

WHITEPAPER

THE AUTOMATION REALITY CHECK

10 costly misconceptions that derail
industrial automation projects



ADAPTIVE
INNOVATIONS CORP

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CROSSING THE GAP BETWEEN PERCEPTION AND REALITY

The landscape of industrial automation is currently saturated with high-level hype that often obscures the practical challenges of implementation. In turn, this frequently leads prospective buyers to develop misplaced or misguided expectations regarding what automation can achieve out of the box.

To ensure a project does not become a costly disappointment, manufacturers must do their homework. This involves moving beyond marketing buzzwords to deeply understand the practicalities of implementation, maintenance, and long-term support required to sustain a high-tech production environment.

Successful automation is rarely about the robot itself. It is about the rigorous process-driven approach that precedes its installation.

To benefit from automation, you may need an automation reality check. So, let's debunk the most common misconceptions about automation in industrial manufacturing.



OPERATIONAL AND PERFORMANCE MISCONCEPTIONS

MISCONCEPTION

1

Automation is a Plug-and-Play Solution that Prints Money

Many manufacturing executives view an automated cell as a set-it-and-forget-it asset. There is a pervasive belief that one can simply install a system, press a start button, and walk away while the machine generates profit without further oversight. This money printer mentality ignores the fundamental complexity of industrial machinery.

REALITY: Automation Requires Ongoing Technical Stewardship

In practice, automation is a sophisticated tool that demands realistic expectations regarding maintenance and the technical resources necessary to keep it running at peak performance. Unlike manual labor, which can adapt to minor changes on the fly, automation requires consistent calibration and skilled intervention. If a manufacturer does not allocate the proper internal resources or budget for long-term technical support, the initial investment will quickly degrade.

2

Systems Will Achieve 100% Reliability and Process Success

A frequent demand from manufacturers is for a system that never fails—a 100% success rate in picking, placing, or processing. On paper, this sounds like a reasonable goal for a machine, but in a manufacturing environment, it is often a statistical impossibility.

Upstream Affects Downstream

During the assembly of fire suppression sprinklers, a new burr created by a changed upstream stamping die caused screws to cross-thread, illustrating how automation often becomes a catch-all for process issues originating earlier in the production line.

REALITY: Variability is the Enemy of Perfection

Achieving a 100% success rate is statistically extremely difficult, if not impossible, due to the sheer number of variables outside the robot's control. Variations in raw materials, upstream processes, environmental conditions, and machine wear all play a role in performance. For example, even a high-performing system will struggle if incoming parts have unpredictable burrs or dimensional inconsistencies. True success is not found in demanding perfection from the machine, but in exercising extreme control over incoming components and acknowledging that some level of variability will always exist.

MISCONCEPTION

3

Lights-Out Manufacturing Means Zero Human Supervision

The vision of a factory running a third shift entirely unattended is a common strategic goal for many manufacturers. The assumption is that once the lights are turned off, the robots will continue working flawlessly until the morning crew arrives.

REALITY: The High Price of Minor Failures

Running a shift with zero supervision is a significant gamble. If a minor, easily fixable issue occurs just 30 minutes into an unattended eight-hour shift, and no one is there to resolve it, the manufacturer loses seven and a half hours of production. This downtime can negate the labor savings of an entire week. It is highly recommended to maintain at least one operator in the area to handle these low-percentage variables and ensure the system remains productive throughout the shift.

TECHNICAL AND TACTICAL MISCONCEPTIONS

MISCONCEPTION

4

Collaborative Robots are Always the Right Choice

Because “cobot” is a buzzword in the industry, many executives view it as a universal solution for every automation challenge. There is a misconception that, because they can work alongside humans, cobots are inherently safer, easier to use, and more efficient than traditional industrial robots.

REALITY: Speed and Force Limitations

The choice of technology must be based on the application, not the current popularity of the tool. Cobots are intentionally force and speed limited to ensure human safety. Consequently, they often move significantly slower and handle far less weight than traditional industrial robots do. For high-throughput or heavy-duty applications, a cobot may be an inefficient choice that fails to meet production targets.

MISCONCEPTION

5

New Machines Must Meet Six Sigma Standards During Development

Many manufacturers include a requirement for Six Sigma performance—meaning only 3.4 failures per million opportunities—within their initial design specifications. They expect the robotics integrator to prove this level of reliability within a standard development window, such as six months.

The Perfection Misconception

An HVAC manufacturer rejected a laser-unloading proof of concept despite a 95–96% success rate because they demanded 100% perfection, a goal that is statistically near-impossible to achieve in industrial automation.

REALITY: Reliability is an Evolution, Not a Day-One Feature

Specifying Six Sigma performance for a brand-new machine during a short development timeframe is unrealistic and prohibitively expensive. This level of precision is not just a function of the machine's design because it requires extreme control of incoming components. Real-world statistical machine performance is a long-term goal achieved through the continuous improvement of the machine, the process, and the product over time. Requiring Six Sigma performance as a condition for acceptance often results in diminishing returns and unachievable project timelines.

MISCONCEPTION

6

Automation Projects Must Be All or Nothing

Manufacturers often feel compelled to automate 100% of their product families, including low-runner parts that are rarely produced. They believe that to be truly automated, every single SKU must be handled by the machine.

REALITY: The Power of the 80/20 Rule

Focusing on the core 80% of production volume yields a much higher ROI than trying to automate every outlier. Low-volume parts often require complex, expensive programming and specialized tooling for little financial gain. These parts are typically better handled manually. By automating the high-volume runners and leaving the complex low-volume runners to human operators, manufacturers can achieve a faster return on investment and a less complex system.

FINANCIAL AND PARTNERSHIP MISCONCEPTIONS

MISCONCEPTION

7

ROI is Calculated Solely Through Direct Labor Reduction

The most common metric for justifying automation is headcount reduction. If a robot replaces two people, the ROI is calculated based on those two salaries.

REALITY: Capturing Soft Returns and Hidden Savings

While labor and throughput are primary metrics, focusing only on them causes manufacturers to overlook significant soft returns. Automation provides massive value by reducing repetitive motion injuries and lowering worker compensation claims. It also eliminates the high costs associated with training and turnover in environments that are dirty, dusty, or loud—positions that are increasingly difficult to fill in the modern labor market.

MISCONCEPTION

8

All Authorized Integrators Provide the Same Level of Quality

There is a common belief that an authorized logo from a major robot manufacturer (like FANUC or ABB) serves as a guarantee of a standardized, high-quality engineering process.

REALITY: Engineering-Centric vs. Gunsmithing

The quality of engineering varies wildly between integrators. Some shops function as gunsmiths, essentially building machines through trial and error without a rigorous plan. Conversely, engineering-centric shops utilize defined peer review processes and standardized methodologies to ensure the machine works as intended before it ever hits the floor. Success depends on choosing a partner who follows a process-driven approach rather than just having the right logo on their website.

MISCONCEPTION

9

The Lowest Bidder Offers the Best Value

In a competitive bidding environment, the temptation to choose the lowest price is strong. Manufacturers often assume that because the bids are for the same project and the same design specification, the cheapest one is the most efficient use of capital.

REALITY: The Hidden Cost of Low Bids

Choosing the lowest bidder frequently leads to project-creep through engineering change orders or, worse, an underperforming machine. This often happens because the integrator either did not fully understand the project's complexities or attempted to shortcut quality and processes to meet a low budget. A low initial price often leads to a much higher total cost of ownership once the machine's failures and required modifications are accounted for.

MISCONCEPTION

10

A SOW is All That's Required to Achieve Project Success

Many manufacturers and integrators believe that a standard **Statement of Work (SOW)** is sufficient to communicate project needs and ensure a successful outcome.

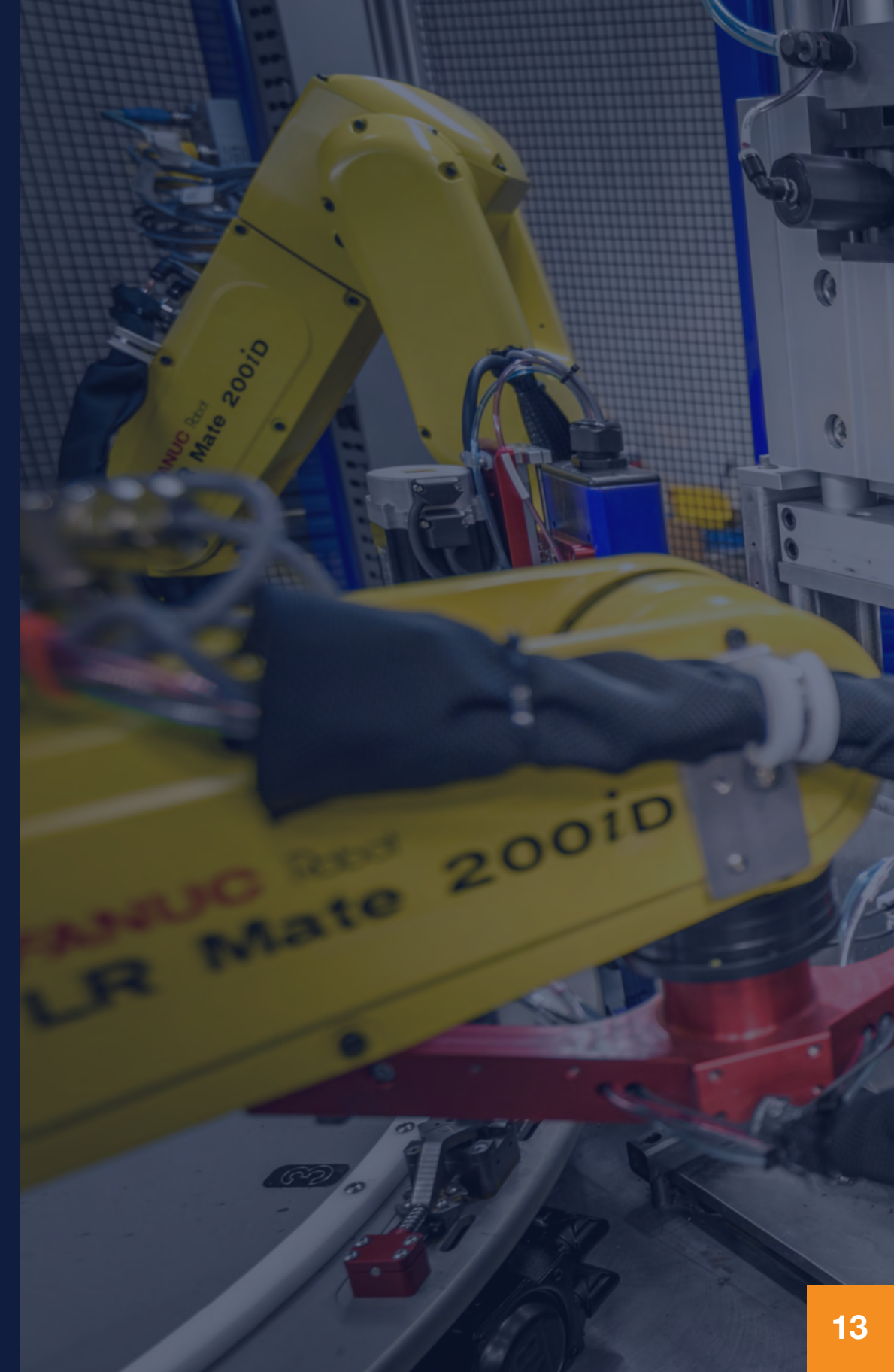
REALITY: The Critical Need for a Design Specification

Relying solely on a SOW often leads to difficult conversations or disagreements at the end of a project when expectations don't match the final output. Especially for complex systems, the generation of, and agreement to, a detailed machine design specification is a critical, risk-eliminating step. This document requires buy-in from both the customer and the integrator, ensuring that every technical detail is understood and agreed upon before fabrication begins.

ESTABLISHING A FOUNDATION FOR SUCCESS

The path to a successful automation deployment is paved with realistic expectations and rigorous planning. **Manufacturers must move beyond industry myths and adopt a defined, process-driven approach.**

By prioritizing engineering quality over the lowest bid and focusing on high-volume throughput rather than unattainable perfection, companies ensure that their automation investment delivers genuine, lasting value to their operations. Success is not found in the robot itself, but in the homework done before the first bolt is turned.



ABOUT ADAPTIVE INNOVATIONS

Adaptive is a custom equipment designer and machine builder that specializes in precision automation systems and custom test equipment. Our engineers have outstanding manufacturing knowledge, tooling design prowess and software/controls expertise. The diverse background and deep experience of our team has culminated into superior capabilities, enabling us to adapt to and support the ever-changing demands of manufacturing.

Building and integrating systems for customers in nearly every industrial sector, we leverage our dynamic knowledge gained from each industry to provide efficient, insightful, and creative automated systems. Driving the integration of technology into industrial machinery, Adaptive is constantly advancing its solutions to provide customers with the most capable and flexible solutions available. Adaptive's advanced experience in test systems is often integrated into our automation systems, **bridging the gap between production and quality.**



Adaptive Clarity Blueprint™

Adaptive Innovations utilizes a proprietary Adaptive Clarity Blueprint™ to transform complex industrial automation and robotic goals into actionable, validated, and predictable engineering specifications. This approach focuses on improving product design, enhancing machine reliability, and creating efficient, scalable automation systems.

Ready to get started or learn more about how we can help your business?

LET'S TALK