

IoT-enabled Grid Monitoring and Management System for Enhancing EV Charging Efficiency in Residential Applications

Project Group 08

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Outline

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- The number of electric vehicle (EV) users in India is rapidly increasing at a rate of 35% year-on-year.
- This surge in EV users can significantly impact the power distribution grid, leading to increased load, grid congestion, voltage drops, and reduced power quality.
- For our project, we plan to focus on developing an Enhanced system for addressing this potential issue.

Objectives

- Develop a system for real time data collection and analysis.
- For this, Smart energy meters with AMR systems are required.
- But, they are designed to operate in smart grids, not suitable for a traditional grid.
- Immediate transition to smart meters require huge financial investments for developing countries like India.
- Alternative Approach: Upgrade existing digital meters with additional circuitry.

Implementation Strategy

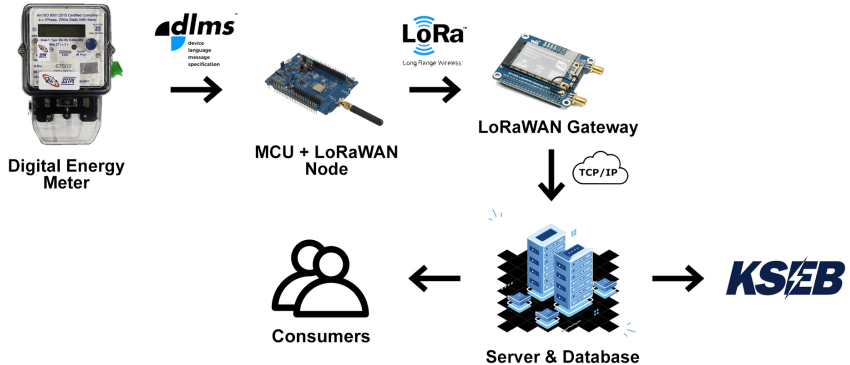


Figure: Proposed Model

Benefits of Upgraded Digital Meters

- Cost Efficiency
 - Minimizes initial investment compared to full smart meter deployment
- E-Waste Reduction
 - Utilizes existing infrastructure, reducing environmental impact
- Enhanced Functionality
 - Enables real-time monitoring and data analytics capabilities
- Integration
 - Supports future scalability and compatibility with advanced grid systems

What we intend to achieve

- An IoT Based module for real time data acquisition from existing energy meters.
- A data analysis and management system for monitoring EV charging usage.
- A dynamic pricing model for regulating EV charging.

References

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