

High Tech Manufacturing: What does outsourcing mean to your supply chain?



UPS Supply Chain SolutionsSM

Our Insight.

A UPS Supply Chain Solutions
White Paper

In the world of high-tech manufacturing, the last several years have presented some challenging conditions for businesses to operate. On one extreme was the “boom” of the late ‘90s and, on the other, the economic downturn that began with the crash of the technology and Internet sectors.

The high-tech boom of the ‘90s created huge demand and leaps in product innovation. While spending was on the rise, technology advancements increased customer expectations for product sophistication and the Internet expanded the channels available to customers. All of this forced Original Equipment Manufacturers (OEMs) to be more responsive: to deliver more advanced products on shorter product life cycles and through expanded distribution channels – all for less money. In an effort to focus on product innovation and reduce capital investment, OEMs increasingly turned to outsourcing some or all of their manufacturing and assembly operations.

STRAINED RELATIONSHIPS

IEC, a Newark, N.J. EMS provider, was awarded \$1.5 million in a lawsuit filed against long-term customer Acterna Corp. for breach of contract and unpaid invoices.

“The current recession has strained relationships with EMS providers and their customers who have cancelled and pushed back orders in response to weak market demand.”¹

As OEMs outsourced production, some related supply chain functions such as sourcing, product design, planning and fulfillment were eventually outsourced by default as well. Many OEMs divested plants and looked to Contract Manufacturers (CMs) for much more than just “board stuffing.” The expanded production and supply chain services that CMs were subsequently providing facilitated the emergence and growth of companies with a 100 percent outsourced manufacturing model. With the enhanced role of CMs came more responsibility for supply chain efficiency and higher expectations for cost reduction and expanded services. In fact, CMs have deviated from their historical role and are now more appropriately referred to as Electronic Manufacturing Service (EMS) providers.

Since mid-2001, all of this growth has come to a screeching halt. As market demand decreased, inventory piled up and expansion and growth strategies were put on hold. Relationships between OEMs, EMS providers and suppliers became strained.¹ As demand slowed, OEMs cut off orders to EMS providers, and EMS providers to suppliers. The ripple effect that is commonly referenced in supply chain circles took effect. Planning processes and tools had not been tested in real time for quick response to sudden demand swings, procurement had been placing double orders to ward against allocation and manufacturing was programmed to build to capacity – all just to keep up with demand. The result? When the market turned in late 2000 and early 2001, inventory piled up throughout the supply chain and obsolescence became a real issue; now a lot of capacity sits untapped. Aggressive growth plans have slowed, and the focus has shifted to regaining efficiency and positioning for the “upswing.”

Over the past year, the high-tech industry in particular has received a wake-up call and been forced to respond to faltering economic performance brought on by lackluster demand, excess inventory and underutilized capacity. While those responses have varied, two fundamental goals that drive this industry have not changed: (1) innovation in new product development and (2) maximizing supply chain efficiencies to reduce costs. These were the same drivers that led the trend

¹EMS provider wins \$1.5 million in court case. By Claire Serant, *EBN*, February 21, 2002; Copyright 2000 CPM Media Inc.

RELATIONSHIPS NEED WORK

“... both sides (EMS and OEM) need to work on improving communication, sharing information, and understanding each others’ strengths and weaknesses. A recent EBN survey of more than 300 OEM executives indicates that EMS outsourcing of many functions, including design services, component sourcing, and logistics and supply chain support, is climbing, yet OEM ratings of EMS performance show a clear need for improvement.”²

toward outsourcing in the first place, a trend we expect will continue. However, the pace and supply chain operational model may be different.

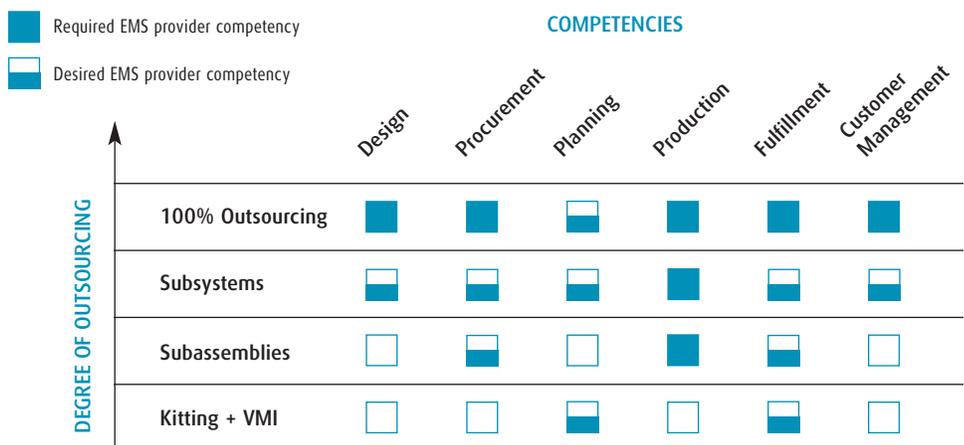
EMS providers must lead these initiatives while maintaining their long-term goal: to become “supply chain” companies – balancing the security and unique requirements of individual customers. Only then will all members of the high-tech supply chain realize the potential benefits of outsourcing. The following trends will be critical to building a successful model for the future.

1. Improving performance of supply chain service offerings
2. Focusing on integrating operations from M&A activity
3. Integrating supply chain technology to enable collaboration

1. Improving Performance of Supply Chain Service Offerings

As OEMs continue to outsource the manufacturing of subassemblies or entire products, EMS providers will inherit more and more responsibility for supply chain functions, including product design, sourcing, planning, production, fulfillment, customer management and reverse logistics – the same processes that many OEMs spent years trying to optimize internally in an attempt to wring out costs. While the functions may have transitioned from the OEM to the EMS provider, perhaps it was naive to expect that supply chain efficiency and optimization would transition as well. Most EMS providers have inherited from their customers a mixed bag of supply chain efficiency. In their attempts to integrate and improve these operations, only marginal success has been achieved across the industry. The long-term success of the outsourcing model depends on EMS providers maintaining and improving on supply chain efficiencies.

Key point: EMS providers must optimize their supply chain operations while building trust and collaboration among their customers and suppliers. OEMs are measuring the success of their outsourcing initiatives on the ability of their EMS providers to deliver value-added services, maintain quality and reduce cost.



²Communications gap persists between OEMs and EMS providers. By Jennifer Baljko Shah and Claire Serant, *EBN*, April 23, 2002.

As EMS providers extend their offerings and include supply chain services, we are seeing some noteworthy practices and proactive initiatives emerging:

PERFORMANCE NOT UP TO PAR

A recent EBN survey of more than 300 OEM executives indicated a need for improvement:³

- The score for timely and accurate data about inventory levels was just 47%.
- A meager 41% rated their EMS partners' ability to adjust inventory levels as forecasts change as "excellent" or "good."

Leveraging Strategic Sourcing

- Sourcing and procurement activities are only a piece of the leverage; the bigger, tougher piece is aggregating and comparing. In order to aggregate volumes and usage and strategically purchase all products, EMS providers need to cross-reference customer part numbers with their own across plants. Future trends involve tightly integrating these cross-references and improving access over the Web to better use excess inventory balances, alternate parts and suppliers, preferred parts and supplier lists, reuse priorities and external content sources.

Collaboration in Planning and Forecasting

- In a volatile market environment where customer demand can change very quickly, communicating demand fluctuations and adapting production quickly is critical. The past year has proven just how costly slow response is – and translated the value into tangible costs (e.g., inventory write-offs, discounting, obsolescence costs, etc.). Collaborative Planning, Forecasting and Replenishment (CPFR) systems and processes can help avoid these costly inefficiencies, but the success of CPFR requires strong relationships and clear agreements with supply chain partners. It is critical to clearly define the amount of responsibility each party will assume with respect to forecast accuracy and plan execution as well as with information sharing and process accountability. Issues of trust and cooperation can prove far more challenging than implementing software tools to facilitate collaborative planning.

Collaboration in Product Design and Introduction

- With stronger design capabilities emerging throughout many EMS companies, the opportunity is even stronger to collaborate in the product design, introduction and life-cycle management areas of a supply chain. Past challenges – sharing data, design formats, design ownership and, ultimately, design and engineering change processes – are becoming less of an issue with the use of better designed tools.⁴ By creating Web-based collaborative product development capabilities, companies will be able to bridge the gap between organizations and facilitate communication between design and other supply chain functions. This will allow EMS providers to speed the production start of new products, decrease communication errors and increase the value services they offer their customers.

Take it All the Way with Fulfillment

- In addition to the already long list of responsibilities for EMS providers, fulfillment has taken on an increasingly important role. Shipping final product directly to end customers (using the OEM's identity), handling complex relationships with suppliers and potentially other EMS providers, and managing reverse logistics are a few hot areas into which EMS providers are now stepping. The biggest challenge overall is balancing accountability, control and action. Regardless of who has responsibility for fulfillment, the OEM is still the final stop in the customer's eyes for delivering a high-quality product on time. EMS providers must continue to enhance their capability to provide seamless, end-to-end fulfillment services.

³Communications gap persists between OEMs and EMS providers. By Jennifer Baljko Shah and Claire Serant, *EBN*, April 23, 2002.

⁴Can design collaboration work? By Jennifer Baljko Shah, *EBN*, January 18, 2002.

2. Focusing on Integrating Operations from Merger and Acquisition Activity

The proliferation of mergers and acquisitions in the contract manufacturing industry means that many EMS providers are facing the daunting task of integrating new acquisitions and, in many cases, integrating plants purchased from customers. Each plant comes with its own infrastructure, processes, people, systems and data. The management challenge of integrating these operations can be formidable for many reasons:

- Lengthy integration time
- Conflicting cultures
- Proprietary product concerns
- Content and data lacking standardization/normalization
- Lack of application standardization
- Technical infrastructure incompatibility
- Global language and geographic barriers

DESIGN COLLABORATION TOOLS IN MOTION

“The likelihood of design collaboration and new product life-cycle management being a bigger part of the supply chain process is very high.”

Kevin O'Marah, analyst, AMR Research, Inc.

“For John Bocher, VP of global supply chain at MSL, it's about a Web portal set up to help engineering teams from key customers find preferred-supplier part information.”⁴

So, what does the integration of acquired businesses entail? It crosses all functions and operations of the business, including administration, finance, manufacturing, facilities management, sourcing, logistics and materials management.

Let's examine one procurement function as an example: aggregating spend across the business. The ability to consolidate spend requires normalized/cross-referenced part and vendor information. In most cases, this is not a technology issue, but a process issue. EMS providers need to have a process for filtering and cleansing the data that comes with acquired operations. These data points primarily consist of component and supplier information but can also include manufacturing, product, inventory and transaction data. If the intelligence is not cleansed, the usefulness of the information deteriorates greatly. Compound this issue with multiple systems, locations, operations and products and the challenge becomes even clearer.

Let's categorize the challenges with integrating new acquisitions into the following four major areas:

a. Plant Operations

As referenced, the goal of outsourcing is to leverage production capacity most effectively among customers. In situations where EMS providers have purchased OEM plants and continued to run them as separate business units to service that OEM, the ability to optimize plant capacity is diminished. Leaders in the EMS space might merge a new plant into their organization and integrate operations, data, systems and processes so that multiple customer products can be manufactured at each plant.

b. Information Management

There are two dimensions of data to consider: stages of data management and categories of data. At a high level, we have categorized critical supply chain data as product, component, forecast and demand. While these categories are rather intuitive, and most companies would probably say they acknowledge them and consider them important to business operations, the challenge is in managing the

⁴Can design collaboration work? By Jennifer Baljko Shah, *EBN*, January 18, 2002.

STAGES OF DATA MANAGEMENT

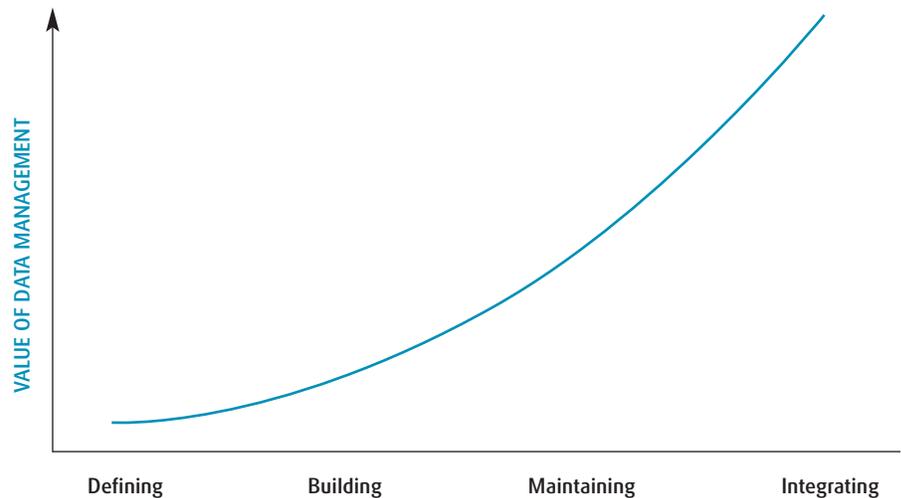
(1) **Defining** includes identifying and articulating the requirements for data at varying levels of detail.

(2) **Building** relates to the process of creating, gathering, cleansing and storing data.

(3) **Maintaining** is a challenge in every company but can be facilitated with systems, processes and recognition of data issues.

(4) **Integrating** considers how the data elements need to interact, integrate, support and display for them to be most effective.

data throughout their life cycles. We see four progressive stages of data management: defining, building, maintaining and integrating. With each stage of management, the value the data has to the organization increases.



The ultimate goal is the integration of data across functional, system and process boundaries. Only then can the data support business transactions, processes, reporting and applications. Companies often lack the appropriate consideration for data management at different stages, thus not fully integrating data for optimal supply chain effectiveness.

c. Supply Chain Optimization

Each acquisition will come with effective and ineffective supply chain processes, systems and operations. With each new acquisition and merger, it is important for an EMS provider to leverage newly acquired best practices within its existing business operations. Don't suboptimize newly acquired best practices in an effort to standardize operations. It is equally important for an EMS provider to roll out existing best practices where new operations fall short. And the final step: fill in the gaps. Where best practices do not exist, there is an opportunity to look for supply chain initiatives that will improve cost effectiveness, promote collaboration and enable operational excellence.

d. Systems Integration

Growth by acquisition means most EMS providers are struggling to maintain disparate supply chain and ERP systems with varying levels of integration. Systems integration is an easy ROI target to identify, but often more difficult to justify and implement. Project timelines can be long and complex. The bottom line: Technology and systems need to support the business. This means sharing information, seamless transaction processing and enabling decision support. With the Internet and different middleware products available today, there are alternatives to consider in overcoming this obstacle.

THE TRUTH ABOUT ROI ON TECHNOLOGY

Much of what has been done so far rests in the area of setting up demand and supply planning systems, and many executives AMR talked to in a recent study said they do not feel that they have yet achieved ROI, but are optimistic about reaching that goal.⁵

3. Integrating Supply Chain Technology to Enable Collaboration

We all understand the importance of being a leader in supply chain competencies, technology, collaboration and information management. OEMs have been taking these initiatives for years. Software vendors have preached the value of advanced planning, scheduling, forecasting and now collaboration. Their value propositions have been hefty and the implementations cumbersome. And, the focus of such efforts was historically within the “four walls” of a single company.

So, why has the trend changed? Why is it different? There’s a new variable, a new enabler, a new complexity factor: the Internet. The Internet has exploded the opportunities, the players and the options for supply chain technology. In the past, we’ve talked about individual system implementations and a discrete list of processes being affected. Collaboration between supply chain partners required customized software solutions or involved a great deal of manual intervention. The Internet has opened technology architectures and broadened capabilities to encompass much more. For example, planning and forecasting now begin with collaborative design and integrate engineering and sourcing with manufacturing and planning. Integration of functions branches out to include OEMs, suppliers and partners.

The EMS space is leading the pack in the need for integrating supply chain systems and operations to achieve collaboration. Years of industry restructuring, technology advancements and shrinking margins in the computer and telecommunications industries made these companies prime candidates for early adoption. Now technology can truly support these collaborative partnerships, allowing organizations to realize tangible and visible results by integrating supply chain technologies.

⁵ROI elusive supply chain software. By Jennifer Baljko Shah, *EBN*, April 23, 2002.

Conclusion

What might the trend toward outsourcing mean to your supply chain?

Supplier Viewpoint

Suppliers are experiencing the trickle-down effects from continued outsourcing, getting progressively further from end customers and thereby losing supply/demand visibility and making pricing strategies more difficult. The best position for suppliers is to have efficient, cost-effective operations able to rapidly respond to the changing demands of their customers.

In a Nutshell:

- Control your own destiny by leading with flexible, adaptable technology that can support different processes.
- Know your costs; get your own house in order. Make your own operations as lean as possible.
- Streamline information flow whenever possible within and outside your organization.
- Take a proactive role and get involved in collaboration efforts with your customers whether they are OEMs or EMS providers. Once collaboration links are established between OEMs and service providers, these initiatives migrate down the supply chain to incorporate key suppliers. Early involvement will allow you a greater voice in how collaboration is structured.
- Strive for as much visibility into the supply chain as possible even if this involves initiatives such as VMI programs. Companies that detect supply build-ups or demand anomalies early will be better positioned to react quickly.

EMS Viewpoint

EMS providers should see themselves as supply chain companies. Their biggest challenges are integrating acquisitions into a single enterprise, while expanding and improving supply chain services to forge strong partnerships with existing customers through value-added services.

In a Nutshell:

- Drive supply chain integration for your own cost benefit and for the sake of building a long-term partnership with your OEM customers.
- Extend supply chain operations to include value-added offerings that will strengthen your revenue model and provide a competitive advantage.
- Develop a scalable, repeatable process for integrating acquisitions quickly and comprehensively.
- Beware of acquisition agreements that stipulate newly acquired plants be treated as separate businesses and other limiting arrangements.
- Invest in technology for decision support as well as transaction efficiencies.
- Design processes and systems robust enough to adapt to the varying needs of different customers while allowing for the maintenance of each customer's privacy.

OEM/Customer Viewpoint

LACK OF TRUST INHIBITS COLLABORATION

Industry executives need to look more carefully at the supply chain metrics they have put in place and increase the level of trust between partners in order to promote greater collaboration.⁶

From the OEM perspective, the focus is clear. OEMs provide the vision and direction of products and customers. They get into the minds of customers to develop the latest and greatest products with the most demand. As outsourcing continues, consider your EMS provider a partner and share lessons learned, best practices and common goals and work together to collaborate.⁶

In a Nutshell:

- Invest time and effort in sculpting the supply chain service offerings of your EMS providers.
- Treat your EMS providers as partners. Move away from the heavy-handed customer/supplier relationship. View the relationship as more than a short-term fix for manufacturing capacity and cost savings – see it as a strategic partnership for competitive advantage.
- If outsourcing includes transferring assets and people to your EMS provider, avoid agreeing to long-term, fixed-volume commitments. Instead, opt for agreements that preserve a percentage of overall volume provided the EMS provider maintains appropriate service levels.
- Expect to be involved with your EMS provider. A concerted investment of time and resources now will pay off through integration and beyond.
- Make decisions about which supply chain functions you would like your EMS provider to deliver and which ones are too important to relinquish. Ask questions such as: Which supply chain services/functions are customer-facing vs. cost-affecting? In the name of creating a partnership, which would you rather risk, cost savings or customer experience?
- Even after outsourcing, never stop monitoring supply chain performance! Regardless of who is responsible for any supply chain miscues, OEMs will continue to bear the lion's share of the cost whether in the form of dissatisfied customers, lost sales or excess inventory write-downs.

⁶Industry hopes to learn from supply chain mistakes. By Jennifer Baljko Shah, *EBN*. April 23, 2002.

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