White Paper: Vendor Managed Inventory

Contents

2 Executive Summary
2 VMI: The Quick and Dirty
5 How Do I Know if I Need VMI?
5 VMI Checklist: What Does It Take to be Successful?
7 Execution, Execution, Execution!
10 Hallmarks of a Successful VMI Program
11 Summary and Conclusion
Executive Summary

Expansion and globalization of supply chain operations—and the risks and pressures created by the global economic downturn—have driven renewed interest in vendor managed inventory (VMI) programs.

Vendor managed inventory programs aim to reduce a company’s inventory holding costs by keeping inventory on the supplier’s books until it is needed for production or sale. VMI programs can also be used to address these three common supply chain-related problems:
1. Lost sales due to parts shortages or poor on-time delivery performance by a supplier
2. Excess and obsolete inventory provisions exceeding 0.3% of materials spend
3. Inventory turns of less than 10 for key parts

The foundation of a successful VMI program is automated connectivity with the trading partners in your extended supply network. This connectivity is critical for enabling partner collaboration and for providing the visibility needed to monitor VMI program operations and results.

In order to set up—and maintain—an effective VMI program, companies should invest in a supply chain solution that offers visibility, collaboration, and control across all relevant trading partners. This solution checklist needs to be complemented with a second critical component: a streamlined supplier onboarding program, perhaps the most significant area of unplanned risk for companies implementing VMI. By failing to account for the significant costs/efforts associated with supplier onboarding, many OEMs run out of budget and resources before a working process is in place.

For this reason, companies should consider the many advantages of an on-demand (or SaaS) software model as opposed to more traditional on-premise solutions. On-demand providers typically have extensive experience enabling B2B connectivity with suppliers and are able to provide the relevant training and technologies needed to get them up and running quickly. As a result, the overall solution is less expensive to implement and maintain for both companies and their partners.

VMI: The Quick and Dirty

Vendor managed inventory (VMI) is a demand-driven replenishment model that originated in retail but is now used across industry verticals. VMI aims to reduce a company’s inventory holding costs (i.e., working capital requirements) by keeping inventory on the supplier’s books until it is needed; the advantage for
suppliers is access to more direct and timely demand signals, enabling them to lower their own inventory costs.

VMI is identical in all but name to supplier managed inventory (SMI) and is fundamentally a process and supporting technology platform to connect trading partners in order to carry out inventory management processes. VMI differs from vendor managed replenishment (VMR) in the ownership of inventory: the vendor (supplier) owns the inventory under VMI/SMI, while the customer owns the inventory under VMR.

In each of these cases—VMI, SMI, VMR—vendors or suppliers are responsible for replenishing inventory to agreed-upon min-max values. Although initial inventory allocations are made on the basis of forecasts, it is actual customer demand that triggers replenishment.

There are three major “flavors” of VMI, each of which varies according to the location of the inventory.

1. VMI at Third-Party Hubs
In many cases, inventory is under the physical control of a third-party logistics provider (3PL), and is stored at their hub. When the inventory is needed, a pull signal is sent to the the 3PL, which is then responsible for delivering the needed goods to the buying enterprise. Finally, a receipt is sent to the supplier so that inventory levels are replenished at the 3PL hub in response to actual demand.

![Figure 1. Vendor managed inventory at third-party logistics provider hub.](image-url)
2. VMI at Buyer Locations
Alternatively, inventory can be held at the buying enterprise’s location—where it is owned by the supplier until it is pulled. Here again, inventory is pulled as needed and is replenished by the supplier on the basis of real demand signals.

3. VMI at “Virtual” Hubs
A third alternative is for suppliers to hold stock at their own locations, creating “virtual” VMI hubs. In this case, suppliers respond to pull signals directly from their own unallocated inventory.
In each of these cases, buying enterprises benefit from lower inventory carrying costs, while suppliers are able to provide improved customer service levels based on more direct demand information. Instead of relying on projections made several tiers away from the final customer, the VMI program feeds suppliers unfiltered demand signals to more cost-effectively manage inventory levels.

How Do I Know If I Need VMI?

VMI programs are implemented in order to reduce inventory costs and increase customer service levels. The most significant drivers of the current resurgence in VMI are the increased globalization of supply chain operations and the risks and pressures created by the recent global economic downturn.

In more specific terms, VMI programs can provide significant value (in the form of lower costs and improved service levels) to companies experiencing one or more of the following supply chain-related challenges:

1. Lost sales due to parts shortages or poor on-time delivery performance by a supplier
2. Excess and obsolete inventory provisions exceeding 0.3% of materials spend
3. Inventory turns of less than 10 on key parts

VMI Checklist: What Does It Take to be Successful?

AMR Research identifies five major elements of a comprehensive VMI program:

1. Visibility and connectivity
2. Demand planning
3. Inventory planning
4. Replenishment planning
5. Performance measurement and analytics

Visibility and Connectivity

The foundation of a successful VMI program is automated connectivity with your trading partners. This connectivity provides visibility across all external parties and inventories, enabling your company to measure partner performance and monitor the operations and results of your VMI program. Multi-enterprise connectivity also facilitates collaboration with partners and the sharing of critical information around inventory levels, purchase orders, forecasts, order status, and demand changes. Key capabilities needed to support multi-enterprise connectivity include:

- Rapid partner onboarding capabilities
- Multiple data protocol options (e.g., EDI, XML, .xls, .csv) to support a wide range of partner technologies and sophistication levels
- Integration of your connectivity solution with multiple backend systems (yours and your partners')
Data cleansing and harmonization, including communication of metadata to align business processes across partners

Given that timely, accurate information exchange lays the foundation for any successful VMI program, traditional manual efforts (phone, email, fax) are off the table. In their place is cloud-based connectivity and data exchange (EDI, Web portals)—making information sharing and operations management fast, seamless, and reliable. Furthermore, the same connections and data flows that make real-time visibility possible simultaneously provide the means to respond to disruptions as they occur in the extended supply chain—and before negative effects are felt downstream. Put differently, cloud-based connectivity can offer both the “nerves” to sense changes, and the “muscles” to respond as part of the same system.

Demand, Inventory, and Replenishment Planning
Demand, inventory, and replenishment planning processes are not unique to VMI programs, as each of these functions needs to be performed regardless of who owns the inventory or where it is housed. Indeed, while implementing a VMI program adds a collaborative element to the inventory and replenishment planning processes, these processes are not radically different from those run by companies with less sophisticated inventory management programs. Nevertheless, the collaborative nature of VMI requires that extra care be taken to communicate operational guidelines and requirements across all relevant external partners. Aligning all organizations across mutual planning goals—and ensuring that all participants understand and commit to their various roles—is one of the greatest challenges companies face when implementing a VMI program. Careful change management efforts are often necessary at both the customer and supplier organizations to ensure that new processes are adopted seamlessly.

Performance Measurement and Analytics
Effective performance measurement and analytics are essential to both the current success of a VMI program and to underpinning a continuous improvement process. Performance management and analytics efforts require agreement among all participants on relevant measures, as well as systems capable of capturing and presenting the necessary data. While the specific KPIs will vary from case to case, they may include measurements such as shipment accuracy and timeliness, inventory levels, and costs.
Execution, Execution, Execution!

The Importance of Collaboration

Forecast collaboration should be a top priority for companies thinking about implementing a VMI program. Forecast collaboration is both an important part of demand planning, as well as an effective means of introducing the organizational changes needed to get your VMI program up and running quickly.

When suppliers do not have ongoing visibility into customer demand forecasts, they manage inventory based on agreed-upon safety stock and min-max inventory levels, historic purchase patterns, or simply the ability to fulfill a PO once it arrives. In order to accommodate changing demand patterns and meet service levels, suppliers often increase their own finished goods inventory, which means additional finished goods locations and higher overall inventory costs. Ultimately, these costs are passed on to the customer in the form of higher prices.

Forecast collaboration allows companies to improve the efficiency of their current inventory management programs, and also puts them in a good position to set up a more sophisticated VMI program:

- By providing suppliers with real-time visibility into the demand forecast, companies are able to more effectively schedule operations and plan capacity usage in order to meet current requirements. This means lower costs across the board—with fewer manufacturing changeovers, an increased percentage of low-cost, full truckload shipments, and the ability to replenish based on minimum economic order quantity.

- By gaining visibility into upcoming sales promotions, suppliers are able to make and ship additional quantities during predefined promotional periods—minimizing last-minute rush shipments and reducing the risk of stockouts. Visibility into promotions also allows suppliers to register (promotion-based) increases in demand as “one-off events,” preventing distortion in average demand calculations, which often leads to unwarranted increases in safety stock.

- By gaining visibility into demand forecasts, suppliers are able to coordinate replenishment orders and deliveries across multiple customers in order to improve service. For example, a non-critical part delivery can be diverted for a day or two to another customer who needs a critical delivery without putting the first customer at risk. Similarly, a smaller-than-usual
replenishment to the first customer may enable a larger-than-usual shipment to another customer in dire need, without disrupting service levels. By being able to balance the needs of various customers, suppliers are able to improve the network’s overall performance without jeopardizing the service levels of any particular OEM or customer. Without demand forecast visibility, suppliers don’t have the timely, accurate information necessary to prioritize customer shipments effectively.

**Avoiding Potential Pitfalls**

Financial exposure from excess inventory is one of the hidden (and potentially costly) issues facing OEMs, contract manufacturing service (CMS) providers, and suppliers. As companies implement programs like VMI, they delay taking ownership of their inventory, and as a result carry less inventory on their books. However, while they are carrying lower inventory on their balance sheets, they are not necessarily facing lower inventory liability risk.

When OEMs implement a VMI program, they don’t carry the inventory on their books or incur any payments until the inventory is pulled from the buffer managed by their supplier. However, the OEM still takes on inventory risk when it communicates its demand forecast (a VMI input), so long as the CMS provider uses that forecast for procuring additional components within contractual guidelines. The forecast is viewed by the CMS provider as a trigger to commit supply in the future. In exchange for this implied commitment, the OEM typically agrees to liability for excess inventory resulting from procurement practices aligned with its forecasting practices. In other words, giving a supplier a VMI forecast within the liability window is essentially the same as sending the supplier a PO that covers requirements for that same time period. How does a company put the necessary controls in place to reduce this financial exposure?

“Freshness” is one way that companies attempt to control the risks associated with inventory liability. Freshness is the amount of time that the supplier inventory (built in support of the minimum inventory levels) remains under title of the supplier before the customer takes ownership. As a result, freshness parameters can be used to put an end date on when an outstanding liability needs to be either resolved or pulled by the customer. VMI contracts should define freshness as clearly as possible in order to reduce fuzziness around who will be kept holding the bag when the music stops. By creating dashboards that provide visibility into the value of expired freshness, a company maintains continued visibility into its liability.

One way to reduce potential liability, then, is to identify the process and technology improvements needed to maintain visibility into inventory freshness.
With VMI programs, the buyer-planner role becomes integrated, requiring buyers to get used to the “fuzzier” areas of planning. Investing in training around liability and freshness is one way to enable buyer-planners to make intelligent decisions to lower inventory liability. Another key investment area is around technologies that enable the buyer-planner to collaborate with suppliers, and to provide them with clear visibility into consumption, forecast, and inventory positions. Other initiatives such as planned ramp-down and a reduction in the number of engineering change orders (ECOs) can also play a role in reducing inventory exposure.

Supporting Technology Infrastructure
In order to set up—and maintain—an effective VMI program, companies should invest in a supply chain solution that offers visibility, collaboration, and control across all relevant trading partners. An ideal solution will:

- Enable near real-time inventory visibility across sites, hubs, suppliers, and in-transit inventories
- Calculate projected inventory positions and potential demand-supply imbalances—and communicate them to OEMs and suppliers
- Enable OEMs to share forecasts with suppliers, and to receive near real-time responses
- Enable exception-based configurable alerts, so that all stakeholders are notified of potential issues and projected inventory violations
- Provide audit trails for visibility into transaction history for liability management and dispute resolution
- Provide B2B integration options that allow you to integrate with 100 percent of your supply base—from sophisticated MNCs to mom-and-pop shops
- Provide a rich set of reports and decision analytics that give a 360-degree view of the entire inventory management process—to ensure that suppliers are replenishing inventories at required levels to meet fluctuating demand.

Key reports include:

- **Execution versus plan reports**, which track how well actual pulls compare with forecasts
- **Trend reports**, which track inventory trends and calculate how closely they stay within defined min-max levels
- **Waterfall reports**, which show a clear record of forecast transactions and inventory positions, as well as identify liability with alerts for impending freshness
- **Performance metrics**, which track key metrics necessary for effective inventory management, including inventory turns, aging, and valuation

This software checklist needs to be complemented with a second critical component: a streamlined supplier onboarding program, which is perhaps the most significant area of unplanned risk for companies implementing VMI.
By failing to account for the significant costs/efforts associated with supplier onboarding, many companies run out of budget and resources before a working process is in place.

For this reason, companies should consider the many advantages of an on-demand (or SaaS) software model as opposed to more traditional on-premise solutions. On-demand providers typically have extensive experience enabling B2B connectivity with suppliers, and are able to provide the relevant training and technologies needed to get them up and running quickly. As a result, the overall solution is less expensive to implement and maintain for both companies and their partners. Finally, on-demand solutions allow your organization to shift focus to inter-company collaboration (a cornerstone of effective VMI)—and away from procuring, installing, and maintaining hardware and software systems internally.

Hallmarks of a Successful VMI Program

Effective VMI programs have a number of common attributes:

Commitment
The hallmark of every successful VMI program is the commitment of senior management at both the customer and supplier organizations. OEMs and suppliers alike need to understand the business value of a VMI program, and should consider it a key component of their overall strategy to enable a demand-driven supply chain. Both sides should also have clearly defined program owners, including personnel in an operational role responsible for the daily execution.

Supplier Agreement
Suppliers and customers should define a VMI contract at the part-number level that clearly defines expectations, service levels, and risks. Information spelled out in the contract should include:

- Current manufacturing lead time (in weeks), and standard minimum order quantity
- Number of weeks of forecast demand used for planning replenishment levels
- Minimum inventory levels required by the customer (typically shown in Days of Supply)
- Delivery response time requirements (in hours)
- Upside percentage, availability period, and upside replenishment lead time
- Total liability window (i.e., the number of weeks for which the customer is liable for forecast, not to exceed standard PO cancellation terms)
- Freshness (i.e., the agreed upon amount of time for which inventory remains under the title of the supplier)
Forecast and Response
The customer should agree to provide electronic forecasts to its suppliers, and the suppliers in turn must agree to respond (positively or negatively) within a stipulated time period. This is critical in order to enable timely customer visibility and action.

Waterfall Chart
The waterfall chart is an important tool to show a clear record of transactions and inventory positions, as well as to identify the customer’s liability based on the supplier agreement and validation of supplier liability claims (based on freshness parameters).

Integration with Backend Systems
Forecast responses and inventory levels from suppliers/3PLs should be integrated into backend ERP systems so that they become a part of standard business reports, including site shortage reports. ERP integration also enables the release mechanism to be directly linked to actual demand, including work order releases and changes in inventory levels.

Clear Framework Defined
In addition to the contractual terms, the objectives of the VMI relationship should be clearly defined, along with any financial and non-financial incentives. The framework should be clearly communicated at all levels of both organizations in order to facilitate streamlined execution.

Summary and Conclusion
VMI programs can be an effective response to the pressures put on companies by the expansion and globalization of supply chain operations—not to mention the recent record-setting economic depression. And the benefits extend well beyond the brand owner—offering suppliers better demand signals, higher customer service levels, and lower costs through automation.

Third-party technology solutions are often necessary for successful implementation of VMI programs, and need to provide real-time visibility and collaboration across all relevant suppliers and customers. A streamlined partner onboarding process is critical as well, and tends to be an area of significant unplanned risk for companies leveraging on-premise supply chain solutions. On-demand solutions offer many advantages in this regard, bringing with them extensive B2B connectivity experience as well as the training and technologies needed to get your partners up and running quickly.
Successful VMI programs share a number of key attributes: the commitment of senior management—at the brand owner, customer, and supplier organizations; well-defined agreements on expectations, service levels, and risks; and tight integration with backend systems. With these elements in place, cogent operational and change management practices can take you over the finish line. In today’s Internet-paced and volatile marketplace, the question is not whether you can afford to implement a sophisticated VMI program—but whether you can afford not to.

About E2open
E2open is a leading provider of cloud-based supply chain management solutions. The company provides software and services that enable visibility, collaboration, and control across large trading partner networks. E2open customers include Cisco, Dell, Hitachi, IBM, LSI Corporation, Motorola, Panasonic, Research In Motion, Seagate Technology, and Vodafone. Headquartered in Foster City, California with operations worldwide, E2open is recognized by Gartner Research as a leader among SaaS integration service providers. For more information, call 1.650.645.6500 or visit www.e2open.com.