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Making Technology a Competitive Differentiator: A Blueprint for Manufacturers

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Key Takeaways:

- Successful manufacturing companies are moving away from short-term, band-aid technology solutions and instead adopting a strategic approach to technology integration.
- The decision to implement automation and robotics should be carefully analyzed to avoid a purely reactive approach.
- Embracing Industry 4.0 technologies, such as AI and intelligent data, can significantly enhance manufacturing efficiency and profitability. Companies must focus on integrating and managing data effectively to gain valuable insights and improve operations.

As wave after wave of new technology washes over the manufacturing industry, more companies are coming to grips with an important realization: The days of applying band-aid technology solutions are over.

Technology, or more specifically how they invest in, use, and manage it, is becoming an increasingly powerful competitive differentiator and riding the waves successfully requires a coherent, strategic plan.

The Fourth Industrial Revolution – Industry 4.0 – is fundamentally reshaping the manufacturing sector, adding to a technological galaxy that already feels endless. Compartmentalizing helps, and while every company's technology stack is unique, most are spending the bulk of their time in three areas, including:

- Identifying and implementing optimal systems updates and programs
- Debating the benefits and risks of automation and robotics as solutions
- Monitoring evolving Industry 4.0 technologies to understand how best to leverage

Developing a strategic plan focused on these pillars and the many underlying drivers will go a long way toward helping companies get better at confidently answering the three biggest new tech questions: 1) the "what", for example, putting the research into truly understand what they need in terms of scope and scale; 2) the "where and why", essentially validating the business-use case; and 3) the "how" – best practices for ensuring seamless, compatible rollouts and integrations.

The importance of being prepared and agile is reflected in a recent Bain Capital survey of 270 manufacturing firms, which found that those with strong digital components to their businesses are three times more likely to achieve their production goals than those with less digital dexterity.[1]

WHAT

Nuts and Bolts: Systems Updates and Integrations

Systems updates and integrations can jump the rails quickly without the right amount of diligence and front-end planning. We have been consulted on many occasions to help with integrations that should have been straightforward but ended up badly, usually due to incompatibility issues. Before making any big purchases, companies need to have their own checklist of technology questions. Are we getting optimal functionality and results from what we already have? How do we know if we're getting too much technology or too little? And then if they decide to go forward, with smart manufacturing on the rise, a big pre-purchase consideration is making sure that anything new being integrated will play well with everything in the existing technology sandbox.

Strategic Use of Automation and Robotics

The decision to insert automation or robotics into a manufacturing process is a significant and sensitive one that requires thorough analysis and should not be influenced by emotions or short-term factors. Optics are important for every business, and for some the switch to automation immediately signals cost-cutting mode. In our experience, however, we are not seeing machines replace humans, but rather they are tackling more of the high-volume, repetitive tasks that can be more prone to human error.

In this way, automation and robotics can drive better quality control and free up workers to focus on highervalue-added tasks.

Industry 4.0: Getting Smarter with Data

Industry 4.0 refers to the increasing interconnectedness of manufacturing-related hardware through the internet ("smart manufacturing"). These technologies are increasingly enabling the design, customization, manufacture, and delivery of goods and services while also meeting consumer preferences.

AI and intelligent data are leading the way. AI gives companies valuable data and insights across critical functions such as inventory, production planning, and vendor management, which can, in turn, be used to improve efficiency and profitability. For example, AI is making a big difference in assisting with predictive maintenance, which involves analyzing data generated by sensors to anticipate equipment failures and delays before they happen and cause major disruptions, as well as in inventory management, where visual tools can provide better insights and thus better inform planning.

Those insights come in the form of proprietary data, which is one of the most valuable assets companies possess. For most, there is no shortage as technology seems to be constantly generating new data on production lines, supply chains, employee performance, and other key metrics. The challenge, however, comes when the data is not fully integrated – for example, one set of data is not informing a key-related function – or it is disorganized, making it difficult to get good visibility. Data management and applicability are the biggest challenges out there, and the companies that figure out how to best manage and utilize it well will be at an advantage.

> "Smart manufacturing refers to fully integrated, collaborative manufacturing systems that respond in real-time to meet changing demands and conditions in the factory, in the supply network, and in customer needs."
>
> —National Institute of Standards and Technology

WHERE & WHY

The Invaluable Value of Internal Due Diligence

In many cases, a new technology rollout stems from a strong desire to resolve an acute problem, usually relating to quality control, as quickly and seamlessly as possible. The problem with this reactive approach is that it only satisfies the quick part and can be anything but seamless.

Automation is a good example. Middle-market manufacturing companies, particularly those going through prolonged labor shortages, often turn to automation as a magic bullet that will help them continue to meet demand and deliver products on time. The problems come when they fail to dig deep enough in their research to realize the flip side of automation, for example, the extra costs for sensors and software, the heightened exposure to cyber-attackers, and the need to find and pay higher-skilled workers to oversee these new solutions.

Whatever the technology-related objective, the foundation for success gets poured first through a mix of analysis and question-asking. What will the new solution bring that we don't have now? Are we comfortable going outside for this? How do we know which technology is best for us?

Determining if technology or people are the best option depends on the true nature of the task at hand, particularly whether it's a higher-volume, repetitive step or more customized in nature. For example, if the task involves welding, but you are only making one or two custom pieces per month, manual labor is the best fit. If the job is custom and high volume, automation or robots could be worth a look. As firms go through each of the major stations along a line, making tradeoffs like these can be valuable.

> "Ideas are easy. Execution is everything."
>
> —John Doerr

HOW

Technology rollouts and implementations are difficult to orchestrate and can often fail outright or fall short in delivering the desired ROI for a variety of reasons.

A lack of patience is typically one of the leading ones. If we go back to the 'why', technology rollouts usually start when a problem needs immediate fixing. In the first meeting to outline the project, someone invariably sets a go-live date that is arbitrary and usually not reflective of the true timeline of work that needs to happen. Like home renovations, plan on everything taking longer. If a firm needs to do master data cleanup, get processes under control, and perform testing, which we always encourage, it could add six months to a year to the original go-live date set. And this is where patience is a virtue. Instead of adjusting expectations – and the schedule – companies take shortcuts to hit dates that were unrealistic in the first place, when they would have benefited greatly from conducting pilots and doing more targeted research before taking the plunge.

The other key area that needs to be strategic and sharp is how the change or integration is communicated to the relevant stakeholders. Getting people onboard and understanding the reason for the change is critical, and there are many variables in play. Some will be naturally resistant to changing a longstanding process entirely, and the project planners need to consider the different learning curves each employee will have in learning the new programs. Consistent communications from the top, reinforcing the reason for the change and the benefits it will deliver are essential. In the case of rollouts or integrations, there is no such thing as over communicating.

Closing Thoughts

A recent industry survey found that most companies (88%)[2] have difficulty measuring the value they are getting from their technology investments. The challenge of ensuring a good return on investment is only growing more complex and difficult, and for many companies operating in the middle markets, good ROIs are absolute necessities. Having a buttoned-up plan in place, one that looks ahead and allows for flexibility, and taking the time to make the best decisions possible are the two most important factors in successfully managing and introducing innovative technologies that can ultimately benefit your business. The stakes are rising every day, the digital revolution is unfolding, and the best managers/optimizers of their technology stand to carve out strong competitive positions.

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[1] Factory of the Future: How Industry 4.0 and AI Can Transform Manufacturing | Bain & Company.
https://www.bain.com/insights/factory-of-the-future-how-industry-4-0-and-ai-can-transform-manufacturing/

[2] Technology leader insights from the PwC Pulse Survey: PwC
https://www.pwc.com/us/en/library/pulse-survey/business-reinvention/technology-leaders.html

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