

Unified IoT Control & Monitoring Platform for Solar Cleaning Robots

Business Problem



- Lack of a digital differentiator to win or retain customers in the face of intense global competition
- Distributed solar fleets operated blind; no real-time visibility
- Customers had no visibility into robot health or plant performance
- Each new product line required a greenfield build - no scalable platform to monetize the broader IoT portfolio
- No predictive capability — unplanned downtime and missed SLAs directly eroded customer satisfaction

Solution

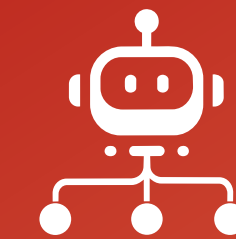


- **Single-window dashboard:** real-time robot status, plant KPIs, and global fleet visibility
- **LoRaWAN + MQTT stack:** wireless robot data ingestion, cloud analytics and predictive health monitoring
- **Multi-tenant AWS architecture:** 24x7 monitoring with role-based access for customers and ops teams
- API and SCADA integration for customer monetization and plant connectivity
- No limits on plants, robots, or users - extensible to onboard future IoT product lines
- ReactJS, CoreJava, PostgreSQL, MongoDB on AWS — Okta IDAM, VAVPT certified

Value Delivered



- ✓ **Competitive differentiation achieved** single-window platform became a product USP vs. global rivals
- ✓ **OpEx reduction enabled** less manual intervention, fewer on-site visits across global plants
- ✓ **Scalable fleet management** no hard limits — platform scales with the business
- ✓ **New revenue streams unlocked** API and SCADA integrations created new monetization avenues
- ✓ **Future-ready IoT foundation** architected to onboard trackers and other IoT products seamlessly



100+

Robots per Gateway



Multi Tenant

Cloud Architecture



LoRaWAN + MQTT

Communication Stack