MATERIAL DATA SOLUTIONS

Manufacturing Intelligence
Without Enterprise MES Cost

Large Dairy & Juice Contract Manufacturer

Executive Summary

The Situation

A large dairy and juice contract manufacturer relied on:

- Manual Excel-based shift reports
- Manually compiled daily executive production summaries
- A $180K (biannual) RedZone contract for operator-level OEE
- Static Cognos reporting
- Disconnected ERP production schedules
- Paper-based ice cream weight compliance logs

Production data existed — but *actionable intelligence* did not.
Executive visibility required extensive manual effort.
Operator systems did not translate into strategic insight.
Customizations were costly and slow.

The Challenge

The organization needed:

- Real-time production visibility across 9 lines
- Automated shift reporting
- Downtime transparency
- ERP production integration
- Timely Executive-level analytics
- Compliance-grade weight tracking
- A path forward without costly, multi-year MES consulting

The Strategy

Instead of pursuing an expensive enterprise MES implementation, we leveraged existing infrastructure:

- Ignition (PLC integration layer)
- Zira cloud analytics platform
- ERP production schedule extraction
- Custom Python aggregation logic
- BI reporting layer (Zap)

The goal was simple:

Capture accurate signal-level data
↳ Structure and label it intelligently
↳ Surface it at every level of the organization

Signal-Level Engineering

The plant environment contained over 20,000 PLC tags across nine production lines.

Through direct tag-level mapping:

- Production count signals were identified, validated, and verified
- Downtime events were calculated using minute-to-minute delta logic
- Shift boundaries were established, with flexibility to change over time
- 60 transactions/hour/line were monitored with reconciliation safeguards

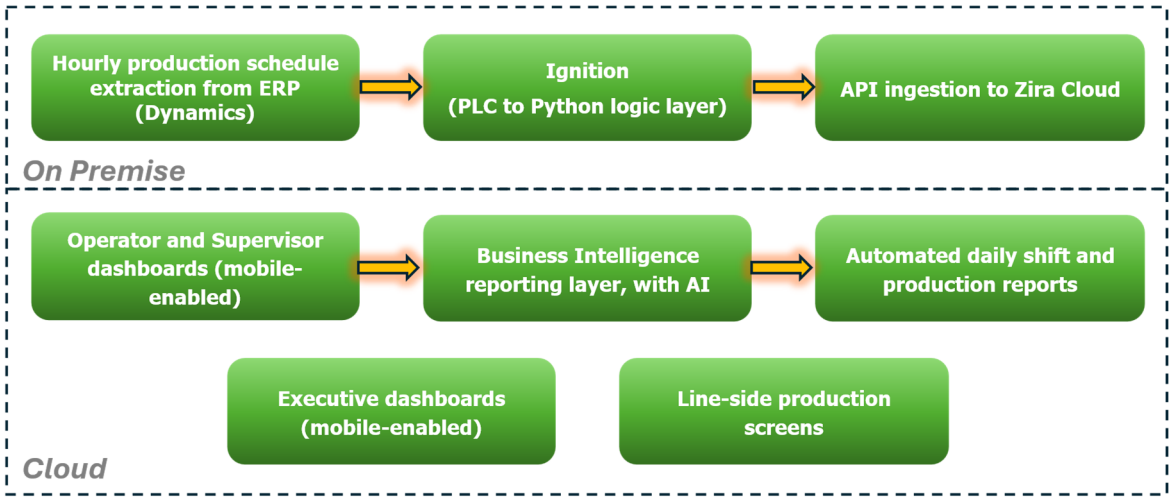
This increasing familiarity with the plant signal environment later enabled:

Ice Cream Weight Automation

- MODBUS integration with scale/metal detector units
- Per-unit weight capture
- Minute-level aggregation (count, min, max, average, tolerance violations)
- Elimination of paper “weight sheets”
- Audit-compliant digital recordkeeping
- Executive drill-down reporting (run → hour → minute)

This closed a significant audit exposure and provided defensible historical analytics during customer weight fulfillment challenges.

Architecture Overview



Custom Python routines later replaced early databased job logic to improve:

- Reliability
- Replicability
- Maintainability
- Data integrity

Cultural Adoption

- Large-format line-side dashboards
- Operator downtime classifications with comments
- Automated daily shift email (replacing Excel compilation)
- Executive mobile access to live production metrics
- Embedded use in daily production meetings

The platform eventually became part of the operational rhythm.

Results

- Avoided $180K RedZone biannual renewal
- Eliminated manual shift and executive production reports
- Unified visibility across 9 production lines
- Automated 100% production transaction capture
- Closed quality audit gap in weight compliance
- Enabled impactful downstream financial modeling
- Delivered enterprise-grade visibility without enterprise-grade cost

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Strategic Outcome

Ultimately, during ownership transition, incoming executive leadership immediately recognized the value of real-time mobile-accessible production intelligence.

The system demonstrated that mid-sized manufacturers can achieve advanced operational visibility by intelligently integrating existing infrastructure — without reliance on costly, multi-year MES implementations.