Beyond Lean Thinking

Looking Back, Looking Forward

A review of AME's history reveals the path to its — and manufacturing's — future.

Part three of a series.

When the *Target* staff started planning how to commemorate the 25th Anniversary of the Association for Manufacturing Excellence, we quickly dispensed with the idea of spending too much time talking about the past. With financial market turmoil and environmental sustainability questions signaling a turning point in business history, we decided to explore how companies and organizations must change business plans and practices in the next 25 years. In this two-part report, we first present a quick review of AME and manufacturing history to put current events into context for our newer members, as well as to refresh the memories of our founders. Then we offer a lengthier view of the forces that portend dramatic change, along with some ideas of what that change might look like. We don't give you the answers, or an oversimplified 10-step approach to adapting to these changes. You'll have to come up with that for yourself. But if you believe, as we do, that transformation begins with an analysis of the current reality, you'll find this report a good starting point for your organization.

LOOKING BACK

AME has done a lot for industry, but today's problems are tougher.

Robert W. Hall

The origin of AME goes back to an APICS conference in 1977 when Nick Edwards presented a paper noting the inadequacies of applying job shop MRP to high-volume repetitive operations. A small group met in a corner to grumble about it. A year later, at the 1978 APICS conference, more presentations made the same point. The malcontents decided to have a meeting on April 18, 1979, at Briggs & Stratton in Milwaukee, hosted by Mac McCulloch. Mac became the leader of this little group, which decided to meet at companies, not at hotels.

When the group next met in April 1980, the manufacturing news was grim. Chrysler was trying to stave off bankruptcy; Xerox had discovered that Japanese competitors were selling equivalent copiers for less than it was paying suppliers for the materials. The group began to see that their interests had to broaden from planning and controlling production, and that they had to step up the energy level. The few who had seen Japanese factories felt sort of like Paul Revere riding to warn the Minutemen.

Larry Higgason and other AME founders from the auto industry recognized that auto leaders were unlikely to heed a group coming from diverse industries. They began beating the drum to form what became the Automotive Industry Action Group as a bridge between automotive OEMs and their suppliers. It took two more years before AIAG legally incorporated in 1982, but that was still before AME. Although founded by some of the same people, the two groups took different paths, as can be seen at the AIAG web site, www.aiag.org.

By October 1980, the group helped organize the first known conference on "Japanese manufacturing" in Ford World Headquarters Auditorium. Fujio Cho, now past-chairman of Toyota, was the featured speaker. Almost 500 people came, filling the house. They left mumbling and shaking their heads — few had ever heard anything like it. Two days later, the same performance was repeated for about 300 people in Pittsburgh.

In early 1981, the group met at Schlage Lock to review an ingenious, non-computerized system to configure a bill of materials at order entry, a forerunner of order configurators commonplace today. At that meeting a steering committee jelled, and affirmed that the group should focus on what was then called JIT systems. In addition, the format of that meeting became the prototype of the AME workshop.

A Turning Point: Kawasaki USA Workshop

In June 1981, only 50 people came to the first JIT (as it was then called) workshop at Kawasaki, Lincoln, NE, but many were the early leaders of the movement: Mac McCulloch, Larry Higgason, Len Ricard, Ken Wantuck, Nick Edwards, and Ed Hay. Those who had never seen anything like lean in action had an epiphany. Enthusiasm kicked up a notch. Both Doc Hall and Dick Schonberger were there and soon began writing the first books on the subject. Other workshops followed. One at

Source: Val Liberman,Underwriters Laboratories Inc.

Omark Industries (now Oregon Cutting Systems) in 1982 featured its Zero Inventory Production System (ZIPS). So far as is known, Omark was the first North American company to attempt conversion as an entire organization, not merely as a shop floor system. Thousands of feet of material travel were reduced to a few feet; another eye-popper.

At Buick City we reviewed how GM could work with the UAW to implement a JIT system — met in the union hall for the first discussion of the human issues in JIT. At NOK (now F-NOK) at LaGrange, GA, we saw another flow process, this time with polymeric seals. Another was at Hewlett-Packard at Greeley, CO. The team at H-P Greeley had made a tape of a JIT game, called the Styrofoam box video, the granddaddy of all "lean simulation" games. That old tape is still played once in a while.

The Zero Inventories Crusade Era

In 1983, the need for improved manufacturing flow was so great that APICS began a two-year "Zero Inventories Crusade," modeled after its very successful MRP Crusade in the 1970s. Doc Hall, Ken McGuire, Ed Heard, Ken Stork, and Ed Hay gave hundreds of presentations to APICS chapters and any other interested group. Because of the troubles of the time, crowds were sometimes large, and manufacturing execs from major companies sometimes attended. Nothing else like it existed.

Few die-hard doubters grilled the presenters, but many attempts to "do something" were weak. Single-shot changes like Quality Circles or cutting inventory beckoned those who wanted a magic technique that "applied to them." A big gap opened between flavor-of-the-month techniques and making changes that lasted. Realizing that nothing would go well without becoming more intense at the gemba level, the group looked for substantive physical transformations; no amount of computer control could fix a broken process. Some of the AME pioneers struggled for years to get their own companies to launch a solid effort.

Ernie Huge began circulating a mimeographed handout that he called *The JIT Technical Newsletter*, almost like an underground news source. It morphed into AME's publication, *Target*, with Ernie as its first editor. As newsletter circulation grew, Lea Tonkin volunteered to help and has been editing *Target* ever since.

The group began to structure itself into a formal organization. Mac McCulloch and his wife Donna kept it going by stuffing mailings on their kitchen table — a true bootstrap operation. Because Mac would be hard to top as a dedicated volunteer, after his death in 2006, AME created an annual award in his honor, the AME Mac McCulloch Lifetime Achievement Award, to recognize outstanding volunteer service of an AME member. (There is also a Mac McCulloch Fund within the AME Institute that will accept contributions to fund AME projects.)

AME as a Formal Organization

The Association for Manufacturing Excellence was incorporated on January 3, 1985. Lee Sage had been elected, sort of, as its first president. He sent letters of invitation to hundreds of people who had been on various mailing lists. Within three months, about 300 of them signed on as members,

In Brief

An AME founder recounts events that led to its founding, and the successes and shortcomings of its first 25 years. AME's history parallels the changes and ongoing problems within North American industry during the same period. The perils of today are different from those that stirred AME's founding.

and AME was off and running — except for having no money.

Whizzer Wheeler personally fronted the funds for the first conference held at the Drawbridge in Covington, KY, in October 1985, a single-track program with nine speakers and 187 attendees. For many years, AME ran on shoestring funding, always depending on volunteers to make the exchanges of learning work. The signature event was a workshop where people were actually doing something, and the tradition of "best practice" presentations took hold; that is, the presentations preferred at conferences and events were by those who had actually made changes that others could learn from. Consultants and professors are welcome, but at events they should primarily heed their "customers" struggling to make new ideas work where rubber meets road.

Membership reached almost 6000 by the early 1990s. Some of the companies and events covered were classic. For example, a workshop and *Target* article on the Xerox program with suppliers in 1987 described a prototype for large companies creating partnerships with suppliers. Xerox cut back from thousands of suppliers to 300, realizing that it had to work closely with them to have a chance of revamping both copier designs and operating processes to compete with the Japanese invasion.

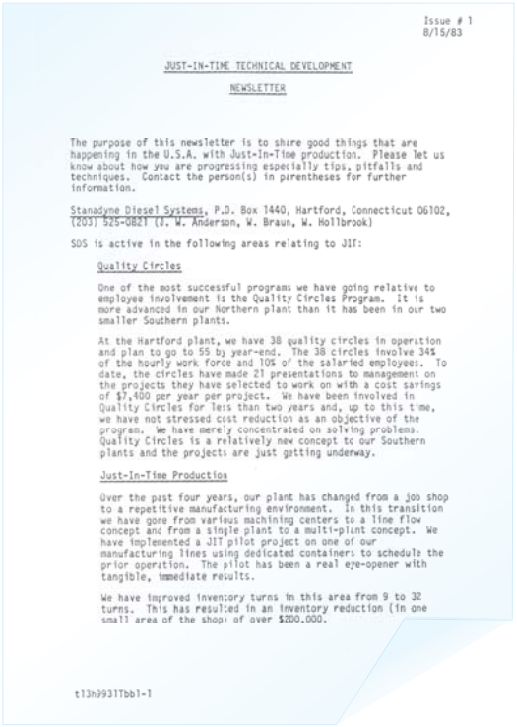
AME workshops and *Target* stories recognized the human side of process improvement too, as reported by Goodyear, AT&T, Steelcase, and Motorola, to name a few. Teams were a favorite topic for years. Likewise, the fickle numerology of cost accounting was soon recognized as a potential torpedo of promising conversions. All kinds of cost accounting alternatives bubbled up, but it took about ten years for them to begin to gel into lean accounting concepts.

In 1990, publication of *The Machine That Changed the World* (Womack, et al), gave the movement new names; lean manufacturing and lean thinking. These names help describe the system using minimal Japanese terms. At the time AME's program formats lent themselves to showing live examples of lean techniques, and for years, that's what people coming to AME events expected to see. Although the founders had a broader view of manufacturing excellence, by default the organization in the 1990s became identified with lean techniques.

A brochure from an early AME conference betrays the Association's humble origins.

In 2001, the founders concluded that they had gotten a number of things right: AME had been instrumental in many different companies adopting lean thinking. However, it had not been successful in some areas that counted. 1) We stayed shop floor-oriented too long and never pressed on to a total enterprise approach that drew in top management. 2) We were too weak in thought leadership because the de facto mission was to validate that which worked in practice. And 3) Operations people not being natural marketers, we drew too little attention to AME purposes and events.

After 2001, the AME annual conferences became bigger and bigger until they became an annual stop for many people leading lean thinking, but lean thinking never really permeated business thinking. Companies started, stopped, or were stymied by the forces that buffet commercial enterprises. Many plants that we benchmarked 20 years ago — Digital Equipment, AT&T, NeXT Computer,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JUST-IN-TIME TECHNICAL DEVELOPMENT

NEWSLETTER

The purpose of this newsletter is to shire good things that are happening in the U.S.A. with Just-In-Time production. Please let us know about how you are progressing especially tips, pitfalls and techniques. Contact the person(s) in pirentheses for further information.

Stanadyne Diesel Systems, P.O. Box 1440, Hartford, Connecticut 06102, (203) 525-0821 (T. W. Anderson, W. Braun, W. Hollbrook)

SDS is active in the following areas relating to JIT:

Quality Circles

One of the most successful programs we have going relative to employee involvement is the Quality Circles Program. It is more advanced in our Northern plant than it has been in our two smaller Southern plants.

At the Hartford plant, we have 38 quality circles in operition and plan to go to 55 by year-end. The 38 circles involve 34% of the hourly work force and 10% o' the salaried employees. To date, the circles have made 21 presentations to management on the projects they have selected to work on with a cost savings of $7,400 per year per project. We have been involved in Quality Circles for leis than two years and, up to this time, we have not stressed cist reductio1 as an objective of the program. We have merely concentrated on solving problems. Quality Circles is a relatively new concept tc our Southern plants and the projects are just getting underway.

Just-In-Time Productio1

Over the past four years, our plant has changed from a job shop to a repetitive manufacturing environment. In this transition we have gone from various machining centers to a line flow concept and from a single plant to a multi-plint concept. We have implemented a JIT pilot project on one of our manufacturing lines using dedicated containers to schedule the prior operation. The pilot has been a real eye-opener with tangible, immediate results.

We have improved invenlory turns in this area from 9 to 32 turns. This has resulted in an inventory reduction (in one small area of the shop) of over $200,000.

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Launched by Ernie Huge, the mimeographed JIT Technical Newsletter *eventually grew to today's* Target *magazine.*

Now in its 25th official year, AME must build on its past to transition to a new era.

Why does process improvement stall?

Stall-outs are, unfortunately, normal. Process improvement gets attention only when necessary, and entrepreneurs, rarely aware of what has come before, re-learn the obvious, becoming as efficient as circumstances require until other matters capture attention. Artifacts of lean techniques are evidence that people long ago thought up "lean techniques." For example, 30 years ago Masterlock reported that a two-container kanban system — invented by a foreman — had been in use for years. Bob Emiliani dug up a book by Frank Woollard (find additional information about this book on p. 52), that reads a lot like Henry Ford, showing that Woollard was familiar with many key points of flow production in Britain in the 1920s. They never caught on; no overall framework of thought entered mainstream practice. The sorry history of process improvement is that big gains dwindle by neglect, and are sometimes crushed by market failure or new management's non-comprehension.

Several old *Target* articles reinforce the point. One was a three-part piece on World War II bomber production. In 1942, Boeing Plant II self-invented a version of lean to ramp up production of B-17 bombers, but regarded it as a temporary program, so at war's end, Boeing went back to "normal." Another was a short acknowledgement of Allan "Mogy" Mogensen, who in the 1920s developed a program called Work Simplification, which he promoted for over 50 years, beginning in 1933 (sometimes assisted by Lillian Gilbreth, Scott Myers, Ben Graham, and other notable pioneers). Mogy's plan was to teach workers a few simple improvement tools so that they could become their own industrial engineer. Asked why it fizzled, Mogy's response was a classic: "It's the same now as when I first went to work (about 1916). The managers think they can control everything in detail, and the workers are only a bunch of ungrateful wretches."

During World War II, the biggest problem administrating Training Within Industries (TWI) was managers' resistance. They could hardly wait to go back to doing things their way. Well-known, of course, is that Juran, Deming, and other quality pioneers received acclaim only when quality improvement obviously had to be jump-started in 1980.

References

1. Frank G. Woolard, *Principles of Mass and Flow Production*, originally written in 1934; available from CLBM, LLC at 860-558-7367.

2. Bill Vogt, "What You Can Do When You Have To," *Target*, First Quarter 1999.

3. Personal conversation with Mogy in 1989, not long before his death. Despite the setbacks, Mogy had no regrets; he knew that his work had made a big difference, even if its popularity was fleeting. Toyota's production system, in mid-development 50 years ago, lagged Work Simplification by nearly three decades. Readers can "get a flavor of it" at www.worksimp.com.

Nortel, plus some automotive ones — no longer exist for various reasons. Others like GE and Steelcase keep on keeping on.

Today, one can learn lean techniques in many places. At AME events one learns more about lean in practice, the importance of a lean culture, and overcoming obstacles that make deceptively simple practices hard to adhere to. Progress is on more solid footing when one realizes that the purpose of the techniques is to change us, not just our processes. Learning techniques, but never learning to change an organization's culture leads to re-learning over and over, a chronic organizational malady long before AME began. (See "Why does process improvement stall?")

AME grew as a movement to compete with Japanese imports in the 1980s. But by 2000, new ogres had appeared: Chinese competition and financial volatility, plus looming environmental crises. Now in its 25th official year (plus gestation time), AME must build on its past to transition to a new era to deal with the challenges now before us.

AMEKENTUCKY2009

Robert Hall will be available to discuss this article and related issues in his forthcoming book, *Compression*, with anyone interested.

See www.ameconference.org for details.

To Taiichi Ohno, Shigeo Shingo, or Henry Ford, today's technology could be imagined only as science fiction. (In their time, advanced technology seemed magical too; for no further back than 1875 few people could imagine so much as a bicycle.) Powerful, but complex software has the potential to generate huge waste as well as huge benefits, but it can enable us to deal with problems those pioneers could not imagine, and unfortunately, we have them. However, a key problem has not changed much: how can we develop our work organizations for high capability much quicker with much less regression and re-learning? All our other wastes grow out of our neglect to develop individuals and work organizations for peak, professional performance. AME's challenge is to discover anew what manufacturing in a holistic sense must become and help new versions of it become established practice.

Robert W. Hall is editor emeritus of Target *and a founding member of AME.*