

Vendor managed inventory and its impact business essay



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Vendor Managed Inventory is receiving considerable attention of late. It represents a powerful tool to remove cost from the supply chain. It is a streamlined approach to inventory and order fulfillment and is a system in which a vendor continuously and automatically replenishes a trading partner's inventory. True VMI occurs between a buyer and a supplier, with Electronic Data Interchange (EDI) being the crucial link between the two companies. Trust is a critical ingredient in a successful VMI alliance. VMI also entails a stocking strategy, whereby manufacturers use their systems to predict and replenish the buyer's warehouse. VMI has produced remarkable results, tangible as well as intangible and enables a company to reduce their customer's inventory levels and reduce customer stockouts. Some buyers may be apprehensive about letting their vendors control their inventory, worrying that this might lead to an oversupply from their vendors. However many authors have allayed this fear by reiterating that VMI eliminates repetitive buyer purchasing activities, eliminates human errors, reduces shipping costs, improves service levels, results in shorter lead times, leads to reduced inventory investments and so on. Distributors and retailers are gaining remarkable efficiencies of scale by reducing errors, costs and backorders while simultaneously increasing customer satisfaction. Thus VMI is almost a win-win situation though there are some pitfalls. Perhaps the single most important benefit of engaging in a strategic VMI alliance could be the chance for cultivating a strong and lasting relationship between the supplier and the buyer, which in the long run can reap rich rewards for both. This paper provides an overview of the basic Vendor managed inventory mechanisms currently in vogue using a series of journal and conference articles that attempt to delineate the dynamics of the VMI process.

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Introduction

Swaminathan and Tayur (2003) described Supply Chain Management as:

... the efficient management of the end-to-end process, which starts with the design of the product or service and ends with the time when it has been sold, consumed, and finally, discarded by the consumer.

As rightly stated by Simchi-Levi (2003), by coordinating different enterprises along the logistics network or establishing business partnerships, SCM is concerned with finding the best strategy for the whole supply chain. One important issue of finding the best strategy for the whole supply chain is sharing product and production information amongst supply chain members. It has been recognized that information sharing at the retailer level produces significant benefits for the supply chain by reducing the bullwhip effect and supply chain costs. However, in spite of these advantages, retailers, most of the time, do not desire to engage in information sharing. This is due to the fact that the primary beneficiary from information sharing is the manufacturers, not the retailers.

As per Nachippan et al. (2005), information sharing plays vital roles in inventory management, particularly in VMI (Vendor Managed Inventory) system. VMI is essentially a distribution channel operating system whereby the inventory at distributor/retailer is monitored and managed by the manufacturer/vendor. Information sharing between supply chain members is necessary for implementing VMI and, with VMI, the supplier inventory level, so as to ensure the predetermined customer service level. In such a relationship, the supplier takes the replenishment decisions for the buyer,

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dispatching a quantity of product that may be variable quantity which leads to product availability and improved customer service level without increasing stock outs. An effective VMI can be achieved by integration technology, enabling network application, customizable replenishment logic, and linkage to internal applications. In this relationship, buyers relinquish control of key re-supply decisions and sometimes even transfer financial responsibility for the inventory to the supplier.

In a VMI partnership, the supplier, usually the manufacturer but sometimes a reseller or distributor, makes the main inventory replenishment decisions for the consuming organization. This means that the vendor monitors the buyer's inventory levels (physically or via electronic messaging) and makes periodic resupply decisions regarding order quantities, shipping, and timing. According to Disney & Towill (2003), vendor managed inventory is one practical way of seeking to obtain the benefits of echelon elimination. VMI is a supply chain strategy whereby the vendor or supplier is given the responsibility of managing the customer's stock.

According to Disney et al. (2003), VMI is practical where the supplier has the responsibility to manage the customer's inventory, including the replenishment process. In this sense, VMI can be understood as a new version or as a " evolution" of the old practical of consigned inventory, however now inserted in an environment business with higher level of contribution.

To Nachiappan et al. (2005), VMI is a centralized link between suppliers and customers that enables faster, less complex transactions without creating individual lines of communication for every business relationship.

According to Disney & Towill (2003), VMI is a supply chain strategy where the vendor or supplier is given the responsibility of managing the customer's stock. VMI is a fundamental change in the approach for solving the problem of supply chain coordination. Instead of just putting more pressure on suppliers' performance by requiring ever faster and more accurate deliveries, VMI gives the supplier both responsibility and authority to manage the entire replenishment process.

To Kaipia et al. (2002), vendor managed inventory is a recent alternative for the order delivery process. The fundamental change is that the ordering phase of the process is abolished, and the supplier is given both authority and responsibility to take care of the entire replenishment process. The essence of the VMI is the responsibility of the supplier in become available the necessary material to the customer to be used when and how much it will be necessary.

Implication of Inefficient Information Transmission – Bullwhip Effect

As per Chopra and Meindl (2003), one important mechanism for coordination in a supply chain is the information flows among members of the supply chain. These information flows have a direct impact on the production scheduling, inventory control and delivery plans of individual members in the supply chain. The Bullwhip Effect (BWE) where the orders' variability is

amplified in each echelon of the supply chain: from retailer to distributor, from distributor to manufacturer and from the manufacturer to the suppliers.

To Chatfield (2004), Bullwhip Effect is the amplification of the demand (order) variance up the supply chain, from customer to factory, as demand information passes back through the supply chain. The phenomenon is shown in Figure 1.

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Figure 1. The Bullwhip Effect

Source: Adapted from Lee et al. (1997)

According to Lee et al. (1997), distorted information from one end of a supply chain to the other can lead to tremendous inefficiencies: excessive inventory investment, poor customer service, lost revenues, misguided capacity plans, ineffective transportation, and missed production schedules.

To Lee et al. (1997), the bullwhip effect refers to the phenomenon where orders to the supplier tend to have larger variance than sales to the buyer, and the distortion propagates upstream in an amplified form. Lee et al. (1997) identified four major causes of the bullwhip effect – Demand forecast updating, the rationing gaming, order batching and price variations. Demand forecast updating refers to the situation where demand is non-stationary and one uses past demand information to update forecasts. The rationing gaming refers to the strategic ordering behavior of buyers when supply shortage is anticipated. When fixed order cost is nonzero, ordering in every period would

be uneconomical, and batching of orders would occur. Finally, price variations refer to non-constant purchase prices of the product.

To Chatfield et al. (2004), the bullwhip effect has a number of baneful consequences on the operation of a supply chain. Because of the higher variance, more safety stocks have to be carried with consequently more investment, extra production capacity, and increased storage space.

EDI and its Importance in VMI

As per Stratman S. (1997), EDI, as a technology, refers to the computer-to-computer transmission of business information between trading partners. But, more importantly, EDI as an enabler of business process re-engineering is the driving force for supply chain efficiency.

EDI transaction sets can be easily transmitted using ftp via the Internet. The cost is the same as sending an email across the Internet, but the EDI data is already in a structured format that can facilitate integration into a VMI system. EDI allows the use of functional acknowledgments that allow for tracking the transmission. EDI value added networks can also be setup to forward files the moment they are received, albeit at a greater cost. Thus it is very important to undertake a careful study of physical logistics and the implied costs before implementing VMI. The lower the customer stock, the less the holding cost, but the higher the replenishment cost and the risk of a stock out.

Frazza V.'s (1998) say on EDI is that VMI is establishing the right product at the right time in the right quantity. Virtually every retailer establishes

metrics for measuring VMI performance: “ Inventory turns and service”.
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Other keys to success include the parties sharing a good EDI data transfer program, the manufacturer having a good forecasting and replenishment system, the vendor having people familiar with the retailer and its requirements and the vendor having sufficient inventory.

Though automated today, VMI was once strictly manual. VMI is enabled by information technology and the most prevalent technology in VMI is EDI.

3. 1 Impact of EDI in VMI on Bullwhip effect

A supply chain is a system consisting of material suppliers, production facilities, distribution services, and customers who are all linked together via the downstream feed-forward flow of information (orders). In a traditional supply chain each “ player” is responsible for his own inventory control and production or distribution ordering activities. According to Disney et al. (2003), in a traditional supply chain, each company operates individually, with interactions between them limited to just feed-forward flow of physical products and the feedback flow of information, in the form of orders and cash. As a consequence of the structure, the traditional supply chain suffers from long lead-times, multiple decision points, unclear information and minimal synchronization.

The lack of visibility of end customer demand causes a number of problems. The most evident is the Bullwhip Effect, as shown in Figure 2, due to the structure of the ordering decisions with its lead-time for deliveries. The retailer as a result of forecasting customer demand introduces extra fluctuations into the pattern of demand. The distributor, whose forecast is based on the orders of the retailer, then increases these variations further.

This effect continues up the supply chain, resulting in a significant distortion of the actual customer demand by the time the manufacturer receives the orders.

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Figure 2. The BWE in a traditional supply chain

Source: Adapted from Disney & Towill (2003)

With VMI, the supplier controls the buyer's inventory level, so as to ensure that predetermined customer service levels are maintained. In such a relationship, the supplier takes the replenishment decisions for the buyer, dispatching a quantity of product that may be fixed or variable.

Replenishment occurs when the stock level at the buyer reaches a specified level, based on both the average demand during the transportation lead-time and safety stock to cover for demand variations. Consequently, there is no passing of orders between the two companies. For VMI be successful it is necessary for a large amount of information to be transferred between both parties, particularly data regarding end user sales and inventory levels at the buyer. A simple diagram of a VMI supply chain can be found in Figure 3.

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Fig 2. The BWE in a traditional supply chain

Source: Adapted from Disney & Towill (2003)

Collaborative Planning Forecasting and Replenishment- A brief overview.

Another concept that is closely tied to EDI and VMI is Collaborative Planning Forecasting and Replenishment (CPFR). Collaborative Planning Forecasting and Replenishment is a collection of new business practices leveraging the Internet and existing technologies to radically reduce inventories and expenses while improving customer service. The advances central to this program involve collaboration between retailers, distributors, and suppliers on forecasting data and assumptions driving to a single shared forecast of consumer demand. This forecast becomes the foundation for integrating value added supply activities across the value chain. The collaborative demand planning and integrated supply management is further enabled through custom processes, which leverage the particular strengths of the trading partners. CPFR allows collaborative processes across the supply chain, using a set of process and technology models that are [Ref: www.cpfr.org]

Open, yet allow Secure Communications

Flexible across the industry

Extensible to all Supply Chain processes

Support a broad set of requirements (new data types, interoperability with different DBMSs, etc.)

CPFR uses a combination of non-proprietary vehicles including the Internet to share information and the distributor and the manufacturer share a broader set of information dynamically.

CPFR begins with an agreement between trading partners to develop a collaborative business relationship based on exchanging information to support the synchronization of activities to deliver products in response to market demand. Using CPFR, supply-chain participants can minimize the inventories that buffer interactions between processes and focus on improving the accuracy of plans to support the flow of products in the channel.

By focusing on the flow of supply to consumers, without the clouding effect of inventory, participants can discover previously hidden bottlenecks in the flow (variances in actual from plan) and address them. In turn, taking care of these now-visible inefficiencies can reduce cross-process operational costs. This jointly agreed to plan fundamentally describes what is going to be sold, how it will be merchandised and promoted, in what marketplace, and during what time frame. This plan becomes operational through each company's existing systems, but is accessible by either party via existing communication standards.

One of the key steps in CPFR is a dynamic data sharing, which will enable trading partners to share forecasted demand across partners. CPFR intends to ensure that the industry actually captures the benefits of inter- and intra-enterprise collaboration through a common, pragmatic approach. Rather than create a new standard, it leverages the legacy of existing standards.

Data format for messages in CPFR is ANSI X12 Electronic Data Interchange (EDI) and the Standard Interchange Language (SIL) standard. [Ref: www.cpfr.org]

The Short Term Impact of VMI

As per Dong & Xu (2002), VMI leads to immediate changes in both buyer's and supplier's inventory management, which can be considered as the direct, or short-term, effects of VMI implementation. At the early stage of VMI, sales and purchase quantities are relatively stable due to the market constraints and other contractual or public agreements with other parties. Purchase price, however, can be adjusted relatively quickly as a new VMI contract is negotiated and determined. Arguably, the direct effects of VMI on firm performance such as costs and profits may be the initial incentive and benefits for the firms adopting VMI or the major concerns for some others not to do so. As observed in many examples noted within this paper, many companies seemed to start or refute a VMI program based on its expected direct effects on their companies.

5. 1 The inventory-related cost perspective

For VMI to be considered and accepted by both parties, it has to be able to induce some observable benefits, e. g., help reduce inventory-related costs. VMI's direct benefits to the buyer's side are straightforward and have been documented in practice, while those to the suppliers are more diverse and controversial. Although some other strategic or managerial considerations, such as strengthening competitive advantage, tightening buyer-supplier relationship or partnership or simply surviving, might play a role in the supplier's decision to adopt VMI, the bottom line is whether or not VMI could <https://assignbuster.com/vendor-managed-inventory-and-its-impact-business-essay/>

eventually save costs or generate revenues for the supplier. We will show that, from the perspective of cost savings, VMI allows the companies to cut total inventory related costs and thus provides a strong incentive for both firms to integrate their inventory systems.

Cross (1993) argues that one of the most successful endeavors to cut supply chain costs in an attempt to boost profitability is continuous replenishment planning, also known as VMI in their specific case. This gives a reason to such an argument and illustrates that managing the entire inventory system by one of the parties allows the supply chain to be better synchronized according to both parties' cost characteristics.

As per Gamble (1994), both trading partners are under tremendous pressure to get rid of waste and inefficiency and build better business processes. The reduction of combined inventory-related costs through VMI, however, does not necessarily imply a cost reduction in the supplier's inventory system, although zero inventories can be realized on the buyer side. Rather, since the supplier handles the combined inventory system, the supplier's inventory costs under VMI are likely to increase. There is, however, a possibility that the supplier's inventory-related cost with VMI is less than that without VMI.

5. 2 The purchase price and profit perspective

Speed (1998) states that with the institution of VMI, the buyer and the seller will renegotiate a new transaction price. Intuitively, since the buyer's inventory is merged into the supplier's with VMI, the buyer eliminates its inventory-related cost while the supplier has to pick up this transferred cost. This might require the buyer to compensate the supplier for its possibly

increased inventory cost. However, the integrated inventory system, as a result of VMI, could yield such a low inventory-related cost that this cost is even less than the supplier's previous inventory-related cost without VMI. If this is the case, the supplier might even be willing to accept a cut on the purchase price so that the two companies can institute a VMI program.

However, even though VMI is proved to have the ability to reduce total inventory-related cost, the supplier may not benefit from this cost reduction. The buyer takes the biggest chunk of the cost savings. This limits the supplier's ability to reach its optimal profit level in a longer term. In fact, the long-term relationship is built upon the supplier's adjustment in purchase quantity so that it can maximize its profit given a purchase price. Meanwhile over the long-term, the buyer could also take advantage of the opportunities provided by the lower inventory-related cost to attract more customer demand.

The Long-Term Impact of VMI

VMI when implemented and accepted in the organization for a considerable time span shows its effect in terms of influencing the supplier-buyer relations, the quantities ordered and the profit implications for both the participants.

6. 1 The change of optimal purchase quantity under VMI

As per Gamble (1994), when VMI is implemented over a long period of time, the indirect effects of VMI, such as changes in purchase quantity, will be observed. It has been reported in practice that companies with VMI had expected an increase in sales eventually, which would also bring up

purchase quantity. Annual sales volume and purchase quantity increase because VMI immediately brings about lower inventory cost in the supply chain, which allows the buyer to sell more products at a lower price.

6. 2 The long-term profit changes under VMI

As per the research carried out by Dong and Xu (2002), VMI inventory program brings positive change to the buyer's profit, which is consistent with its short-term motivation. The long-term impact of VMI on the supplier's bottom line is improved from that of the short-run. This stems from the fact that in the long-run VMI provides solid efficiency gain for the buyer which can lower his final market sale price and obtain a higher sales volume. The higher sales volume of the buyer is then relayed to the supplier in the form of a higher purchase volume, accompanying with similar or even higher purchase price. All these help the supplier to improve his operations and profit position relatively to the short-term case.

Cottrill (1997) states that this may explain why the supplier is initially only lukewarm or even suspicious of such program but gradually accepts it due to other strategic considerations, opportunities to reduce other costs and to increase long-term profit.

Distributor-Supplier Partnership Issues

According to Choi & Hartley (1996), the basic function of distribution is to provide a method of getting the manufacturer's product to the dealer in the most efficient manner possible. Efficient product logistics are a must and most distributors go beyond that and offer additional services like post marketing support, sales and credit support etc.

Often the distributor faults the supplier for inconsistent lead times, poor order fill rates and high prices. The vendor on the other hand accuses the distributor of inadequate inventories, poor inventory management and trying to make too much margin on the product.

Distributor-Supplier relationships fail for many reasons. Some of the major reasons are lack of communication and probability of decrease in short-term profitability of the supplier due to implementation of VMI.

Product availability is the most critical success factor for a distributor. Every distributor requires emergency shipments at one time or another. A disorganized, poorly managed distributor undoubtedly will require more emergency shipments than a well-managed distributor. This kind of abusive use of emergency shipments plays havoc with the supplier's inventory management thus increasing supplier's cost

Russ Brockelmann in his excellent book "Inventory classification innovation" talks about the evils of having preseason programs. He feels that preseason programs are disruptive and disturbs the even flowing look ahead forecast replenishment system that is usually working and the additional seasonal product should somehow be added on to that basic program and not take the place of it. The regular smooth flow of product should not be interrupted prior to the season by a disruptive and exclusive pre season program.

Electronic commerce and look-ahead forecast systems have proven to eliminate redundancy and raise customer service. The addition of history data of the distributor's sales transactions allows for look-ahead forecasting.

Armed with this important information, the supplier is in a position to utilize the techniques of Distribution Resource Planning (DRP).

DRP was developed for manufacturers so that they could keep factory owned distribution centers can be supplied accurately. Transaction history and on-hand inventory is required for a DRP system to properly function. Supplier Assisted Inventory Management (SAIM) presents an almost ideal communication link between the distributor and the supplier. The SAIM process forces a discipline whereby products are better identified and described which results in fewer mistakes in receiving, stocking and shipping. Distributors and suppliers are constantly looking for ways to increase profitability. SAIM represents the ideal choice in regards to assisting both partners to increase their profitability. In SAIM and VMI the forecast of future inventory requirements is parameter driven. These parameters result from the dialogue and analysis of the distribution and supplier partners.

Obstacles to VMI

There are two major recurring obstacles to a successful VMI implementation, one is strategic and the other operational. At the strategic level, a high level decision must be made about how the company wants to position itself. Operationally job functions, processes and performance measurements will all need to change in order to get the most benefit. Resistance will be felt from employees who fear change.

Strategic obstacles are the concerns most often expressed at the distributor level. Some distributors are concerned about letting their private information getting into the hands of their vendors as they feel that this would give the

vendors direct access to the distributor's customers. However Bruke (1996), argues that is frivolous since pipelines that will be most attuned to consumer's needs are those that have a cooperative demand chain focus on the consumer. The distributors that will prosper in the coming years are the ones that will give most value to the customers and suppliers.

Bruke (1996) argues that operationally the sources of resistance are many, but the overwhelming theme is change. A major change of company operations requires a cultural adjustment as well as a significant reorganization of everyday job duties. Culturally many companies have not yet recognized the importance of supply chain and will not give supply chain managers the necessary authority to implement, and will not make the necessary investments. Without top-level support for the program there will be little attitudinal change. The new culture must acknowledge that the consumer has ultimate power, that the supply chain itself is a competitive tool, and that the cooperation between the trading partners is essential.

Other issues that warrant consideration are regarding the management of change and specific job changes. Concerns such as the role of buyers and sales people in the new environment and the new measurement systems must be addressed. Roles and measurements will change, but with proper adoption of cultural values, it will be obvious that job changes are needed.

K-Mart for example did a good job in achieving service levels of 99.5% while maintaining inventory at 70% above objective. However soon the suppliers were dropped since it was found out that most manufacturers did not have

adequate suppliers. K-Mart's loss of control over the scheduling of shipments was a major factor in trimming the program.

Spartan Stores a Michigan cooperative grocery wholesaler decided to halt the VMI program after a tumultuous 12 months. The results weren't just good enough and though the inventories did fall, it was only because small orders were being placed at more frequent intervals. Spartan and their VMI vendors did not come up with an effective way to deal with promotions, planning and pricing. The administrative costs too increased as the vendors failed to do a good job with forecasting.

However there are many success stories as well. Oshawa Foods, a large Canadian grocer distributor is preaching that VMI is only a temporary solution and that they expect to eventually move towards sophisticated retail managed inventory systems. Oshawa has a highly successful VMI program in place.

Bruke (1996) concludes that VMI does make good sense and in fact presents a tremendous opportunity. A supply chain partnership between large volume trading partners will normally have two driving objectives. With the overriding goal of maximizing value for the end customer, the partnership attempts to increase sales and reduce operating expenses in the supply chain. VMI can contribute to both goals. The customer provides the information and the supplier does the planning, and between them they increase supply reliability and reduce supply costs. To Bruke (1997), VMI is a way for a supplier to improve the supply process for small-unsophisticated

customers or a way for a large customer to add value by absorbing administrative chores.

Conclusion

As per Sari (2007), VMI program will be effective in reducing the inventory-related costs for the system of buyer-supplier channel as a whole, even without changing any cost characteristics of the channel or demand level at the end market, a condition described as direct changeover or short-term. It achieves this through optimizing shipment quantities as observed in typical VMI practice. The buyer will snatch most of these short-term cost savings, as its profit under VMI is always higher than that before VMI when both parties manage their respective inventory independently. Such cost savings are not always shared by the VMI supplier, because the supplier's extra burden of carrying the buyer's inventory operations may not be sufficiently compensated by the VMI buyer's purchase price. However, VMI provides opportunities for the supplier to streamline the operations of the whole system such that its inventory-related cost is even lower than that prior to VMI, i. e., its profit higher than that prior to VMI. This clearly suggests that companies interested in adopting a VMI program should focus more on those transaction relationships where both parties' inventory systems are significantly different.

According to Sari (2007), VMI's benefits go beyond a simple switchover. In a longer period when both the buyer and the supplier adjust their production, distribution and marketing efforts to take advantage of this lower system-wide inventory-related cost, the final sales volume and thus the purchase quantity will likely increase, as observed in the logistics practice of Proctor <https://assignbuster.com/vendor-managed-inventory-and-its-impact-business-essay/>

and Gamble. More importantly, the channel profit as a measure of the supply chain success will increase as a result, approaching a maximum scale afforded by full channel coordination and providing significant opportunities for a mutually beneficial relationship. The buyer typically enjoys a solid gain in its profit through such a long-term adjustment under VMI, while the supplier's financial gain is much less evident. However, as discussed above, other strategic benefits such as long-term partnership with the buyer and reductions in certain cost components would make the VMI program sufficiently attractive to the supplier.

However, Simchi-Levi (2003) is of the opinion that VMI is still an amorphous term changing shape according to who is using it. While purists will say that VMI has to involve EDI and that distributor customer programs should be rightly called DMI, most industry professionals agree that VMI can indeed, take many forms.