

Industrial Automation Playbook:

An Overview: The Industrial Automation Environment

Industrial Automation is defined as the use of **systems and technologies** to monitor and control the production of goods on assembly lines in manufacturing facilities. The technologies and systems are part of an ecosystem that includes:

- **Robotics**
- **Machines**
- **Motion Control equipment**
- **Computer Software**

Different levels of software are used in manufacturing facilities:

- Level 0 (field level): found on the factory floor to manage production processes through the use of sensors and controls that run equipment.
- Level 1 (control level) is made up of programmable logic controllers for stations, process sequencing and model or component management
- Level 2 (supervisory level) monitors the assembly line, providing data acquisition, real-time analysis and KPIs
- Level 3 (management level) provides production analysis, information to rebalance lines, track and trace, quality containment
- Level 4 (enterprise level) uses Enterprise Resource Planning software to control business planning and logistics

Eight Core End-user Drivers in the Manufacturing Environment:

Time-to-Market	Safety	Quality	Cost Savings	Digital Transformation	Cybersecurity	Workforce	Sustainability
<p>Refers to the speed and lead times for getting products to market – from design to the production floor to customers.</p> <p>+ Speed: increase production output to reduce lead times.</p> <p>+ Agility: promptly react and respond to predicted or unpredicted changes.</p>	<p>Protecting employees and systems from hazards, risks, accidents and near misses.</p> <p>+ Maintenance: automated diagnostics send alerts for preventative measures.</p> <p>+ Training: product application and safety training from solution providers.</p>	<p>Improving product consistency, reducing defects and decreasing the rate of errors in production.</p> <p>+ Accuracy: standardizing methods & design for product consistency.</p> <p>+ Track & Trace: identify and verify product flow to improve</p>	<p>Lowering operational costs through:</p> <ul style="list-style-type: none"> ✓ energy management ✓ productivity improvements ✓ minimizing downtime ✓ product quality improvements ✓ repair reductions; and ✓ reduced facility and labour requirements 	<p>The use of digital technologies to enable major business improvements across the value chain.</p> <p>+ Internal benefits:</p> <ul style="list-style-type: none"> ✓ process and workplace improvements ✓ integration of manufacturing and business systems ✓ cost reductions 	<p>Continuously monitoring applications and networks to ensure they are not compromised and enabling rapid detection and intervention of threats.</p>	<p>Building a high-skilled workforce to support and optimize automated and digitized processes.</p> <p>Automation and digitization processes also enable continuous operations when labour shortages are prevalent.</p>	<p>Reducing the energy footprint of a production facility to support a circular economy and abide by environmental, social and governance criteria, commonly known as ESG.</p>

		quality control + Maintenance: preventative upkeep to ensure a safe and operable manufacturing environment.		+ External benefits: ✓ heightened customer service ✓ more effective supply chain management ✓ improved business intelligence			
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Manufacturing plants are described by:

Type of products	Volume & variety of products	Production process
<ul style="list-style-type: none"> Discreet Manufacturing Process Manufacturing Project Manufacturing 	<ul style="list-style-type: none"> Mass Manufacturing Batch Manufacturing Job Shop Manufacturing 	<ul style="list-style-type: none"> Made to stock Assemble Made to order Engineer to order

Industrial Automation Product Categories:

Automation & Robotics	Machine Safety	Motion Control	Process Controls	Industrial Computers & Monitors	Software
Product types: Robotics Low Voltage Products Control Components Enclosures Cables and Connectors Terminal Blocks Programmable Logic Controllers Human Machine Interface	Product types: Light curtains Fencing and guarding Machine stop devices Safety relays Safety controllers Safety mats and edges Safety switches Control devices Area scanners	Product types: Motion Controllers Gear Box Servo Motors Conveyors Stepper Motors Linear Motion	Product types: Instrumentation (analyzers, sensors & transmitters, meters and gauges) Distributor Control Systems Valves	Product types: Hazardous Non-Hazardous	Product types: Integrated into components and machines System information or architectural products Distributor Control Systems Power Monitoring Visualization

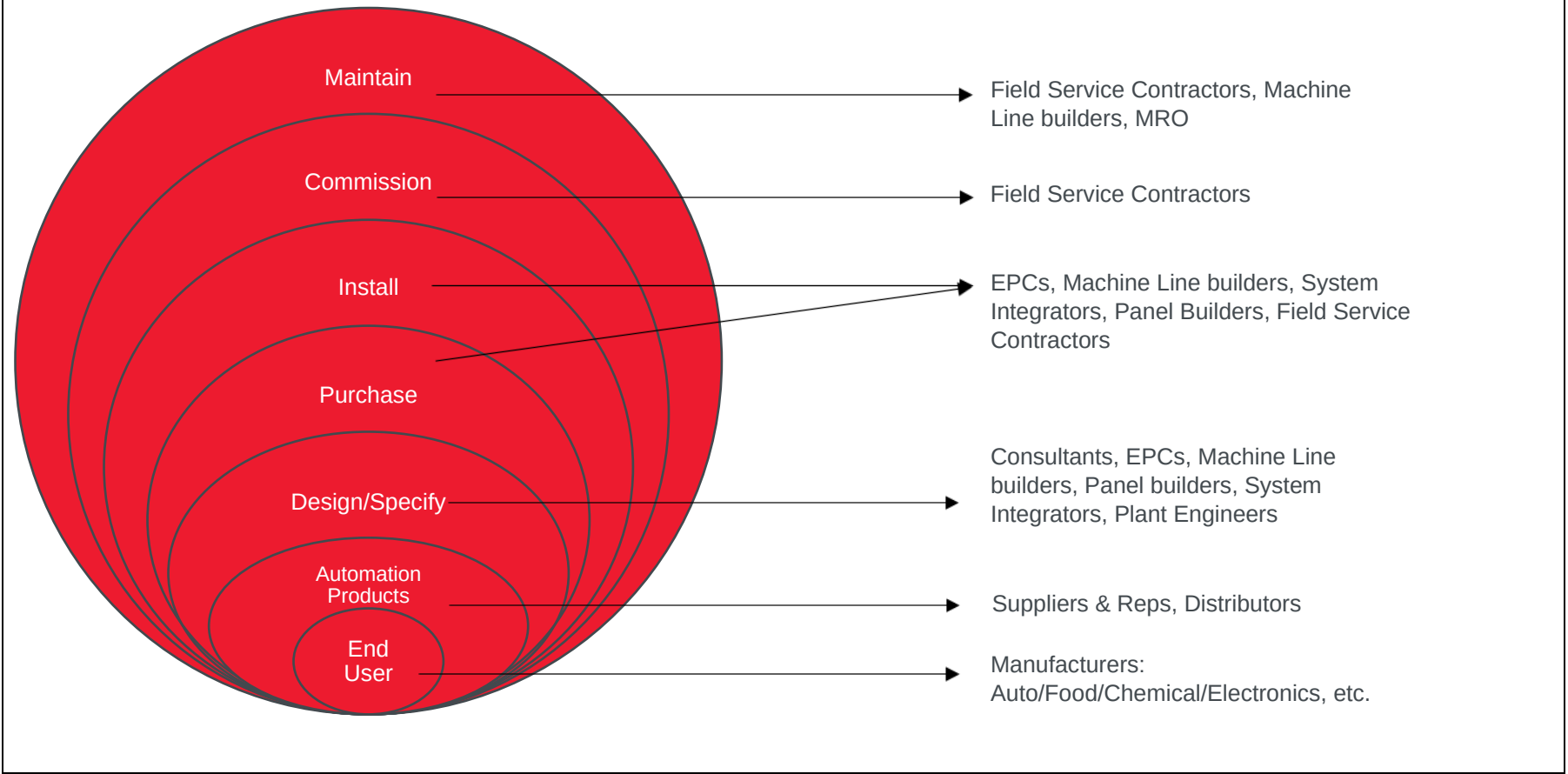
Sensors & Switches	Pneumatics	Energy Monitoring	Process Controls	Power Control & Energy Management
Product types: Acceleration sensors Fibre optic sensors Level sensors	Product types: Actuators Air Preparation Equipment	Measures the flow and use of: Water Air	Product types: Instrumentation (analyzers, sensors & transmitters, meters and gauges)	Product types: Variable speed drives AC drives and motors DC drives and motors

Pressure sensors Proximity sensors Photoelectric sensors Safety detectors Limit switches	Directional Control Valves Sensors & Switches Connectors Airline Equipment	Gas Electricity Steam	Distributor Control Systems Valves	Intelligent motor control centres
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Industry Players:

Engineers & Consultants	Engineering/Procurement/Construction (EPC) Firms	System Integrators	Machine Line Builders	Panel Builders	Field Service Contractors	Maintenance, Repair & Operations (MRO) Technicians	Suppliers & Reps	Distributors	Certification Bodies
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Quick Review: Roles & Industry Players



Designing and building a factory production line:

Design Phase		Build	
The Design team depends on the size & scope of a project and the industry focus	Design blue print & Bill of materials	Installers: Production line 'builders' vary by scale of project	Building the machines, the production lines, or panel

Quotation Checklist:

Specifications	Partner Alignment	Competitive Actions	Closing strategy
Does the product abide by the specification?	How strong are your relationships vs. that of your competition's within this project?	What are your product and service advantages versus those of their competitors?	Consider factors such as solution adjustments and price levels.

Selling Through Distribution

Distributors are an important industry player in the industrial automation segment. They offer a multitude of services to the entire ecosystem and are the primary connection to manufacturer end users.

The Relationship Gap	The Knowledge & Expertise Gap	The Training Gap	The Service Gap	The Assortment & Quantity Gap	The Finance Gap
Direct link to end users	Offer extensive knowledge of end users' needs, Distributors also have vast knowledge of electrical and automation suppliers' product lines.	Distributors provide essential training services to industry players	Distributors provide value added services such as transportation, delivery, material handling and local support	Distributors provide convenient one-stop shopping with a large variety of automation products	Distributors provide credit and financial support to customers

Considerations for distributor & supplier partnerships:

Geography	Customer Type	Product Offering
Do the geographic regions align between the manufacturer and distributor?	Do the customer types align between the manufacturer and distributor?	Do the product requirements align between the manufacturer and distributor?

Distribution strategy can be categorized into three alignment models:

Exclusive	Selective	Broad or Mass
When a distributor has exclusive access to products for a geographic region	When a select few distributors have access to products to several regions	When products have full coverage across all distribution channels

Key financial metrics for distributors with common programs to support partnerships:

Sales Growth [Current Sales – Last Year’s Sales / Last Year’s Sales] x 100 = Sales Growth %	Gross Margin $\$Sales - \$Cost\ of\ Goods\ Sold = \$Gross\ Margin$ $\$Gross\ Margin / \$Sales = \% \text{ Gross Margin}$	Inventory Turns $\$Sales / \$Inventory\ Investment = \# \text{ of turns}$	Reduce Operating Costs Costs associated with the maintenance and administration of business on a day-to-day basis. i.e. advertising, payroll, overhead, equipment	Improve EBITDA (Net Profit): Total Sales – Total expenses before interest & taxes = Earnings before interest, tax, depreciation & amortization
Supported by: Building Brand Strength Joint Calls Market Plans Merchandising Promotions New Products Training Web Support	Supported by: Building Brand Strength Training Price Management Ship & Debit	Supported by: VMI Inventory-levelling Programs Reliable Delivery	Supported by: EDI VMI Reliable Delivery Quick Access to Info Extended Terms	Supported by: Rebate Programs