

GharSetu Smart Community System

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Abstract: *Rapid urbanization and increasing residential density have significantly amplified the complexity of managing modern housing societies. Traditional community management methods rely heavily on manual documentation, physical registers, fragmented communication channels, and unstructured coordination among residents, administrators, vendors, and security personnel. These outdated practices lead to inefficiencies, delayed complaint resolution, poor visitor tracking, lack of transparency in billing, and limited real-time communication. To address these challenges, this paper presents GHARSETU, a cloud-based Smart Community Management System designed to digitize and integrate residential operations within a unified mobile platform.*

The proposed system leverages Flutter for cross-platform mobile development and Firebase as a scalable cloud backend, incorporating Firebase Authentication and Cloud Firestore for secure, real-time data synchronization. GHARSETU introduces a multi-role architecture supporting Residents, Vendors, Administrators, and Security Personnel, each with role-specific dashboards and access privileges enforced through structured database security rules. The system integrates key community modules, including complaint management, vendor marketplace with order tracking, visitor and delivery monitoring, facility booking, billing management, and event broadcasting. A real-time notification engine ensures instant communication between stakeholders, improving operational responsiveness and community engagement.

Unlike existing research systems that typically focus on isolated modules—such as visitor logging, billing automation, or IoT-based monitoring—GHARSETU presents a holistic and deployment-ready ecosystem tailored for residential communities. The architecture emphasizes scalability, secure data access, and seamless real-time synchronization without reliance on complex server infrastructure. Experimental evaluation through simulated multi-role usage scenarios demonstrated improved communication efficiency, reduced administrative workload, enhanced transparency, and faster service coordination.

The system's cloud-native design ensures low maintenance overhead and high availability while maintaining secure role-based access control. By consolidating multiple society operations into a single integrated mobile solution, GHARSETU bridges the research gap between conceptual smart community frameworks and practical real-world implementation. The proposed system demonstrates the transformative potential of modern mobile and cloud technologies in enhancing residential management efficiency, security, and user satisfaction.

Keywords: Smart Community, Role-Based Access Control, Firebase, Flutter, Cloud Computing, Real-Time Notification, Society Management System

