

A N A L Y S T C O N N E C T I O N



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Optimizing the Global Manufacturing Network

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The following questions were posed by SAP to Simon Ellis, practice director of Supply Chain Strategies at Manufacturing Insights, on behalf of SAP's enterprise customers.

Q. What are the supply chain problems that today's manufacturers need to solve?

- A. The expanding use of outsourcing, both offshore and nearshore, has resulted in highly distributed supply and manufacturing networks that require multiple partners, both direct and indirect, to bring products and services to the global market. Consequently, they have become highly complex, involving a myriad of touch points that range from raw materials to the delivery of finished goods. These global supply networks must exhibit a high degree of adaptability, responsiveness, and collaborative capability, or they quickly become chaotic with poor service levels and high inefficiency costs.

The globalization of manufacturing (owned and outsourced, nearshore and farshore) and product demand, and the resulting variability of both, can quickly degrade service and cost performance if companies do not have the ability to respond quickly and decisively to these inevitable changes. We are also seeing growth in customer demands for diversification and broader variety — in both products and product delivery — that is driving higher-than-ever levels of supply chain complexity while companies attempt to accommodate increased expectations for reduced delivery lead times. In a highly distributed, global manufacturing network, this heightened complexity is compounded, and a corresponding inability to respond to these new market realities will lead to increased out of stocks and lost revenue.

These trends are particularly complicating for the manufacturing network that is struggling to properly balance cost and service in an environment where demand signal data is increasingly available. It is the manufacturing network that is the most globally distributed, often with a mixture of owned and outsourced capacity, which drives a great deal of complexity, usually with a corresponding lack of visibility and agility. The inability to operate this network in a connected, synchronized way drives up inventory levels and pushes down service levels. At the same time, as the fulfillment end of the supply chain becomes more demand driven, there is further pressure on the manufacturing and supply network to better balance pull "make-to-order" with push "make-to-inventory" environments.

Traditional measures such as operational efficiency and line utilization are giving way to more holistic views such as inventory/capacity balancing and internal service metrics.

We should also not lose sight of the fact that there are enormous cost pressures on the supply chain to increase productivity and reduce inventory levels, and that these pressures are in great part responsible for the distributed global supply networks that many companies now operate. These cost pressures are not going away, so it is incumbent on supply chain organizations to continue to eliminate waste and improve productivity.

Q. In a modern supply network, with both distributed and outsourced manufacturing locations, what is the impact on manufacturing network planning and execution?

A. The modern supply chain model we use at Manufacturing Insights to articulate current challenges in supply chain organizations looks quite distinctly at two components of the global supply network: the supply side and the demand side. While these are clearly two pieces of the same whole, quite different cadences and challenges face each. The demand side is affected by demand and is therefore characterized by demand-driven processes and short lead times in a pull environment. The supply side is affected by globalization and supply variability and is therefore characterized by cost-driven processes and longer lead times in a push environment. Balancing push and pull processes across a distributed network requires clear business rules (metrics), improved collaboration, and a transparent flow of information and decision making.

Manufacturing is a critical component of the supply side and, whether owned or outsourced (contract manufacturing), is a major contributor to both operational supply chain cost and the asset cost base. The manufacturing component of the global supply chain also buffers capacity and/or material supply interruptions through conversion and inventory trade-offs — and while these trade-offs have historically been cost driven, there is a growing view that minimizing costs has to be balanced with improving customer service.

There has been a great deal of discussion in recent years about visibility and collaboration across the supply network and how they can reduce the "bullwhip" effect that can be so detrimental to overall performance. Manufacturing Insights believes that visibility is most critical in manufacturing operations where the role of synchronizing material supply and conversion processes to meet key metrics can be most negatively affected by this bullwhip effect. An effective manufacturing planning and execution process with proper transparency to both potential supply interruption and demand variability is perhaps the single most critical capability to enable responsiveness across the supply network and is, in fact, the "engine" of the supply chain.

Q. How does the manufacturing network balance cost with customer service?

A. At Manufacturing Insights, we see supply chain organizations struggling with the quite basic question of whether they are about cost first or service first. The answer we always give, of course, is that it has to be both. This is particularly true of the distributed manufacturing network that is both the biggest contributor to overall supply chain cost and the biggest influence on service because of the extended lead times inherent in managing component and material supply.

Specifically in the manufacturing network, balancing cost and service is about transparency, flexibility, and collaboration. Having the proper metrics in place, particularly those that help to define the business rules between the supply side and the demand side, is the "table stakes." It's the ability to have visibility into the process and then the flexibility to do something about it that allows companies and their partners to make the proper trade-offs. If this sounds a lot

like "sense and respond," it is. Whether it's about companies making decisions around manufacturing capacity flexibility, using multiechelon inventory optimization tools, or using modern postponement techniques, it is ultimately about using visibility and flexibility to eliminate redundancy and waste.

Q. What are the metrics that companies use to measure their supply and manufacturing network performance?

- A. Best-in-class companies are always clear and concise in their use of metrics. They maintain a clear scorecard with a limited number of metrics designed to measure the business drivers that they have defined as most critical. Metrics hierarchy is also logical and consistent. Metrics evolve, however, and we have seen the most change across the supply and manufacturing networks, particularly as companies look to better balance the supply and demand sides of their overall supply chain.

Although traditional manufacturing cost metrics still obviously exist (procurement cost, operational efficiency, line utilization, capacity utilization, labor efficiency), companies are increasingly using service-driven and agility-driven metrics (inbound materials service levels, lead-time consistency, demand accuracy, multiechelon inventory levels/cover, service levels to distribution network, factory SKU coverage, time to recovery) in an attempt to take a less parochial approach to manufacturing. One company we have talked to uses a blended measure of inventory and percentage of postponed production as a proxy for manufacturing flexibility. Although it would be naïve to think that the supply chain will not continue to be managed for low cost, we are seeing more companies view the manufacturing network through the lens of differentiation and look for new metrics to measure it.

Q. What are some of the current industry supply and manufacturing best practices, and how can technology help?

- A. At Manufacturing Insights, we see manufacturing networks of all shapes and sizes and with performance levels ranging from poor to best in class. Given the overwhelming trend toward distributed, outsourced manufacturing locations, we are increasingly seeing some common threads among best-in-class organizations that drive their network performance.

The first capability we typically see in high-performing manufacturing organizations is an integrated, collaborative process across distributed factory locations — often, as we observed earlier, a combination of owned and outsourced locations. The ability to have precise control of both planned and actual production is critical to the effective operation of the manufacturing network and allows for proper balance between the supply side and the demand side of the full supply chain. We have talked a lot in our research about the "schism" that so often exists in managing across the supply-side/demand-side interface and that an integrated, collaborative manufacturing network is very useful in understanding supply constraints, creating flexible postponement strategies (often with regional/global supply networks), and then balancing "make to inventory" and "make to order" to drive better service levels at the lowest reasonable cost. It is important to note that this balance between push and pull manufacturing is further dependent upon visibility (both internal and external components of the manufacturing network and the multiple elements of inventory) and flexibility (both factory capacity and supply consistency).

The second capability we typically see is a manufacturing network that has successfully evolved from being multinational to truly global. Companies that view their manufacturing locations as a single, distributed network are generally much better at making the proper trade-offs across various locations (cost versus lead time, capacity utilization versus logistics cost) with greater visibility and agility. Further, we see quite sophisticated approaches to

supply network management, specifically with strategic network designs that plan for the supply implications of capacity, inventory, and, increasingly, energy costs. These globally managed manufacturing networks also exhibit a greater ability to sense and respond to unexpected changes in supply, demand, or execution. Can the manufacturing network, for example, change production at a moment's notice (e.g., a mechanical failure, a weather-related supply interruption), not just within a factory but across a network of distributed factories and minimize impact to service and time to recovery?

The third capability is something we have come to call "profitable proximity," and while it is part of the strategic network design process, it is also important in the planning and execution of the manufacturing network. We find, increasingly, that best-in-class manufacturing networks take a holistic and balanced view of supply and demand: Some products should be optimized for cost, others for lead time, and still others matching demand with proximal supply. Along with emerging topics such as sustainability, this more flexible view of the manufacturing network appears to be meeting a more balanced view of cost and service and avoiding lengthy network recovery time.

Technology, in the form of network planning and execution applications, can play a critical role for the best-in-class manufacturing network because it can facilitate synchronized production across multiple factory operations, drive down overall costs, and enable the supply side to more responsively meet the requirements of the demand side.

ABOUT THIS ANALYST

Simon Ellis leads the Supply Chain Strategies practice at Manufacturing Insights, one of IDC's industry research companies that addresses the current market gap by providing fact-based research and analysis on best practices and the use of information technology to assist clients in improving their capabilities in key process areas. Within the Supply Chain Strategies practice, Ellis specializes in advising clients on low-cost sourcing (LCS), RFID, data synchronization, lean, Six Sigma, and more.

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