

JobAI

Intelligence for Your Shop Floor

Comprehensive Platform Guide

IQ Associates, LLC

Analytics & Process Intelligence for Job Shop Manufacturing

Version 3.0 | March 2026

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Executive Overview

JobAI is a comprehensive analytics and process intelligence platform purpose-built for job shop manufacturers. It integrates with Manufacturing ERP/MRP systems to transform raw operational data into actionable intelligence across every department: production, quality, shipping, purchasing, and management.

Core philosophy: "We don't change how your ERP runs your shop. We change what it tells you about your shop." JobAI reads data directly from your existing ERP database, providing real-time dashboards, AI-powered analysis, and proactive alerts without disrupting your established workflows.

Key Differentiators

- **On-Premise Data Security:** All data stays on your premises. TLS encrypted. No cloud dependency. Internal-only deployment option eliminates ITAR compliance friction for aerospace/defense customers.
- **Zero ERP Disruption:** Read-only connection to your ERP database. No writes, no schema changes, no risk to your production system.
- **Real-Time Visibility:** Live dashboards refresh automatically. No manual report generation, no stale spreadsheets.
- **AI-Powered Insights:** Integrated Claude AI analysis provides plain-language interpretation of SPC data, process trends, and quality metrics.
- **Industry Expertise:** Built by engineers with 25+ years in aerospace manufacturing, ISO 9001, and regulatory compliance.

Industries Served

- Aerospace & Defense (AS9100, ITAR, NADCAP)
- Medical Device Manufacturing (ISO 13485)
- Automotive (IATF 16949, PPAP)
- Precision Machining & General Job Shop

Module 1: ProcessIntel — Production Analytics

ProcessIntel is the core production intelligence dashboard. It connects directly to your ERP database and provides real-time visibility into job status, capacity, scheduling, and operational performance across the entire shop floor.

1.1 Manufacturing Pipeline

The main dashboard provides a complete view of all active jobs flowing through the shop. Each job displays its current status, routing progress, and delivery timeline at a glance.

Feature	Description
Active Job Tracking	Real-time view of all jobs in production with status, work center, and completion percentage
Color-Coded Status	Visual indicators for on-time, at-risk, and late jobs based on promised delivery dates
Routing Progress	Step-by-step operation tracking showing which operations are complete, in-progress, or pending
Customer Grouping	Jobs grouped by customer with aggregate statistics and delivery performance
Quick Search	Instant search by job number, part number, customer name, or PO number

1.2 Work Center Capacity

Displays workload distribution across all work centers with scheduled hours vs. available capacity. Identifies bottlenecks before they impact delivery dates.

Feature	Description
Capacity Bars	Visual bars showing scheduled hours vs. available hours for each work center
Overload Detection	Automatic flagging when a work center exceeds capacity threshold
Date Range Filtering	Adjustable time window to view capacity for current week, month, or custom range
Department Grouping	Work centers organized by department (Swiss, Turning, Milling, Grinding, etc.)

1.3 Job Capacity

Analyzes capacity at the individual job level, showing remaining hours by operation and estimated completion dates. Essential for production scheduling and customer promise date management.

1.4 Program Monitor

Customer program management dashboard for tracking multi-job programs with delivery schedules, quality status, and milestone tracking.

Feature	Description
Customer Program View	Hierarchical view: Customer > Part Number > Active Jobs with delivery status
Traveler Integrity Tab	Three-level expandable hierarchy with color-coded Gantt routing bars showing SKIPPED and UNCLOSED operations
Issue Detection	Automatic identification of routing issues: skipped operations, unclosed steps, and sequence problems
Scope Filtering	Filter by customer, date range, or issue type for focused investigation
Print Report	Formatted print output for quality review meetings

1.5 Equipment & Operator Performance

Detailed performance analytics for individual machines and operators, enabling data-driven decisions about scheduling, training, and equipment investment.

Feature	Description
Machine Utilization	Run hours, setup hours, and idle time per machine over configurable time periods
Operator Efficiency	Parts per hour, scrap rates, and setup times by operator across different machines
Trend Analysis	Historical performance trends to identify improvement or degradation patterns
Comparative Views	Side-by-side comparison of operators on the same machine or same operator across machines

1.6 Additional Production Tools

Feature	Description
Weekly Production	Week-over-week production output with parts completed, shipped, and in-process by department
Engineering Backlog	Tracks jobs waiting for engineering release, programming, or first article approval
Job Assessment	Risk assessment for active jobs based on schedule, capacity, material, and routing analysis
Machine Availability	Real-time machine status showing which machines are available for scheduling
New Travelers	Newly created job travelers requiring setup, tooling, and material preparation

Part Details	Deep-dive into part history including all jobs, routing, quality data, and AI analysis
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Module 2: Machine Status — Real-Time Shop Floor

A live, auto-refreshing dashboard showing the status of every machine on the shop floor. Designed for large-screen display in the production area as well as mobile access for supervisors.

Feature	Description
Live Machine Cards	Each machine displays current status (Active, Idle, Offline, Staging), current job, part, customer, and operator
Color-Coded Status	Instant visual identification: green = active production, yellow = staging/setup, gray = idle, red = offline
First Run Flags	Visual indicator when a machine is running a first article or new part requiring extra attention
Operator Tooltips	Hover over any machine to see today's operator, parts produced, scrap count, and cumulative job progress
Next Job Queue	Shows what job is queued next for each machine, including setup status and due date
Production Sparklines	Mini charts showing daily production rate trend for the current job on each machine
Floor Notes	Add, view, and manage notes attached to machine operations — visible to all shifts
Department Filtering	Filter by department to focus on specific areas of the shop
Stock Job Detection	Build-to-stock jobs flagged with distinct visual indicator
Auto-Refresh	Dashboard refreshes automatically every 90 seconds with background cache warming

Module 3: Shipping — Delivery Management

Complete shipping management suite covering daily schedules, on-time delivery KPIs, monthly performance tracking, and change audit trails.

3.1 Daily Ship Schedule

The primary shipping operations view showing all upcoming deliveries with color-coded urgency indicators and delivery notes.

Feature	Description
Target Ship Dates	Calculated using customer ship lead days and ERP promised dates — matches your ERP shipping module exactly
Urgency Categories	Color bands: Very Late (30+ days), Late, On Time, Slight Early, Next Week, Future
Delivery Notes	Per-delivery note system stored directly in the ERP — notes persist across sessions and are visible to all users
Inventory & OSP Status	On-hand quantities and vendor activity displayed inline for each delivery
Configurable Range	Adjustable date window (default 14 days ahead) to control workload visibility

3.2 Shipping KPIs

On-time delivery performance metrics with trend analysis. Uses daily aggregation for accurate historical tracking.

Feature	Description
On-Time Percentage	Overall and daily on-time delivery rate based on actual ship dates vs. promised dates
Trend Charts	Visual charts showing OTD trends over configurable date ranges
Late Shipment Analysis	Average days late, worst offenders, and root cause patterns
Customer-Level Metrics	Break down delivery performance by individual customer

3.3 Monthly Shipments

Historical shipment data grouped by month and week, providing the big-picture view of shipping volume and performance trends.

3.4 Job Change Tracker

Audit trail for promise date and quantity changes on active jobs. Identifies suspicious patterns such as repeated date pushes or quantity reductions.

Feature	Description
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Change History	Complete log of promise date changes with old value, new value, days pushed, and who made the change
Suspicious Pattern Detection	Automatic flagging of jobs with both date pushes AND quantity reductions
User Attribution	Filter by user to see who is making the most changes and why
Job Timeline View	Drill into any job to see its complete change history as a timeline

Module 4: SPC & Quality Management System

A comprehensive Statistical Process Control and quality management system that unifies measurement data from multiple sources (Keyence CMM, imported inspection reports, manual web entries) into a single analytical platform.

4.1 SPC Capability Analysis

Full-featured SPC analysis with industry-standard statistical calculations, control charts, and AI-powered interpretation.

Feature	Description
Cpk/Ppk Calculations	Process capability (short-term Cpk) and process performance (long-term Ppk) using within-subgroup and overall variation methods
Control Charts	X-bar/R charts for subgroups, I-MR charts for individuals, with UCL/LCL automatically calculated
Histograms	Distribution analysis with normal curve overlay and specification limit markers
Run Charts	Individual measurement values over time with operator and machine identification
Capability Ratings	Automatic rating: World Class (Cpk \geq 2.0), Excellent (\geq 1.67), Capable (\geq 1.33), Marginal (\geq 1.0), Inadequate
Multi-Dimension Overview	All dimensions for a part analyzed simultaneously with worst-first ranking
Capability Trends	Monthly or quarterly Cpk/Ppk trending to track process improvement or degradation
Source Filtering	Filter by data source (Keyence, imported, manual), inspection type (First Piece, Final), or specific jobs
AI Analysis Panel	Claude AI provides plain-language interpretation of SPC data — explains what the numbers mean in practical terms for operators and managers

4.2 Compliance Dashboard

Active job inspection compliance tracking that cross-references ERP job data with inspection records to identify gaps in quality documentation.

Feature	Description
Job-Level Compliance	Every active job displayed with its inspection status: Pass, Has Fails, or No Inspection
Keyence Integration	Automated Keyence CMM inspection results linked to jobs via part number and date window matching
Dimension Breakdowns	Per-type dimension counts (First Piece, Final, PPAP) showing OK vs. NG for each job

Z1.4 Sampling	ANSI/ASQ Z1.4 sampling plans auto-calculated based on lot size with Accept/Reject numbers
Quality Notes	Per-job note system for quality engineers to document observations, dispositions, and follow-ups
Inspection Requirements	Job routing keywords auto-detect whether First Piece, Final, or PPAP inspections are required
Drawing Viewer	Embedded PDF viewer for customer drawings and bubbled inspection drawings

4.3 Inspection Forms

Digital inspection forms that replace paper-based processes, with automatic data capture into the SPC database.

Feature	Description
First Piece Inspection	Digital F-71-01-3 form with dimension catalog auto-population, evaluation method codes, and drawing references
Final Inspection	AS9103-compliant final inspection with Z1.4 and AS13002 sampling plan integration
Job Context Auto-Fill	Work center, lot size, drawing number, and sample size pre-populated from ERP and prior inspections
Calibration Equipment	Live calibration status from uniPoint, with equipment search by type, range, and eval method code
Training Mode	Practice submissions that don't affect production data — with bulk purge capability
Approval Workflow	Accept/reject disposition with audit trail and inspector attribution

4.4 Additional Quality Tools

Feature	Description
Gage R&R	Full ANOVA-based Gage Repeatability & Reproducibility studies with operator and part analysis
Dimension Catalog	Master list of dimension specifications per part, importable from Keyence programs or manual entry
Inspection History	Searchable archive of all inspection events with filtering by type, result, date, and inspector
Keyence Inspection Viewer	Event-level detail for Keyence CMM inspections showing all dimensions, judgments, and unit corrections
PPAP Support	Production Part Approval Process documentation and dimensional tracking

Module 5: OSP Receiving — Outside Processing

Tracks incoming shipments from outside processors (heat treat, plating, anodize, etc.) with full receiving workflow, inspection queue, and Z1.4 acceptance sampling.

Feature	Description
Incoming PO Dashboard	All open PO lines from outside processors with due dates, urgency color-coding, and linked job information
Barcode Scan Receiving	Scan PO barcode to pull up order details, linked jobs, and receiving form
Job Linkage	Automatic job matching via part number, PO notes, and vendor cross-reference
Target Ship Dates	Each PO line shows the customer's target ship date for the linked job — prioritizes urgent receipts
Duplicate Detection	Warns when a PO/Job combination has already been received, with mandatory reason for override
Real-Time Locks	Prevents two users from receiving the same PO simultaneously
Z1.4 Sampling Plans	Full ANSI Z1.4 Table II-A with arrow resolution, AQL selection, and interactive chart visualization
Inspection Queue	Pending inspection list with sample sizes, accept/reject numbers, and disposition workflow
Lot Rejection Workflow	Document lot disposition (Return, Rework, Use As Is, Scrap) with SCAR generation
SCAR Generation	Auto-generated Supplier Corrective Action Request documents from rejected lot data
Photo/Video Evidence	Upload inspection media (photos, videos) linked to specific receipts
Audit Trail	Complete change history for every receipt with field-level tracking
PO Line Notes	Activity notes per PO line for tracking vendor communication and follow-ups
Search	Global search across POs, jobs, parts, customers, and vendors regardless of status or date
Supply Type Filtering	Toggle between OSP vendors and raw material suppliers

Module 6: Supplier Quality — Vendor Management

Converted from Excel-based tracking (legacy spreadsheets) into a live, interactive dashboard with real-time data from both the ERP and your quality management system (QMS).

Feature	Description
On-Time Delivery Tracking	Receipt-based OTD calculation with configurable tolerance (e.g., 7 days grace period)
Vendor Classification	Supply type, risk level, and approval status from uniPoint quality management system
NCR Integration	Non-Conformance Reports linked to vendor deliveries with status, disposition, and close dates
Supplier Report Cards	Individual vendor scorecards with OTD percentage, NCR count, rework lines, and performance period
Rework Tracking	Identifies vendor deliveries that required rework processing
Performance Distribution	Vendor population breakdown: Poor (<50%), Average (50-75%), Good (75-90%), Excellent (90%+)
Volume Analysis	Year-over-year order volume trends by vendor and supply type
Slicer Filters	Filter by year, supply type, risk level, approval status — matching the original Excel slicer functionality
NCR Detail View	Full NCR details including root cause, disposition, quantities, and processing costs

Module 7: Stock Status — Inventory Management

Real-time inventory visibility designed to support yearly physical inventory counts and ongoing material management.

Feature	Description
Material Location View	All materials with on-hand quantities, locations (row/shelf), and last activity dates
WIP Tracking	Filter to show only Work-In-Process materials or exclude WIP to focus on finished goods
Make vs. Buy	Separate views for manufactured parts (no vendor) and purchased materials (has vendor)
Multi-Location Items	Automatic detection and flagging of materials stored across multiple locations
Demand Forecasting	Forward-looking demand from active job material requirements: 30/60/90 day buckets
Customer Filtering	Filter inventory by customer to see what's on hand for specific programs
Row/Location Filtering	Drill into specific warehouse rows or shelf locations for physical count support
Class Filtering	Filter by material class (Raw, WIP, Finished, Hardware, etc.)
Days Since Activity	Identifies stale inventory that hasn't moved in extended periods

Module 8: First Run Management

Dedicated tracking for first article and new-part jobs that require additional oversight, tooling, programming, and qualification steps before volume production.

Feature	Description
First Run Job List	All active first-run jobs with operation readiness flags (Engineering Release, Material, Tooling, Gage, Programming, FAI, PPAP)
Readiness Indicators	Visual status for each prerequisite: Engineering Release, Material Availability, Tooling, Gage Readiness, CNC Programs, Inspection Programs
Work Center Operations	Drill-down view showing all open/started operations by work center with operator assignment and estimated hours
Production Progress	Days in production, total operations vs. completed, quantity produced vs. ordered
Schedule Tracking	Promised date, scheduled start/end, and actual production dates for timeline analysis
Department Filtering	Filter by run type and work center to focus on specific areas

Module 9: Capacity Planning

Advanced capacity planning module for evaluating new customer programs against existing shop capacity. Includes multi-scenario modeling, material readiness analysis, and proven capacity baselines from historical data.

9.1 Capacity Dashboard

Feature	Description
Department Utilization	Monthly hours view per department showing current baseline load + plan overlay vs. available capacity
12-Month Projection	Forward-looking capacity projection combining historical run rate with planned production
Multi-Plan Stacking	Toggle multiple customer plans on/off to model different scenario combinations
Baseline Methods	Multiple baseline calculation methods: Simple Avg, Exclude Lows, Trim High/Low, Median — with transparent methodology
Backlog Integration	Current active job backlog hours by department overlaid on projections
Machine-Level Detail	Drill from department down to individual work center capacity and utilization

9.2 Proven Capacity Analysis

Statistical analysis of actual historical production to establish machine-level capacity baselines. Uses 5 years of daily production data with recency weighting.

Feature	Description
Percentile Analysis	P50 through P95 daily hours for every production machine based on actual logged hours
Recency Weighting	Recent years weighted higher (5x for current year, 1x for year 5) to reflect current capability
Degradation Detection	Linear regression on yearly P75 values to identify machines losing capacity over time
Complexity Banding	Operations categorized by cycle time (Quick/Standard/Complex/Very Complex) with per-band throughput rates
Operator Comparison	Per-operator daily production rates to identify training needs and scheduling optimization
Scrap Trending	Monthly scrap rate trends per machine to detect tool wear or process drift
One-Click Apply	Apply proven capacity values directly to ERP work center configuration

9.3 Scenario Hub

Part-level analysis engine that evaluates every part in a capacity plan against historical job data, routing information, material availability, and OSP requirements.

Feature	Description
Part-Level Risk Scoring	Composite risk score based on machine validation, material status, OSP dependencies, FAI requirements, and cycle time accuracy
Machine Rationale	For each part, explains WHY the assigned machine was selected, with historical job evidence
OSP Mapping	Outside processing steps identified per part with vendor history and lead time estimates
Material Readiness	Cross-references plan material specs against ERP inventory with surplus/deficit calculations
Pipeline Status	Shows which plan parts already have active jobs vs. which need new orders
Quick-Fix Actions	One-click corrections for invalid machine names, missing departments, or material assignments
Audit Trail	Every change to plan data includes a mandatory reason and is tracked with before/after values

9.4 Supply Chain & OSP

Feature	Description
Vendor Scorecards	For each OSP vendor in a plan, pulls delivery performance, NCR count, and quality classification from uniPoint
Material Gap Resolution	Auto-populate material mappings from historical job data with fuzzy matching (alloy + diameter)
Projection Modes	Flat, Staggered, or Frontloaded distribution of projected production runs across the planning horizon
Delivery-Aware Projection	Active deliveries from ERP drive near-term projections; remaining EAU distributed across future months

Platform Architecture & Security

Data Architecture

JobAI uses a read-only connection to your Manufacturing ERP database. All analytics are computed in real-time from live production data. No data is copied, exported, or transmitted outside your facility.

- **ERP Integration:** Direct SQL Server connection to your ERP database (read-only). Supports major Manufacturing ERP/MRP systems.
- **Quality System Integration:** Optional connection to your quality management system (QMS) for calibration, vendor management, and NCR data.
- **Keyence CMM Integration:** Automated measurement data sync from Keyence coordinate measuring machines with unit correction and tolerance validation.
- **Technology Stack:** Node.js/Express backend, SQL Server database, modern web frontends. No Java, no Flash, no plugins required.

Security & Compliance

Feature	Description
Data Location	All data remains on customer premises — no cloud storage, no external transmission
Encryption	TLS encryption for all network communication between application server and client browsers
Access Control	Network-level access control. Internal-only deployment recommended for ITAR environments
ITAR Compatibility	Internal-only deployment eliminates most ITAR compliance friction — no controlled technical data leaves your network
Read-Only ERP Access	Database user has SELECT-only permissions. Cannot modify, insert, or delete ERP data
Audit Logging	All quality system actions (inspections, dispositions, approvals) include full audit trails
Demo Mode	Built-in data masking across all modules for safe demonstrations — customer names, part numbers, and job numbers automatically anonymized

Deployment Options

- **Internal Only (Recommended for ITAR):** Application server on your local network. Accessible only within your facility. Zero internet exposure.
- **Secure Remote Access:** Optional Cloudflare tunnel for authorized remote access with authentication. No open inbound ports required.
- **Hybrid:** Internal primary access with selective remote access for management dashboards only.

Appendix A: Sampling Plan Reference

JobAI includes built-in support for three industry-standard sampling methodologies used across the platform in OSP Receiving, SPC Compliance, and Inspection Forms.

ANSI/ASQ Z1.4-2003 (R2018)

Normal single sampling, General Inspection Level II. Full Table II-A implementation with arrow resolution logic. Configurable AQL from 0.065 to 25.0. Used for incoming material inspection and OSP receiving.

C=0 (Zero Acceptance Number)

Binomial model sampling plan for aerospace applications where zero defects are required. Any single defective item rejects the entire lot. Based on 95% confidence level.

AS13002 — Cpk-Driven Frequency

SAE AS13002 alternate inspection frequency plans. Inspection frequency reduces as demonstrated Cpk increases. Requires minimum 25 consecutive conforming parts for qualification. Critical characteristics always require 100% inspection.

Contact

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To schedule a guided demonstration or discuss how JobAI can transform your shop floor visibility, contact IQ Associates. We offer personalized pilot programs scoped to your specific ERP system and operational needs.