



Superior Processes at Industrial Equipment Manufacturers

Benchmark best practices and performances for next-generation success



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Executive Summary

Industrial equipment manufacturers today face unprecedented demands from their customers for more value in the products and services they provide. Meeting these increasing demands puts immense pressure on profit margins already strained through recession, forcing industrial equipment manufacturers to continuously improve both the products they offer *and* how they offer them. For many firms in a challenging economy, this too often means struggling to achieve even one day's targeted performance—much less achieve quarterly or annual goals.

Truly competitive industrial equipment organizations, on the other hand, look further down the road *while* they aggressively deal with today's challenges, obstacles, and opportunities. They seek to create world-class organizations built on a foundation of continuous improvement—in which improving processes is just as important as improving products. These firms invest time, effort and resources in establishing the best practices, technology systems and solutions, and workforce cultures that will sustain and grow their businesses into the next generation.

In 2009, the Manufacturing Performance Institute (MPI) surveyed more than 2,500 manufacturers regarding progress in implementing six key strategies that will sustain growth into the next generation. The six strategies explored by the Next Generation Manufacturing Study (and the world-class definitions for those strategies) are:

- **Customer-focused innovation:** Develop, make, and market new products and services that meet customers' needs at a pace faster than the competition.
- **Engaged people/human capital acquisition, development, and retention:** Secure a competitive performance advantage by having superior systems in place to recruit, hire, develop, and retain talent.
- **Superior processes/improvement focus:** Record annual productivity and quality gains that exceed the competition through a company-wide commitment to continuous improvement.
- **Supply-chain management and collaboration:** Develop and manage supply chains and partnerships that provide flexibility, response time, and delivery performance that exceed the competition.
- **Green/sustainability:** Design and implement waste and energy-use reductions at a level that provides superior cost performance and recognizable customer value.
- **Global engagement:** Secure business advantages by having people, partnerships, and systems in place capable of engaging global markets and talents better than the competition.

From this Next Generation Manufacturing Study research, MPI extracted and analyzed data for industrial equipment manufacturers, focusing specifically on their pursuit of superior processes and process improvement and the degree to which they have achieved world-class performance with that particular strategy.ⁱ

Introduction

It's no longer enough for industrial equipment manufacturers simply to be good machine designers and builders. As their customers look for ways to reduce costs, many facets of equipment specification, production-line development, and maintenance have now been pushed upstream to equipment providers. Customers now demand more product customization and insist on value-add services such as line integration (pulling equipment makers and suppliers together to design and install lines), asset management, training, and leasing.

The good news is that there are profits to be made by incorporating value-add products and services, provided such work can be managed in addition to maintaining high quality and delivery standards. To do this, and keep costs acceptable for customers, industrial equipment manufacturers must focus on continuous improvement of all their organization's processes, from design through delivery and maintenance.

To achieve superior processes—from plant floor through the front office and into the value chain—industrial equipment manufacturers must rethink their operations strategies and do three things exceptionally well if they want to leverage the new market dynamics and retain profitability. They must:

- Recognize that superior processes and operations development must be a core strategy, and that achieving world-class performance in this strategy—the ability to record annual productivity and quality gains that exceed the competition through a company-wide commitment to continuous improvement—is a key to survival in the machine industry.
- Support process improvement with dedicated employees, resources, investments, and best practices to ensure that organizational efforts—both traditional and emerging product and service lines—satisfy customers in the most productive, cost-effective manner possible.
- Monitor performance, striving to more effectively manage operations and more productively satisfy customers.

World-Class Processes and Process Improvement

Few industrial equipment manufacturers have achieved world-class processes and process improvement: According to the Next Generation Manufacturing (NGM) Study, only 7 percent of industrial equipment manufacturers report themselves as having achieved world-class processes and process improvement (ranked 5 on a 1–5 scale). Another 34 percent believe themselves to be near world-class status (ranked 4 on a 1–5 scale; *see Table 1*).

Table 1

Rate your organization's progress toward world-class processes and process improvement:	Industrial equipment manufacturers
1=No progress	3.4%
2	16.8%
3	38.8%
4	33.9%
5=World-class	7.1%

Source: Next Generation Manufacturing Study

A significantly higher percentage of industrial equipment manufacturers, though, recognize the importance of process improvement: 58 percent of industrial equipment manufacturers rate process improvement as “highly important” to their organization’s success over the next five years (*see Table 2*). That’s not surprising, given that process improvement should be on the radar of any manufacturer, especially one that serves other manufacturers.

Table 2

Rate the importance of process improvement to your organization's success over the next five years:	Industrial equipment manufacturers
1=Not important	0.5%
2	3.2%
3	12.5%
4	25.9%
5=Highly important	57.9%

Source: Next Generation Manufacturing Study

Yet there’s a sizable gap between recognition of this strategy and the ability to achieve world-class status. This means that many industrial equipment manufacturers may be striving to improve but are either unaware of best practices or unable to execute them. Are they constrained by their current leaderships, workforce skills, cultures, or inflexible systems that won’t support improvement initiatives? Then, too, 4 percent of industrial equipment manufacturers think superior processes and process improvement aren’t important (ranked 1 or 2 in Table 2). These organizations are unlikely to actively seek better performance through better processes. What chance do those firms have to run profitable, customer-satisfying operations in the long-term?

Recognizing the importance of a strategy, such as superior processes and process improvement, is the key first step in achieving success with the strategy. Not surprisingly, those industrial equipment manufacturers that are *at or near* world-class processes and process improvement are more likely to recognize its importance: 71 percent of industrial equipment manufacturers at or near world-class processes and process improvement rate the strategy as highly important, compared to only 49 percent of industrial equipment manufacturers furthest from world-class status.

Resources, Best Practices, and Investments

In order to compete in the next generation with superior processes and process improvements, industrial equipment manufacturers must follow up recognition with execution: investing in people, equipment, and product and process technologies (i.e., applications and systems) and applying best practices to bring about positive change. Only by doing this can industrial equipment manufacturers optimize every inch within their facilities and every mind within their workforces, delivering impeccable quality, finding and eliminating waste and costs, innovating new products and services, and turning operations excellence into a competitive differentiator. But many industrial equipment manufacturers fail to make a serious, company-wide effort at execution: 34 percent of industrial equipment manufacturers report that less than one-quarter of their employees are fully engaged in their improvement methods/approaches (*see Table 3*).

Table 3

What percentage of your workforce has been fully engaged in your organization's specific improvement method/approach?	Industrial equipment manufacturers
<26%	34.0%
26–50%	21.4%
51–75%	23.2%
76–99%	14.3%
100%	7.1%

Source: Next Generation Manufacturing Study

Conversely, 67 percent of industrial equipment manufacturers at or near world-class processes and process improvements have a **majority** of their workforces fully engaged in their improvement methods, compared to only 28 percent of industrial equipment manufacturers furthest from world-class status. In which type of organization is a problem more likely to be identified and resolved? Many industrial equipment manufacturers, when asked to identify a process improvement best practice, cited lean manufacturing as their approach.

Why do so many industrial equipment manufacturers, especially those furthest from world-class, keep the vast majority of their workers on the improvement sidelines? Why use their bodies and hands, but not their brains? Many industrial equipment manufacturers are reluctant to give employees the autonomy, on the shop floor or in the office, to identify and solve problems as they occur, without intervention by management. Many in the machine industry still rely upon command-and-control supervisors, managers who “firefight” through isolated issues rather than relying on the broader-based skills and expertise of their workforces. Perhaps, too, employees don’t have the tools and systems to support their efforts. Is data and information available to allow informed decisions? Just as importantly, employees require training in improvement skills and methodologies to become effective problem-solvers.

Just 29 percent of industrial equipment manufacturers indicate that a majority of their workforces regularly participate in empowered work teams, and 40 percent have less than a quarter of their workforces participating in teams (*see Table 4*). At the same time, many machine manufacturer employees simply don’t receive the training necessary to be anything more than workers attending to equipment: Only 25 percent of industrial equipment manufacturers train each employee more than 20 hours annually; 31 percent train each employee less than 8 hours annually (*see Table 5*).

Table 4

What percentage of employees regularly participate in empowered work teams (i.e., make decisions without supervisor approval)?	Industrial equipment manufacturers
<25%	39.9%
25–50%	31.3%
51–75%	17.4%
76–90%	7.8%
>90%	3.7%

Source: Next Generation Manufacturing Study

Table 5

How many formal training hours are devoted annually to each employee?	Industrial equipment manufacturers
8 or fewer	30.6%
9–20	44.0%
21–40	16.1%
>40	9.3%

Source: Next Generation Manufacturing Study

Not surprisingly, 42 percent of those industrial equipment manufacturers at or near world-class processes and process improvement have a *majority* of their workforce participating in empowered work teams (compared to 20 percent of industrial equipment manufacturers furthest from world-class status), and 32 percent train each employee more than 20 hours (compared to 21 percent of industrial equipment manufacturers furthest from world-class processes and process improvement).

Industrial equipment manufacturing relies on an array of capital equipment (from stamping presses to powder-coating booths) and information technologies to connect to hundreds of vendors within complex supply chains. IT solutions become especially critical as machinery manufacturers connect to their installed base of products, performing asset management and other functions such as field service for customers. In addition to providing their workforces with new skills, machinery manufacturers must also provide appropriate equipment and IT to support process improvement and pull the supply chain along with their efforts. Some industrial equipment manufacturers are investing heavily in their organizations' infrastructures, as 39 percent spend more than 5 percent of sales (three-year average) on capital equipment, and 17 percent spend more than 5 percent on sales on information technologies (*see Tables 6 and 7*) — but these percentages are well below those in other industries. For example, in the food and computer industries, 27 percent and 31 percent of manufacturers, respectively, spend more than 5 percent of sales on IT (hardware and software).

Table 6

What is your organization's investment in capital equipment as a percentage of sales (three-year average)?	Industrial equipment manufacturers
<1%	10.4%
1–5%	50.4%
6–10%	28.9%
>10%	10.4%

Table 7

What is your organization's investment in information technology (hardware and software) as a percentage of sales (three-year average)?	Industrial equipment manufacturers
<1%	30.1%
1–5%	52.8%
6–10%	12.8%
>10%	4.2%

Source: Next Generation Manufacturing Study

Among industrial equipment manufacturers at or near world-class processes and process improvement, 43 percent spend more than 5 percent of sales on capital equipment, and 19 percent spend more than 5 percent of sales on IT (marginally better than the 37 percent and 16 percent, respectively, of industrial equipment manufacturers furthest from world-class processes and process improvement).

Industrial equipment manufacturers must diligently monitor processes, workforces, and equipment if they want to identify problems and issues, explore cost-savings opportunities, and uncover new ways to enhance quality, safety, and customer value. The NGM Study's industrial equipment participants cited the following best practices related to monitoring: "Constant review and improvement of processes through employee involvement"; "constant review and monitoring of processes and audits of [our] methods of working"; "monitoring internal and external satisfaction"; and "review, review, and review."

Unfortunately, many industrial equipment manufacturers have little or no effective means in place to review or measure their process improvement efforts: 16 percent of industrial equipment manufacturers have no measurement systems or reviews in place to track return on their process improvements, and another 34 percent have only ad hoc monitoring and reviews. Just 9 percent report "regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization" (see *Table 8*).

Table 8

What best describes your measurement system for reviewing return from process improvements?	Industrial equipment manufacturers
No measurement system per se or reviews	16.2%
Ad hoc monitoring of basic measures and ad hoc reviews	34.2%
Company-specific metrics monitored regularly by operations staff	19.7%
Regular monitoring and review of company-specific metrics by CEO and senior staff	20.9%
Regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization	9.1%

Source: Next Generation Manufacturing Study

Among those industrial equipment manufacturers at or near world-class processes and process improvement, 68 percent have measurement procedures better than ad hoc monitoring or reviews, and 17 percent have "regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization," compared to 37 percent and 4 percent, respectively, of industrial equipment manufacturers furthest from world-class status. World-class industrial equipment manufacturers understand that without visibility and review of performance data—accessible at all levels of an organization—it's difficult to identify areas for improvement or to make informed decisions about product development, service offerings, sourcing, and production activities.

Strategic Attention Drives Process Improvement

Recognizing and executing against a next-generation manufacturing strategy, such as superior processes and process improvement, is meaningless unless it actually improves operational and financial performance. NGM Study data confirms that industrial equipment manufacturers at or near world-class processes and process improvement are more likely to outperform competitors (perfect deliveries), and they are more likely to develop a supply chain that gives them competitive advantages.

Approximately 23 percent of industrial equipment manufacturers report that more than 98 percent of their deliveries are “perfect”; at the other extreme, 10 percent report that less than 80 percent of deliveries are perfect (*see Table 9*). Perfect delivery performance is not possible without a well-orchestrated supply chain with visibility of schedules and activities among all participants. A few industrial equipment manufacturers have done a reasonably good job of turning their complex supply chains into competitive advantages, with 18 percent reporting the existence of “strategic suppliers and customers as active participants.” Here, too, though, a whopping 34 percent describe their supply chains as buy-and-sell relationships of “suppliers regularly measured on cost, quality, and delivery performance” (*see Table 10*).

Table 9

What percentage of deliveries reach customers in perfect order (i.e., on time, high quality, to all customer specifications)?	Industrial equipment manufacturers
<80%	9.9%
80–90%	21.3%
91–95%	21.8%
96–98%	24.3%
>98%	22.8%

Table 10

How is your supply chain a competitive advantage in terms of flexibility and speed to the marketplace?	Industrial equipment manufacturers
Suppliers regularly measured on cost, quality, and delivery performance	33.9%
Suppliers regularly measured on cost, quality, and delivery performance as well as total acquisition cost	11.7%
Suppliers regularly measured on cost, quality, and delivery performance as well as total acquisition cost and “soft” qualities (e.g., trust, flexibility)	36.5%
Strategic suppliers and customers are active participants in our operations, continuous improvement, and product development efforts	15.2%
Strategic suppliers and customers are active participants in our operations, continuous improvement, and product development efforts and participate fully in strategic planning and identifying and responding to new markets	2.8%

Source: Next Generation Manufacturing Study

Among industrial equipment manufacturers at or near world-class processes and process improvement, 27 percent report that more than 98 percent of their deliveries are perfect, compared to 20 percent of industrial equipment manufacturers furthest from world-class processes and process improvement. Approximately 23 percent of those at or near world-class status report a strategic relationship with suppliers and customers, compared to 14 percent of industrial equipment manufacturers furthest from world-class processes and process improvement.

Meeting delivery demands frequently comes at a cost to an organization, as overtime, expediting, fire fighting, and workarounds to hit delivery dates take precedence over root-cause problem-solving and data-based and information-based process improvements. One key measure of internal performance is productivity (value-add per employee). Nearly 35 percent of industrial equipment manufacturers report value-add per employee of greater than \$125,000, and just 20 percent of industrial equipment manufacturers have been able to improve productivity during the past three years by more than 50 percent (see Tables 11 and 12).

Table 11

What is your value-add per employee ([sales – cost of materials] ÷ number of employees)?	Industrial equipment manufacturers
< \$75,000	27.8%
\$75,000–\$125,000	37.6%
\$125,001–\$175,000	21.7%
> \$175,000	12.9%

Table 12

By what percentage has productivity (i.e., value add) improved during the past three years?	Industrial equipment manufacturers
<25%	47.4%
26–50	32.8%
51–75%	14.1%
76–99%	5.0%
>100%	0.7%

Source: Next Generation Manufacturing Study

Approximately 44 percent of industrial equipment manufacturers at or near world-class processes and process improvement report value-add of greater than \$125,000, and 28 percent report three-year productivity improvements of more than 50 percent, compared to 28 percent and 14 percent, respectively, of industrial equipment manufacturers furthest from world-class processes and process improvement.

Conclusion

With new customer demands creating new revenue-generating opportunities, industrial equipment manufacturers must advance beyond traditional manufacturing mindsets not only to retain existing business, but to capture new work. Without a focus on superior processes and process improvements and investments in best practices and business systems—such as enterprise resource planning (ERP), supply chain management (SCM), and customer relationship management (CRM) solutions—to support that focus, operations can rapidly deteriorate, leaving firms scrambling to meet basic customer requirements (and profit objectives). Executives at growth-minded industrial equipment manufacturers must commit to continuous improvement of their processes and the goods and services they provide, and in doing so reduce waste, lower costs, and improve customer satisfaction.

World-class industrial equipment firms achieve superior processes and an improvement focus by:

- 1.** Making process improvement a strategic corporate goal.
- 2.** Applying the best practices and investments to execute toward their goals.
- 3.** Rigorously monitoring their progress toward world-class processes, continuously solving problems and recalibrating their approaches to operate more effectively.

Is your industrial equipment company ready to achieve world-class processes and process improvements?

¹All research in this report is based on data from The Next Generation Manufacturing (NGM) Study, which was conducted by the Manufacturing Performance Institute (MPI) in 2009 to better define the strategies and business activities necessary for world-class performance and success into the next generation. The NGM Study was coordinated by the American Small Manufacturers Coalition; conducted by the Manufacturing Performance Institute (MPI); and supported by Manufacturing Extension Partnership centers and partnering organizations. A total of 2,529 manufacturers participated; for this report 410 manufacturers were identified as “industrial equipment manufacturing” using the three-digit NAICS code 333. For more information on the NGM Study, go to www.mpi-group.net.

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