INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE AND MANAGEMENT

CONTENTS

CALL FOR MANUSCRIPTS

We invite original research papers in the area of computer, finance, marketing, HRM, Banking, Insurance, and other allied subjects. The above mentioned tracks are only indicative, and not exhaustive. The journal expects unpublished and original quality research articles/papers only.

You may submit your articles/papers at the email addresses, info@ijrcm.org.in or infoijrcm@gmail.com.

GUIDELINES FOR SUBMISSION OF MANUSCRIPT

1. COVERING LETTER FOR SUBMISSION:

The Editor
IJRCM

Subject: **Submission of Manuscript**.

Dear Sir/Madam,

Please find my submission of manuscript for possible publication in your journal.

I hereby affirm that the contents of this manuscript are original. Furthermore It has neither been published elsewhere in any language fully or partly, nor is it under review for publication anywhere.

I affirm that the all author (s) have seen and agreed to the submitted version of the manuscript and their inclusion of name(s) as co-author(s).

Also, if our manuscript is accepted, I/We agree to comply with the formalities as given on the website of journal & you are free to publish our contribution to any of your two journals i.e. International Journal of Research in Commerce & Management or International Journal of Research in Computer Application & Management.

Name of Corresponding Author

Designation:

Affiliation:

Mailing address:

Mobile Number (s):

Landline Number (s):

E-mail Address (s):

2. **INTRODUCTION:** Manuscript must be in English prepared on a standard A4 size paper setting. It must be prepared on a double space and single column with 1" margin set for top, bottom, left and right. It should be typed in 12 point Calibri Font with page numbers at the bottom and centre of the every page.
3. **MANUSCRIPT TITLE:** The title of the paper should be in a 12 point Calibri Font. It should be bold typed, centered and fully capitalised.
4. **AUTHOR NAME(S) & AFFILIATIONS:** The author (s) full name, designation, affiliation (s), address, mobile/landline numbers, and email/alternate email address should be in 12-point Calibri Font. It must be centered underneath the title.
5. **ABSTRACT:** Abstract should be in fully italicized text, not exceeding 300 words. The abstract must be informative and explain background, aims, methods, results and conclusion.
6. **KEYWORDS:** Abstract must be followed by list of keywords, subject to the maximum of five. These should be arranged in alphabetic order separated by commas and full stop at the end.
7. **HEADINGS:** All the headings and sub-headings should be in a 10 point Calibri Font. These must be bold-faced, aligned left and fully capitalised. Leave a blank line before each heading.
8. **MAIN TEXT:** The main text should be in a 8 point Calibri Font, single spaced and justified.
9. **FIGURES &TABLES:** These must be simple, centered & numbered, and table titles must be above the tables. Sources of data should be mentioned below the table.

10. **REFERENCES:** The list of all references should be alphabetically arranged. The author (s) should mention only the actually utilised references in the preparation of manuscript and they are supposed to Harvard Style of Referencing. The author (s) should mention only the actually utilised references in the preparation of manuscript and they are supposed to follow the references as per following:

- All works cited in the text (including sources for tables and figures) should be listed alphabetically.
- Use (**ed.**) for one editor, and (**ed.s)** for multiple editors.
- When listing two or more works by one author, use --- (20xx), such as after Kohl (1997), use --- (2001), etc, in chronologically ascending order…
- Indicate (opening and closing) page numbers for articles in journals and for chapters in books.
- The title of books and journals should be in italics. Double quotation marks are used for titles of journal articles, book chapters, dissertations, reports, working papers, unpublished material, etc.
- For titles in a language other than English, provide an English translation in parentheses.
- Use endnotes rather than footnotes.
- The location of endnotes within the text should be indicated by superscript numbers.

PLEASE USE THE FOLLOWING FOR STYLE AND PUNCTUATION IN REFERENCES:

Books

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio," Ohio State University.

Contributions to books

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

Journal and other articles

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.
- Kiran Ravi, Kaur Manpreet (2008), Global Competitiveness and Total Factor Productivity in Indian Manufacturing, International Journal of Indian Culture and Business Management, Vol. 1, No.4 pp. 434-449.

Conference papers

- Chandel K.S. (2009): "Ethics in Commerce Education." Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

Unpublished dissertations and theses

- Kumar S. (2006): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University.

Online resources

- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

Website

- Kelkar V. (2009): Towards a New Natural Gas Policy, Economic and Political Weekly, Viewed on 31 January 2011 http://epw.in/epw/user/viewabstract.jsp

POTENTIAL OF VMI APPLICATION IN COMMERCIAL VEHICLE MANUFACTURING INDUSTRY- A CASE STUDY

M.NAGALATHA
ASST. PROFESSOR (S.G.)
DEPARTMENT OF MANAGEMENT STUDIES
SAVEETHA ENGINEERING COLLEGE
THANDALAM
CHENNAI – 602 105

S. HUSSAIN
M.B.A. STUDENT
DEPARTMENT OF MANAGEMENT STUDIES
SAVEETHA ENGINEERING COLLEGE
THANDALAM
CHENNAI – 602 105

ABSTRACT

Various cost reduction techniques are involved in the management of inventory. VMI model is one of the ways to cut inventory related costs and keep inventory levels low. VMI model helps companies to reduce the inventory-associated costs by shifting the responsibility of managing and replenishing inventory to vendors. It has been intensively discussed as an innovative technique for increasing economic potentials by reducing the inventory cost in real time. However, a systematic application in different industries has not yet been achieved. This paper reveals the potential of the use of VMI in a leading commercial vehicle manufacturing company. This approach has been implemented to illustrate how VMI model can minimize the inventory associated costs. The findings may be generalized to a variety of other manufacturing industries.

KEYWORDS
Case study, Manufacturing operations, Vendor managed inventory

INTRODUCTION

Inventory management is primarily about specifying the size and placement of stocked goods. Inventory management is required at different locations within a facility or within multiple locations of a supply network to protect the regular and planned course of production against the random disturbance of running out of materials or goods. The scope of inventory management also concerns the fine lines between replenishment lead time, carrying costs of inventory, asset management, inventory forecasting, inventory valuation, inventory visibility, future inventory price forecasting, physical inventory, available physical space for inventory, quality management, replenishment, returns and defective goods and demand forecasting. Balancing these competing requirements leads to optimal inventory levels, which is an on-going process as the business needs shift and react to the wider environment.

VENDOR MANAGED INVENTORY

Some firms have successfully improved their supply chain performance by implementing an approach known as Vendor Managed Inventory (VMI). Business models, including Just in Time (JIT) Inventory, Vendor Managed Inventory (VMI) and Customer Managed Inventory (CMI) attempt to minimize on-hand inventory and increase inventory turns. VMI is a supply chain practice where the supplier is responsible for maintaining the clients inventory levels (Peter Kahn 2007). The supplier has access to clients' stock levels and generates the stock replenishment orders based on agreed inventory levels, fill rates and transaction costs. Orders are usually send automatically by the stock monitoring software, but they can be overridden by both supplier and the client. VMI and CMI have gained considerable attention due to the success of third-party vendors who offer added expertise and knowledge that organizations may not possess. With VMI, the vendor specifies delivery quantities sent to customers through the distribution channel using data obtained from EDI. Vendor Managed Inventory, Just-in-Time Distribution (JITD), and Efficient Consumer Response (ECR) all refer to similar concepts, but applied to different industries. For example, the grocery and apparel industries tend to use ECR, whereas the automobile industry tends to use VMI and JITD.

BRIEF LITERATURE REVIEW

Narayanan and Raman (1998) focus on the effects of brand switching and the use of supply chain contracts, such as VMI to mitigate the misalignment of retailers and manufacturers incentives regarding stock outs. Few empirical studies investigate VMI relationship. Clark and Hammond (1997) assess the relationship between Business Process Reengineering and channel performance when EDI (i.e., Electronic Data Interchange) is in place. Johnson, Davis and Waller (1997) use simulation to examine VMI benefits under several scenarios including volatile demand, partial adoption and limited manufacturing capacity. All these studies suggested that VMI leads to operational and economic benefits. Daniel Nowak, Robert Nyman, Marie Lundberg, (2006) indicates that the benefits from a VMI implementation will be greater for Kongsberg Automotive, than for the suppliers. Specifically, a reduction in inventory value can be attained by KA, while the suppliers only can obtain minor improvements within the areas of inventory, production, and order processing. The conclusion of this study is that a VMI strategy, in

supplement with a consignment stock policy, is possible for KA. Mette Eisenso, Liselott Dahl, (2007), concluded that in order to have a successful collaboration and implementation, it is important to know what basis to choose suppliers and understand what needs to be in place, internally and externally, before starting either a JIT or VMI relationship with different suppliers. Erica Henningson, Therese Linden,(2005), indicate that there is a risk of an increase in inventory levels at Ikea's distribution centers. However, this can be avoided if the manufacturer follows its routines and jointly with the supplier set maximum and minimum inventory levels.

Many references study the benefits of a VMI system over other inventory management system. Waller (1999) studies the effect of the VMI in several environments. He states that, in this relationship buyers relinquish control of key supply decisions and sometimes even transfer financial responsibility for the inventory to the supplier. Some advantages of VMI are pointed, for example reducing costs for each partner, reducing demand volatility, mitigating uncertainty of demand and solving the dilemma of conflicting performance measures. Aichlymayr (2000) shows some benefits of VMI and collaborative planning, forecasting and replenishment. Disney (2002) defines VMI as a production, distribution and inventory control system where stock positions and demand rates are known across more than 1-echelon of the supply chain. Cheung and Lee (2002) studied a VMI policy where the objective was to minimize the average daily distribution cost during the planning period without causing stock-outs at any of the customers' location. The motivation of this work was based on the advantages that seen to exist when using a VMI system in the operational level of inventory management.

ASHOK LEYLAND

Ashok Leyland (AL) is a commercial vehicle manufacturing company based in Chennai, India. Founded in 1948, the company is one of India's leading manufacturers of commercial vehicles, such as trucks and buses, as well as emergency and military vehicles. Operating six plants, Ashok Leyland also makes spare parts and engines for industrial and marine applications. Spread over 135 acres, Ashok Leyland, Ennore is a highly integrated mother plant accounting for over 40% all production. The plant manufactures a wide range of vehicles and house production facilities for important aggregates such as engines, gear box, axles and other key in-house components. It sells about 60,000 vehicles and about 7,000 engines annually. It is the second largest commercial vehicle company in India in the medium and heavy commercial vehicle (M&HCV) segment with a market share of 28% (2007-08). The company claims to carry over 60 million passengers a day, more people than the entire Indian rail network.

FIGURE 1: INVENTORY CONTROL MEASURES IN ASHOK LEYLAND

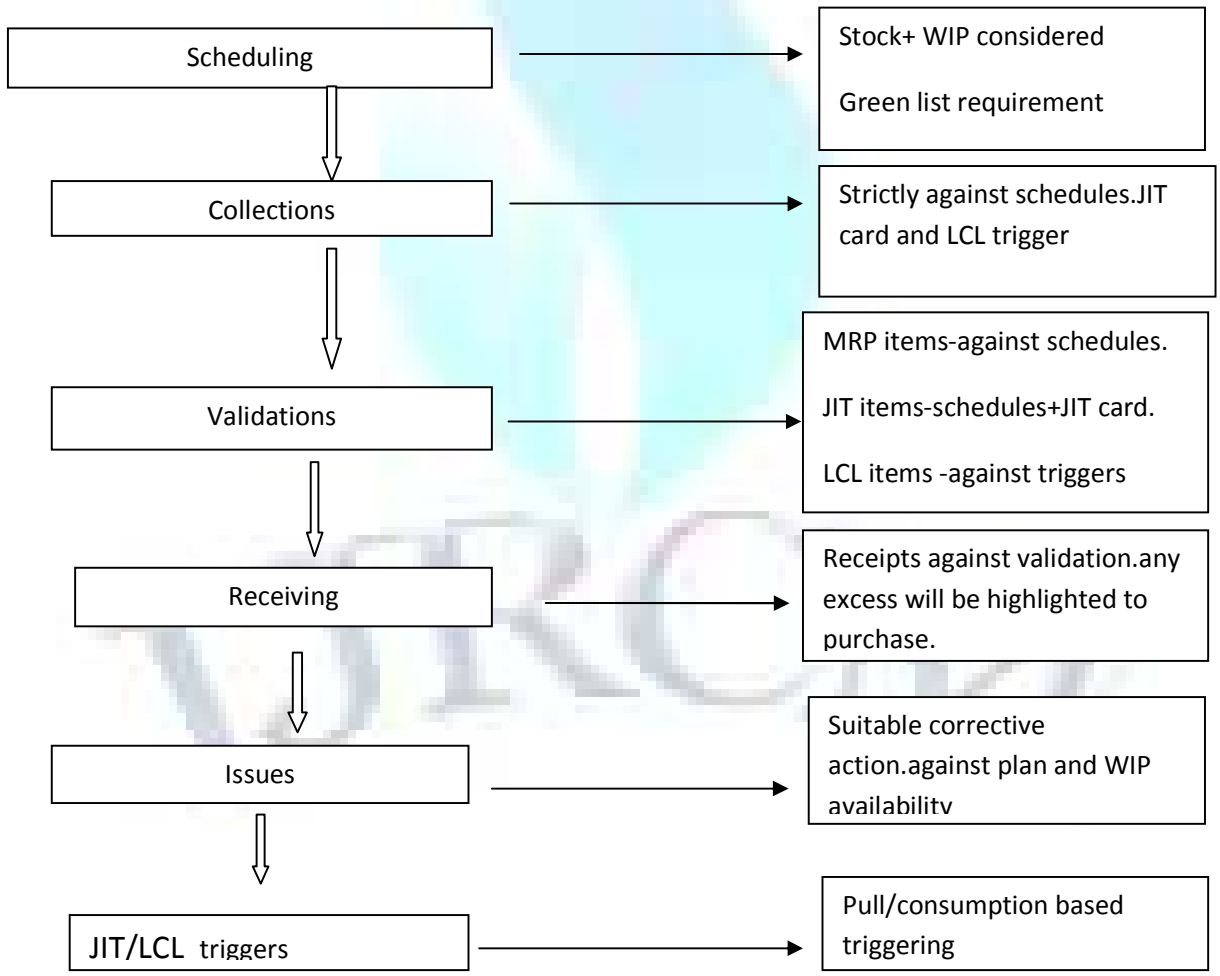

TABLE 1: TREND ANALYSIS OF INVENTORY MANAGEMENT IN ASHOK LEYLAND (RS. IN MILLIONS)

Year	Inventory	Estimated	Year	Forecasted
2001	5176.74	-2330.73	2010	7944.84
2002	5953.44	-1189	2011	9086.57
2003	4104/56	-47.27	2012	10228.3
2004	5069.41	1094.46		
2005	5680.81	2236.19		
2006	9025.61	3377.92		
2007	10703.21	4519.65		
2008	12239.14	5661.38		
2009	13300.14	6803.11		

Source: Annual report of Ashok Leyland

SUGGESTED PROCESS OF VMI

The stock information was retrieved to implement VMI in the first phase. The following table depicts the chosen components for VMI implementation

STOCK INFORMATION SYSTEM

SI NO	AL PART NO	XX PART NO	DESCRIPTION	STOCK SIZE	LOT SIZE	SAFETY STOCK
1	0E1090	0987891	RADIATOR	40	20	36
2	NP098N	OP2901B	BATTERY	40	20	36
3	09NIU2	OP09823	POWER STEERING	64	32	49
4	OJ34913	0451032	PROPELLER SHAFT	64	32	80
5	9034NG	IO524J36	GEAR BOX	52	32	64
6	N7893L	034190H	AIR CYLINDER	52	25	60
7	N4109N	0384TU8	TYRE	40	40	43
8	I09214	OP0342N	BRAKES	40	40	58
9	9HU438	05432M1	FRONT/REAR LIGHT	40	20	54
10	350I12	043NBG4	SEATS	70	35	24

TABLE 2: SELECTED COMPONENTS FOR VMI IMPLEMENTATION

A VMS display board was established which shows the VMS items which should be segregated from other components.

VMS DISPLAY BOARD

PART NO :
PART NAME :
BIN LOCATION :
BUFFER QUANTITY :
MAX QTY :
SUPPLIER :
SUPPLIER LOCATION :
XXXX CONTACT PERSON :
CONTACT NO :
TRIGGERING MODE :
TRISSELIN TIME :

Table 3: VMS display board

To make VMI system practically possible in a trial basis, the below mentioned measures were expected:
Step 1: All the identified items should be stored in designated locations.
Step 2: Identified components stock to be sent to supplier by 9.00am everyday though email.

Step 3: Days plan given by PPL should be sent along with stock by 9.00am every day.
Step 4: All components selected for VMS should be under green channel.
Step 5: Priority to be given for VMS vehicle in gate entry & unloading.
Step 6: No other material should be carried in VMS truck. Quantity of the material to be supplied will exactly match to the current day's plan.
Step 7: Suppliers to be educated about the process.
For ease of operation, two phases have been identified and components were selected for both the phases to implement the process. Both the phases comprised of 5 components each. A comparison could be made of the stock level, before and after the implementation of VMI in Ashok Leyland.

STOCK LEVEL BEFORE THE IMPELEMENTION OF VMI IN AL

SI NO	AL PART NO	XX PART NO	DERCRIPTION	STOCK SIZE	STOCK VALUE
1	0E1090	0987891	RADIATOR	40	260000
2	NP098N	OP2901B	BATTERY	40	260000
3	09NIU2	OP09823	POWER STEERING	64	416000
4	0J34913	0451032	PROPELLOR SHAFT	64	416000
5	9034NG	I0524J36	GREAR BOX	52	338000
6	N7893L	034190H	AIR CYLINDER	52	338000
7	N4109N	0384TU8	TYRE	40	260000
8	I09214	OP0342N	BRAKES	40	260000
9	9HU438	05432M1	FRONT/REAR LIGHT	40	260000
10	350I12	043NBG4	SEATS	70	455000
					3263000

Table 4: Estimated stock level before implementation of VMI

STOCK LEVEL AFTER THE IMPLEMENTATION OF VMI IN AL

SI NO	AL PART NO	XX PART NO	DESCRIPTION	STOCK SIZE	STOCK LEVEL
1	0E1090	0987891	RADIATOR	40	220000
2	NP098N	OP2901B	BATTERY	40	220000
3	09NIU2	OP09823	POWER STEERING	64	352000
4	0J34913	0451032	PROPELLOR SHAFT	64	352000
5	9034NG	I0524J36	GREAR BOX	52	286000
6	N7893L	034190H	AIR CYLINDER	52	286000
7	N4109N	0384TU8	TYRE	40	220000
8	I09214	OP0342N	BRAKES	40	220000
9	9HU438	05432M1	FRONT/REAR LIGHT	40	220000
10	350I12	043NBG4	SEATS	70	385000
					2761000

Table 5: Estimated stock level after implementation of VMI

CONCLUSION

VMI programs should be done with strategic partners who supply high and predictable volumes and with whom there is already an established long-term relationship. It gives the visibility to respond quickly to both increases and decreases in demand influenced by the economy. This allows the manufacturer to work with the distributors to refine replenishment to accurately mirror the actual market demand. Inventory level has been considerably reduced to 5.37Lakhs from 16.51 Lakhs during phase-I. Since the Vendor Managed Inventory is hold to be efficient and effective, which has been implemented in the components like radiator, battery, power steering, propeller shaft and gear box after the approval from the stores the inventory amount has been considerably reduced. Inventory level has been reduced to 12.78Ls from 28.72Ls during phase-II. The components chosen for implementation of VMI for the second phase were air cylinder, tyres, brakes, front/rear lights, and seats. An additional positive effect is the reduction in number of store rooms. At present the store rooms which are utilized for the storage of implemented components are 3. But after the implementation of the VMI, the store rooms could be reduced to 2 due to the condensed inventory level. The area space for operations can be drastically abridged to 100 sq. meters from 500 sq.meters. Area space is the main perspective of an organization to improve its production efficiently, especially in Ashok Leyland which is a vehicle manufacturing company, area space plays a crucial role. VMI plays a great role in reducing the area space. The carrying cost can be considerably reduced since the whole cost incurred for carrying the stocks will be taken by the vendor who is supplying the materials. VMI is still just the beginning in the industry, and will grow.

REFERENCES

1) Aichlymayr. R.M (2000). "*DC mart, who manages inventory in a value chain*?" Transportation and distribution 41(10): 60-66
2) Cheung K.L and Lee H.L (2002) "*The inventory benefit of shipment and coordination and stock rebalancing in a supply chain*". Management science 48(2): 300-306
3) Clark. T.H and J.H. Hammond 1997. Reengineering channel reordering process to improve total supply chain performance. *Production and Operations management*: 248- 265
4) Daniel Nowak; Robert Nyman; Marie Lundberg; (2006), VMI, a successful supply chain strategy? : Towards a VMI implementation at Kongsberg Automotive.
5) Disney.S.M and Towill.D.J (2002). "*A procedure for the optimization of the dynamic response of a vendor managed inventory system*". Computers and Industrial engineering 43: 27-58.
6) Erica Henningsson; Therese Linden; (2005), www.vendormanagedinventory.com/ vmi@vendormanagedinventory.com
7) Johnson M.E. T. Davis and M. Waller (1999). Vendor managed inventory in the retail supply chain. "*Journal of Business Logistics* 20(1): 183-203
8) Mette Eisenso; Liselott Dahl; (2007), From process selection to supplier selection: a case study about an accessory purchasing department exploring JIT and/or VMI process collaboration with their suppliers. www.essays.se/essay/7dbb91b05f
9) Narayanan. V.G. and A.Raman.1998. Assignment of stocking decision rights under incomplete contracting. Harvard business school, Boston, MA
10) Peter Kahn (2007): Introduction to vendor managed inventory http://www.forestryscotland.com/

REQUEST FOR FEEDBACK

Esteemed & Most Respected Reader,

At the very outset, International Journal of Research in Commerce and Management (IJRCM) appreciates your efforts in showing interest in our present issue under your kind perusal.

I would like to take this opportunity to request to your good self to supply your critical comments & suggestions about the material published in this issue as well as on the journal as a whole, on our E-mails i.e. **info@ijrcm.org.in** or **infoijrcm@gmail.com** for further improvements in the interest of research.

If your good-self have any queries please feel free to contact us on our E-mail **infoijrcm@gmail.com**.

Hoping an appropriate consideration.

With sincere regards

Thanking you profoundly

Academically yours

Sd/-

Co-ordinator