

The Common Ground between Original Equipment Manufacturers (OEMs) and their Domestic Suppliers

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Abstract:

Supply chain relationships are a key element of successful business practice. Unfortunately, such relationships are often perceived by participants—especially suppliers—as being heavy-handed and/or positional. The Wisconsin Manufacturing Extension Partnership (WMEP) has pioneered a unique extended enterprise approach to supply management that facilitates mutually beneficial customer - supplier relationships by creating common ground between Original Equipment Manufacturers (OEMs) and their suppliers. It does so through developing a collaborative focus on continuous improvement. This paper provides a discussion of this topic in more detail and summarizes the results of a six-year WMEP proof-of concept supplier development initiative.

Changing Supply Chain Dynamics:

The term mutually beneficial is sometimes touted as a necessary underpinning of supply chain success---at least sustainable supply chain success. In fact, a recent survey of over 2500 U.S.-based manufacturers found that over two-thirds believed that “supply chain management and collaboration” would be “Important” or “Highly Important” to their company’s success in the coming five years (Next Generation Manufacturing Study, 2009). Many suppliers, though, tend not to put a positive spin on their relationships with OEM customers, believing that OEMs will never be satisfied with current purchased material pricing and regarding requests for price reductions as attacks on margins. On the other hand, many OEMs would likely tell you that once suppliers secure new business they are reluctant to continue refining their production processes for increased competitiveness unless pressured to do so. Because of this, at first glance, it might seem that conflict, rather than common ground, should be in the title of this paper.

Global competition has raised the bar on supply chain continuous improvement expectations. In the past, a supplier might reasonably assume that a successful quote on new business might also have assured their sole source status for the life-of-the-product. Today, OEMs or suppliers that rely on static relationships or existing technologies/methodologies risk losing competitiveness. Yet, “more than 90 per cent of manufacturers have performed at levels (that would be considered) less than world-class in productivity improvements” (NGM, 2009). Consequently, a successful quote should be viewed as the first step

in a journey toward building a strong and profitable supplier/OEM relationship; not the last step.

Extended Enterprise Supply Management is a concept that can be used to support the drive to reduce vertical integration, a strategy many OEMs have adopted in order to increase their own market competitiveness and financial success. Reducing vertical integration involves outsourcing primary operations and a focus on final assembly. Consequently, the value of purchased material in an OEM’s cost-of-goods-sold can approach 90% of total product cost. This increased reliance alone provides OEMs a huge incentive for development of mutually beneficial outcomes. An abbreviated definition of Extended Enterprise Supply Management can be phrased:

“Expanding supply chain business relationships by providing process management support to suppliers and supplier tiers in order to reduce cycle time and system cost while simultaneously improving the quality of goods or services provided by the suppliers.”

The definition implies an OEM approach that features less distinction between internal and supplier operations. Under such a strategy, taken to its ultimate degree of execution, an OEM would provide equal levels of support to all elements of its supply chain, internal or external. Such a strategy, however, should not be regarded as a “free pass”. Why? Because OEMs have tended to be more attuned to the challenge of globalization and, as a consequence, have long adopted continuous improvement as an

ongoing focus. In fact, internal OEM cost reduction goals are usually found to be more aggressive than those set for purchased material, a fact that is not widely understood in the supplier community.

This perspective brings the issue of supply chain competitiveness and OEM ongoing continuous improvement expectations back into the common ground category. Clearly, what is good for an OEM should also be good for suppliers, and vice versa.

There is one notable difference between OEMs and suppliers in working towards ongoing competitive improvements. Namely, OEM production supervisors with cost reduction goals are likely to have access to sufficient manufacturing resources and expertise to aid them in achieving their targets. In contrast, many small (200 employees or less) and mid-sized (201 to 500 employees) supplier manufacturers do not have levels of internal staff support comparable to OEMs.

The Gap:

A point of pride with many small and mid-sized manufacturers (SMMs) is that they see themselves as “lean and mean”, i.e. their overhead costs are low. In other words, SMMs typically staff at levels commensurate with two main objectives:

1. Winning new business, and
2. Getting product out the door on a daily basis.

When a “lean and mean” staffing strategy conflicts with continuous improvement on current work, however, the result can be anorexic, rather than lean-ness. Many SMMs also pride themselves on their “can do” self-sufficiency. Consequently, they are

often reluctant to seek outside help, either for the extra set of hands it represents or for its’ expertise, as that might suggest a lack of internal competence.

Access to—and the cost of—outside assistance are also issues. Most national consultancies aren’t interested in “small fee” accounts, and even if they were, SMM suppliers are likely unable to afford their relatively high rates. This can create a real barrier to SMM supplier adoption of continuous improvement initiatives.

On the OEM side, most local and regional consultants can’t provide the depth and breath of service that OEMs would need to support national domestic supply chains.

To close the loop in creating mutually beneficial supply chain relationships, suppliers must have access to the process management support they need to remain competitive. Most OEMs, however, are not set up to provide sufficient process management support to their supply chain partners, even if they were inclined to. On the other hand, OEMs have significant influence with their suppliers and, by introducing and sponsoring needed assistance can also have a positive impact on supply chain competitiveness.

One such resource that seems custom-built to fill this gap is the Manufacturing Extension Partnership (MEP) System. This nationally subsidized, non-profit network has local offices in all 50 states, a proven track record of helping SMMs increase competitiveness (Voytek, Lellock, & Schmit, 2004), and provides experienced consultants at an affordable price. Further, MEP’s targeted clientele are the SMMs that make up most OEM supply chains. The Wisconsin office of the MEP

(WMEP) has recently completed a six year initiative that demonstrated the MEP System's ability to fill the SMM process improvement resource gap and, in turn, support OEM Extended Enterprise Supply Management strategies and contribute to mutually beneficial supply chain relationships.

Closing the Gap:

A May 2004 press release announced the creation of the WMEP – OEM Supplier Development Consortium. The impetus behind its formation was the need to answer two fundamental MEP System-related supply chain questions.

1. Can multiple OEMs agree on the use of common tools in support of their individual supplier improvement support efforts?

Typically, OEMs employ tools specifically tailored to support company supply chain programs.

The motivation for investigating this issue is the recognition that for the MEP System to succeed as a 3rd party provider of supply chain services, OEM acceptance of common supplier support tools that can be applied MEP System-wide is essential.

In support of this, OEMs do recognize that requiring suppliers to use an OEM's internally-developed supply chain programs and tools adds complexity and cost to supplier operations, particularly when these suppliers service multiple OEM customers. They also recognize that reducing complexity by using standardized tools would benefit their supply chain partners.

2. Given their independent operation, can multiple MEP Centers consistently deliver services using a common system-wide tool?

In other words, does the MEP System have the wherewithal to close the SMM resource gap necessary for development of mutually beneficial supply chain relationships?

This is an issue since most OEMs have suppliers located in many states. Consequently, supply chain improvement efforts will cross MEP Center areas of responsibility. Under the current MEP System structure, OEMs must work separately with each MEP Center where suppliers targeted for assistance are located. To be considered a viable option as a 3rd party provider of OEM supply chain support, OEMs must have a single MEP System point-of-contact, regardless of where in the MEP System suppliers are located. It is also necessary for the MEP System to demonstrate that consistent service can be delivered, regardless of supplier geographic location.

OEMs understand that superior supply chain performance will be a fundamental competitive differentiator in the future. Yet three-quarters of them fall farthest from world class in leveraging their supply chain for competitive advantage in terms of flexibility and speed to market (NGM, 2009). Because of this many OEMs are considering new strategies and resources beyond today's supply management models to achieve the necessary depth and breadth of supplier support services needed to attain and sustain this advantage.

Service Delivery Product Development Considerations:

Most OEMs share three principle supplier performance metrics: Price; On-Time Delivery; and As-Delivered Quality. Price, as previously outlined, has emerged as the single most important metric over the last few decades due to the dramatic increase of global competition. All three metrics, however, represent a trinity of needed outcomes for any MEP System service delivery product. Consequently, development of a supply chain support product that would positively impact these three outcomes and could be deployed generically across all servicing MEP Centers was the central goal of the WMEP - OEM Supplier Development Consortium.

Suppliers are often reluctant to share the operational data needed to plan and implement manufacturing efficiency improvements with their OEM customers because this same data has the potential to be used against them in price negotiations. So, to be effective, any MEP System-wide product must be palatable to suppliers, and the design of the product must also allow for the MEP System to establish and maintain an “honest broker” role. Put another way: even though the MEP System is working with OEMs to improve supply chain performance, MEP cannot be perceived as an agent of the OEM if it is to effectively collaborate with suppliers.

Accelerate:

Accelerate—the service delivery product developed by the Consortium to meet the common supply chain management needs of its OEM members—was designed to both align with OEM supplier continuous improvement goals and also be non-threatening to suppliers. Presented these needs, the three Consortium OEM members settled upon Manufacturing Critical-path Time (MCT), a Quick Response Manufacturing (QRM) metric of “true” lead-time (Suri, 2010).

The fact that MCT is a measure of “true” supplier order fulfillment time, an important issue to most OEMs, also made this choice popular with Consortium OEMs, since long supplier lead-times negatively impact the OEMs’ ability to efficiently satisfy customer demand. Using MCT reduction as the key driver behind Accelerate supplier improvements addressed several OEM supply chain management concerns, including:

- ▶ The need to reduce supplier lead-times. Reducing lead-times allows OEMs to maintain customer fill-rates with less reliance on cost intensive pre-built inventory.
- ▶ The need to reduce supply chain waste. There is a high correlation between long MCT and waste. Post-project price negotiations can occur without negatively influencing collaboration since waste reduction can yield a lower price without reducing or threatening supplier margins (Stoflet, 2007).

- ▶ The need for improved supplier order fulfillment performance. MCT reduction also correlates highly with improvements in On-Time Delivery and As-Delivered Quality. As suppliers become less reliant on forecasts for order fulfillment planning, OEM customer fill-rates increase (Ericksen et al, 2005).
- ▶ MCT is an indicator of lean-ness and can be a valuable part of an OEM’s supplier viability assessment process (Suri, 2010).

In its final form, Accelerate delivered on all of the issues as defined by Consortium OEMs yet did not compromise the confidentiality needed by suppliers. For instance, even though Price didn’t end up as a specific Accelerate output, “before” and “after” elements of direct cost became visible as a result of its application.

The Accelerate model employs a two-phased structure of engagement. Phase I assesses the supplier MCT reduction opportunities, and Phase II implements and measures the achieved improvements

Answers to the two Consortium questions were delivered from WMEP’s proof-of-concept project data, as follows:

1. Could multiple OEMs agree on the use of a common tool in support of their supplier improvement efforts? And, in this same vein, did the tool support their supply chain management needs?

Data from 261 supplier Accelerate projects with 13 different OEMs is summarized in Table I

below. Participating OEMs represented various industries ranging from “high-tech” to “basic-industrial”. According to the data:

- ▶ The potential for MCT reduction is consistent across OEM supply chains and industries. Accelerate Phase I MCT Reduction Potential averaged over 45% and had a relatively tightly banded standard deviation of 7.1.
- ▶ Application of basic Lean manufacturing principles consistently reduced supplier MCT regardless of OEM or industry. Accelerate

**Table I
MCT Assessment and Reduction (per OEM)**

OEM	Supplier Projects	% MCT Reduction Potential	% of Potential MCT Reduction Achieved
1	3	32.33	63.92
2	15	37.06	75
3	2	51	78.43
4	5	48.2	102.07
5	15	43.33	98.31
6	29	46.45	104.01
7	38	45.36	87.12
8	1	43	97.67
9	5	54.6	93.77
10	96	48.42	94.04
11	3	59.33	105.62
12	11	41.27	116.3
13	38	42.29	88.61
	261		

X bar = 45.58 X-bar = 92.68
 Standard deviation = 7.1 Standard deviation = 14.11
 6 Sigma = 24.28 - 66.88 6 Sigma = 50.35 - 135.01
 (42.6)

Phase II % of Potential MCT Reduction Achieved averaged over 92 and had a relatively tightly banded standard deviation of 14.1.

- ▶ Based on the Accelerate track record in:
 - a. Accurately assessing supplier manufacturing improvement potential; and
 - b. Positively impacting supplier competitiveness;
- ▶ it can be concluded that common supply chain management tools can be successfully used to support supplier improvement efforts across multiple OEMs.
- ▶ Further interpretation of the Accelerate data results in two general conclusions. First, high levels of waste currently exist in domestic supply chains, regardless of industry. This implies that significant potential exists for improving the competitiveness of small- and mid-sized U.S. manufacturers, thus confirming the business payback potential of an extended enterprise strategy. Second, reducing the competitiveness gap between U.S. manufacturers and their foreign competition is achievable in a fairly straight-forward way. This, again, confirms the middle ground of mutually beneficial supply chain relationships.

2. Were multiple MEP Centers able to deliver services that provided consistent, positive impact using a common, system-wide tool?

The 261 Accelerate projects were delivered by 16 MEP Centers. The data summarizing this delivery is found in Table II. Although there was wide variation in number of completed

projects per state, four states (Connecticut- 20; Illinois/IMEC- 18; Minnesota- 15; and, Iowa- 13) presented a significant number of data points and another six (Pennsylvania- 10; Missouri- 9; the Dakotas- 7; Chicago/CMC- 6; Michigan-6, and; Ohio/Tech Solve- 5) provided an adequate sample size for statistical analysis. Similar to the OEM comparisons, the results obtained by the various MEP Centers showed a great deal of consistency:

**Table II
MCT Assessment and Reduction by MEP Center**

MEP Center	Project Count	% MCT Reduction Potential	% of Potential MCT Reduction Achieved
California	1	49	83.67
CMC	6	48.16	76.12
Connecticut	20	49.1	89.41
Dakota	7	41	119.16
IMEC	18	45.78	96
Indiana	3	46.33	97.12
Iowa	13	60.54	77.25
Michigan	6	52.83	80.44
Minnesota	15	34.6	112.14
Missouri	9	28.89	85
North Carolina	1	28	182.14
NWMOC	2	36	87.5
Pennsylvania	10	53.1	93.78
Tech Solve	5	32.2	90.68
Texas	1	27	96.29
WMEP	144	46.17	94.75

X bar = 43.38
Standard deviation = 9.74
6 Sigma = 14.16 - 72.6
(58.44)
Range = 27.00 - 60.54
(33.54)

X-bar = 88.54
Standard deviation = 11.84
6 Sigma = 53.02 - 124.06
(71.04)
Range = 77.25 - 119.16
(41.94)

- ▶ The potential for supplier MCT reduction is consistent across servicing MEP Centers. Accelerate Phase I MCT Reduction Potential averaged over 43% and had a relatively tight standard deviation of 9.7.
- ▶ Application of basic Lean manufacturing principles consistently reduced supplier MCT regardless of MEP Center. Accelerate Phase II percent of Potential MCT Reduction Achieved averaged over 88% and had a relatively tightly banded standard deviation of 11.8.
- ▶ Based on the MEP Center track record in:
 - a. Accurately assessing supplier manufacturing improvement potential; and
 - b. Positively impacting supplier competitiveness; it can be concluded that different MEP Centers can consistently provide services using a common, system-wide tool such as Accelerate.

The overall conclusion that can be drawn from this data is that the MEP System can indeed fill the current Extended Enterprise Supply Management process improvement support gap by providing a competent, national 3rd party provider of supply chain support services.

Payback:

When third party assistance is used as a part of a manufacturing solution, the question arises: “did the

cost justify the benefit?” The first issue that needs to be examined here is affordability.

The average cost of MEP Accelerate facilitation was well within the range of what most SMMs can afford, due in part to the MEP’s non-profit status. This cost is well within the range of what most SMMs can afford. Under WMEP’s initiative, this fee was paid in two ways. In the first, the OEM financed the project as a way of exposing their supplier to the potential benefits of a continuous improvement program. The vast majority of the projects were paid for in this way. In the second, the cost was split evenly between the OEM and supplier. Supplier payment participation makes sense since suppliers need to eventually assume responsibility for their own continuous improvement. Having them share in the “pilot” cost represents a serious step in this direction.

Project impact also must be considered. Data from a sample of projects showed a 2% – 4% percent direct cost reduction associated with the average 43% MCT reduction result. The payback period for Accelerate projects, then, depends on the size of the value stream impacted by the projects. Using the low end (2%) of this savings range, an annual value stream in the low- to mid- six figures would yield a one-year payback on the cost of the MEP support. The range in size of project value streams varied greatly across supplier projects, but the average size was several hundred thousands of dollars, with many exceeding \$1 million. Consequently, the program was justifiable to most program participants based on normal R.O.I. parameters.

Mutually Beneficial:

Under normal circumstances, most suppliers should understand that the sharing of internal cost reductions offers a win-win way to support joint market driven continuous improvement needs. A further indication of the value of the program from a supplier point-of-view can be seen in post-project activity. As previously stated, the vast majority of initial MEP-supported supplier projects were financed by the participating OEMs. Post-project, more than 25% of participating suppliers have continued working with their MEP Centers, without outside financial assistance. In addition, these suppliers have invested two to three times (to date) the amount of the initial project cost out of their own pockets.

This signifies an emphatic endorsement of the value of those services and represents an assumption of supplier ownership of continuous improvement for the participating suppliers. Once suppliers understand the potential of ongoing continuous improvement activities and that real savings can be achieved, OEM-purchased material cost reduction goals become easier to accept. A common ground between suppliers and OEMs is clearly established, and as a result, global competitiveness is mutually enhanced.

Next Steps:

The MEP System continues to augment its line of Extended Enterprise Supply Management service delivery products. Additional service delivery products and competencies will be developed and made available to supply chains. As this happens, the MEP System will work with OEMs to ensure their supply management programs leverage the extended enterprise suite of benefits that become available.

WMEP has taken a lead role in this development. If you are an OEM or supplier looking to develop and execute an extended enterprise strategy of mutually beneficial supplier relationships, please contact WMEP for more information.

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Paul D. Ericksen retired from John Deere after 30 years experience in increasingly responsible positions. He was a founding father of Deere's Supplier Development function, having developed and launched the Order Fulfillment focused process that was later adopted across Deere. Paul is considered the architect of the Commercial & Consumer Equipment Division's Supply Chain Flexibility Initiative that facilitated Deere's marketing of lawn mowing equipment through mass merchandiser channels. He is also a member of the executive team that managed the transition of that division's Supply Management organization from a Unit- to a Division-based structure. After leaving Deere, Ericksen served a stint as Chief Procurement Officer for S & P 500 corporation. He now is Program Manager of MEP Supply Chain Advantage.

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