

Heartland Co-op Modernizes Grain Operations with IBM i and IoT

Heartland Co-op modernized its grain, energy, and agronomy operations by extending its trusted IBM i environment with real-time IoT data. Through its Heartland Automation Products Lab, the co-op streams sensor data from bins, equipment, and fields into IBM i dashboards, improving visibility, grain quality, and operational efficiency. This approach accelerates innovation while preserving reliability and existing IBM i skills.

Outcomes

- Improved operational visibility and decision-making
- Higher grain quality and asset reliability
- Accelerated innovation with lower risk

Solution components

[IBM Power](#)

[IBM i](#)

[IBM Rational Developer for i](#)

[IBM Bob](#)



Heartland Co-op Modernizes Grain Operations with IBM i and Real-Time IoT Insights

Business Challenge

Historically, staff relied on manual checks and disconnected systems to understand conditions in bins, on scales, and in the field, making it difficult to track grain moisture, temperature, and Co2 trends in time to prevent spoilage; to monitor bearings, fans, fuel usage, and scales spread across widely dispersed sites; and to give managers a single and trusted operational view integrated with core IBM i business data. Heartland wanted a more automated and data-driven approach without abandoning its stable and trusted IBM i environment or retraining its developers on an entirely new platform.

Transformation

Heartland created Heartland Automation Products (HAP), an internal R&D lab launched in 2017 to design hardware, firmware, and software that stream live operational data back to [IBM i](#) on [IBM® Power®](#). The team uses 3D printing and custom PCBs to build devices such as bin-temperature and moisture sensor cables, wireless sensor platforms, Co2 and bearing-monitoring units, fan-control modules, field prescription and GPS systems, scale and moisture bridges, and fuel flow-meter solutions. All of these devices communicate through a wired or wireless stack using LoRa gateways, secure VPN tunnels, and MQTT brokers into Node-Red flows and IBM Db2 for i. Heartland supports this ecosystem with C/C++ firmware, Node-Red dashboards, modern web technologies, and Free Form RPG on IBM i to store telemetry, expose APIs, and integrate with existing grain, energy, and agronomy applications. A unified set of Node-Red dashboards presents this live data as simple visual tiles, enabling managers to act on real-time insights and build new applications quickly while reusing IBM i skills and data models.

Results

While still expanding its HAP portfolio, Heartland Co-op is already realizing meaningful benefits from its IBM i-focused automation strategy, with managers now able to view real-time bin-conditions, fan status, scales, moisture readings, and fuel usage through a single dashboard that enables faster and data-driven responses. Continuous monitoring of moisture, temperature, Co2, and bearing health has improved grain quality and equipment reliability by supporting more proactive maintenance across critical assets. Field and logistics operations have also become more efficient, as HAP-RX systems automate the transfer of prescription files to applicators, track GPS and application data, and reduce manual steps while improving traceability from field to elevator. They also participated in the preview program for IBM Bob, an AI-powered development partner that accelerates IBM i application modernization through AI-assisted code understanding, RPG logic explanation, and refactoring insights. By applying Bob within its environment, the organization is boosting developer productivity, easing onboarding for new team members, and accelerating innovation while building on trusted core systems.