

VENDOR MANAGED INVENTORY (VMI) SYSTEMS IN INDIA

– FOCUS ON RETAILING

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Introduction

Efficient inventory management is indispensable for the success of any business. All the elements of inventory like raw materials, semi finished and finished goods are key determinants of the firm's profitability as they block capital. Mismanaged inventory can create a permanent dent in the business. Diverging above and below the optimal inventory level leads to overinvestment or underinvestment in inventory which can prove to be very detrimental for the business. Hence inventory management is gaining relevance as it helps organizations to strike the right balance in maintaining supplies and in providing a solution to the confounding issue of optimum investment in inventory.

Vendor Managed Inventory (VMI) is a system where the vendor takes the responsibility of managing the retailer or customer's supply chain with real-time information inputs through Electronic Data Interchange (EDI) and high speed

connectivity over the Internet. VMI is a farsighted solution innovated by Wal-Mart (the premier retail outlet in the US) with one of its suppliers of baby diapers, Proctor & Gamble at its retail chains. Attempts to replicate this across several sectors like retail, electronics components, textiles and automobile manufacturing in India have taken place over the last 10 years with Marico Industries Limited, Shoppers Stop, Future Group, Nokia India, Maruti Udyog Limited, Praxair India, Mahindra & Mahindra, to name a few implementing VMI in different forms to manage their inventories.

Scope and significance of the study

According to the research report published by Ernst & Young (E & Y) India and IBEF (2010), it is estimated that India's consumer class will grow twelve fold from 50 million at present to about 583 million by about 2025 with more than 23 million people who will then be counted among the world's wealthiest citizens. The purchasing power of this neo-rich class of customers has spawned the growth of new products, new retail outlets and brought in lots of vibrancy in the entire organized retail sector in India, with retailers expanding their reach into Tier II, III, IV towns. FMCG companies are focussing on the rural market which comprises 33% of India's retail customer base. India is also turning into a price-competitive sourcing base for strong retail players like Wal-Mart, Tesco, JC Penney, Gap etc. India is also home to successful retail players like Shopper's Stop and Future Group who handle large volumes of products daily all across the country.

The increased volume of goods that are transported from the manufacturer to the retailer and then to the end-customer through the different stages of the supply chain carries with it inherent complexities in managing a wide variety of products & destinations. The traditional systems of managing inventory have given way to more advanced systems like Just In Time (JIT), Postponement or Delayed Configuration, Flexible Manufacturing Systems (FMS), Quick Response Logistics (QRL), 3rd party & 4th Party Logistics (3PL/4PL), Vendor Managed Inventory (VMI) & strategic methods like Collaborative, Planning, Forecasting & Replenishment (CPFR) etc.

Over the last two decades, there is a slow shift of convenience with the responsibility of managing a supply chain and inventory moving from the owner to the vendor. The study aims to illustrate the challenges in the implementation of the VMI. The study aims to enlighten decision makers about the positive aspects of VMI implementation as well as tries to dispel off the negativity & doubts about the feasibility of such a model. The study tries to bring out the inherent strengths & weaknesses of the VMI system vis-a-vis the Indian retail scenario and also to understand the conditions which are necessary for better results on implementation.

The research will go a long way in understanding the importance of inventory management in the exponentially growing organized retail sector in India. Key variables that determine the success or failure of adopting a revolutionary system of inventory management like the VMI will be identified.

Objectives of the study

The major objectives of the present study are as follows:

- To study the history of VMI in the Indian and international scenario.
- To compare the traditional inventory system with the VMI system.
- To evaluate the key performance indicators in the implementation of VMI in Indian retail sector.
- To identify the challenges faced while implementing VMI with focus on retailing.
- To understand the major changes brought about by RFID implementations in Indian retail outlets.
- To suggest strategies for effective implementation of VMI in Indian retail industry.
- To understand the factors that decides the success and failure of VMI implementation in Indian retail.

Methodology

The research has been conducted in two phases. In Phase I, a survey of managers working at the operational level in the supply chain of selected organized retail firms has been conducted. Phase II deals with a comprehensive analysis of case studies of implemented VMI systems in selected firms in the Indian retail sector.

The population of the study involves all stakeholders in the supply chain of

the organized retail organizations in India. A judgment sample of 100 managers working in the supply chain of selected organized retail firms across India was taken. Retail firms like Subhiksha Retail, Reliance Fresh, More, Heritage Fresh, Big Bazaar, Shoppers Stop, eZone, Viveks Retail were chosen. Manufacturers like Marico Industries, distributors of Hindustan Unilever, and company officials of manufacturers of products supplied to retailers were contacted. The survey included 20 manufacturers, 4 distributors, 20 wholesalers & 56 retailers.

VMI is a recent concept in inventory management & full fledged implementations are very few in numbers in India. This has led the researcher to go in for a case study of VMI implemented systems in India to supplement the survey data of Phase I. Marico Industries, Subhiksha Retail, Shoppers Stop and Future Group were selected for the case studies.

The VMI implementations at Maruti Udyog Limited & Mahindra and Mahindra, from the automobile sector, have also been studied for extracting information about the topic under study as these two organizations had adopted VMI successfully much before that of the retail sector. Information from these two implementations has helped the researcher in understanding the benefits & flaws of VMI. The study covers the period from year 2005 to 2010. The collected survey data were processed and analysed using SPSS and various parametric and non parametric tests were used for the analysis.

Findings of the Study

A) History of VMI in Indian and International Scenario

The researcher has in detail traced the history of inventory management starting from the post World War II days leading to the influx of several Japanese concepts popularized by the Toyota Production System, namely kanban, kaizen, jidoka, ishikawa, lean production, unit load concept and JIT. The success of JIT led to the birth of several other concepts like Postponement and JIT II or Lance Dixon Bose Configuration. The retailer, Wal-Mart and its supplier, the FMCG major Proctor & Gamble introduced the pioneering experiment called Vendor Managed Inventory around 25 years ago on their product line of disposable diapers. The need for further streamlining of the SCM function led to Flexible Manufacturing System, 3rd Party and 4th Party Logistics service providers.

The researcher has elucidated examples of VMI implementations by retailers like K Mart, Dillard Department Stores, JC Penney, Grand Union, Fred Meyer, wholesalers like ACE Hardware, electrical component manufacturer Panduit, semi-conductor giant Motorola, an OEM Celestica, Boeing Skin & Spar's association with its supplier Alcoa, a water cooler retailer Elkay and an industrial furniture manufacturer Herman Miller.

In India, experiments with VMI/RFID implementations were conducted by automobile companies like Maruti Udyog Limited and Mahindra & Mahindra Limited, manufacturers like Madura Garments, Marico Industries, Ranbaxy Labs, Pfizer

Laboratories, retailers like Pantaloon, Future Group and Shoppers' Stop and even public services like Airport Authority of India. The major software companies like Infosys Technologies, Wipro Technologies, Mahindra Satyam and Tata Consultancy Services offer technical support for the implementations.

This shows that VMI and RFID are seriously gaining acceptance in modern SCM, with all the major players across sectors being involved in the implementations.

B) Comparison of the traditional inventory system with the VMI system

In the traditional inventory replenishment process, sales are forecasted using historical sales data. The retailer or customer tracks inventory and sales figures using information of on-hand items and forecasts the order.

In the VMI replenishment process, the forecasting and creating of purchase orders are done by the vendor/manufacturer rather than the retailer. Electronic Data Interchange and RFIDs take a prominent place in the communication systems in a VMI arrangement. The retailer updates the inventory and sales position regarding the product of the vendor or manufacturer in real time using the EDI or any other B2B arrangement set up by them in collaboration. The retailer is freed from the activities of forecasting and creating purchase orders. The vendor takes responsibility of maintaining the stock plan of the retailer, vis-a-vis the vendor's product. The vendor sends the shipment notices before sending the product. The invoice follows the shipment notice. Upon receipt of the product, the retailer handles the payment through its accounts department.

Modern technology has facilitated the genesis of such an arrangement. Vital

to the success of this arrangement is the existence of a real-time link between the supplier-retailer & a contractual arrangement based on mutual trust and cooperation for optimal functioning of the entire supply chain rather than solely focusing on profits for the individual units.

C) Identification of the key performance variables

The following factors were identified as crucial for measuring the success or failure of the VMI system

- Pure Metrics like Distributor Stock out percentage, excess Stocks and Accuracy of Forecasts.
- Derived Metrics like Estimated secondary loss of sales and estimated primary loss of sales
- Other measures like cost of misdistribution, cost of old stocks remaining in the supply chain and also overall supply chain costs are also vital.

D) Challenges faced while implementing VMI/RFID systems

The following challenges faced by the companies that implemented or were in the implementation stages of VMI and RFID systems in Indian retail were identified, while in the implementation stage .

- 1) FMCG retailers are found to be very reluctant to share information across the supply chain unless the entire system is under the control of one system. The biggest requirements for the success of VMI implementations are trust and a

mutual partnership agreement among the supply chain stakeholders, that works for the improvement of the whole supply chain instead of trying for individual profits.

- 2) There are great differences in the work ethics of organizational cultures and degree of transparency in the dealings of different stakeholders in the supply chain. This makes it very difficult to have an inter-organizational system that is seamless and has acceptance across the supply chain.
- 3) Some software solutions providers built the VMI module separately from the existing ERP application in place, thus creating a problem with proper integration of the two systems. The entire ERP operations have to be tweaked to seamlessly integrate the VMI operations into the scheme of things for it to be successful and also to reflect the changes as and when it occurs.
- 4) There are opinions that improperly implemented VMI simply transfers the ownership and costs rather than attaining the aim of reducing the cost across the supply chain.
- 5) A lot of business time is lost in the testing and validation of the EDI data and standardisation of protocols of the systems used between different organizations that are part of the supply chain.
- 6) Many retailers and suppliers have cited a lot of impatience in waiting for the expected results. Initially there was high degree of expectations about the speed of results of such a business process reengineering effort, but in due course, organizations became impatient with the slow results.

- 7) Some companies are still sceptical and secretly employ the traditional methods of replenishing inventory.
- 8) Vendors who follow traditional methods with the retailers are doubtful and a little pessimistic about the priority services given to VMI.
- 9) In most cases there was a lack of clarity over what could be done with the ordering errors.
- 10) Many employees are not aware due to lack of effective communication about the new system of managing inventory using VMI.
- 11) Even though the costs of planning & forecasting of inventory has been shifted to the supplier, there is still no clarity on the accountability and compensation for the losses incurred due to forecast errors.
- 12) Special pricing schemes & promotion schemes which are devised seasonally or suddenly to boost sales in the short term send the VMI forecasting haywire and systems need to be in place to incorporate them in the system.
- 13) Since the initial costs of forecasting & planning are shifted up the supply chain towards the supplier, there are lot of disagreements as to the percentages of profits and the method of apportioning them across the supply chain.
- 14) The degree to which confidential data can be shared across the supply chain is another grave issue. Holding back data may reduce the efficiency while releasing sensitive data may amount to compromising on a trade secret.
- 15) Minimum volume agreements & Exclusivity agreements with priority partners are

difficult to incorporate into the VMI system which is implemented across the supply chain. .

16) Pacifying the non-VMI suppliers who may feel short changed due to their inability to be a part of the high technology VMI network.

17) The retailers in many cases are forcing the suppliers & manufacturers to absorb the additional costs of tagging RFID onto the cases/products.

18) Manufacturers rarely report short-term gains after the RFID implementation. Short term gains are usually seen for the retailers, though in the long term both parties gain. This makes manufacturers and vendors slightly apprehensive of the technology.

19) Data synchronization, integration and lack of standards (even though the EPC Global acts as a standard) are major issues when used across countries.

20) Due to the nascent stage in the technology, the RFID technology is still not fully fool-proof and there are issues of electromagnetic interference and wrong reading being reported as the technology is still not fully perfected. Metal and liquid can play havoc with RFID signals with the current technology available if not properly done.

21) There are fears that competitors may develop systems which can track a particular company's shipments and inventory as vulnerabilities still exist in the security system as is the case with credit cards. Issues of whether customer data is safe with the retailer also arise.

The cost of an RFID tag in India is close to Re. 1 per tag. This is still

prohibitive for a firm dealing in millions of SKUs a year. Major retailers like Future Group and Shoppers' Stop still practice pallet or box tagging rather than tagging individual units. RFID implementation becomes fully effective only when individual units can be tagged. For this to happen, more RFID manufacturing units should come up in India based on more retailers adopting RFIDs. The increased usage will bring down the prices to a stage where it comes down to the acceptable and desired level of around 50-60 paise per RFID tag making it accessible even to a medium enterprise.

E) Changes due to RFID implementations in Indian retail outlets

Radio-Frequency Identification Device (RFID) is an automatic identification device technology used to remotely store & retrieve data without actual scanning of the data source.

The data transmitted can provide identification information, location information, the product details like batch number, colour, date of purchase, shelf life, time on shelf till now, price, date of manufacture, time spent in transit, location of distribution centre, name of last person to hold the item along the supply chain among other details depending on the level of information required on the tag for different product categories. This has improved product traceability and global supply chain visibility exponentially

F) Factors that decide the success and failure of VMI implementation in Indian

retail

The derived benefits perceived by both manufacturers and retailers who are either in the implementation stages or who have successfully implemented VMI are mentioned below

1) Perceived Benefits to the Manufacturers

- Supply chain operations become more streamlined as better partnerships are established & collaborations based on trust are formulated.
- Better realization of the market situation due to better access to real time demand & inventory data across the supply chain.
- Improvement in Service levels due to the right product being replenished at the right time in right quantity due to better visibility of the demand realities.
- Savings in the costs of raw material and finished goods inventory due to lower investment in overall inventory.
- Better promotional plans can be formulated at the strategic and operational levels due to improved visibility of product levels & inventory levels.
- Obsolescence of the held inventory can be better controlled due to lesser amount of inventory held at the manufacturer level.
- Prioritization of the production & replenishment can be done by checking the real time stock position. The traditional practice of routine

replenishment can be discontinued improving the capacity utilization.

- The accuracy of forecasts also goes up drastically with the advent of technology like RFID & POS data capture which aids VMI practices. This helps the manufacturer also to plan effectively for the replenishments.
- The ordering errors at the distributor levels are also reduced considerably.
- The lead-time in delivery of products by the manufacturers is also reduced drastically.
- Even though initially firms experience a reduction in profits in the short run due to the new investments in technology & processes, in the long run the return on investment for the manufacturer increases.

2) Perceived Benefits to the Buyer

- The cost of ordering, inventory planning & replenishments goes down drastically as the responsibilities of managing the inventory gets shifted further to the supplier or the manufacturer, thus enabling the retailer or buyer to concentrate more on the selling of the available stocks.
- The costs of forecasting and purchasing functions are also transferred towards the supplier side of the supply chain.
- There are reduced instances of stock outs, lower levels of inventory

held, fill rates show improvement & there is higher inventory turnover in the buyer site.

- Service levels go up due to better product availability for the customer.
- The VMI arrangement usually is on a contract that the buyer will not be paying for the inventory until it has been sold or used as the responsibility of sending the quantity of supply is with the manufacturer & the forecasting done by them using the VMI system in place.
- The buyer is able to relay the sudden changes in trends to the supplier or manufacturer.
- Better product mixes can be planned considering the priorities at hand when compared to the earlier routine replenishment system.
- Transfer costs or pipeline costs are also kept at the minimum as there are lesser inventories blocked up in the channels of distribution.
- The extra costs of holding safety stocks are also brought down
- The data entry errors are also brought down considerably as VMI systems mostly used remote or automatic data capture techniques like bar code scanner, electronic smart trolleys and RFIDs for the tracking of consignment.

Limitations to the success of the VMI programs

- There is an inherent lack of mutual trust between all concerned parties when the arrangement is taken up as it involves huge investment and changes in processes.
- Introduction of the arrangement is seen as more of an experiment by the stakeholders rather than a reengineering exercise.
- Absence of standardized implementations across the supply chain in many cases leads to improper data communication.
- There is a lack of communication between management and stakeholders in many cases when such a big venture is taken up.
- Non VMI vendors feel shortchanged with the arrangements as they are given an option of being forced into the arrangement or lose out on business for no fault of theirs.
- Clarity on the accountability during initial stages of implementations when errors are inevitable is necessary for employees to feel comfortable.
- Relatively high cost of RFID tags is still prohibitive for individual product tagging.
- Lack of sufficient training sessions due to rushed implementations prove detrimental to the success of the program.
- Lack of service standards and clarity on what to do in cases of exceptions also exists.

G) Recommendations

- An understanding that short and long term results of implementation would be different in terms of revenue and profits is vital for it to gain acceptance. The managers expect a short-term reduction in sales in the initial stages but with its improved forecasting and planning capabilities in the long run the stocks at its distributors can be reduced resulting in a long term increase in sales revenue.
- The emphasis during implementations should be on mutual trust and partnerships based on overall supply chain profits rather than individual stakeholder' s profits.
- Clear contractual agreements regarding the degree of ownership of the supply chain management should be chalked out.
- A relaxation of the tight purse strings by the retailer initially to support the supplier & manufacturer to get seamlessly integrated into the system is imperative as it has been generally found that the latter reaps benefits only in the long run while the retailer experiences benefits earlier.
- Standardization of the protocols of EDI and other technologies used across the supply chain also has to be ensured for deriving the maximum value of this re-engineering exercise.
- Clear communication to all the stakeholders and employees of the benefits,

the intermediate lethargy and change management issues that will crop up during the implementations will go a long way in lending clarity to the necessity of this change.

- Bringing on-board all the VMI and the non-VMI vendors to clarify any doubts of priority services being rendered to either parties will ensure more support from the non VMI vendors also.
- To quell the high initial expectations from the re-engineering activities being undertaken expectation management becomes necessary.
- Clarity on the problems that invariably crops up due to some forecasting errors and ordering errors in the initial transition stages needs to be communicated.
- The relatively high cost of RFID implementation has kept the implementation levels to tagging cases rather than tagging individual units. More retail players need to awaken to the possibilities of improving their business practices and come forward to adopt VMI, so that higher manufacturing volumes will bring down the cost of tagging an RFID and make it accessible to all retailers, not just the giants.
- Only realistic targets should be set during the initial stages of implementation, which can be revised periodically in a phased manner.
- It should be clearly communicated to all stakeholders that the venture will not start yielding results in the short run as is the case for any

Large scale Business Process Reengineering program.

- Before the actual implementation, elaborate simulation sessions & pilot implementations are to be repeatedly conducted till the attainment of perfection
- Incentive programmes should be based on partnerships and the focus should be on contribution to the entire supply chain profits rather than individual volume & performance.
- Well-defined contractual agreements on service standards that are to be adhered in the supply chain should be entered into by all the stakeholders
- In the event of exceptions in the functioning of the VMI arrangement, the course of action to be followed should be decided and communicated in the initial stages of the implementation itself.

Conclusion

The sharp acceleration in the purchasing power of the Indian consumer, who constitutes the youngest population worldwide, has led to the burgeoning of the Indian retail sector. The boom of the IT and service industries has resulted in skyrocketing salaries and greater disposable income in the hands of the Indian consumer, who is now spoilt for choices with the entry of all major foreign brands into the Indian retail scenario.