

Supply chain management in Newspaper Industry: A case of responsiveness

Shubham Sharma

Mechanical Engineering Department, School of Engineering, Gautam Buddha University, Greater Noida, Uttar Pradesh-201301, India
shubhamsharma.5617@gmail.com

Abstract - The purpose of this paper is to assess the responsiveness of supply chain in newspaper industry at discrete events. Newspaper industry presents a different set of challenges and opportunities for implementing supply chain management initiatives.

The paper focuses on a survey-based research that has sought to assess the responsiveness of supply chain at discrete events. Typically, a responsive supply chain is capable of meeting market demand and increased capability to provide/produce more at less cost in less time. Looking at the perishable nature of newspaper, the responsiveness assumes significance.

Four key determinants-forecast uncertainty, demand variability, contribution margin, and time of delivery are found suitable to assess the responsiveness of the newspaper supply chain. The methodology is based on literature review, field surveys, and interviews conducted at various stages in supply chain.

The paper summarizes the observations based on survey/interviews conducted on various entities and events in the entire supply chain. It also explores various drivers responsible for adding value in the supply chain. Lastly, the responses by the survey respondents indicate that not enough resources were allocated to meet the desired responsive levels in supply chain.

The results and insights derived will be useful for business managers to understand and implement supply chain plans in terms of responsiveness.

Keywords: Supply chain management, Responsiveness, Discrete events, agility

1. Introduction

In 21st century business environment, newspaper industries in India and in other emerging economies are facing obstacles in responsive coordinating supply chain due to limited resources and lack of infrastructure. Scholars defined the concept of responsiveness in Supply chain as the ability of the organizational department to react to changes in customer needs and wants or in market condition (Frey, 1988). Supply chain management (SCM) is the balance of inventory flow, information and currency between the different drivers of supply chain (mentzer et.at 2001).

Mohanty and Deshmukh [1] describes, "A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products and the distribution of this finished products to customers. Supply chain exists in both service and manufacturing organizations, although the complexity of chain may vary greatly from industry to industry and firm to firm."

All organizations have supply chains of varying degrees, depending upon the size of the organization and the type of product manufactured. Included in this supply chain process are customer orders, order processing, inventory, scheduling, transportation, storage, and customer service. Competition for market share is no longer between single firms but mostly between supply chains (Taylor, 2003).According to[2]

Othman and ghani (2008), lean and Just in time (JIT) in supply chain practices can improve schedule for delivery, can eliminate the waste, and make close collaboration, rationalization and progress of effective suppliers.

The purpose of this paper is to develop a theoretical frame work for business managers to understand and implement supply chain plans in terms of responsiveness.

Literature Review:

Supply chain responsiveness means how rapidly an organization treats with customer inputs. Agile and quick supply chain is important. (Li et al 2008).[3] If the goal and vision of supply chain members are different then the profit of supply chain cannot be achieved (Arshinder et al, 2007).Agility in the supply chain is important factor. Agility means quickness, in which time you fulfill the order. Conflicts increase individual profits instead of profit of whole supply chain. There are three basic outcomes of long-term orientation one is relational behavior maximization second is minimization in conflicts and third is full satisfaction. When there is supply chain responsiveness in supply chain then delivery will be on time, cost will be reduce and forecasting of data will be accurate (Mehrjerdi, 2009).

Supply Chain Responsiveness

It includes a supply chain’s ability to do the following –

- Respond to a wide ranges of quantities demanded
- Meet short lead times
- Handle a large variety of products
- Build highly innovative products
- Meet a high service level
- Handle supply uncertainty

On the basis of simulation studies, [4]Mason-Jones and Towill (1997) suggest there is evidence for the argument that the responsiveness of supply chains increases the further ‘decoupling points’ can be extended apart. Supply chain management does not begin at the gates of the company. Suppliers and customers may represent the polarities of what at some point becomes a supply chain. But in contrast to these polarities, supply chain management is about creating a meeting point of these polarities inside the firm.

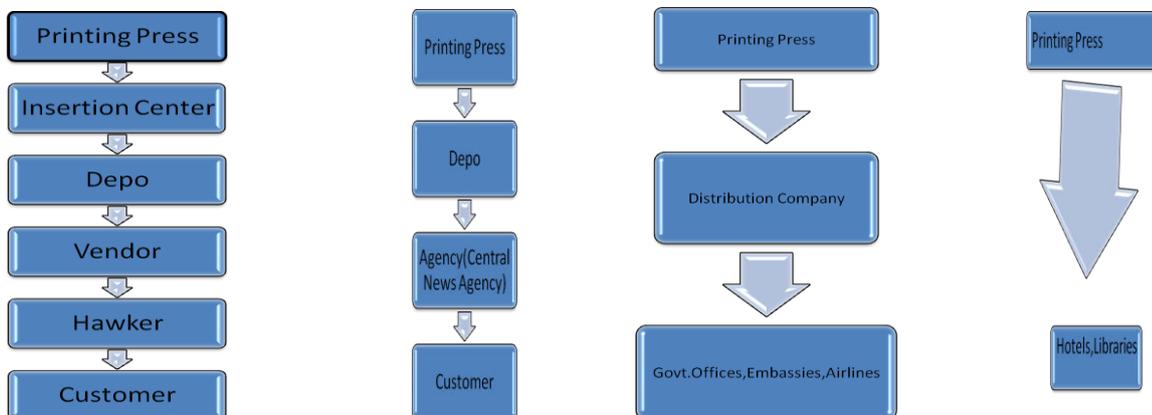


Figure.1 Four Distribution Channels in Newspaper supply chain

Methodology

The paper summarizes the observations based on survey/interviews conducted on various entities and events in the entire supply chain. It also explores various drivers responsible for adding value in the supply chain. Lastly, the responses by the survey respondents indicate that not enough resources were allocated to meet the desired responsive levels in supply chain.

The methodology selected for this study is the idea drafted followed by reviewing research literatures. Method of data collection is explained in the flow chart given below in the Fig 2.

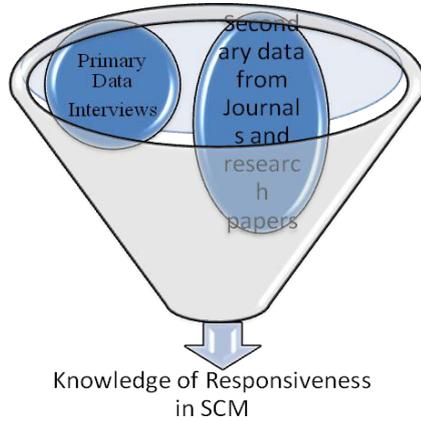


Figure: 2 Methods of data collection

The required data is collected using both primary sources and secondary Sources. Interview technique is used for primary data while secondary data is collected through available published materials in the library and internet. The primary data is collected by means of personal interviews. A set of questions were prepared for the personal interview consisting of questions to meet the objectives of knowing the practices of supply chain management in the industry. The questions were asked and have been thoroughly discussed with the respondent to clarify doubts, if any, regarding what has been asked. It had taken us nearly four weeks to complete the interviews.

Key Determinants for Measuring Responsiveness of Supply Chain in Newspaper Industry

Based on a literature review, the following are the key determinants for a responsive supply chain of Newspaper company:

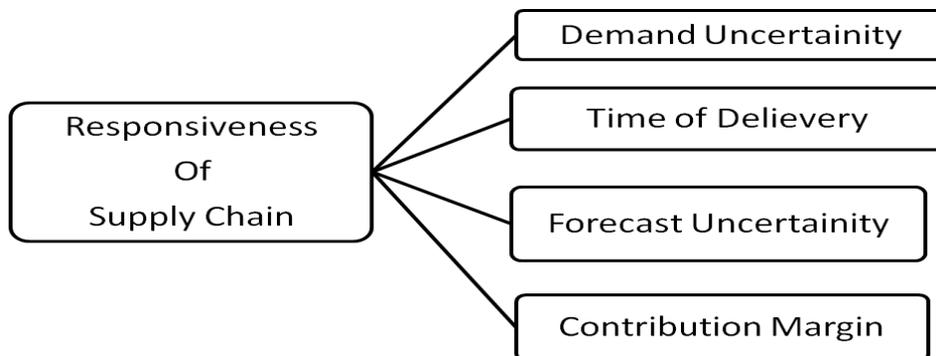


Figure.3 Key Determinants for Measuring Responsiveness of Supply Chain

- **Supply Chain Responsiveness -Time of Delivery**

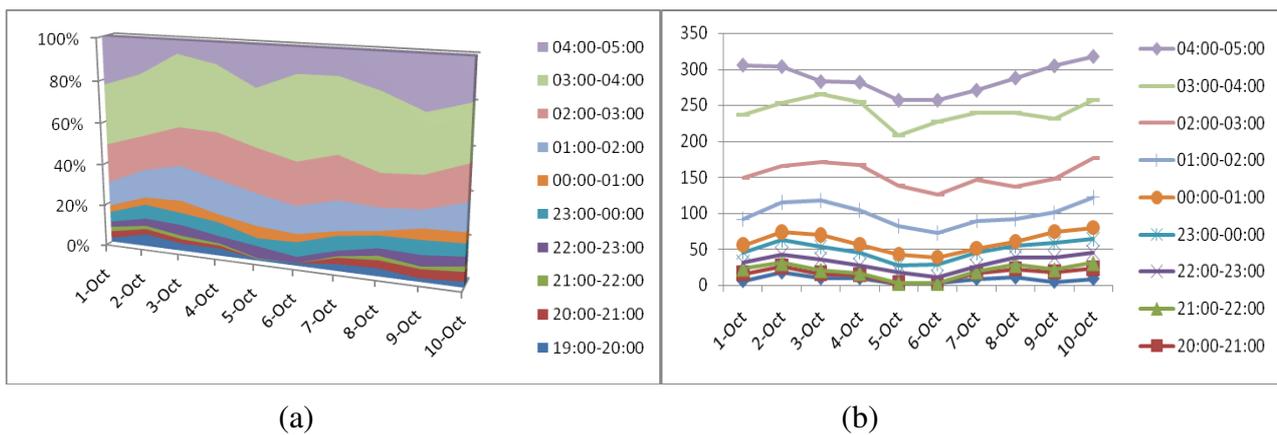
The challenge is on minimizing the delivery time taken by logistic service provider to distribute the newspaper to customer in least cost and time. It can be achieved by streamlining the flow of newspaper in following ways

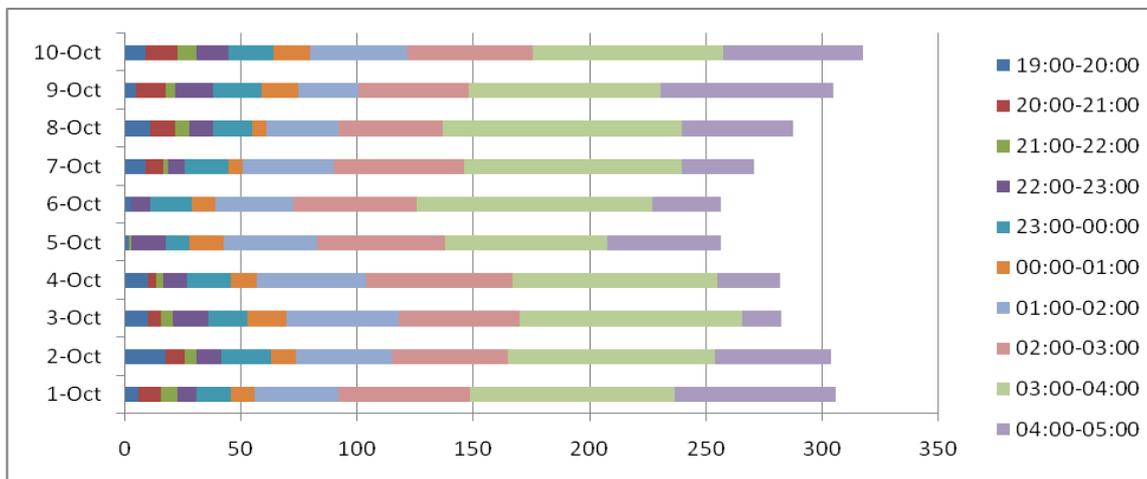
1. Minimizing time in dispatch from mailroom to loading platform and finally to truck
2. Allocating Insertion center near the press and reduce the travelling time thereby
3. Timely labeling of tags on bundles ready for loading into truck
4. Issue of challan and loading of trucks with newspaper should be quick before truck leaves for depot.

Table 1. Number of vehicles leaving the Newspaper press

Number of Vehicles Leaving the Newspaper Press on Dates given below											
Time(hrs)	1-Oct	2-Oct	3-Oct	4-Oct	5-Oct	6-Oct	7-Oct	8-Oct	9-Oct	10-Oct	Mean
19:00-20:00	6	18	10	10	2	3	9	11	5	9	8.3
20:00-21:00	10	8	6	4	0	0	8	11	13	14	7.4
21:00-22:00	7	5	5	3	1	0	2	6	4	8	4.1
22:00-23:00	8	11	15	10	15	8	7	10	16	14	11.4
23:00-00:00	15	21	17	19	10	18	19	17	21	19	17.6
00:00-01:00	10	11	17	11	15	10	6	6	16	16	11.8
01:00-02:00	36	41	48	47	40	34	39	31	26	42	38.4
02:00-03:00	57	50	52	63	55	53	56	45	47	54	53.2
03:00-04:00	88	89	96	88	70	101	94	103	83	82	89.4
04:00-05:00	69	50	17	27	49	30	31	48	74	60	45.5
Total	306	304	283	282	257	257	271	288	305	318	45.5
	Wed	Thurs	Fri	Sat	Sun	Mon	Tue	Wed	Thurs	Fri	

^a Table for Measuring the Number of vehicles leaving Newspaper Press





(c)

Figure.4(a),(b),(c) showing the Dispatch data of Truck from XYZ company

As shown in figure 4 we observe that number of vehicles leaving the press during 3 to 4 am is greater than trucks leaving press between 2 and 4 am, there is a need to balance the dispatching of vehicles during this period by utilizing latest technology like RFID/GPS to monitor truck movement and by improving the existing layout of the conveyor system for streamlining the movement of newspaper bundles till they arrive at loading platform for dispatch. These efforts will further improve the time delivery of newspaper to the customer.

- **Supply Chain Responsiveness – Contribution margin at various stages**

Traditionally, SCM theories have described 'responsiveness' as an effect of the ability to think supply chain management from 'customer's customer to supplier's supplier'[5] (Ellif, 1996).

Company share

Circulation earns barely 10-15% of revenue for the company. Rather it involves more expenditure than income. This is major challenge that the print media faces and overcomes it through advertisement revenue.

Vendor/Agent Share

The daily newspaper on an average comprises more than 80 per cent of the total annual income of a vendor. Thus daily newspapers reap assured profits. Secondly, they are read by a large majority. This implies that they have a huge demand or readership in the market. This has proved true in the Indian scenario which has seen robust growth in newspaper market since 2007 and would continue to do so at the rate of 6.8% annually up till 2014.

A vendor earns a commission of 30% of the cover price of each copy of a newspaper he purchases from the salesman. Bureau of Circulation (ABC) considers any copy sold above 33% commission as sold for free. This rate functions like a norm for any transaction in a daily newspaper purchased by the vendor. Thus a vendor distributing 1000 copies of TOI a normal weekday costing Rs.3 each would earn Rs. 1000 for the day. Likewise his commission income increases on weekends when the same newspaper costs Rs.5. However,[12] the commission rate stands variable. It may increase from 30% to say 50% in case of the newly launched newspapers who offer the high commission rate as a promotional measure. For example, a newly launched paper Lok Satya pays an 'invitation discount' of 50% commission rate. This may also remain less than 30% in case of certain newspapers. For instance, before the launch of the Mint newspaper in February 2007, the commission rate offered on the ET was 25%. The ET could still continue circulation because it enjoyed monopoly amongst the economic newspapers in Delhi. But this could not comfortably

continue for long and witnessed a major strike against by the vendors against the ET at the Nehru Place newspaper depot in 2003-4. The company attempted to break the strike by circulating the newspaper itself in a few places. Eventually the strike broke down after lasting for barely two days. Commission rates for ET finally rose to 30% on the midnight when the HT group declared the launch of the Mint. A similar strike broke out for the same reasons against the Business Standard on 8 July 2011 (Friday) when its salesman declared to pay a 25% on the day's newspaper which costs Rs. 7 each copy.55 However like the previous strikes this too remained unsuccessful and most barely go noticed. Out the segment of daily newspapers distributed by a vendor, it is the city edition which forms the largest share in total pie. City editions on an average would comprise more than 85% of a vendor's annual income. At the Nehru Place newspaper depot out of the total 168 vendors all of them deal in city editions of newspapers..

- **Supply chain Responsiveness- Forecast Uncertainty**

Newspapers are like goods with a shelf life of one day and they have to be distributed daily basis to the sales points.[6] A problem that most newspaper companies encounter daily is how to predict the right number of newspapers to print and distribute among distinct sales points.

In Delhi circulation of a newspaper equals to the printed quantities of the newspaper. [7]It also equals sum of net sales and returns. Therefore, our study includes two parts; one is forecasting the net sales, the other one is determining the expected returns. We will use our forecasting model to forecast only circulation of Agency.

The objective is to predict newspaper demand as accurately as possible to match up customer need with least number of returns, missed sales and oversupply. This makes it necessary to develop a short-term forecasting system. The data taken from one of the largest newspaper distribution agency of Delhi.

The newspapers we use in this study have different properties that affect their sales. Newspaper1 is a employment newspaper. Job opportunities affect its sales. Especially, in India where number of job seekers is all time high, there is constant hike in the sales of newspaper1. Newspaper2 is one of the biggest newspapers in Delhi-NCR. It often gives promotions and free supplements and makes coupon campaign. These sales techniques cause increases in the sales of it. Sport activities like cricket matches also increase its sales. These increases also cause fluctuations and greater RMSE value than others. Newspaper3 is more stable than the other newspapers since it doesn't usually have promotion, free supplements and coupon campaigns. It has basic sales. [8]So, its RMSE value is smaller than others.

We use about two-year the net sales data of XYZ Agency between 30/06/2012-31/06/2014. The data set includes 760 observations about daily net sales for each newspaper. The time series graphs of each newspaper are obtained and given in Figure 5.

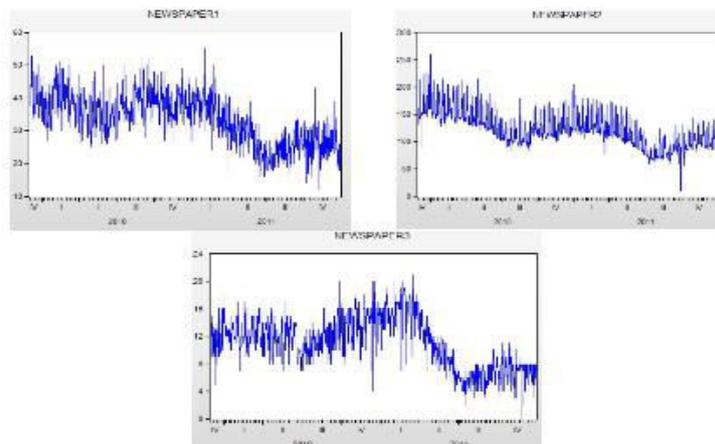


Figure.5 Time series graphs of three newspaper1,2 and 3.

- **Supply chain Responsiveness- Demand Variability**

This paper studies the management of supply chain demand variability in a model with one supplier, N retailers, and stochastic demand. Retailers implement scheduled ordering: They may order only every T periods, and their order quantities must equal an integer multiple of a fixed batch size, Q . Scheduled ordering policies influence the propagation of demand variance within a supply chain. Lee et al. (1997) demonstrate that the supplier's demand variance depends on the alignment of the retailers' orders. The supplier's demand variance is maximized when the retailers' orders are *synchronized*, i.e., all N retailers order in the same periods. It is minimized when the retailers' orders are *balanced*, i.e., the same number of retailers order each period. Assuming balanced orders, this paper demonstrates that the supplier's demand variance is further reduced when the retailer order intervals are lengthened (T is increased) or when the retailers' batch size is reduced. The combination of these actions can dramatically dampen the supplier's demand variance.

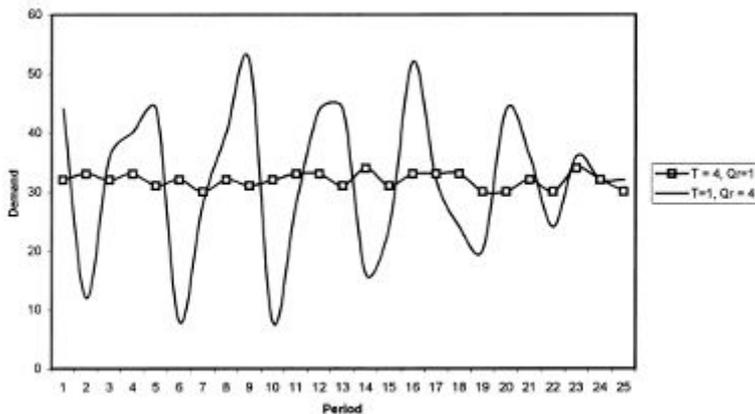


Figure:6 Simulated Supplier Demand and the Agent Ordering : T Order Interval Length; Q_r Batch Size

Practical Problems and Issues due to demand Variability

As demand increases salesman inform the sales office which gives information to production department which then again shares it with RMD dept. In case of demand variability last changes are done in the manifest just before production starts. Arrangements are done in advance for transporting the extra copies to depots by using extra vehicles. The outbound logistics which is responsible for carrying out distribution of newspaper is on contractual basis which has average 350 trucks in his fleet. There are different types of vehicles having varying capacity which are hired on contract basis by company. As pagination increases the size of bundle decreases and stacking time increases, weight of bundle increases and ultimately an extra arrangement is to be done for proper transportation to depot.

RMD plans, co-ordinates the activities of dispatching..

Demand during the week varies according to the number and type of supplements. For example: Times Accent which is sold in bulk quantities on Wednesday. On Sundays and Saturdays the government offices and embassies, school are closed so demand of English newspaper decreases while demand of Hindi dailies increases.

Use of SAP has increased the responsiveness of the system as all the information is equally shared to all departments accordingly maintaining the information flow at all levels and sharing demand variation information. New machines are installed which have enough capacity to handle the print order but they do not have appropriate infrastructure which can bear the dispatch or post press operations. Company is ready to make investment to enhance the infrastructure of press mailroom.

In a short span of 1 hour the printing machine produces 1.5 lakh copies which are capable of balancing the changes in the demand. Due to different capacities of line 1 and line 2, print order keeps on changing depending upon the varying pagination, printing delay, insufficient space in mailroom.

Discussion

The aim of the research presented in this research was to add to the knowledge on supply chain responsiveness in newspaper industry. Firstly, this study investigate the effect of key determinants like Demand uncertainty, time of delivery, forecast uncertainty, contribution margin on the supply chain responsiveness. Overall, this study contributes to the knowledge of the role of supply chain responsiveness of the firm in supply chain management field. Secondly, this study provides a practical and useful tool for supply chain managers to audit and assess supply chain management practices. Third, this study provides conceptual and prescriptive literature regarding supply chain responsiveness and agility. Fourth, the results lend support to the claim that better of supply chain management responsiveness lead to better competitive advantage of the firm.

Research finding showed that 57% of the respondents indicated that their firm has not embarked upon a program aimed specially at implementing supply chain management. Of the remaining 43% of the respondents indicated that their firm has embarked on a supply chain management program for just two years or less. The findings of this research assure the practitioners that SCM is an effective way of competing, and the implementation of SCM practices does have a strong impact on supply chain responsiveness and competitive advantage of the firm.

Moreover, responsiveness on all dimensions, namely, supply side, within the organization, and downstream is needed for total responsiveness of the firm. The key learning of the study suggest that there is a bunch of supply chain management good practices exists in the Indian Newspaper industry. The major limitation of the study was that most of the respondents being very loyal to the company and were reluctant to give response. The numbers of respondents need to be increased.

Acknowledgment

The author gratefully acknowledge the motivation and guidance provided to this study by Prof.S.G Deshmukh ,Department of Mechanical Engineering, Indian Institute of Technology (Delhi), India.

References

[1] Ph.D.R.P. MOHANTY, Ph.D. S.G. DESHMUKH., *SUPPLY CHAIN MANAGEMENT (THEORIES & PRACTICES)*

. Dreamtech Press, 2005.

[2] A.A. Thatte (2007), "Competitive advantage of a Firm Through Supply Chain Responsiveness and Supply Chain Management Practices", Published PhD Dissertation. University of Toledo.

[3] Hoekstra, S. and Romme, J. (1992): *Integrated Logistics Structures: Developing Customer Oriented Goods Flow*. McGraw-Hill, London.

[4] Cao, N., Zhang, Z., To, K.M. and Ng, K.P. (2008), "How are supply chains coordinated? An empirical observation in textile-apparel business", *Journal of Fashion Marketing & Management*, Vol. 12 No. 3, pp. 384-97.

- [5] Aviv, Y. (2001), "The effect of collaborative forecasting on supply chain performance", *Management Science*, Vol. 47 No. 10, pp. 1326-43.
- [6] Moberg, C. R., Cutler, B. D., Gross, A., and Speh, T. W. (2002), "Identifying Antecedents of Information Exchange Within Supply Chains", *International Journal of Physical Distribution and Logistics Management*, 32(9), pp. 755-770
- [7] Billah, B., King, M.L., Snyder, R.D. and Koehler, A.D. (2006). Exponential smoothing model selection for forecasting, *International Journal of Forecasting*, 22, pp. 239-247.
- [8] Box, G.E.P. and Jenkins, G.M. (1976). *Time Series Analysis: Forecasting and Control*, Revised ed. Holden-Day, San Francisco, USA.
- [9] He, Y., Zhao, X., Zhao, L. and He, J. (2009), "Coordinating a supply chain with effort and price dependent stochastic demand", *Applied Mathematical Modelling*, Vol. 33, pp. 2777-90.
- [10] Huin, S.F., Luong, L.H.S. and Abhay, K. (2002), "Internal supply chain planning detriments in small and medium sized manufacturers", *International Journal of Physical Distribution & Logistics Management*, Vol. 32 No. 9, pp. 771-82.
- [11] Jharkharia, S. and Shankar, R. (2005), "IT-enablement of supply chains: understanding the barriers", *The Journal of Enterprise Information Management*, Vol. 18 No. 1, pp. 285-309.
- [12] Interview, Mayank Maletha, Assistant Manager Circulation, Lok Satya, 2 July 2014.
- [a] Interview, Anonymous, newspaper VDR, Nehru Place depot, 19 July 2014.
- Interview, Anonymous, newspaper VDR, Nehru Place depot, 19 July 2014.
- [b] Interview, Sri Kant Verma, newspaper vendor, Nehru Place depot, 10 July 2014.
- [c] Interview, RM Sharma, newspaper VDR and MTNL employee, Nehru Place depot, 30 June 2014. He distributes almost 200 copies of TOI and HT in the nearby NP apartments.