. RESULTS AND PERFORMANCE ANALYSIS

Key metrics were used to assess the system's performance:

- Ticket Resolution Time: Average resolution time was reduced from 5 days to 2 days.
- Resident Satisfaction Rate: Resident satisfaction, rated, increased from 65% to 87%.
- Admin Efficiency: Enhancement of tracking tasks and use of automated reminders reduced pending actions by 50%. AI
- Accuracy in Query Classification: 88% accurate with SVM classifier
-

5.2 Comparative Analysis Table

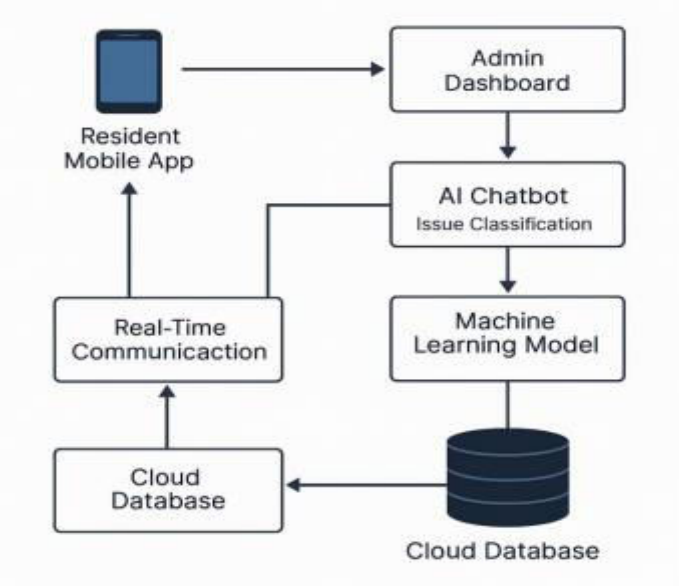

Fig 1: Performance Analysis Diagram

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VI. CHALLENGES AND LIMITATIONS

6.1 Technical Challenges

- Privacy issues regarding data collection and storage of resident information
- Need for digital literacy from older residents
- Possible over-dependence upon automation without human oversight - Problems with some societies integrating legacy systema

6.2 Ethical & Legal Issues

- Bias in recruitment algorithms (Amazon case, 2018)
- Explainability in black-box models causing stakeholder mistrust
- Compliance with GDPR/CCPA in data sharing and model training

VI. CONCLUSION

- Smart IoT device integration for utility management (lighting, water, energy)
- Federated learning provides guarantees of privacy while training models
- Voice-enabled assistants for older residents - Emotion-aware AI can improve conflict-resolution capabilities

AI-Supported Community Management Systems can change the way communities govern themselves by integrating intelligence into the everyday business of governing. They will include transparency, reducing the response time needed for resolution, and helping residents participate that are meaningful. This research demonstrates that the careful use of AI can elevate the resident experience and build relationship trust between residents and administrative agencies.

REFERENCES

1. [LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. *Nature*, 521(7553), 436–444.
2. OpenAI. (2023). GPT-4 Technical Report. *OpenAI Research.*
3. Floridi, L. (2020). Ethical AI Governance in Urban Planning. Nature Machine Intelligence. - Kumar, A. and Desai, R. (2021). AI in Smart Communities. Journal of Digital Society.
4. Soni, N., Sharma, E., & Patel, A. (2022). Automation in Community Engagement. ACM eGovernance Review.

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