HOME AUTOMATION

COMPARITIVE ANALYSIS OF TRADITIONAL AND OUR HOME AUTOMATION SYSTEM:

Feature	Traditional Non-Automated Household	Partially Automated Household	Our IoT-Based Home Automation System
Control Accessibility	Manual operation of lights, fans, and appliances on-site	Limited remote control; some devices may be controlled via remote apps	Complete remote control via Wi-Fi; accessible through a single interface on mobile or web platforms
Energy Efficiency	High energy usage; devices often left on unintentionally	Some energy savings through time-based schedules	Optimized energy usage with occupancy-based controls and remote monitoring, allowing users to switch devices on/off as needed
Temperature Monitoring	Manual adjustment of fans or heating, no temperature tracking	Basic thermostat control	Real-time temperature monitoring with data accessible remotely; allows proactive climate control adjustments
Security & Surveillance	Limited security; manual locks, no occupancy detection	Basic security, possibly with CCTV	Enhanced security with ultrasonic sensor for occupancy detection, sending alerts if someone approaches sensitive areas
Convenience	Requires physical presence for all tasks	Some convenience features (e.g., automatic lights)	Full convenience with remote control of devices, real-time updates, and multi-functional controls in a single platform
Scalability	Not easily scalable; each new device requires manual setup	Limited scalability; adding new automation requires additional setup	Highly scalable; ESP32 supports multiple sensors and can integrate additional devices with minimal setup
Cost-Effectiveness	No upfront cost, but high energy bills over time	Medium cost; automation equipment is ↓ lly proprietary	Cost-effective with low-cost ESP32 and sensors, and offers significant savings on energy and maintenance over time