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"Our company participated in a Mafia Offer Boot Camp in late November 2006. With the ideas and guidance we received from the Boot Camp we have achieved three highly important outcomes.

We transformed our historical 60%, on time record to 100% on time, in about six weeks. We have now been 100% on time for the last four weeks. We found ....hidden production capacity and also increased our profitability. We will start bringing our Mafia Offer to market this week.

We have never had these kinds of dramatic results, or results so fast with any other thing we have tried, and we have tried everything.

This is one program that delivers what they claim."

Richard Pettibone  
Drewco Corporation - Designer and Builder of special workholding devices.



BY JAMEY MILLER, CPIM, CIRM, CSCP, C.P.M., PMP

# Shared Success

*Working together to find the value of VMI*

**W**hen supply chain professionals discuss vendor-managed inventory (VMI), they often quote the benefits as they relate to their own companies. Although these advantages are valid and provide great value to a company, VMI's true significance can be overlooked with such a narrow focus. The real benefits of VMI relate to driving a lean supply chain centered on creating an end-to-end pull system, which is based on end user demand cascading through the chain.

The benefits of VMI can be grouped into three general categories: cost, delivery, and quality.

A VMI relationship offers cost benefits because the vendor holds inventory on site or near the customer, giving the customer near-instant access and the ability to pull inventory as needed and only pay for that which is consumed. This reduces inventory investment and increases inventory turns.

In most VMI arrangements, the vendor is responsible for replenishing stock, which includes ordering the inventory and the logistics and freight to ship the material, as well as stocking

and counting the inventory. By passing on these expenses to the vendor, the customer can reduce overall cost and increase product margin.

Although many people consider inventory to be bad, VMI often is a valuable asset because it separates demand fluctuations and forecast inaccuracies among upstream and downstream supply chain partners. Through this decoupling, it removes the need for each supply chain node to buffer its inventory position, thus reducing the overall amount of inventory and the associated costs of maintaining the inventory.

VMI also enables the customer to pull inventory in the quantities needed to meet customer demand, and, as a result, eliminate minimum-order quantities. The vendor may replenish the VMI inventory based on prespecified minimum-order quantities internal to its company; however, because the inventory liability largely resides with the vendor, it has more of an incentive to eliminate requirements that push unneeded inventory and cost into the supply chain.

Delivery efficiency is also improved

with VMI. By having the inventory on site or near the customer, the customer can pull product quickly and efficiently, based on its production needs, and effectively reduce the lead time to almost nothing.

VMI also helps compensate for the lack of system integration among supply chain partners by enabling inventory to reside within the vendor's enterprise resources planning (ERP) system until pulled by the customer. By keeping inventory in the ERP system, it provides more accurate input into the material requirements planning process, as well as a clearer demand history, which can be diluted by minimum-order quantities and other planning variables. This enables the vendor to more accurately predict customer demand and improve delivery performance.

In addition, because inventory is at or near the customer, VMI offers a more reliable mechanism for delivery compared to traditional ordering approaches, such as discrete purchase orders. By providing such a reliable delivery mechanism, VMI removes variability from the delivery process,

making it possible for the customer to improve the delivery of its product to the customer.

For example, assume a business has a product that contains 200 components, and each of those components must be physically in hand in order to start production. If each of the 200 components has an on-time delivery performance of 99 percent, the overall product delivery performance would be only 13.4 percent (.99<sup>200</sup>). In order to achieve a product on-time delivery performance of 98 percent or greater, the delivery performance at the component level must be 99.99 percent (.9999<sup>200</sup>). The only way to achieve this type of delivery performance is through the use of VMI.

VMI also enhances process quality because, as previously mentioned, VMI facilitates a pull-based approach that helps prevent excess inventory from being pushed into the supply chain. Reducing inventory levels within the supply chain drives both the customer and vendor to more quickly identify quality issues in the material or product because users are accessing inventory in close to real time. In addition, there is no excess inventory in the channel to enable production to continue, which traditionally helps mask quality issues.

In addition, VMI promotes a quality-conscious culture because inventory resides on the vendor's books until pulled by the customer. Whether one likes to admit it or not, a vendor will be more responsive in addressing and resolving a quality issue if the inventory is on its books.

#### **VMI implementation**

Although VMI seems somewhat simplistic in nature, there are a few critical steps that must be taken to ensure success for both vendor and customer. First, the vendor and the customer need to negotiate terms and conditions of the replenishment methodology and target inventory levels. One of the best approaches to manage this replenishment methodology is to set a dynamic minimum (lower control limit) and maximum (upper control limit) that fluctuates throughout the quarter.

The minimum threshold can be calculated by taking the average of a rolling four weeks of forecast and multiplying it by the target number of weeks of inventory that is agreed upon by the vendor and customer. This makes it possible for the VMI to increase during peak time periods and decrease during lulls.

The vendor also must review the updated forecast from the customer on a biweekly or monthly basis and adjust the minimum and maximum levels accordingly. VMI does not eliminate the need for a forecast, as it is still required to provide guidance to the vendor on the amount of raw material to purchase and to determine minimum and maximum stocking levels.

In addition, the vendor should review inventory on a daily basis through physical or systemic processes in order to maintain inventory levels within the minimum and maximum thresholds. Because the vendor owns the replenishment and stocking process, it needs to account for not only the manufacturing lead time, but also the logistics lead time. This enables the firm to deliver the product to the specified VMI stocking location.

The last process step is to ensure metrics are in place to measure vendor performance. The customer should have visibility to the inventory positions within VMI in order to ensure the vendor is meeting delivery expectations. In more advanced applications, the customer can receive e-mail or other notifications for items that drop below the minimum threshold.

#### **Potential obstacles**

With any supply chain strategy, benefits are counterbalanced with possible drawbacks—and VMI is no exception. When implementing a VMI process, both the customer and vendor need

to clearly understand and document that inventory is owned and managed by the vendor; however, the customer cannot expect the vendor to maintain this inventory on its balance sheet indefinitely. Therefore, clauses must be added that address aging inventory

and the point in time when the customer would be required to buy the inventory, whether there is demand or not.

In addition, a customer using VMI should never exhaust all on-hand inventories, so there will be inventory that rolls over from one month to the next. It is important that the vendor and customer clearly define how price increases and

decreases are handled for on-hand inventory.

Because the customer is relinquishing control of inventory-management responsibilities, the vendor also must be accountable for guaranteeing inventory is used on a first-in first-out (FIFO) basis. If FIFO is not stringently adhered to, the risk of inventory obsolescence increases due to engineering change orders or other such product variations.

Lastly, in the case of inventory being physically stored on site with the customer, insurance liability needs to be defined in the event of a disaster.

#### **A VMI application**

Operating as a vendor to a VMI solution, one company manufactured product in Mexico and then shipped it across the boarder to Texas. There, finished goods were managed by a third-party logistics provider. Initially, the inventory was "pushed" into the warehouse based solely on static values derived from forecasted requirements and adjusted on a quarterly basis. Replenishment demand signals were generated for any parts that dropped below the minimum thresholds in the VMI and were communicated to the

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contract manufacturer in the form of discrete purchase orders (POs) on a daily basis. At any given time, there could be multiple POs open against the same part for different quantities. Weekly meetings were held with the contract manufacturer to prioritize all outstanding purchase orders, which, in turn, were used to set the manufacturing schedule.

This VMI and replenishment approach resulted in numerous problems, such as

- the wrong product mix
- excessive discrete PO maintenance, which caused confusion and churn in the manufacturing schedule
- component part shortages due to excess product being pushed into the VMI
- a low on-time-delivery average of about 85 percent.

In order to remedy these issues and take full advantage of the true value of VMI, stakeholders implemented the following four steps. First, the VMI

replenishment methodology was modified to account for the 20 percent, 30 percent, and 50 percent split by month within a quarter. This was accomplished by taking a rolling four-week average of the forecast and multiplying it by two weeks, which was the target inventory level needed to maintain in VMI inventory for the supply base. Through this approach, minimum inventory levels increased and a more level load in the factory was achieved.

The second step involved revamping the way requirements were communicated to the contract manufacturer. There were too many discrete purchase orders to manage, and they caused more confusion than the value they were adding. Thus, blanket POs were established for each product configuration based on the quarterly forecast. This enabled the contract manufacturer to ship product in a more efficient manner. In addition, the system for communicating build requirements was augmented through the use of a

customer order-position report, which prioritized build requirements.

Performance metrics were put in place to measure the success of the new approach. In this example, the percentage of on-time delivery out of the VMI location exceeded 95 percent.

Most importantly, firm leaders recognized the importance of cross-functional support when developing, documenting, and implementing a VMI relationship. Even though the process is mainly led by supply chain professionals, other departments—such as sales and engineering—are critical in assuring success. ■

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