

White Paper

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Orchestrating Supply Chain Activities

Managing outsourced manufacturing, logistics & fulfillment 2.0

By Anand Iyer

SERUS CORPORATION

Intelligence for Outsourced Manufacturing

about Serus Corporation

A leading pioneer of technology and managed services for companies with distributed or outsourced manufacturing operations.

Our SaaS solutions enable efficient automated collaboration, execution, and decision making across global supply and distribution networks, saving millions of dollars for manufacturers.

We provide end-to-end solutions that satisfies inter-company business process requirements for product engineering, operations, and finance to manage outsourced partners.

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Business Backdrop

The high-tech supply chain of today requires decision makers at all levels to assemble an impressive array of data, understand the interactions between different functional silos and then make a judgment. Given the degree of outsourcing, assembling the data requires cooperation across multiple enterprises. However, a decision, once made, also requires complex coordination across multiple enterprises – the Contract Manufacturers, the tier 2 suppliers, the logistics partners not to mention the customer. The specific dynamics of the market also dictate that this complex juggling act be repeated day in and day out.

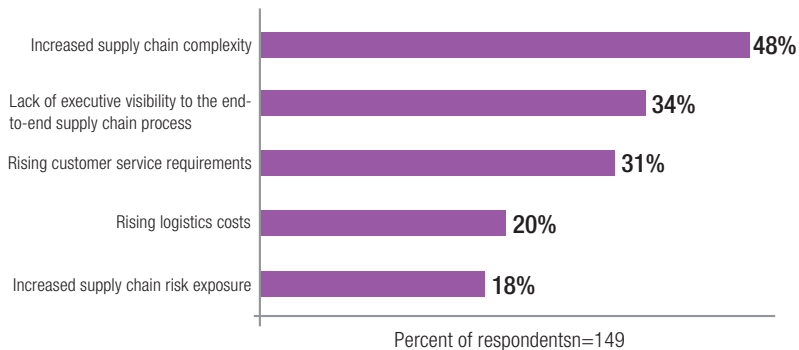
Several factors, some unique to the high-tech business, drive the complex mechanics of decision making. The first is the differential between the customer order lead time and the supply lead time. In many sub-segments, the customer order lead time (the difference between the book date and requested delivery date) is far smaller than the supply lead time (the difference between the time a firm order or build signal is sent and delivery at the ship-to location). Supply lead time itself is influenced by several factors first among them being the location of the outsourced manufacturing plant. Product form factors and the need to control rising freight costs often also dictate the need to use ocean or surface modes in larger proportions relative to air freight. The gap between the two lead times drives the amount of inventory carried at various echelons and locations across the supply chain.

Fast facts

- Forty-eight (48%) percent of companies indicated that increased supply chain complexity is a top pressure
- Fifty-one (51%) percent of companies indicated that redesigning SCM processes to reduce solution complexity is their top strategic action

Source: Aberdeen Group, Nov 2010

Top Pressures forcing companies to Supply chain application



Source: Aberdeen Group, November 2010

However, since unit forecasts at the location/echelon level are often quite inaccurate, how exactly to distribute that inventory-which locations, what quantity, at what level of the Bill-Of-Material- is still a challenge. Traditional inventory management techniques make assumptions about the data that are rarely valid in reality.

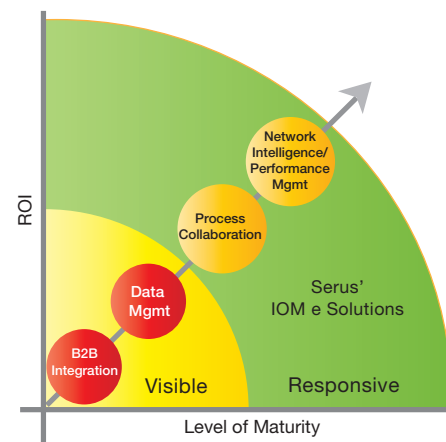
Finally, there is significant complexity in how the outsourcing activity is managed. There is rarely in uniformity in the business agreements and outsourcing model across different manufacturing or distribution partners. Each one has a different rules and operating protocols. Most large OEMs have global commodity management teams that are responsible for procuring and managing critical components/commodities several levels upstream in the supply chain. The interaction between physical consumption of inventory, understanding of liability and the inventory buy/sell transactions can be quite complex to decipher and reconcile.

Operating Environment

The lead time differential, forecast accuracy at the mix level and 24/7 nature of the supply chain essentially make the inventory balancing act a daily activity. More importantly, the nature of the decisions erases the traditional distinctions between “solution silos” – visibility, B2B, analytics, planning. In this environment, the atomic problem of operations can't be neatly segmented into distinct solution classes.

When external partners are involved, answering questions like the ones below does not allow the planner/analyst to make a neat distinction between the boundaries of acquiring data for visibility and using the data for making a decision.

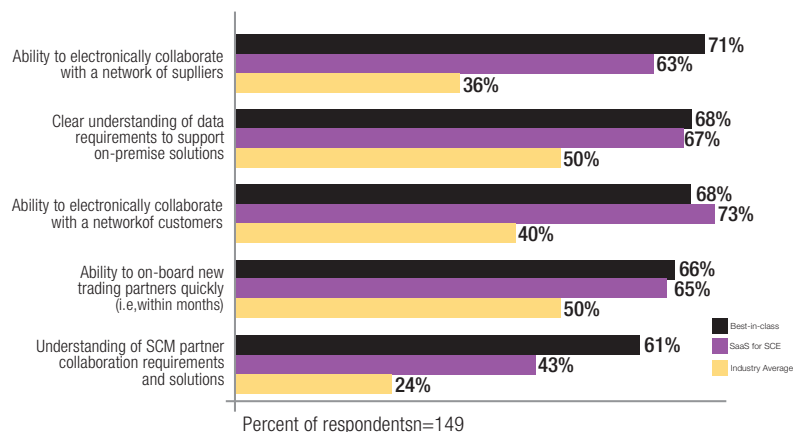
- Do I have enough supply of a critical component in VMI Hub managed by a tier 2 supplier?
- What is the impact of a general strike at Europort in Rotterdam ? Which shipments, which products and which sales orders are impacted?
- Supplier X claims that we have liability for Y \$ of inventory. Can we trace the arc of forecasts, firm orders and shipments and reconcile it with the contractual agreement?
- We received an invoice. Can we validate it and determine if it is consistent with the supplier quote and our purchase orders?



Secondly, work content at many levels of the organization is organized differently than in an environment where most activities are done in-house. It is very typical for fulfillment teams to be organized to manage the entire supply chain from supply to fulfillment.

This essentially transforms the OEM's organization into a set of smaller supply chain management teams that have end-to-end responsibility. In this environment, a monolithic, one-size-fits-all process and solution architecture organized around traditional lines is not very effective and does not do justice to the unique drivers of each mini-supply chain.

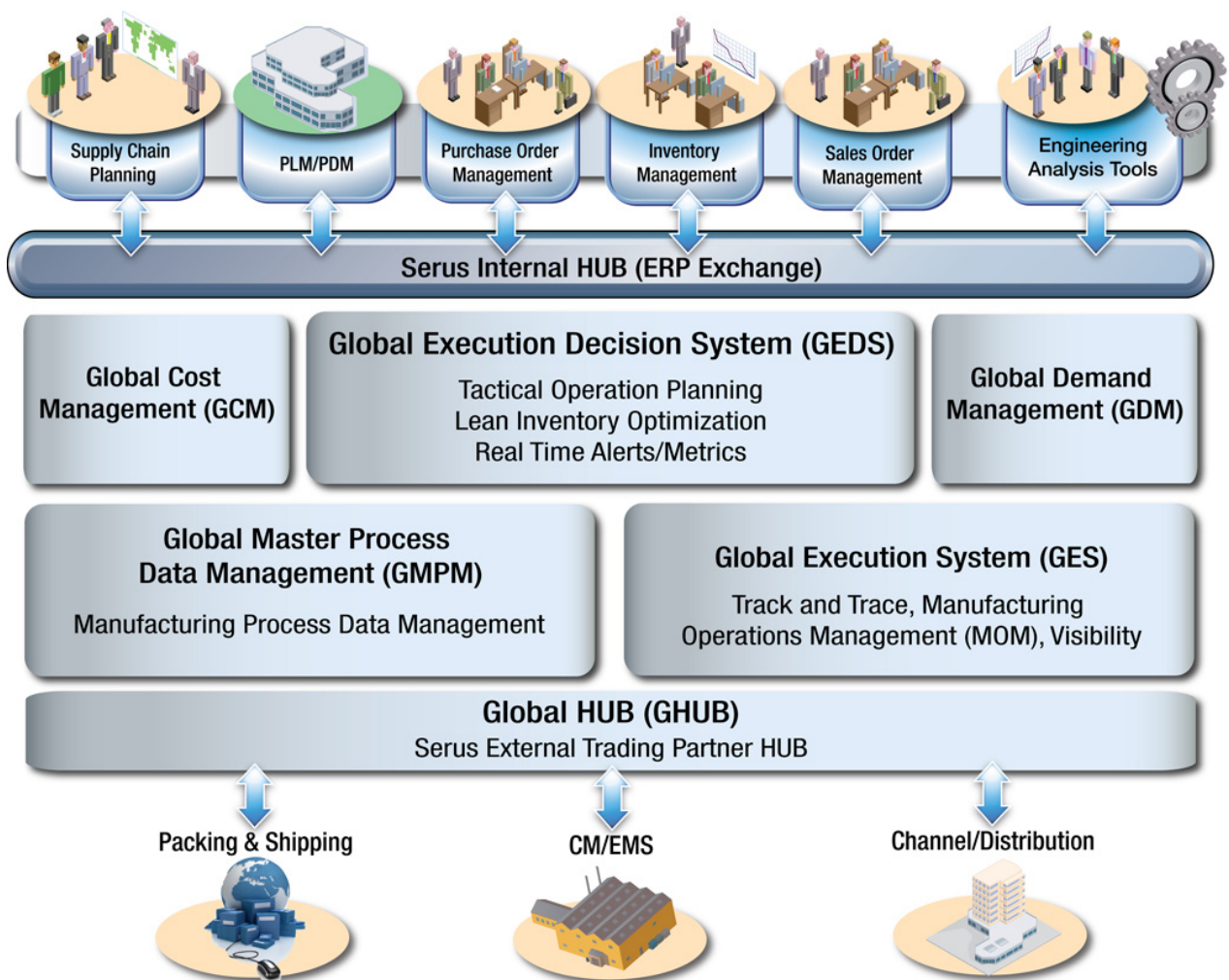
Software as a service usage for Supply Chain Execution



Source: Aberdeen Group, November 2010

The Serus Solution

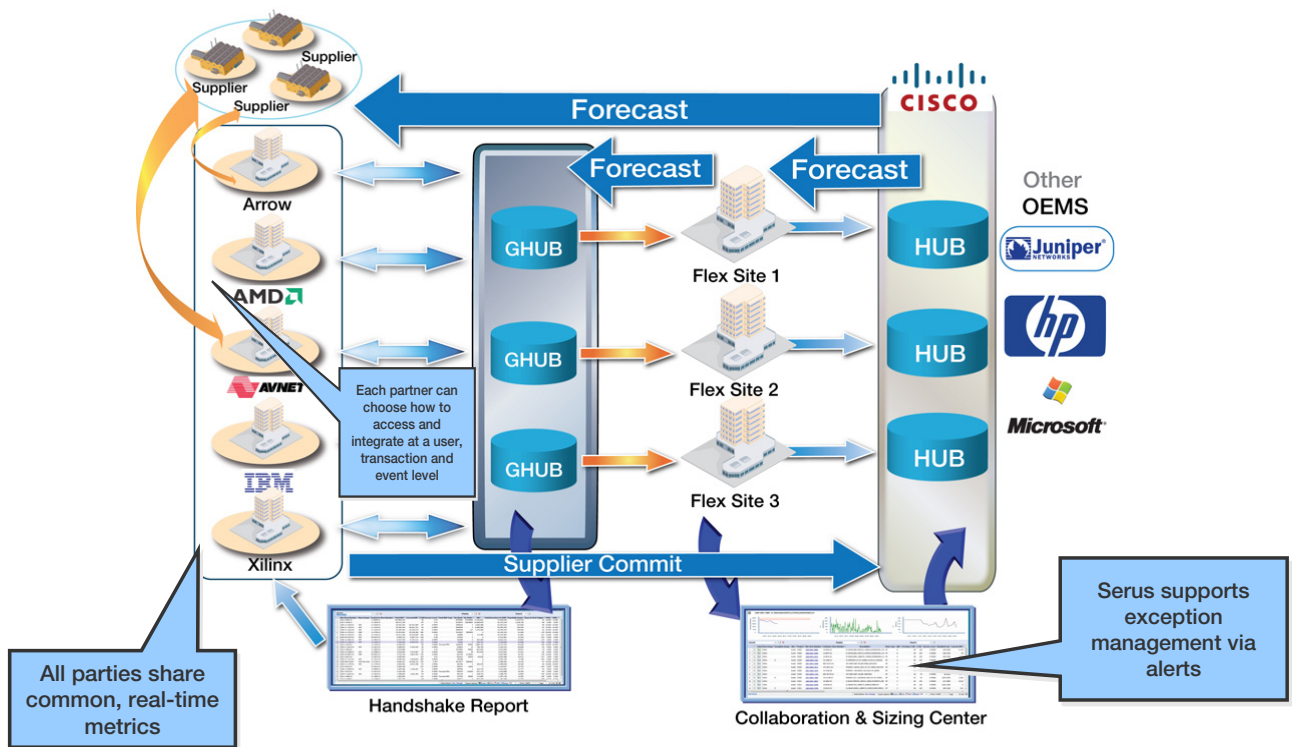
The Serus Intelligent Operations Management solution is designed from the ground up to address the challenges described previously. Serus IOM is built as a single data source addressing different work-flows based on the insight that one integrated solution is more effective than many silo-based solutions, no matter how well designed, because of the ability to have different functions driven from the same source of truth. This is somewhat analogous to the convergence argument used in consumer electronics to design devices that subsume the functions of previously separate devices. Our experience suggests that a solution in this environment must have the following capabilities to address the needs of stakeholders in business and IT.



Modeling the Supply Chain

Any solutions that attempts to provide visibility, analytics and decision support has to be able to describe the supply chain and its operating protocol along with all attributes that are required to meet the needs of different classes of users. Thus, the solution must be able to capture the routes products follow across suppliers to customers. It must also be able to describe, if required, more specific details within each supplier. For example, in some industries, critical components are used and consumed at several levels in the Bill-of-Material requiring that the manufacturing process be modeled in some detail to describe the consumption of the critical component. Similarly, in other industries, payments for services are based on usage of capacity. This also requires that the capacity consumption steps be modeled in detail so that invoices can be validated. It also requires that the supply chain model support the ability to indicate that some supply chain steps are also pay points.

Modeling the supply chain, in this context, also extends to being able describe the various events in the supply chain using a rich set of transactions. Serus has a transaction set that encompasses transactions available in RosettaNet and EDI such as Send PO, PO Acknowledgement, ASN, Return Material.



The Serus transaction set also includes transactions that are not covered by other standards such as:

- Stage Move, Split Order, Split Work Order, Consume Material, Scrap Material (useful in describing manufacturing activities)
- Pack, Split Load, Combine Loads (useful in describing logistics activities)

This flexibility to describe the supply chain and capture events appropriate to that level of detail provides tremendous flexibility to manage outsourced and in-house operations at an appropriate level of granularity.

Data & Supplier On boarding

A significant amount of data required to manage virtual operations comes from entities outside an enterprise. Therefore, how data and users from those entities are incorporated into an operations platform is a significant determinant of how effective the platform really is.

Having worked with many organizations, large and small, both as customers and as suppliers to our customers, it is clear that a one-size-fits-all approach to on boarding data and suppliers is bound to fail. For example, any practical solution in this space has to account for the fact that most OEMs have suppliers with different levels of B2B sophistication. Also, the process and operating model varies from supplier to supplier as well. Therefore, the solution has to be able to account for the fact that some suppliers provide information by logging in, while others may have a sophisticated IT infrastructure to provide detailed data. Similarly, the solution architecture also has to account for the fact that it may be impractical to force every supplier to supply data in a standard format.

Error Management

In order to orchestrate activities around the supply chain, not only do enterprises need data for visibility but they also need the data to be clean and timely. Obtaining data and then ensuring that it is clean has many different facets. Some of the capabilities that Serus has designed into the solution are:

- The ability to cross reference supplier/customer data against a dictionary. Thus, part names, facility names and product attributes can be cross referenced to make sure that incoming data is valid at the most basic level.
- Built-in and configurable rules that validate inbound data. For example, it is not uncommon to see shipment data that suggests that shipments are being shipped to an invalid location because the products in question are not qualified for a particular customer. Any shipment transaction received with this data should trigger an alert.
- Error stacking when multiple transactions are received for an entity that already has an error reported. For example, if a PO has a transaction error associated with the PO Acknowledgement, all subsequent transactions such as PO updates for that PO will be queued until the first error is resolved.
- Inventory reconciliation to periodically reconcile supplier reported inventory by inventory type and location against inventory positions computed from transactions. Done periodically, this exercise provides a mechanism for ongoing data and process improvements.

Decision Analytics

In an outsourced environment, several different groups use the same data for their own purposes. For example, Supply Chain Operations uses current and projected inventory positions together with demand backlog and forecasts to project shortages of critical components. Accounts Payable uses a subset of transactions and data to do 3-way matches or analyze accruals. Commodity management teams use historical manufacturing data to analyze historical spending by suppliers in order to make decisions about purchasing budgets and simulate the impact of future decisions.

What is clear from analyzing user's actions is that it is not possible to draw clear lines separating historical reporting using BI tools from predictive analytics to simulate the impact of decisions. As a result, Serus has developed a framework for decision analytics that allows users to:

- Report and analyze KPIs
- Analyze transaction data and mine it for insights
- Analyze supply-demand match decisions, perform *what-ifs* and compare the *what-ifs* in order to make a decision

A Fresh Approach

While the outsourced operations environment has evolved over the last decade to cope with changing industry dynamics, the solution environment has failed to keep pace. Many vendors continue to attempt to work within the boundaries defined by precedent and analysts. Serus has taken a fresh approach to the problem by developing a solution that tackles the problem of managing outsourced operations without imposing preconceived boundaries.

The Serus solution allows different stakeholders within an organization to operate from a single source of truth. Since organizations with significant outsourcing structure work differently, such a solution meets the needs of users without requiring extensive spreadsheet manipulation. Powerful decision analytics, enabled by visibility and deep supply chain modeling capability, allow OEMs to orchestrate activities around the supply chain to deploy inventory to maximum revenue and margin effect.

About the Author

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Prior to joining Serus, Anand spent the last 13 years at i2 Technologies where he was responsible for the Global Process Consulting practice. In this role Anand led a group of 23 consultants responsible for domestic and international customers across a wide variety of industries including Semiconductor, High-Tech, Metals, Pharmaceutical, Chemicals and Downstream Oil.

He was also responsible for incubating i2's Managed Services business and managing the company's global patent portfolio. Over his career in Supply Chain Management, Anand has held positions in R & D, Product Management, and Product Marketing.

He has published papers in peer-reviewed journals like IIE Transactions and The European Journal of Operations Research as well as articles in practitioner-oriented magazines like APICS and Supply & Demand Chain Executive.

He is the author of several US and international patents. Anand earned a M. S in Industrial Engineering and a Ph.D in Systems & Industrial Engineering from the University of Arizona.

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