



AI Chief Engineer for Smart Buildings

Transforming building operations with AI-powered diagnostics, predictive maintenance, and intelligent automation.

CLIENT CASE STUDY

Built and implemented by RPI AI Lab



40-50%

HVAC's Share of Building Energy Consumption

Why It Matters

- High operational cost
- Reactive maintenance challenges
- Significant optimization opportunity for AI systems

Source: U.S. DOE / WBDG

Key Business Challenges

01



Knowledge Fragmentation

Disconnected systems create information gaps across teams.

02



Knowledge Loss

Critical operational expertise is lost with employee turnover.

03



Slow Diagnostics

Manual troubleshooting delays issue resolution and increases downtime.

04



Reactive Maintenance

Problems are addressed only after failures occur.



Result: Higher operational costs, downtime, and reduced efficiency.

*HVAC systems account for a significant **portion of energy consumption** in buildings, highlighting the **urgent need** for **efficiency improvements** and **smarter solutions**.*

Current Operating Flow

The pre-AI workflow is fragmented and reactive, leading to delays, inefficiencies, and higher operational costs in HVAC operations.



Workflow Inefficiencies



Multiple systems lacking integration



Manual log reviews take time



Overreliance on senior engineers



Reactive Troubleshooting



Issues addressed only after failure



Slow response to system faults



Lack of predictive maintenance tools

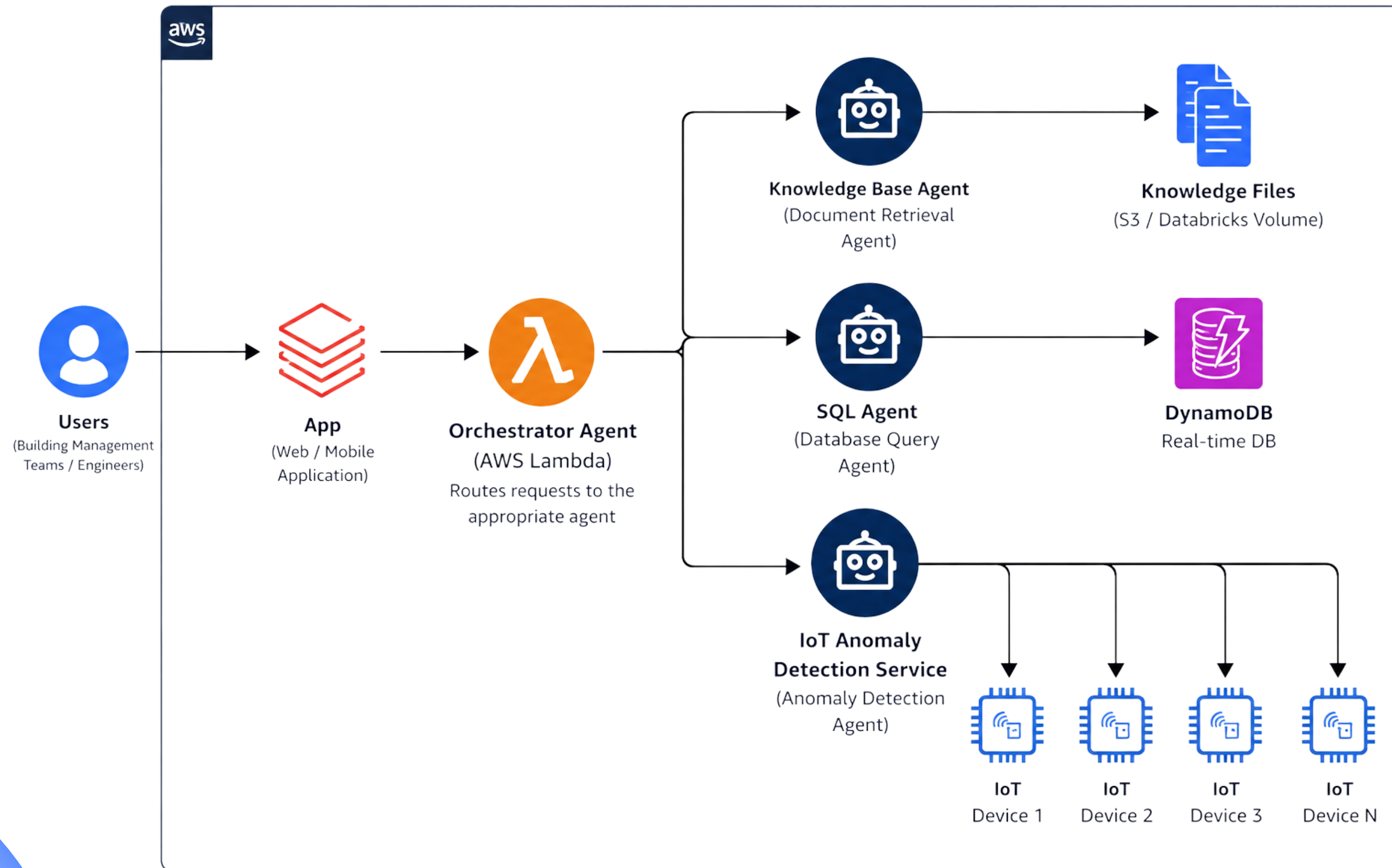
Our GenAI-Powered Solution

RPI AI Lab developed an intelligent building operations platform designed to transform reactive maintenance into predictive, AI-driven operations.



Unified AI intelligence for **smarter building operations.**

AI Workflow Architecture



*AI agents
orchestrating
building operations,
diagnostics,
maintenance
intelligence, and
operational
insights.*

Solutions We Developed

AI Autopilot: Optimal Loading Agent

Optimizes HVAC and chiller performance using real-time IoT and AI models.



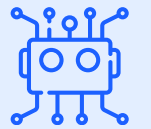
AI Ticket Analytics

Automatically classifies maintenance issues, prioritizes urgency, and detects anomalies.



AI SQL Agent

Allows non-technical users to query operational data using natural language.



AI Knowledge Assistant

Uses RAG-based search to retrieve manuals, procedures, and technical knowledge instantly.



IoT Anomaly Detection

Continuously monitors building systems to identify abnormal behavior and risks.



System Diagnostics Agent

An AI-powered virtual engineer for troubleshooting, diagnostics, and operational support.



Visualized Dashboard



***Your AI-powered
command center
for Energy
Performance
Management.***

Operational Intelligence Features

AI-powered insights that drive efficiency, reliability, and smarter operations.



Fault Detection

Detects HVAC
issues before
failures occur.



Contextual Maintenance

AI-driven maintenance
recommendations in
real time.



Energy Tracking

Monitors energy
usage and
optimization patterns.



Alarm Interpretation

Transforms alarm
data into actionable
insights.

Ready to Transform Building Operations with AI?

Enable predictive maintenance, operational intelligence, and smarter energy optimization with AI-powered building systems.

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