
Aligning Business and Automation Strategy

White Paper

Paul J. Galeski, P.E., CAP

MAVERICK Technologies, LLC



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Introduction

If your company is a U.S.-based manufacturer, particularly in the process industries, you've long known that investment in automation is vital for establishing and maintaining global competitiveness. But previously, your company may have looked at automation as a series of stand-alone projects, as opposed to approaching automation from an integrated strategic level on a plant- and enterprise-wide basis. This approach may have resulted in poor or inconsistent return on investment (ROI), as certain projects may have been technically successful, while not fully achieving desired results because they didn't positively affect the bottom line.

A better approach to automation investment begins with a strategic vision that drives a methodical approach to business improvement. Manufacturers must look at automation from the top down, first identifying the strategic challenges of the business, and then finding ways automation can be used to meet those challenges and attain business objectives. This starts by changing the perception of automation within the organization.

Manufacturers must change their mindset and view automation as a key part of their overall business strategy, as opposed to a series of independent projects. Development of an automation investment strategy should be approached with the same dedication and focus as a sales, marketing or operational strategy — it's vital to the success of any manufacturer. This idea must be solidified in the minds of enlightened leadership, because it alters the lens through which automation is viewed across the enterprise.

With this new mindset in place, it becomes easier to align business and automation strategy, and to see how the two are closely linked. This realization will result in transformational change as “automation projects” start to become “automation solutions” — and drive results for the entire business, allowing the attainment of business goals through smart automation investments, not sub optimization of individual processes or functions.

Smart companies are taking this approach and using automation strategies to implement the right technology in the right way and at the right time and place, to get ahead of their competition. These enlightened companies recognize there has never been a better time to make wise investments in automation, as current market conditions have created an attractive opportunity.

Now's the Time for Automation Investment to Restore Manufacturing Competitiveness

Despite substantial investment in automation and other areas related to manufacturing processes, the United States is still losing its manufacturing base in many industries. Consumer demand and relentless global competition have resulted in shorter product lifecycles, a need for reduced turnaround time, and a renewed emphasis on quality and cost reduction. To meet these challenges, U.S.-based manufacturers must become more competitive, and in many cases, the most cost-effective way to attain this goal is through prudent investment in automation.

Reasons to Invest Now in U.S.-based Manufacturing Automation

- 1 Global competition is ever increasing
- 2 Capital is readily available and its cost is low
- 3 Domestic demand is strong and rising
- 4 Exports are rising
- 5 Required infrastructure is very well developed
- 6 Security of investments and physical assets is excellent
- 7 Intellectual property is highly protected
- 8 Oil and gas production is booming
- 9 Utility costs are relatively low, particularly for power
- 10 Highly educated workforce is available

Fortunately, this is a particularly good time to invest in your manufacturing operations in general — and especially in automation — for a number of reasons as listed in Table 1 and detailed below.

Many U.S.-based manufacturers have excess capital on hand, and deploying this capital in profitable internal investments is often the best way to deliver above average returns to stakeholders. For those without available excess cash on hand, borrowing costs are very low, as the Federal Reserve is focused on keeping interest rates at historic lows.

The U.S. market for manufactured products of all types, from cars to chemicals, remains among the world's largest. Nearby access to such a large and contiguous market fuels demand across the entire manufacturing landscape, starting with those firms directly supplying products to consumers and extending to upstream suppliers.

Adding to demand is the rise in exports from the United States to the rest of the world. This rise is due to a number of factors including a favorable exchange rate with many trading partners, the proliferation of free trade agreements and a more highly developed worldwide communication and transportation infrastructure.

Compared to the advanced economies of Europe and Asia, the United States has much lower costs for land, utilities, telecommunication services and energy. The U.S. business infrastructure — from roads to airports to ports — is much more developed than those in many emerging economies.

Additionally, when compared to most emerging economies, the United States has the lowest overall risk of investment as the security of physical and intellectual assets is the best in the world. Unlike many developing nations, there is no threat of asset seizure due to changing government regimes, and there is a high degree of protection for all types of intellectual property.

Investment and asset risk can also be more pronounced in some highly developed countries as many have a more socialistic government structure with a past history of forcibly converting private companies to government ownership.

Oil and Gas Boom Can Increase the Competitiveness of U.S.-based Manufacturers

The United States is one of the lowest-cost producers of many of the raw materials used in various manufacturing processes. In particular, recent advancements and technical developments are transforming the United States from a net importer to a net exporter of oil and gas. A recent article in *The Economist* succinctly states the good news: “The shale gas revolution in America has been as sudden and startling as a supertanker performing a handbrake turn. A country that once fretted about its dependence on Middle Eastern fossil fuels is now on the verge of self-sufficiency in natural gas. And the news keeps getting better. This week the International Energy Agency predicted that the United States would become the world's largest oil producer by 2020, outstripping Saudi Arabia and Russia.” (Reference 1)

A leading automation industry analyst agrees. “When making investment and sales decisions, it is imperative that executives understand the context within which they will be operating,” says Frost & Sullivan Industrial Automation and Process Control Global Vice President Sath Rao. “Game changing trends exist in many areas — the U.S. shale boom is one example. Manufacturing competitiveness in the U.S. is likely to improve as a result of the shale gas revolution. The growth in this industry is expected to place downward pressure on natural gas prices, which will benefit the manufacturing and process industries even further, and have repercussions for industries globally.”

This move toward energy independence needs to be considered as a key factor in the strategic plan of manufacturers, particularly those in the process industries. Rapidly rising oil and gas production and consequently lower prices, particularly for natural gas, are the spark that is shifting the competitive landscape quickly in favor of U.S.-based manufacturers.

Lower oil and natural gas prices provide benefits in two ways. First, much of the feedstock for the process industries is derived from oil and natural gas, so feedstock will be widely available and reasonable in cost. Second, many power plants are fueled by natural gas, and the price of power produced by these facilities is dropping.

Another key advantage for U.S. manufacturers is a world-class education system at the university level. Each year, U.S. universities graduate many of the world’s best potential manufacturing employees. These graduates are naturally attracted to the United States, as are others from overseas, in large part because the United States has a favorable reputation for innovation and technology advancement. And, current high unemployment rates mean that many talented workers are readily available.

Automation Investment Is a Cornerstone of a World-class Manufacturing Strategy

There are always doubts as to the direction of the economy, which might make your company reluctant to risk capital on the critical automation projects needed to drive innovation and improve competitiveness.

In many ways, U.S. companies are technology leaders, but long-term success will require these companies to also become automation leaders. In order to make this transition, manufacturers must recognize that technology is a tool used in the production process. They must also understand that the best ROI comes through the development of automation solutions that enhance the process used to produce their product, not from faster microprocessors or the latest revision of software operating systems and applications.

In many cases, this reluctance is well founded, as it’s based on your personal prior experience with automation investments that simply didn’t produce improved financial performance. Past experiences may have reduced your confidence in long-term automation investments and left you looking for a different approach — one that first identifies those automation projects with the best ROI and highest probability of success.

This is in fact the best way to invest both in manufacturing technology in general and automation in particular; rigorously ranking investments based on realistically achievable ROI offers the best chance of success. Once projects are ranked based on ROI, a systematic plan must be created for implementation.

A recent white paper (Reference 2), *In Today's Economy, the Best Investment Is in Your Own Back Yard*, summarizes reasons and methods for investing in automation. The white paper shows why both U.S.-based and other manufacturers should invest in automation, how investment decisions should be made and what should be the expected ROI.

In summary, your company and other U.S.-based manufacturers must not only invest in automation to survive in an increasingly competitive global economy, but must also invest wisely, using a top-down approach to identify and execute those automation projects with the highest and quickest returns.

Table 2

**Automation System
Total Cost of Ownership
Components**

Cost

Of the project

For integration with other automation and information systems

For training personnel to use new system

Savings from

Reduced maintenance

Avoided downtime

Reduced changeover time

Improved quality

Reduced energy use

Increased throughput

Better cyber security protection

The Right Automation Strategy Metrics

All manufacturers want to identify those automation investments with the best ROI, but the right way to accomplish this task isn't always immediately evident. Too many manufacturers focus on the wrong areas, taking an approach that isn't oriented to finding the best overall solutions with the lowest total cost of ownership (TCO).

Automation projects in particular can show a huge divergence from expected and actual ROI if TCO isn't taken into account. As listed in Table 2, TCO takes into account all the cost and savings factors that result from a project.

The first three items in Table 2 are direct and indirect costs of implementing a new automation project. The remaining seven items are expected costs savings. A typical mistake is not taking all expected cost savings and efficiencies into account, leading to understated ROI and underinvestment in automation. The bottom line is that understated ROI means missed business opportunities.

Accurately quantifying the cost-saving components of TCO typically requires an unbiased resource because the best way to estimate these savings is to look at real numbers from comparable projects that are already up and running. The right partner can help provide this viewpoint, as they will have typically executed similar projects for other manufacturers within your industry.

Take great care when selecting a partner. Hardware and software suppliers make their money by selling products as opposed to business solutions, and as a result often mistake technology improvements as successful projects. Product code conversions are not solutions, but are instead tools available to achieve desired business outcomes. The right external partner will provide a technology-independent point of view, looking at technology as a means to a desired end, rather than the solution in and of itself.

For example, many manufacturers and suppliers mistakenly view software conversion as a solution instead of a tool. Converting an old program or code base to a new platform or format might confer a feeling of progress, but it can be like putting ball-bearing wheels on a buggy pulled by a horse, as opposed to making the smarter investment of purchasing a new vehicle to replace the horse and buggy.

Picking the right partner — one that understands both your business strategy and automation landscape — will help ensure that all TCO factors will be identified and accounted for in a proper manner. This approach will go a long way toward identifying those automation projects with the best ROI; your next step is to work with your partner to create a strategic plan for implementing these projects. Further success will be realized if your selected partner company is also capable of executing the automation program and projects.

Creating and Executing the Strategic Automation Investment Plan

Your company shouldn't look at automation investments as a series of unrelated projects. This fragmented approach will limit overall positive impacts, sub-optimize your operations and won't sufficiently improve your competitiveness. Automation must instead be part and parcel of your firm's overall business strategy.

Any automation investment has to fit into your organization's overall strategic plan. From there, other important facets such as cultural fit, flexibility and adaptability must be considered. Just as a CEO wouldn't develop a five-year strategic plan by simply looking at a financial audit, you shouldn't make automation investment decisions based strictly on isolated financial factors such as the ROI of one-off projects.

Instead of looking at automation investments individually, your organization should first develop an automation investment strategy based on a myriad of factors including but not limited to customer wants and needs, agility, relationships with key suppliers and existing employee skill sets — as well as ever-present financial constraints.

From this business strategy and vision, your automation investment plan can be developed — one that serves the larger goals of the organization as a whole. Combining your strategic vision with operational and financial metrics will result in optimal investments both in automation and other related areas.

A big part of any strategic plan is measuring results versus pro forma projections. For manufacturers, this requires connecting automation systems to the overall enterprise to deliver real-time performance information to all relevant parties, from maintenance and operating personnel to company executives. Most manufacturing companies have great people armed with real-time and in-context information running their operations. Those world class resources can and will do wonders for the bottom line.

Choosing the Right Partner

The effective execution of your automation strategy requires the right partner to help guide and drive the process. The new breed of automation solutions provider (ASP) is a true partner, helping you and your company identify, develop and then implement the most beneficial automation investments — those that will exhibit a high and timely ROI, and will further your company's overall business objectives.

When choosing a partner, make sure that the selected ASP offers the required scope of services, the necessary domain expertise and the needed scale and size. Avoid those prospective partners that view automation as simply an investment for the sake of improved technology.

Your automation investment should begin with the end goal in mind. The right partner will be able to assist in formulating this vision, and will be able to implement your strategy by executing each of your automation projects in a systematic, well-choreographed and consistent manner.

A key attribute for your selected partner is prior experience in program management, project execution and standards development. It is critical that you find a partner that is “proven in use” for your particular industrial processes and projects.

After each project is installed and running, your partner firm should be able to work with you to ensure that each automation and information system continues to perform as designed so that expected ROI is attained over the long term. It must be understood that ROI isn't sealed in on the day of startup. Rather, the gains that you have achieved must be locked in, with further improvements made over time, through the implementation of a long-term sustaining services program.

The selected ASP must have the size and scale required to work with your company at both the plant level and across your entire enterprise. They also need to have the ability to provide the local support that you need through nationwide coverage and remote management capabilities, both on a 24/7/365 basis.

Platform independence is another key to success, as it leaves the ASP free to propose the best products for the particular application. Unlike automation vendors, a true ASP isn't inclined to lead with a products-first approach. This is of particular importance in the automation arena, where many of the most profitable investments are made by getting more out of existing assets through relatively inexpensive software configuration and other service-related improvements, as opposed to making new and often costly equipment, hardware and software purchases.

In fact, the end product of an independent ASP will be whatever happens to be the best solution to your particular issues. And these issues will have been identified up front by your company and the ASP as you worked together to develop a top-down automation investment plan.

Of course, even the best investments will fall short of projected ROI without proper execution; this is an area where your partner must have the required skills and expertise. Look for a diverse partner that can bring fresh ideas to your industry and company. This prior experience is invaluable and should be a key differentiator when you're evaluating candidates.

Finally, your partner must have the depth of resources, long-term staying power and the commitment to make sure that each of your automation investments performs as desired over the entire lifecycle of the asset. This requires a holistic combination of people, processes and technology expertise — and also a close match with your company’s culture.

Table 3 provides information for comparing different types of potential partners based on the factors detailed above. This table can be used a guide for picking the right partner to execute your company’s automation investment strategy.

Table 3

Picking the Right Partner

Partner Type	Industry Domain Expertise	Automation Expertise	Business Strategy Expertise	Automation Program Execution Capability	Size & Scale	Platform Independence	Long-term Flexibility	Ongoing Support and Service
Automation Solutions Provider	High	High	High	High	Medium	High	High	High
Major Engineering Firm	High	Low to medium, varies widely	Medium	Medium	High	High	Low	Low
Big 4 or Similar Management Consultant	Low	Low	High	Low	High	High	Medium	Low
System Integrator	Medium	High	Low	Medium	Low	High	High	Medium, limited geographically
Major Automation Vendor	Medium	High, but limited to their products	Medium, but often lead with products	Medium	High	Low	Low	High, but costly

Notes

1. Process industry domain expertise varies widely among partner types rated as High.
2. Project execution capability is based on ability and willingness to execute automation projects on a fixed price, as opposed to a time and material basis.
3. Size and scale and long-term staying power vary widely from one ASP to another.

References

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AUTOMATION CHALLENGE

I challenge each and every manufacturing leader to make automation a fundamental part of their overall business strategy. Once a strategy is formed with automation in mind, drive that vision throughout the entire organization, choose the right partner and get moving!

I feel strongly that this approach will help improve competitive advantage, which in turn will create new jobs and protect existing ones, while delivering stellar financial results for company stakeholders. Let's all pull together and make the U.S. manufacturing renaissance a reality. We owe it to ourselves, to our country and to future generations of Americans to take action now.

MAVERICK Technologies, LLC

265 Admiral Trost Drive | P.O. Box 470 | Columbia, IL 62236 USA

+1.618.281.9100 | Fax +1.618.281.9191

mavtechglobal.com



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