INFORMATION REPLACES INVENTORY:
A SEAGATE TECHNOLOGY CASE STUDY

An E2open White Paper

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A Demand-Driven Supply Chain

Many companies are facing a hyper-competitive business environment with shortening of product life cycles, volatile demand and very tough customer requirements. An effective strategy utilized by leading companies is to shift from a traditional forecast-driven supply chain to a demand-driven supply chain. This strategy extends proven “lean” practices outside the four walls of manufacturing to the entire end-to-end supply chain. A key building of a demand driven supply chain strategy is an effective vendor/supplier managed inventory (VMI/SMI) program.

Case Study: Seagate Technology

Seagate Technology is the largest disk drive manufacturer in the world with $8 billion in revenue and was recognized by Forbes Magazine as America’s Company of the Year in 2006. Each year Seagate ships 100 million drives. Each day it consumes 90 million parts from its suppliers. Seagate computer systems, notebooks, gaming consoles, TVs, digital cameras, and cars are all over the world.

The implementation of its VMI/SMI program was a critical element to Seagate’s successful transition to a “demand-driven” supply chain. In doing so Seagate grew its volume from 4 million to 25 million drives per quarter while reducing operations head count by 50 percent and doubling inventory turns from 8 to 16.

An Effective VMI/SMI Program

The goals of implementing an effective VMI/SMI program as part of a demand-driven supply chain strategy include the following:

1. Eliminate excess inventory at each stage of the supply chain
2. Shorten cycle time
3. Deliver better service to customers
4. Increase responsiveness to changes in demand

VMI/SMI, in essence, is a process whereby a supplier allocates inventory for a customer based on forecasted demand, but the customer pulls that inventory based only on actual demand. The key requirements for an effective VMI/SMI program include

- Delivery of materials triggered by actual demand
- Suppliers allocate, hold, and manage inventory based on continuous forecast
- Physically, the inventory can be located and managed using a number of
methods, including on-site supplier store, third-party logistics provider (3PL) warehouse, or supplier warehouse. The key element being that the inventory is staged within close proximity of consumption point, enabling timely deliveries

- Agreements signed between customer and supplier at the part number level identifying flexibility and liability parameters based on the customer forecast. This should include a freshness or aging clause that defines how no longer needed components are handled when the suppliers delivered them to the VMI/SMI hub based on the customers’ forecast but they became obsolete due to a change in demand

- Where applicable, the supplier is the importer of record into the country of intended consumption by customer, with ownership transferring upon receipt to customer

The basic processes involved in executing a VMI/SMI program are

- An ongoing forecast-commit process: a forecast from the customer by part number, with a closed-loop commit in return from the supplier

- An agreed, continuously adjusted minimum/maximum inventory level, typically calculated dynamically based on the rolling forecast

- The allocation and delivery of the inventory to the VMI/SMI hub by the suppliers, in accordance with the forecasted requirement

- An ongoing customer pull of inventory based on actual demand which automatically triggers the invoice and payment cycle

The successful ongoing operation of the VMI/SMI process, particularly for complex supply chains, requires the following technical infrastructure:

- A single, comprehensive shared system of record which stores and manages all transactions and data across the entire process between customers, suppliers and 3PLs. This system of record provides clarity and allows each participant in the process—customer, supplier, logistics providers, regional carriers, and freight forwarders—to collaborate on their part of the process. A key ingredient for success is having one cohesive and complete view of the relevant data to avoid disputes and decision bottlenecks
• In some cases the customer’s customers (sell-side) are also integrated into the solution to more accurately assess demand and further automate the demand-supply synchronization

• **Real-time visibility across all participants** in the supply chain to inventory levels at all locations, and material movements to and from these locations. Identifying potential inventory problems, late shipments, and demand-supply disconnects before there is a stock out or excess inventory at a VMI/SMI hub, allowing these exceptions to be prioritized and resolved before they become major issues. Furthermore, the solution should reduce supply chain errors by putting automated control points in the VMI/SMI consumption and replenishment process

• **Automation of most process steps** so that only exceptions require human intervention

• **An effective set of metrics and dashboards** which allow each participant in the VMI/SMI program to benchmark and optimize its contribution

Seagate’s VMI/SMI Solution Road Map

The Context
Seagate manufactures its own technology (e.g., wafers) only where it gains competitive advantage. Commoditized components and assemblies are manufactured by its suppliers. Also outsourced is VMI/SMI hub management using 3PLs. The company uses hundreds of suppliers and maintains 100+ VMI/SMI hubs for its customers.

The Problem
Seagate’s customers have large and broad product lines with rapidly evolving features and often short life cycles. New products are being launched every week while older products are being continuously phased out. New marketing programs and promotions are launched frequently with sometimes unpredictable success.

As a result, Seagate’s customer demand changes quickly with little advance notice. Customer expectations for prompt and correct delivery however remain very high. In a traditional "build-to-forecast" supply chain this volatility of demand leads to:

• Excess inventory
• Excess logistics costs associated with moving inventory in the pipeline
• High process costs
• High facilities and related asset costs
To solve this problem Seagate shifted to a demand-driven strategy and implemented a highly effective VMI/SMI program.

The Solution
The transition to a demand-driven strategy and the implementation of its VMI/SMI program happened gradually without disruption. At each stage substantial, measurable financial benefits were realized:

- Evolution of supply chain planning and execution from “build-to-forecast” to “auto replenishment”
- Consolidation of 3PLs
- Adoption of VMI/SMI practices
- Automation of manual process steps with management by exception

By implementing this approach, Seagate achieved several business benefits, including

- Large one-time inventory take down
- Large ongoing reduction of both cycle and safety inventory
- Reduction of critical parts shortages
- Supported growth in unit volume from four to 25 million drives while reducing supply chain and procurement head count by 50 percent

Seagate’s VMI/SMI Program
Seagate evolved to a demand-driven strategy by moving to a pull-based model, building and shipping product based on actual customer demand.

The following figure shows the information and material flow.

The first arrow on the right in the diagram shows the customer sending a signal to pull a part from the VMI/SMI hub (“JIT Hub”) that Seagate operates on behalf of its customers. If finished goods inventory drops too low in the JIT hub, a signal is sent to Seagate’s plants, which send a signal to the VMI/SMI hub for components (“3PL VMI Hub”), which in turn sends a signal to Seagate’s suppliers. Material is then shipped to the 3PL VMI/SMI hubs and on to Seagate’s plants, which builds the
finished good product for shipping to the customer-facing JIT hub. As a result of its real-time exchange of actual pull information, Seagate can now build to actual pulls while planning to forecast. Building to actual demand gives Seagate greater manufacturing flexibility and reduces inventory.

Seagate's VMI/SMI Business Case

Internal process improvements were key to Seagate’s business case. Seagate previously had a 30-day replenishment cycle that involved manually entering customer pulls into the ERP system on a weekly basis. This was followed by an inventory evaluation and a manual planning system, followed by master schedule updates which were sent to the factories where executives would need to meet, analyze and issue response to these updates. The factory commits to the updates were then updated in the master schedule, and a new 13-week commit schedule was issued. The factory would then build the product, pack and ship, and send it to the hub.

Process redesign and automation has enabled Seagate to cut this 30-day process in less than half. Manual steps have been eliminated, such as keying purchase orders and gathering supply chain teams across regions to review, analyze and discuss forecast updates.

Entering pull signals into the ERP system alone was not only time consuming but very expensive as each JIT hub pull signal required a duplicate sales order and invoice be manually generated in its ERP system. Seagate employed an entire group of full time clerks to enter more than 20,000 pull signals transaction orders per week into the ERP system.

In addition, Seagate spent a great deal of time “chasing after paper”—in case of changes or disputes. Automation has enabled Seagate to cut manual change order processing and the associated labor costs to less than half.

Conclusion

Seagate’s implementation of a demand-driven supply network delivered outstanding results, including

- Grew volume from four to 25 million units per quarter, while head count for inbound supply chain processing was cut by 50 percent
- Increased inventory turns from 8 to 16
- Eliminated critical part shortages
- Improved customer satisfaction

To accurately estimate VMI/SMI cost savings, the following factors much be considered:
- Fill rate
- Average lead time
- Lead time variability
- Average unit revenue
- Average demand
- Demand variability
- Planning cycle frequency
- Average logistics costs
- Warehouse costs
This was only possible by moving Seagate, its suppliers and customers to a demand-driven strategy based on a pull model and by implementing an effective VMI/SMI program supported by process automation across the entire end-to-end supply chain. In effect, Seagate, its suppliers and customers replaced large inventory pools with information. Their teams are now focused on managing exceptions and continuously improving the process instead of performing manual tasks.

About E2open

E2open is the leading provider of software and services to manage inter-company processes such as inventory management, order management, demand/supply forecast synchronization, outsourced manufacturing visibility and multi-tier visibility—integrating trading partners across multiple tiers of distributed global supply and demand networks. For more information, call 1.650.645.6500 or visit www.e2open.com.