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Implementation of Vendor Managed Inventory: Practices And Issues

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ABSTRACT

Purpose – The purpose of this paper is to analyze the before and after implementation of vendor managed inventory in selected organization.

Design/methodology/approach- Methodology involve review of case studies on implementation of vendor managed inventory and hypothesis testing to find out the acceptance and rejection.

Findings- Generic framework of vendor managed inventory implementation is been studied. Challenges and issues in implementing the process are described.

Research limitations/implications- This research intends the original contribution in stream of supply chain research. This research is limited to the challenges of the implementing the VMI process, future research can involve the challenges of other side involved i.e supplier's side.

Originality/value- The research is of original value and contribute in understanding the challenges and issues faced while implementing the process.

Keywords- Vendor managed inventory, supply chain, forecasting, and supplier collaboration. **Paper**

Type- Research paper

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1. INTRODUCTION

Healthcare sector has been changed in last decade rapidly. Due to increased competition, the growing influence of patient-associations and a necessity to deliver health services in a more efficient and effective way, many health care organizations have started projects in the area of patient logistics, clinical pathways, data interchange and vertical integration (Vries&Huijsman, 2011). Vendor managed inventory (VMI) is an integrated approach for customer-supplier coordination, according to which the supplier decides on the appropriate inventory levels of each product (within previously agreed upon bounds) and on the inventory policies to maintain these levels. In the initial stages, supplier delivery plans must be approved by the customer, but the goal of many VMI programmes is to eliminate customer oversight on specific orders (Danese, 2006). The benefits of the VMI have been clear since the adoption of the approach in the first implementation cases. VMI was popularized in the late 1980s by Wal-Mart and procter& Gamble and became one of the key programmes in the grocery industry's pursuit of "efficient consumer response" and the garment industry's "quick response". While redesigning the supply chain strategies, the firm must initiate internal integration by combining purchasing, production control and distribution into a solid internal supply chain (Borade&Bansod, 2010). The main reason for the healthcare sector's difficulties in implementing effective SCM practices is that the healthcare supply chains are much more complex compared to supply chains in other industries. In VMI, vendor performs the key SCM activities like production planning, purchasing, logistic and distribution management and sales forecasting. In turn, manufacturer has to supply the relevant information to the vendor (Borade&Bansod, 2010). The Delhi's hospital supply chain has a threetiered structure including the manufacturer, wholesaler/distributor and a hospital. This implies that the flow of products from the manufacturer to the healthcare organization typically takes place through the wholesaler/distributor. Therefore we employed a case study design involving a network of ten organizations from the healthcare sector including each of these three tiers to answer the above two research questions empirically. By answering these research questions we contribute to the literature by developing a list of contingent factors and associated propositions that can guide inventory management decisions (Bhakoo, Singh, &Sohal, 2012).

2.LITERATURE REVIEW

Despite the plethora of studies existing in literature on the VMI partnership, there are some unanswered questions which may be relevant both to practitioners and theorists, and whose answers call for empirical evidence. Most authors do in fact tend to consider VMI as an approach for managing materials and information flows between one or more customers and their immediate suppliers. On the other hand, fierce competition in today's global markets has forced business enterprises to invest in, and focus attention on, their supply networks in a much broader sense. The links between supply chain partners are analogous to computer network, which is defined as a collection of independent computers and devices that are connected by communication channels in

order to share resources (Zhang, Gunasekaran, & Wang, 2015). There is evidence that VMI is beneficial to both a buying company and a supplying company, though the supplier may take a longer period of adjustment and reconfiguration before the benefits of VMI can be realized. Northwestern Steel and Wire as a supplier, reported by Nolan (1998), was able to generate more volume after VMI because inventory turns were up (Dong & Xu, 2002).

In terms of strategic partnerships between healthcare and their supply chain partners, (Scheller&Smeltzer, 2006) highlight the role of the distributor and the healthcare organization within the distribution function. A decision to outsource the distribution function allows the healthcare organisation to allocate capital to other critical functions. This decreases the workload of the senior clinical staff, who can then focus on other strategic activities in the healthcare organisation rather than supervising supply chain personnel in the healthcare organisation. Materials management and the pharmacy departments in healthcare organization would be ideal candidates for using a just-in-time (JIT) system because they have “manufacturing like” operations as they deal with high volume products, tangible items and operations that are repetitive. However, he did not make any explicit distinctions between JIT techniques to be more applicable to scheduled interventions vis-a`-vis emergency admissions. Further, questions have been raised about the suitability of the JIT technique in a rural setting where the warehouse can be at a considerable distance from the distributor.

Application of vendor managed inventory system in healthcare supply chains

Strategic approaches to the management of inventory in the literature highlight the significance of the vendor managed inventory (VMI) system. The VMI strategy originated in the USA in the 1980s and early adopters of this strategy were large retailers such as Wal-Mart and JC Penney.

VMI is a system whereby the supplier takes responsibility for monitoring the retailer’s inventory levels and makes periodic replenishment decisions regarding order quantities, delivery mode and timing of replenishments (Waller, M.E., & T., 1999). The two essential elements for the success of a VMI arrangement are first, high levels of trust between supply chain partners participating in such an arrangement, and second, the ability of the supplier to use data for planning purposes and aligning incentives and organisational structures appropriately to such an arrangement (Waller, M.E., & T., 1999). Further, (M.J.T., Weele, A.J.v. and Raaij,,&E.M.v., 2008) testify empirically that implementation of the VMI system leads to improved service levels rather than cost reductions. Most of the empirical studies addressing the issue of VMI have focussed on manufacturing firms and retailers (Waller, M.E., & T., 1999). The literature has largely ignored the application of the VMI system within the healthcare domain. However, some recent studies highlight the advantages of implementing the VMI system in the healthcare setting. (D., 2005) Discusses the adoption of the VMI system between the wholesaler and the healthcare organisation warehouse specifically for pharmaceutical products in South Korea. This had several advantages, with the most significant being the reduction in inventory levels by 30 per cent. Further, it decreased the workload of the pharmacy staff in the healthcare organization and facilitated information integration between the wholesaler and

the healthcare organization as the wholesaler had access to information on the usage of drugs in the healthcare organization. The application of the VMI system studied by (D., 2005) seems rather simplistic when compared to the study conducted by (danese, 2006). This is because the study by (Danese, 2006) fills a void in the literature by discussing the applicability of this system at the “network level”, compared to previous studies that have evaluated the application of this strategy at the dyadic level. This was accomplished by exchanging information vertically with supply chain partners positioned upstream and downstream in the network while the horizontal information flows were between the supply chain partners in the same echelon in the supply network.

In this paper, we particularly focus on the external integration, which refers to the integration of a firm’s activities with those of their customers and suppliers (D.S., Leuschner, &Charvet, 2013) to discuss the interconnectivity among those supply chain entities and required elements. However, it does not hinder the importance of internal integration as we consider it to be essential readiness for extending to external integration. The comprehensive model is actually a generic interface explanation between supplier and its customer, we will not distinguish the difference between upstream integration and downstream integration as (Wang & Chan, 2010).

3.RESEARCH METHOD

The case for this study was selected so that there were similarities amongst cases for theoretical replication purposes along with differences and diversity in the cases in order to maximise learning. Further, case study scholars recommend including extreme or “polar cases” in the sample to check whether the emergent theory is applicable under those circumstances. This was particularly evident with organisations which were the focal entity in the network similar in terms of their size, number of SKUs they handled and their budgets. They also represented the largest healthcare organization within a network of healthcare organization across the metropolitan district.

Hypothesis testing is done to test the hypothesis formulated. It helps in analyze the effect on cost saving before and after implementation of vendor managed inventory VMI.

4.CASE STUDY

VLCC healthcare is a beauty and sliming service provider large chain spread in India and gulf countries. Services ranges spreads from beauty, wellness and slimming services. This company is facing a regular issue of inventory expenditure on one of its product that is valued as a profit earning product for the company.

This product is called as cool sculpt card which is used as a consumable in cool sculpt machine which is a slimming machine. These cards were imported from U.S.A from a renowned company and then stocked in warehouse of company. After stocking, the cards are then distributed to all canter of the company in PAN India which again incurs the courier cost to company. This has become a major cost incurring issue for the company for which company needs a solution.

Major challenges for company regarding cool sculpt cards stocking and purchasing:

1. Import cost for importing the cards from U.S.A
2. Inventory carrying cost of the cards at company's warehouse.
3. Courier cost to distribute the cards to all centres of the company across PAN India.

Cool sculpting technique and cool sculpt cards:

Coolsculpting is the non-invasive technique for fat reduction. It uses controlled cooling technique to remove stubborn fat from different part of the body that resist through normal diet and exercise routine.

The therapy is performed on patients through cool sculpt cards that are used in the cool sculpting machine. Results can be seen after each session. These cards are of different types according to the action of region. Different types of cards are as below mentioned:

1. Yellow card (16 cycles)
2. Purple card (24 cycles)
3. Blue card (24 cycles)
4. Cool advantage card (24 cycles)
5. Cool advantage plus card (16 cycles)

All the above mentioned cards are used for different area of fat reductions. These cards are originated in USA and are distributed worldwide for application.

4.DATA ANALYSIS:

In this section, different tables formulated below are used to show the comparison of product cost, import cost and various other cost.

Table 1: Table comparing number of cards procured before and after implementation of VMI (Vendor managed inventory)

Name of cards	Number of cards procured during 2017-2018 (Before VMI implementation)	Number of cards procured during 2018-2019 (After VMI implementation)
Yellow	48	65
Purple	60	82
Blue	30	50
Green	6	10

Table 2: Table comparing import cost incur by company before and after implementation of VMI (Vendor managed inventory)

Name of cards	Import cost 2017-2018 (Before VMI implementation) INR	Import cost through supplier 2018-2019 (After VMI implementation) INR
Yellow	24106	20614
Purple	16452	15734
Blue	16452	15734
Green	19513	18435

Table 3: Table comparing Courier cost before and after implementation of VMI (Vendor managed inventory)

Name of cards	Courier cost 2017-2018 (Before VMI implementation)	Total number of cards 17-18	Total cost	Courier cost 2018-2019 (After VMI implementation)	Total number of cards 18-19	Total cost
Yellow	Rs. 45/piece	48	2160	NA	65	NA
Purple	Rs. 45/piece	60	2700	NA	82	NA
Blue	Rs. 45/piece	30	1350	NA	50	NA
Green	Rs. 45/piece	6	270	NA	10	NA

Table 4: Table comparing cost of cool sculpt cards before and after the implementation of VMI (Vendor managed inventory)

Name of cards	cost 2017-2018 (Before VMI implementation) in INR	cost 2018-2019 (After VMI implementation) in INR	Percentage decrease (%)
Yellow	386615	336000	13.09
Purple	258170	225000	12.85
Blue	258170	215000	16.72
Green	295547	225000	23.87

Hypothesis Formation:

H₀: There is no significance difference between the cost saving before and after implementation of VMI (Vendor managed inventory)

H_a: There cost saving after implementation of VMI (Vendor managed inventory) is more than before implementation of VMI.

Table 5: t-test for paired sample of lenses

Paired Samples Statistics

	Mean	N	Std. Deviation
Before VMI implementation	299626	4	60611
After VMI implementation	250250	4	57361

Paired differences				
Mean difference	Std. Deviation	t-value	df	2-tail significance
-49376	15820	-6.24	3	0.0082

The output table shown in table 5 shows that 2 tail significance of test is 0.0082 which is less than 0.05, significance value.

“There was a significance difference in cost of purchase of cool sculpt cards before VMI implementation (M=299626, SD=60611) and after VMI implementation (M=250250, SD=57361) conditions; $t(3) = -6.24, p=0.0082$ ”.

5.CONCLUSION

A paired sample t –test was conducted in the study to compare the effect of VMI implementation. Result shows cost saving is more after implementation of VMI that before this implementation. As the null hypothesis was rejected in the analysis so it shows that VMI has an overall impact on cost saving for cool sculpt cards. Percentage of saving is also calculated for each card.

Cost saving components are calculated as listed below:

1. Cost saving in product price
2. Courier cost saving
3. Import duty cost saving

All these three costs are important part of expenditure for the company, so these costs are reduced after implementation of VMI. All these costs are improves after effective implementation of these major cost contribution product of the company and hence management is working on other different products of the company that makes maximum cost contribution to the company.

5.FINDINGS

The results of this study revealed a plethora of variations in the application of the VMI system and other collaborative arrangements by supply chain partners within the healthcare domain. We present the results categorised for each stakeholder group.

Manufacturer perspective

Pharmaceutical manufacturers reported an absence of collaborative arrangements with their supply chain partners downstream in the supply chain. Manufacturer was the only exception and had implemented the VMI system. The rationale for the implementation of the VMI system was that manufacturer had a distinct supply chain structure as it supplied directly to clients and did not use a wholesaler/ distributor. In addition, the “product type” that this manufacturer dealt with was cool sculpt cards which could be classified under the functional product category. Finally, a key prerequisite for the application of this system was that the manufacturer had a storeroom in the premises and its own staff performed the crucial internal distribution and inventory management functions. In some cases, the manufacturer delivered directly to the pharmacy department. In other cases, the manufacturer split the order and delivered to the individual wards to meet their specific needs.

Wholesaler/distributor perspective

Amongst the two wholesalers/distributors, Wholesaler/ Distributor was relatively more progressive in implementing the VMI system and referred to it as the “ward box” system with the successful application of this system.

6.DISCUSSION

The findings of this study suggest that aorganisation can engage in myriad collaborative arrangements with supply chain partners to manage inventory. These arrangements lie on a spectrum ranging from internal control to complete outsourcing. Organisation may choose to retain complete internal control over its distribution and inventory management functions. It can also enter into collaborative arrangements with others using systems such as VMI and CPFR. As a partial outsourcing system, a small fee was charged by this wholesaler/distributor as the third party for managing the procurement, warehousing and inventory management functions, but the price negotiations were conducted by the organisation and the supplier. The third party also had its own personnel who distributed the goods

within the specific centres of organisation. The critical success factor for this arrangement is that there was complete compatibility in information systems between the third party and the organisation.

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