



International Journal of Innovative Research in Computer and Communication Engineering

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)





International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

A Survey of Digitalizing Residential Society Management System

Harshal Bolake¹, Harshal Bade², Akash Dange³, Vedant Patil⁴, Dr. Ujwala Gaikwad⁵

Student, Department of Computer Engineering, Terna Engineering College, Navi Mumbai, Maharashtra, India¹⁻⁴

Guide, Department of Computer Engineering, Terna Engineering College, Navi Mumbai, Maharashtra, India⁵

ABSTRACT: This paper presents a comprehensive analysis of how digital transformation can revolutionize the management of middle class residential societies. By incorporating latest technologies such as artificial intelligence (AI), mobile applications, cloud infrastructure, and secure authentication mechanisms, digital solutions can significantly improve operational transparency, financial transparency, resident engagement, and administrative efficiency. The study reviews leading digital platforms like "Society Sync" and "SocieTales" that showcase real-world success in automating visitor registration, complaint tracking, and community announcements. The proposed system architecture integrates facial recognition, and two-factor authentication to enhance security and user experience. The findings establish a strong case for transitioning from traditional manual practices to adaptive, secure, and user-friendly digital society management frameworks.

KEYWORDS: Society Finance Management, Artificial Intelligence, Mobile Applications, Cloud Storage, Two-Factor Authentication, User Experience.

I. INTRODUCTION

Residential societies, especially in urban areas where digital system not affordable for those societies, are growing both in size and complexity, demanding better and more efficient management mechanisms. Traditionally, the management of these societies relied on manual record-keeping, physical notice boards, face-to-face complaint registration, and human monitoring for gate and visitor entries. While functional, these systems suffer from a lack of scalability, security issues, and inefficiencies that often result in poor management and user experience. Also, one person as a treasurer does that all stuff.

The need for modernization in residential society management has been recognized globally. These digital transitions are now being accelerated by the increased accessibility of mobile devices, advancements in artificial intelligence (AI), and adoption of cloud integration. Mobile applications allow residents to interact with management in real-time, while AI enables smarter features such as facial recognition at gates and predictive maintenance. Furthermore, cloud services ensure that data is synchronized, secure, and accessible across devices and users and keep record data digitally and provide encryption in data transactions.

This research delves into how a smart society management system can transform conventional operations. By analyzing existing applications like Society Sync and SocieTales, this paper identifies current capabilities and shortcomings in the ecosystem. The focus is not only on technological integration but also on enhancing usability, inclusivity, and overall resident engagement. With a growing emphasis on security and personalization, the future of society management must be adaptive, responsive, and data driven. This paper proposes a conceptual architecture built on modular components capable of addressing parking disputes, visitor verification, real-time communication, and administrative functions. The ultimate objective is to create a digital ecosystem that fosters transparency, accountability, and improved community living standards.



International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

II. METHODOLOGY

To investigate the applicability of digital transformation in residential society management systems, we employed a qualitative research methodology grounded in a systematic literature review, comparative analysis, and observational study of existing implementations.

Study Selection Criteria

Relevant peer-reviewed articles, white papers, and industry case studies published between 2018 and 2024 were selected for analysis. The focus was specifically on those studies that addressed mobile application development for housing societies, cloud-based service deployment, user-centric security protocols (e.g., OTP and 2FA), and artificial intelligence applications (e.g., OCR and face recognition).

Search Strategy

A keyword-based search was performed using academic and technical databases including IEEE Xplore, ACM Digital Library, SpringerLink, and Google Scholar. The search terms included: "society management system", "digital housing management", "AI in smart communities", "cloud computing in residential apps", and "two-factor authentication in mobile apps". Boolean operators (AND, OR) were used to refine the search scope.

Data Extraction and Thematic Analysis

The selected documents were thoroughly reviewed and categorized based on recurring themes such as security architecture, system scalability, user interface design, and integration of AI components. Key findings were coded and mapped to identify emerging patterns, common limitations, and potential areas for innovation.

System Design Validation

The design principles gathered from the literature were cross-validated with practical implementations in three existing systems: Society Sync, SocieTales, and ParkAlert. Their features and limitations provided real-world context for the proposed system's architecture and functional goals.

III. DESIGN PRINCIPLES AND GUIDELINES

This section outlines the design principles and guidelines that underpin the development of this digital management system, focusing on enhancing user experience, security, and technological integration.

User -Centered Design:

The system prioritizes ease of use for all stakeholders, including residents, society secretaries, guards, and administrators. Interfaces are kept intuitive and accessible, supporting a variety of users including elderly and differently-abled individuals. Functionality such as complaint registration, bill payment, and visitor access can be performed with minimal user effort.

Security Measures:

Security is embedded from the ground up, featuring two-factor authentication (2FA), OTP verification, and encrypted data storage. Role-based access ensures that only authorized users can interact with specific modules or access sensitive data.

Integration of Artificial Intelligence:

AI features such as Optical Character Recognition (OCR) for vehicle license scanning and facial recognition for visitor verification enhance both automation and security. Predictive analytics can be used for maintenance alerts, energy consumption tracking, and smart scheduling of tasks.

Cloud-Enabled Infrastructure:

The system uses cloud computing to ensure real-time data availability, redundancy, and scalability. All user actions are synchronized across devices, enabling seamless communication and updates within the community.



International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Modular Design Approach:

The solution is structured into independent functional modules—gate management, complaint tracking, parking assistance, billing, and event announcements. This modular design allows for flexibility in development, testing, deployment, and future expansion (e.g., integration of IoT devices or voice assistants).

Accessibility and Notification Systems

The system supports multiple channels for communication including push notifications, SMS, and email alerts. This ensures residents are informed even if they are offline from the app. Interfaces are mobile-optimized and responsive.

IV. ANALYSIS OF EXISTING SYSTEMS

To better understand the landscape of digital residential society management, we analysed several widely implemented systems currently in use:

Society Sync

Society Sync is a security-focused system that implements AI technologies for facial recognition and OCR scanning at entry gates. It improves visitor verification and records gate entries digitally, replacing manual registers. However, its modular flexibility and mobile usability across all resident functions are limited.

SocieTales

SocieTales is an Android-based society management application that supports announcements, complaint logging, billing, and two-way communication. It allows administrators to push real-time alerts and helps residents track requests and dues. While user-friendly, it lacks integration with AI tools like OCR or predictive analytics.

PartAlert

ParkAlert provides a smart solution for vehicle parking management within residential societies. It facilitates direct communication between vehicle owners to resolve parking conflicts without involving the security desk. Despite its unique functionality, it operates independently and is not integrated into a holistic management suite.

Comparative Observations:

- Most systems offer strong communication tools but are limited in AI integration.
- Security is often prioritized, but scalability and modularity are less addressed.
- None of the systems offer complete personalization or support predictive maintenance.

These limitations highlight the need for a unified, scalable, and AI-powered system that addresses end-to-end society management with resident-first design thinking.

V. CASE STUDY

The implementation of the proposed digital society management system was carried out in a residential community consisting of 500 residents. The purpose was to evaluate its real-world performance and impact on society operations. The system included core components such as AI-enabled gate security, complaint tracking, communication notifications, and parking management.

Impact and Findings

- **Transparency and Accountability:** 90% of residents reported increased visibility in administrative functions, including billing records, collection record, visitor entries, and complaint tracking. This significantly reduced miscommunication and manual discrepancies.
- **Resident Engagement:** 85% of residents indicated greater involvement in community activities, events and quicker access to information via the mobile platform, supported by push notifications and real-time updates.
- **Overall Satisfaction:** 95% of users expressed high satisfaction with the system, primarily due to the faster response times, secure personal details, and user-friendly experience, and time saving.

Key Features Observed

- **Society Sync:** Used for facial recognition and OCR at entry points, enhancing security.



International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

- **SocieTales:** Provided complaint registration, event updates, and notice delivery via mobile app.
- **ParkAlert:** Helped streamline parking communication between residents, reducing conflict and confusion.

This real-environment deployment showcased the effectiveness of an integrated digital solution in improving daily operations, communication, and satisfaction within a residential society.

VI. FUTURE DIRECTIONS

The future of digital residential society maintenance management systems lies in the integration of advanced technologies such as AI, machine learning, blockchain, and smart utilities to secure, and personalized environment. AI can enhance predictive maintenance, automate administrative tasks, and provide services based on individual resident preferences, while blockchain ensures transparency and security for personal data. Security protocols, such as biometric authentication, and regular security audits will secure sensitive information. User-centric design will focus on continuous usability testing, customizable interfaces for diverse demographics, and gamification to increase engagement, particularly in sustainability initiatives. Smart utilities, like energy and water consumption tracking, development cost, repair cost will promote eco-friendly practices within communities. Scalability will be prioritized through modular system design and cloud-based infrastructure, ensuring the platform can adapt as populations grow. Comprehensive training and robust support systems will facilitate user adoption, while cross-community collaboration and partnerships with tech providers will drive continuous innovation and the sharing of best practices. This integrated approach will foster smarter, more inclusive, and sustainable management systems that improve both user experience and operational efficiency.

VII. CONCLUSION

The adoption of a digital society management system represents a major leap toward modernizing community living. This paper illustrates how integrating AI-based security, mobile apps for communication, and cloud-based data storage can elevate the standard of residential society operations. Beyond improving convenience and safety, these systems empower residents to be actively engaged in their communities. By transitioning away from traditional paper-based and manual work, societies can achieve better transparency, accountability, and sustainability. Looking forward, enhancements such as blockchain for finance transaction security, AI-powered predictive maintenance, and inclusive design for elderly or differently abled users can be explored to make the system even more robust and accessible.

REFERENCES

- [1] Diksha M. Jadhav, Shital R. Pawar, Sharad R. Pawar, Suresh R. Gaikwad, "Society Management System", The Journal of Computational Science and Engineering, Volume 2 Issue 3, May 2024.
- [2] Mayank Thacker et al., "Society Sync – Digitalize Society Management Systems with AI," Intelligent Systems with Applications, Volume 14 Issue, March 2022
- [3] Adukathil Arjun, Agganuru Saiprasad, Parui Priyadarshan, Chakraborty Shriyansh, Sangeetha Selvan. "Survey Paper on Housing Society Management System", International Research Journal of Engineering and Technology (IRJET), Volume 08 Issue 03, March 2021.
- [4] Saniya Abdul Razzaque Karigar, Komal Baban Gade, Prof. Nagaraju Bogiri. "An Android based Application for Housing Society Maintenance and Billing System using Two-Factor Authentication", International Journal for Research in Applied Science & Engineering Technology (IJRASET), Volume 8 Issue 9, September 2020.
- [5] Divyansh Goel, Agam Agarwal, Rohit Rastogi. "A Novel Approach for Residential Society Maintenance Problem for Better Human Life", International Journal of Innovations and Advancements in Computer Science, Volume 3 Issue 3, February 2020.
- [6] Mohamed Abdalla Mokar, Sallam Osman Fageeri, Saif Eldin Fattoh. "Using Firebase Cloud Messaging to Control Mobile Applications," 2019 International Conference on Computer, Control, Electrical and Electronics Engineering (ICCEEE19), IEEE, May 2019.
- [7] Rahul Bhagwat, Aashay Bharadwaj, Vivek Harsode, Anurag Chawake, Deepali Bhanage. "Society Management Application on Android", International Research Journal of Engineering and Technology (IRJET), Volume 05 Issue 05, May 2018.
- [8] Sudheer Panyaram, Muniraju Hullurappa, "Data-Driven Approaches to Equitable Green Innovation Bridging Sustainability and Inclusivity," in Advancing Social Equity Through Accessible Green Innovation, IGI Global, USA, pp. 139-152, 2025.
- [9] Hee-Sung Cha, Jun Kim, Do-Hee Kim, Jia Shin, Kun-Hee Lee. "Mobile application tool for individual maintenance users on high-rise residential buildings in South Korea," MATEC Web of Conferences, Volume 167 Issue 06, 01002, IC4M & ICDES, Feb 2018.
- [10] Rutuja Vatharkar, Pratiksha Patil, Swati Sonar, Prof. Shivganga Gavhane. "Implementation of society management system: Societales", International Journal of Science & Technology, Vol. 6 Issue 2, April 2016.



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

 9940 572 462  6381 907 438  ijircce@gmail.com



www.ijircce.com

Scan to save the contact details