



## PRIVATE EQUITY PERFORMANCE IMPROVEMENT

# Factory of the Future: Paving the Way to Industry 4.0



Factory of the Future initiatives have been a topic of discussion for over a decade and refer to a transformation within the manufacturing industry by adopting digital technologies to improve process performance. However, when manufacturing leaders are tasked with driving long-term, sustainable impacts to the bottom line, their first thought is not typically commissioning a digital twin, developing AI-enabled procurement processes or building a “lights out” greenfield factory. Due to idealistic mindsets around the Factory of the Future, these initiatives, often referred to as “industry 4.0 initiatives,” are perceived as fantasy as opposed to more traditional, practical approaches to improving business performance. This perception may influence manufacturing executives as they navigate improvements, continuously balancing high-impact, long-term projects against quick wins while ensuring sustained success and controlled capital expenditure (CapEx).

What would happen if two projects appeared equal on the surface — both with high return on investment (ROI), short payback and operationally controllable inputs — but one was a stepping stone toward the Factory of the Future and the other was not? Would leadership recognize and prioritize accordingly? If the former was outside the leadership’s personal experience, would it get dismissed? This concern emphasizes the need for leaders to be informed on how to translate immediate opportunities into the beginnings of industry 4.0 initiatives to future proof the business from an increasingly challenging labor market, volatile supply chains and changing demand patterns.

## How Do Leaders Start the Journey Toward a Factory of the Future?

To set the stage for the Factory of the Future and implement industry 4.0 initiatives, leaders must define a clear vision of the desired future while being honest about the current state of their business and the necessary steps to achieve the future state. Though the desired future state may be decades from realization, it will steer the short-term decisions made along the way. These short-term opportunities can provide clear, quantifiable value that garners buy-in and delivers results, but first they must be understood in the context of the business’s long-term goals.

Before investing resources into 4.0 initiatives, manufacturing leaders must deploy a full supply chain diagnostic. Value stream mapping is a common practice for this, scoping the value stream upfront to provide clear improvement boundaries and ensure team focus with identified start and end points of considerations. When deployed correctly, this mapping can identify pain points and improvement potential for lead time, cost, delivery and other financially impactful considerations that can support 4.0 initiatives.



## What Is the Best Approach to Develop Industry 4.0 Initiatives?

Once parameters identified by value stream mapping are in place, there are five key steps to defining a future Industry 4.0 vision for manufacturing businesses:

### 1. Set the Strategy



The first step is to define the overarching goals and objectives for improvement. These should be focused and measurable so improvements, particularly the digital transformation considerations, can be quantified. It’s critical at this stage to have broad stakeholder alignment on the strategy and objectives as well as the key performance indicators being used to measure success.

### 2. Map the Value Stream



To understand the current state of manufacturing processes, leaders should “walk the floor” from the beginning to the end of the defined scope to observe and document findings. Processes should be accurately represented, and what is actively observed and measured should be reflected in the value stream. Otherwise, creating a picture of how things should work instead of how they actually work will create a skewed perspective. Sticking to the facts while gathering data at each operation will be crucial to determining and implementing industry 4.0 initiatives.

### 3. Identify the Opportunities



Utilizing the current-state process, leaders can pinpoint areas for improvement within the value stream. Visually, leaders may find it helpful to physically map the process with sticky notes before separately identifying improvement areas as another layer of notes on top of the current process. While feasibility should not impact identification at this stage, preliminary assessments of effort, impact and 4.0 enablement should be designated for each improvement opportunity.

- **Effort Ranking – 1 (low) to 5 (high):** As a rule of thumb, a 5 should include any activities that would take longer than 12 months to implement while a 1 should designate tasks that require small teams, can be completed in short one- to three-month timeframes or may be decision-driven actions that will stop waste-driving activities immediately.
- **Impact Ranking – 1 (low) to 5 (high):** Impact should be ranked relative to business goals, with 5 being reserved for high-impact activities that directly relate to the strategy defined in step one. For example, if the focus is lead time reduction and a particular opportunity would decrease labor cost, the strategic focus should prioritize other high-impact projects with more closely related goals even if reducing labor costs may provide value to the organization.
- **4.0 Enabler – Designate as supportive, where applicable:** Leaders should look for opportunities to integrate industry 4.0 technologies — such as internet of things (IoT), AI and automation — which can transform operations and provide a competitive edge. A project may be considered a 4.0 enabler if it provides a stepping stone toward labor automation (e.g., standard work development), enhanced information flow (e.g., barcode scanning), or decision-processing (e.g., optical inspection processes).

### 4. Create a Future-State Value Stream



To design an optimized version of manufacturing process, the current state can be remapped as a future-state roadmap that incorporates the identified improvements. This map should reflect a streamlined process with reduced waste and improved efficiency while defining specific targets for the future state, such as reduced lead times, lower costs or improved quality metrics. It is appropriate to estimate the anticipated benefits — such as lead time reductions and cost savings — at this point; solutioning for the result is achieved by executing the roadmap and is not necessary in the development of the roadmap itself.

### 5. Leverage Experts and Form Solutions



Teams should be formed with experts from various fields, including engineering, operations, IT and quality assurance, as their diverse perspectives will help in crafting comprehensive solutions that address the identified opportunities. These teams should initially be tasked with agreeing on the final assessment of how the identified projects will impact the current state; once a final designation for each project has been considered, it's important to translate these ideas into a project plan. The lowest-effort, highest-impact projects should be completed first while low-impact, high-effort projects should be deprioritized. Dependencies should be considered — specifically, industry 4.0-enabling projects should be considered as an added point of value above projects with similar impact that are not enablers. The resulting project list should give a clear perspective of which five to ten projects should be a focus, with 4.0-enabling projects surfacing to the top. These considerations provide leadership with clarity on how to achieve near-term goals set ahead of the exercise while also advancing 4.0-supportive initiatives that can be iterated on to achieve automation.

### Translating Strategy to Long-term Value

The journey toward the Factory of the Future is not merely a visionary pursuit but a strategic imperative for manufacturing leaders aiming to secure long-term success in an evolving industrial landscape. By embracing industry 4.0 initiatives, leaders can transform immediate opportunities into foundational steps that future-proof their businesses against challenges such as labor market fluctuations, supply chain volatility and shifting demand patterns. The process begins with a clear vision and a comprehensive understanding of the current state through value stream mapping. By setting focused strategies, identifying improvement opportunities and leveraging 4.0 technologies, manufacturers can design an optimized future state that enhances efficiency and competitiveness. Additionally, the collaboration of cross-functional expert teams ensures that the most impactful projects are prioritized, aligning short-term achievements with long-term goals. Ultimately, this approach not only delivers quantifiable value but also positions the organization to continuously adapt and thrive in the face of future challenges.



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