



VMI Takes the Guesswork Out of Replenishment

Understanding the mechanics of Vendor Managed Inventory.

In today's business environment, everyone is looking for ways to improve efficiency and "do more with less." With this in mind, processes such as vendor managed inventory, or VMI, are becoming more valuable. While the term VMI is used quite a bit, the mechanics and details are not always well understood.

What is VMI? At its core, VMI is simply a partnership between a customer and supplier in which the supplier assumes responsibility for maintaining the customer's inventory levels in warehouses or stocking locations. At a deeper level, VMI is driven by electronically transmitted data and transactions between the customer's and the vendor's business systems. In order to provide the supplier with the information necessary to replenish the item, the customer regularly sends item activity information. This information, paired with pre-established triggers, is used by the supplier to calculate when stock should be replenished.

VMI relies on efficient communications between customer and supplier, mostly facilitated by business-to-business e-commerce technologies such as electronic data interchange or EDI. On a regular basis, typically daily, the customer's business system communicates inventory levels to the vendor's VMI system. The vendor's VMI system uses this data and the pre-determined triggers to determine when replenishment orders should be created and what quantity the orders should contain. Once the order is created, it is automatically communicated from the vendor's VMI system to the customer's business system. As

the order is processed and shipped, the shipment information is transmitted from the vendor's system to the customer's system. This gives the customer precise information about the expected shipments, enabling the creation of in-transit tags to speed up the receiving process.

Beyond these core VMI transactions, additional information is often useful. For example, certificates of test reports are often sent by the vendor's system and automatically absorbed by the customer's business system. Meanwhile, the customer may benefit from electronically transmitting purchase order change data, receipt reports, and so on.

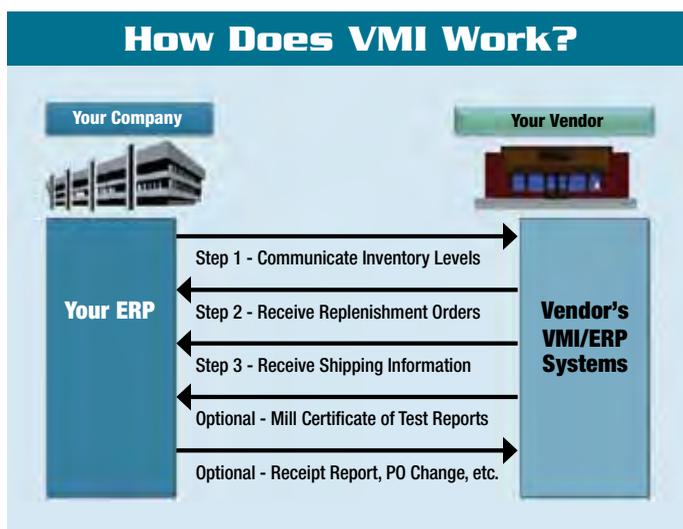
The Mechanics of VMI

There are some basic variables—some calculated and some assigned by the trading partners—that flow into the equations driving a VMI system.

Typically the customer will determine the minimum inventory requirement and maximum inventory requirement for each item that will be managed via VMI. These values will be stored in the vendor's VMI system and used to determine order quantities. The vendor will determine the lead time,

typically in days, required to get a shipment from the mill to the customer's warehouse. This will be stored in the VMI system and will help determine the timing of orders.

The customer's business system will communicate regularly, typically daily, with the vendor's VMI system to update information about inventory usage. Common information required includes:



- Item forecast—typically a month’s usage.
- Previous day’s sales—this is an optional value that could be used depending on the volume and frequency of sales for the item in question.
- Available on-hand inventory for the item.
- Total quantity on order for the item.

These values are used by the vendor’s VMI system to drive ordering activity based on the following series of formulas:

- **Forecast Over Lead Time**—This formula converts the customer’s monthly forecast into a daily usage rate. This daily rate is used to calculate how much will be consumed during the lead time.

$$\text{Daily Forecast} = \text{Monthly Item Forecast} / \text{Number of Days in Month}$$

$$\text{Forecast Over Lead Time} = \text{Daily Forecast} \times \text{Lead-time}$$

- **Reorder Point Quantity (ROP)**—This formula is used to determine when a replenishment order should be generated. In other words, when quantities reach this level, it is time to reorder.

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$$\text{ROP} = \text{Minimum Inventory Quantity} + \text{Forecast Over Lead Time}$$

- **Average Order Quantity (AOQ)**—This formula is the amount that should be ordered based on the min, max and bundle sizes. This is the quantity used on the replenishment order. AOQ should be rounded to the nearest bundle size for the item.

$$\text{AOQ} = \text{Maximum Inventory Quantity} - \text{Minimum Inventory Quantity}$$

- **Available Inventory (AI)**—This formula is the amount of inventory that is either on hand or on order. AI is com-
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