Salem Automation Services by Automation Pyramid Level

Contents

Overview

Salem Automation provides comprehensive industrial automation solutions across all levels of the automation pyramid. Our integrated approach bridges operational technology (OT) and information technology (IT), providing end-to-end solutions from field devices to enterprise systems.

Level 0: Field Level (Sensors & Actuators)

Engineering & Consulting Services

- End-of-Arm Tooling (EOAT) Design: Custom grippers, weld guns, vision systems, and specialty tooling.
- Vision-Guided Robotics: High-precision automation using advanced camera and AI inspection systems.
- Robotic Maintenance & Support: Preventive maintenance, troubleshooting, and parts planning.
- Electrical Design & CAD Drafting: Panel layout, wiring diagrams, and system documentation.

Software & Data Services

- IIoT Enablement: Secure cloud integration for predictive maintenance and analytics.

Level 1: Control Level (PLCs, Controllers)

Automation Services

- Legacy PLC Migration: Modernize control systems without downtime
- Control System Design & Specifications: PLC and DCS system architecture design

- Custom PLC Programming: Rockwell, Siemens, CODESYS, Emerson, Omron, and other platforms

Robotics Solutions

- Robotic System Design & Integration: End-to-end robotics for assembly, packaging, palletizing, and inspection
- Autonomous Mobile Robots (AMRs): Material transfer, line feeding, and warehouse logistics
- Collaborative Robot Deployment: Safe, space-efficient automation alongside human operators
- Robot Programming: Custom logic for material handling and production workflows
- Robotics Retrofits & Upgrades: Modernizing older robot systems with new controls or safety features
- Robotic Maintenance & Support: Preventive maintenance, troubleshooting, and parts planning

Engineering & Consulting Services

- Electrical Design & CAD Drafting: Panel layout, wiring diagrams, and system documentation

Software & Data Services

- IIoT Enablement: Secure cloud integration for predictive maintenance and analytics

Level 2: Supervisory Level (HMI/SCADA)

Automation Services

- SCADA & MES Integration: Real-time visibility, production tracking, and OEE reporting
- Custom HMI Programming: Ignition, Emerson Movicon, FT View SE, and other platforms
- Control System Design & Specifications: PLC and DCS system architecture design

Software Development Services

- VB6, VBA Development: Legacy HMI and operator interface support
- Modernization of Legacy Operator Interfaces: Transitioning to modern HMI platforms

Emulation Services (Typical Use Cases)

- vtVAX and vtAlpha Emulation: Support for legacy SCADA systems
- Virtualization of VAX/Alpha-Based Operator Interfaces
- Gigabit Ethernet Support: High-speed network communication for real-time data
- Zero Code Changes: Preserves existing HMI/SCADA applications during hardware upgrades
- Data Preservation: Protects irreplaceable historical manufacturing data
- Performance Improvements: Faster processing on modern x86-64 hardware
- Disaster Recovery Strategies: Ensures manufacturing data and execution continuity

Engineering & Consulting Services

- Electrical Design & CAD Drafting: Panel layout, wiring diagrams, and system documentation

Level 3: Planning (Manufacturing Execution Systems (MES) & Overall Equipment Effectiveness (OEE))

Automation Services

- Integration with MES, ERP, and Inventory Systems
- Centralized Data Storage: Flexible reporting and analytics capabilities
- Detailed Reporting: Lot tracking, timestamps, and operator logs
- Real-time Analytics: Safety and efficiency monitoring using AIoT and IIoT
- Machine Learning for Predictive Maintenance
- OEE Performance Management: Continuous monitoring of equipment utilization to reduce downtime, increase production speed, and improve quality

Software Development Services

- IIoT Enablement: Secure cloud integration for predictive maintenance and analytics
- Energy Management Solutions: Automated reporting for Environmental, Social, and Governance (ESG) compliance and utility cost savings
- Modern Application Development: Python, Java, C# for MES applications
- SQL-Based Systems: Manufacturing data management and reporting
- Database Migration: Oracle RDB to Microsoft SQL Server transitions
- Database Management & Support: Reliable industrial IT infrastructure

- Legacy System Modernization: Transitioning older MES platforms to contemporary technologies

Legacy Services (Typical Use Cases)

- DEC VAX VMS and OpenVMS Emulation: Support for legacy MES applications

Level 4: Management (ERP)

Automation Services

- Integration with ERP and Inventory Systems
- Support for Net-Zero Carbon Initiatives: Environmental compliance and sustainability reporting

Software Development Services

- Legacy Language Support: COBOL and Fortran for business and planning systems
- Oracle RDB to SQL Server Migration: Enterprise data system modernization
- Integration with Modern Business Intelligence Platforms

Legacy Services (Typical Use Cases)

- Legacy Business System Emulation: VAX/Alpha systems running enterprise applications
- Software and Data Investment Protection: ERP systems and financial databases
- Business Continuity Assurance: Minimizes operational interruptions during transitions

Cross-Level Services (Spanning Multiple Layers)

Automation Services

- Process Automation & Control Systems (Levels 1-3): End-to-end automation from control to execution
- Material Handling & Robotic Palletizers (Levels 0-2): Automated material movement and packaging
- Energy Management Systems (Levels 1-3): Monitoring, control, and reporting for energy efficiency
- AIoT & IIoT Integration (Levels 2-4): Intelligence and analytics spanning supervisory to business systems
- System Modernization (All Levels): Comprehensive upgrades across the automation pyramid

Software Development Services

- VAX Support, VMS Support (OpenVMS), DEC VAX VMS Support: Underlying OS platform for Levels 2-4
- Legacy Programming Language Support: Fortran, COBOL, CRISP, DEC C across all application levels
- 24/7 Mission-Critical System Support: All operational levels with minimal downtime
- System Modernization Without Business Disruption: Level 2-4 transitions with continuity
- Internal Team Training and Knowledge Transfer: Organizational capability building

Legacy Services

- Hardware Replacement Strategy: Reduces downtime from days to minutes across all levels
- Energy Consumption and Cooling Cost Reduction: Facility-wide operational benefits
- Standardized, OEM-Supported Modern Hardware: Replaces unreliable legacy systems
- Comprehensive VAX and VMS Support: Maintains all applications running on these platforms
- No Retraining Required: Preserves organizational knowledge across all system levels

Additional Content and Background Information

Strategic Value: Emulation as a Horizontal Enabler

Salem's emulation services don't fit into a single pyramid level—they provide a **virtualized infrastructure layer** that supports Levels 2-4 simultaneously. This approach is particularly valuable in industrial environments where:

- **Level 2 SCADA systems** have been stable for decades and continue to perform reliably
- **Level 3 MES databases** contain irreplaceable historical production data
- **Level 4 ERP integrations** would cost millions of dollars to rewrite

Key Benefits:

- Defer expensive application rewrites while gaining modern hardware reliability

- Achieve better performance than original hardware (often running faster on x86-64 platforms)
- Implement robust disaster recovery without changing existing software
- Reduce system downtime from days to minutes

Salem's emulation approach represents a pragmatic middle path between "keeping failing hardware limping along" and "rip and replace"—enabling companies to modernize infrastructure while preserving decades of software investment and operational knowledge.

Salem Automation's Competitive Advantage

By offering services across all pyramid levels, Salem Automation provides:

1. **Complete OT/IT Integration**: Seamless connection between plant floor operations and business systems
2. **Legacy System Bridge**: Expertise in maintaining and modernizing decades-old infrastructure
3. **Future-Proof Solutions**: Modern technologies with backward compatibility
4. **Minimal Business Disruption**: Transitions that preserve operational continuity and institutional knowledge

This comprehensive capability makes Salem Automation uniquely positioned to serve industrial clients with complex, multi-generational technology environments.