Benchmarking

An executive primer to locating and leveraging manufacturing best practices

By John R. Brandt
and
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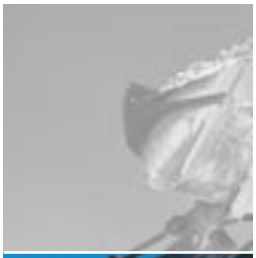
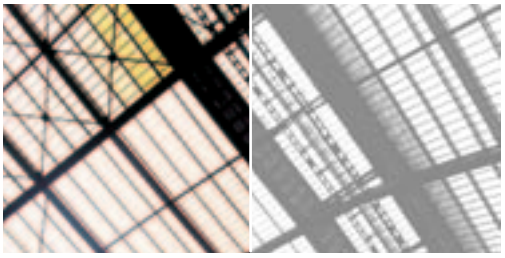


Envy may be one of the seven deadly sins, but its presence is vital when it comes to operations performance. Every executive wants his or her company or plant to be at least as good as those of his or her peers; most, in fact, want them to be better — or even the best.

Unfortunately, it takes more than simple desire to be the best. Outperforming competitors requires an intense study of those competitors — of their financial results, of their operating metrics, of their management strategies and practices — as well as a willingness to invest time, energy, and resources into adapting the results of that study to a new operations environment.

In short, every great performance, every continuous-improvement project, begins with a benchmark. Leading manufacturing facilities annually save on average more than $8,000 *per employee* through continuous-improvement projects and programs,[1] and benchmarking is a core component of that success. And while no two organizations benchmark in the same fashion, there are four fundamental phases that manufacturing organizations must address in order to get the most out of a benchmarking effort (see chart *Manufacturing Benchmarking*).



[1] *IndustryWeek's Best Plants 2003 Statistical Profile, IndustryWeek* magazine, 2003

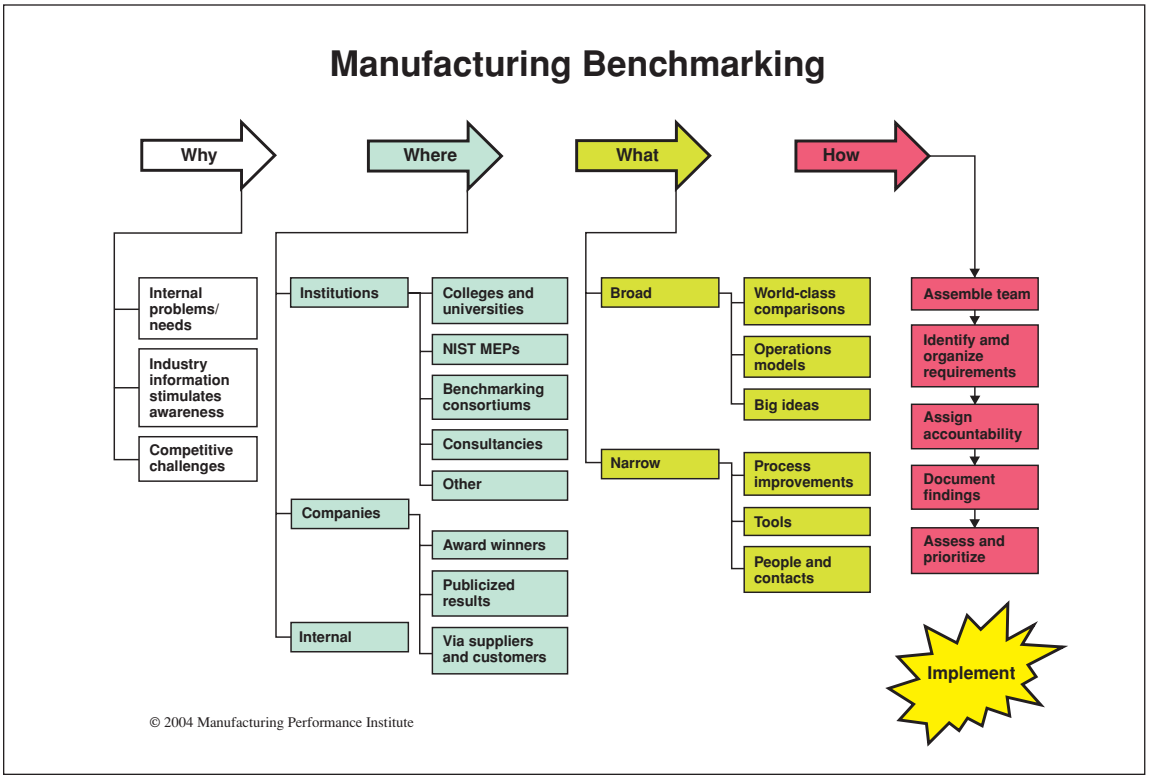
Why benchmark?

Even world-class organizations believe that thousands of companies — good and bad — around the world offer them infinite ideas on how to improve their own operations. This results in a benchmarking paradox: Typically only high-performance organizations — those that need improvement the least — benchmark, while the worst performers continue to stumble along without a clue as to how much they could or should improve. For example, Armstrong World Industries' Building Products Operations (seven plants in six states) conducted 84 benchmarking studies the year prior to winning the Malcolm Baldrige National Quality Award, and that number of studies was twice that of the previous year.[2] Each of the 25 finalists in *IndustryWeek*'s 2003 Best Plants competition conducted, on average, more than seven *major* benchmarking studies during the previous year. Many of the plants conducted more than 10 major benchmarking studies.[3]

How does a company or plant start to benchmark? They do it by assigning responsibility for monitoring financial and operational health. Depending on the size of the plant or company, this assignment will vary, but it typically falls to a senior executive or continuous-improvement (CI) leader or team. This person or group gathers *internal* data and observations — even as simple "we're losing customers" or "sales are off by 40%" — which then trigger a search for potential targets or performances against which to compare. Additionally, there should be no limit to the number of individuals and departments feeding early "signals" of financial and operational health in the direction of the CI executive or team.

This internal assessment and subsequent overview of the manufacturing landscape are crucial to benchmarking: Without comparisons culled from other manufacturers or companies in similar industries, executives remain unaware of how much improvement is possible and the competitive challenges they face.

These comparisons spur the executive or CI team or leader to look for specific solutions that address problems at his or her facility or company. It's important to note that a "problem" isn't always an obviously poor metric, but can instead be any issue that blocks progress toward world-class performance.



[2] "Malcolm Baldrige National Quality Award 1995 Winner Armstrong World Industries Building Products Operations," *www.quality.nist.gov*, National Institute of Standards and Technology, 2001

[3] *IndustryWeek's Best Plants 2003 Statistical Profile*, *IndustryWeek* magazine, 2003

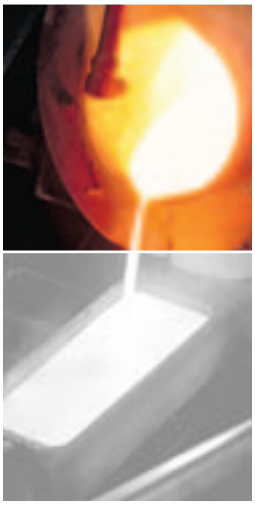
Where to benchmark

Although many organizations focus their initial search for benchmarking ideas beyond the walls of their own plants, experienced executives and CI teams make sure to look within their own companies as well. They know that innovation and best practices are often as close as the next work cell or facility — and that homegrown solutions may be easier to adopt. This is especially true for companies with extensive plant networks that stretch across the country or around the globe; indeed, for highly proprietary issues, this may be the only available resource.

Eventually, however, every dedicated benchmarking effort must seek data and best practices from other organizations. First-time benchmarkers are often surprised at how willing other companies are to exchange ideas, especially through trade or industry associations. Why are even world-class companies so willing to share? Because they realize that while it's one thing to know *how* to use a best practice, it's quite another to coordinate the momentum and resources for implementation. When former General Electric CEO Jack Welch discussed that organization's Six-Sigma approach, it convinced many companies to adopt the Six-Sigma approach. But few firms have attained GE's world-class status merely by following their process lead. For example, just 39% of manufacturing plants that say they've implemented Six-Sigma methodologies rate themselves as having made significant progress toward or achieved world-class status (only one plant believes it has achieved world-class).[4]

World-class companies also pass along tips through direct contact, speaking engagements, industry magazine articles, published technical papers, and other magazines and published documents. Other good preliminary sources include suppliers and customers (who better to identify best practices in a given industry?).

Smart benchmarkers make sure they also look beyond the walls of their own industry; some of the greatest competitive leaps result from transplanting ideas from one value chain to another. For example, a beverage maker may have problems with quickly changing over equipment when processing distinct beverage flavors or colors. The paint process at an appliance maker may have faced the same challenge when shifting from dark pigments to light pigments. Cultural issues and best practices are even more broadly applicable; many service industries, for instance, are now focusing on the application of lean manufacturing to business processes in general. Thanks to cross-industry benchmarking, what began at Toyota decades ago is now helping call centers, retail stores, and banks to improve their operations as well. In yet another example, Xerox, seeking to improve its order-fulfillment process, looked to the catalog retailer L.L. Bean and examined its practices for quickly processing customer orders and providing timely deliveries.[5] The point is that benchmarking is intended to interject new ideas, approaches, targets, and practices into an organization so that manufacturers can explore and test new means to improvements (some that may work, and some that won't). Smart benchmarkers don't restrict their search to territory they already know — they look anywhere and everywhere.



As part of its total-quality strategy, Trident Precision Manufacturing tracks operational and financial performance, and also analyzes internal and external data collected from semiannual surveys of customers, suppliers, and employees; benchmarking studies; discussions with customers; employee forums; market reports; quarterly quality audits; and an independent assessment of Trident's competitive position in its industry. The company won the Malcolm Baldrige National Quality Award in 1996 and posted various impressive improvements: decreased employee turnover from 41% in 1988 to 5% in 1994 and 1995; increased sales per employee from $67,000 in 1988 to $116,000 in 1995; increased on-time delivery performance from 87% in 1990 to 99.94% in 1995.[6]

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[4] *IndustryWeek*/Manufacturing Performance Institute 2003 Census of Manufacturers, cross-tabulation of 29 plants, The Manufacturing Performance Institute, 2003

[5] Letts, Christine; Ryan, William; Grossman, Allen; "Benchmarking: How nonprofits are adapting a business planning tool for enhanced performance," *The Grantsmanship Center Magazine*, Winter 1999

[6] "Malcolm Baldrige National Quality Award 1996 Winner Trident Precision Manufacturing Inc.," *www.quality.nist.gov*, National Institute of Standards and Technology, 2001

What to benchmark

Identifying *where* to look guides benchmarkers in their search for *what* to benchmark, a process made more efficient by having standardized processes to capture and implement benchmarking ideas. This phase should take on both a broad perspective, coordinated at the company or plant level, as well as a series of narrower, tactical targets and improvements:

BROAD PERSPECTIVE

An overarching benchmarking approach is vital because it:

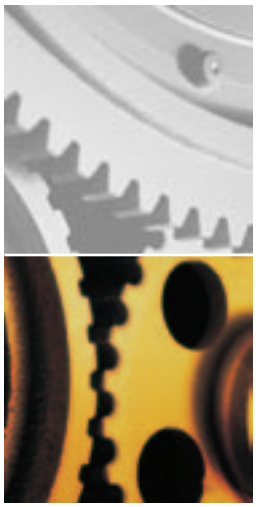
- Uses a fact-based approach to position the organization relative to world-class enterprises (even if the facility is already at or near world-class standards).
- Structures the effort within the context of the company's existing manufacturing strategy (although it may identify weaknesses in the manufacturing strategy).
- Offers an argument for organization-wide changes if internal analysis and benchmark comparisons lead to evidence of systemic weaknesses (e.g., inherently flawed plant manufacturing practices, methods, or strategies).
- Establishes an umbrella strategy to uniformly upgrade all operations and plants, reducing the likelihood of rogue efforts and resistance to change.

The broad approach uncovers new improvement philosophies and searches not for specific tools or tactics, but instead for companies and organizations with great ideas and leadership. These leading companies may be identified by awards or publications (see sidebar *Benchmarking Jump Start*) or by organizations that foster the exchange of best practices, such as benchmarking consortiums, NIST Manufacturing Extension Partnerships, colleges, and universities. For example, Ohio State University is home to the Center for Excellence in Manufacturing Management (CEMM), a consortium of business leaders, educators, and researchers that share a common goal of achieving world-class manufacturing excellence. Similar networks exist throughout the country.

Through the CEMM and like-minded organizations, executives can interact with world-class manufacturers. Smart benchmarkers introduce themselves into this group, meet with members, and then:

- walk through their operations;
- meet with a range of their executives, managers, and supervisors;
- talk with frontline employees;
- share data and processes; and
- speak with their customers and suppliers.

A common experience of first-time benchmarkers is that the exposure to new ideas offered by these tours and information exchanges rapidly expands their own lists of goals and targets. But benchmarkers should be careful to frame their efforts based on what's applicable to their organizations and manufacturing strategies. Additionally, although improving operations to industry standards is always beneficial, too slavish an imitation of another company's *strategy* (e.g., markets to pursue, products to develop) may permanently brand an organization as an industry bridesmaid. Leaders may benchmark processes and performances for *how* to make decisions and manage strategy, but they must always devise their own paths to market greatness.



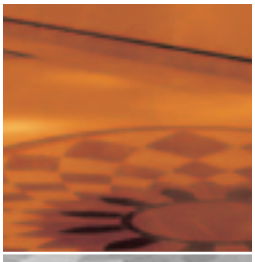
Benchmarking Jump Start

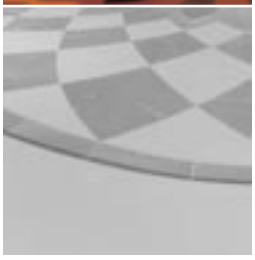
- **Malcolm Baldrige National Quality Award:** Under the guidance of the National Institute of Standards and Technology, this U.S. award recognizes companies that exhibit exemplary product and process quality, selecting winners from business, healthcare, and education. *[www.quality.nist.gov]*
- **IndustryWeek/Manufacturing Performance Institute Census of Manufacturers:** One of the largest surveys conducted of U.S. plants, this effort results in a database of manufacturing and management practices and metrics that can be analyzed by industry, value chain, and many other criteria. *[www.mpi-group.net/toolkit]*
- **Shingo Prize for Excellence in Manufacturing:** Administered by Utah State University's College of Business, this award program recognizes excellence in manufacturing in the U.S., Canada, and Mexico. *[www.shingoprize.org]*
- **Best Manufacturing Practices:** Run by the Office of Naval Research, this program is intended to increase the quality, reliability, and maintainability of goods produced by U.S. firms by identifying best practices, validating and documenting the practices, and encouraging government, industry, and academia to share the information. *[www.bmpcoe.org]*
- **America's Best Plants:** This award program, run by *IndustryWeek* magazine, annually recognizes 10 "best plants" from the U.S., Canada, and Mexico based on best practices and metrics (e.g., management, employee development, operations, safety, environmental, supply chain). *[www.industryweek.com/iwinprint/bestplants]*

Tactical focus

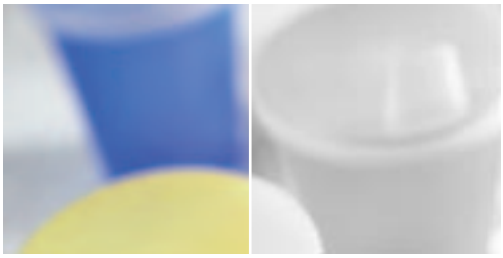
In conjunction with a broad review of operations and relevant practices and metrics, smart benchmarkers compile and prioritize lists of tactical problems and possible benchmark solutions across three categories:

- **Processes:** Benchmarkers will uncover myriad ways to upgrade processes, and many of these will support various improvement methodologies. But benchmarking teams must be wary of prematurely narrowing their approach and grabbing only *pieces* of process improvements. No improvement methodology works as well on a piecemeal basis as it does when deployed in a complete and holistic manner. This is especially true if benchmarking efforts aren't centralized, and various teams are left to their own devices to find scattered solutions to increasingly fragmented problems.
- **Tools:** This category includes everything from training manuals and literature to pieces of equipment or software applications that help a company function more efficiently. Smart benchmarkers cast a critical eye on recommendations in this category since they often require higher levels of investment. Tools may indeed be necessary, but due diligence and well-documented return-on-investment calculations must be required for any investment.
- **Talent:** Few (if any) organizations are blessed with all the talent needed to take on major improvements. Smart benchmarkers compile a list of skills among management and plant-floor personnel necessary to implement improvements, and then determine where gaps exist. Next they determine whether they can they train for these skills or if they need to recruit new employees. Benchmarking also can help identify where and how to find talented staff, on a temporary or full-time basis, as well as indicating an approach to developing skills within communities (e.g., apprenticeship programs with local schools and universities).





All processes, tools, and talent should tightly mesh with the findings of the broad review, collectively pointing toward the operations targets the company hopes to achieve.



How to benchmark

Once benchmarkers know *what* to look for and *where* to find it, they need to learn *how*. Many companies have invested heavily in benchmarking efforts, only to fail at adopting the best practices they've uncovered. Smart benchmarkers follow the steps below, with variations based on cultures and project management practices.

1. **Assemble a benchmarking team.** Smart benchmarkers pull together a cross-functional team(s) of employees assigned to categories of improvement (e.g., quality, downtime, purchasing, safety) and/or specific problem areas (e.g., maintenance, receiving dock); these teams are then charged with finding practices and metrics that can drive improvement. A benchmarking team reports to the CI team or executive, but includes representation significantly broader than the CI team itself. Some team members will have an immediate stake in the improvement process, such as a quality supervisor or a production employee in a cell targeted for quality improvement. Other team members may have indirect influence (they work in a process that receives product from the troubled cell, or in a cell scheduled to undergo similar improvement). Many organizations will select areas of focus, team members, and roles as part of their existing continuous improvement or *kaizen* process, mirroring the teaming structure and processes involved with *kaizen* events.
2. **Itemize targets and findings.** Smart benchmarkers aggregate the types of benchmarking data and practices they find, and then prepare a database to house the information. This database or spreadsheet can include various types of information, but at a minimum it should include:
   - internal practices under review;
   - industry comparisons;
   - world-class comparisons;
   - best practices identified;
   - companies exhibiting best practices, including contact information;

- team/individual assigned to this piece of improvement effort; and
- goals, timeframes, and periodic tracking of improvement.

A similar database of performance measures and ongoing improvements may already exist in some format within a plant that can be augmented with the new benchmarking information. (Note: Many best-practice plants and companies host tours in exchange for visitors' benchmarking information and databases, and find other unique ways to supplement the compilation of benchmarking data. For example, executives and facilities management professionals in life sciences can access an online tool — The Johnson Controls Facility Insite Tool — to benchmark their facility spending against the performance of life science facilities managed by Johnson Controls. The tool, in turn, allows Johnson Controls to quickly see how its spending stacks up to the industry.[7]

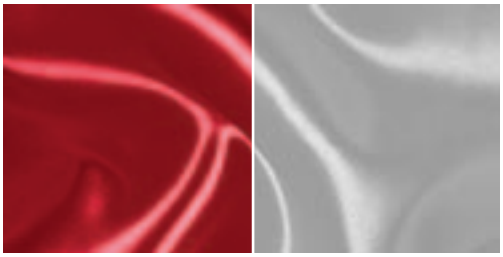
3. **Assign individual accountability/responsibility.** Regardless of the benchmarking venue — online database searches, plant tours, attending conferences — everyone on a benchmarking team must have specific assignments. If, for example, a firm opts to send a benchmarking team to a conference, each individual benchmarker should focus on specific information related to previously identified needs — asking questions, cornering speakers, reviewing event materials, and talking with other attendees. Without division of labor, a benchmarking team can quickly be overwhelmed by the volume of information.

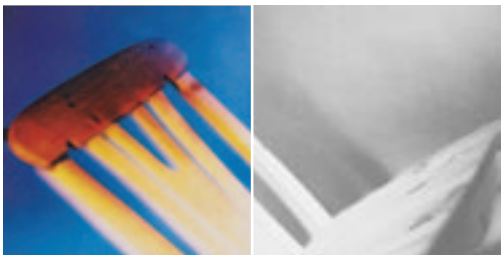
4. **Codify the findings, and update the benchmarking database.** After external benchmarking efforts, employees will need to update the database with specifics on what they've found and prepare recommendations they plan to put before the CI team. Supporting analysis, such as estimates of return on investment, should be included. For ongoing benchmarking work, establish timeframes for updating information.

5. **Assess and prioritize action steps.** During regular meetings between the benchmarking team(s) and CI team, participants will deliver their findings, evaluate options, and prioritize specific actions the team recommends. Participants must question and constructively criticize any planned action by a benchmarking team, ensuring that enough options have been considered and that collateral results (e.g., effects on other areas or processes) have been taken into account. Regular meetings will also help to determine whether benchmarking efforts have stalled (i.e., no team reports any updates). Out of these meetings will emerge specific implementation assignments, timetables, and resource allocations.

Although the benchmarking effort technically ends here, the real work is just beginning. Successful implementation will mean progress toward world-class status — and toward becoming a plant or firm that competitors envy.

[7] "Johnson Controls launches facility performance benchmarking tool for life sciences industry," Johnson Controls, May 15, 2003



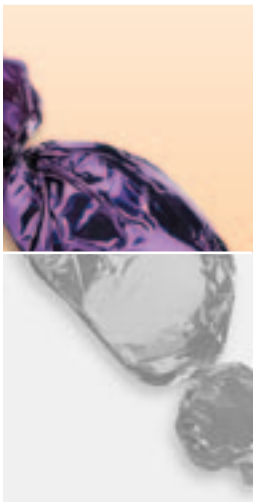


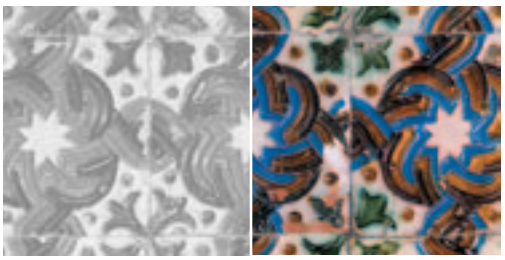
Successful benchmarking efforts are always underpinned by well-designed performance measures that track activities, establish targets and goals, and ensure that implementations achieve desired outcomes.

If your company would like to increase productivity and improve yields while being cost-efficient at the same time, then Italian machinery and technology should be a consideration in your upcoming capital purchases.

Contact Machines Italia c/o the Italian Trade Commission at **1-888-ITALTRADE** or visit us at **www.machinesitalia.org** for more information on Italian companies and technologies which are providing North American companies with better benchmark results every day.

The next White Paper from the Italian Trade Commission — Powerful Performance Measures — will help organizations transition to measures that continuously drive manufacturing improvement.





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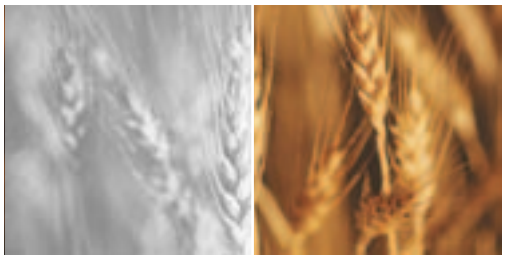

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