Study of Pull and Push Systems

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***Abstract*—This paper tries to find out whether firms should follow a push system or pull system and how their supplier chain works. Depending upon the nature of firm, it can be a mix of both the systems. This study gives an idea on aspects which offers best result to fit for firms and their trade. It also discusses the advantages and disadvantages of both the systems. This study also includes about the inventory levels suitable for each system.**

***Keywords*— Push System, Pull System, Inventory Levels.**

I. Introduction

The suppliers are vital part of all the production system and in today's competitive atmosphere, planning and managing the supplier's chain properly is equivalent to managing the complete firm [1]. The system chosen by the firm decides the complete model followed by the firm. Supply chains are deigned on basis of manufacturing of a product, delivered to wholesalers, retailers and made available to the customers. The most common systems for moving from upstream to downstream sites are push and pull systems, or mix of both. The basically firm's all processes in supplier management fall into any one of the two categories depending on the timing of their implementation with respect to the customer demand. These practices are either Pull/Push System [2–4]. Push system is a production system in which production is aligned on an estimated production plan and where data flows from management to the market, the same direction in which the materials flow. Pull System is a production system in which making is based on actual daily demand (sales), and where data flows from market to management in a direction opposite to that in traditional (push) systems [5–8].

II. Definition

A. Pull System

Manufacturing system in which production is based on actual daily demand and where information follows from market to management is called pull system.
Example: JIT system (as presented in Figure 1)

B. Push System

Manufacturing system in which production is based on a projected production plan and where information follows from management to market is called push system.
Example: MRP (Materials Requirement Planning)

III. Push based Supplier Chain System

In this system the material is pushed to the supplier chain from the initial raw material end to the customer end on the basis of the demand forecasts. At the end of the supplier chain, the finished goods await customers' orders. Naturally inventory in various forms (raw material, work-in-progress and finished goods) exists at the various points in the supplier chain, 'just-in-case' it may be required. Push process operate in an uncertain environment in which customer demand is not yet known [9].

IV. Pull based Supplier Chain System

In this system a customer's order pulls items into the chain. If, the customer is willing to wait during the time the product is being processed in the supplier chain, then this strategy starts to fail. Pull system operate in a situation in which customer demand is well-known. A major advantage of this strategy is that in an ideal situation, there would be zero inventories all across the supplier chain [10, 11].

Initially most of the businesses were following Push system but in the last two decades pull system is pushing the push system. These systems have led to the upgrading of lean manufacturing and Kanban System. Although all segments cannot go for the pull system and some have to follow push. This study tries to learn which system is best fit for which type of business. Kanban means flag or signal, and is a visual help to convey the message that action is essential [12].

V. Advantages and Disadvantages of Pull System

A. Advantages

- Pull system requires limited inventory that needs to be stored, hence minimizing inventory levels and the price of carrying and stored goods.
- Pull system follows a system make-to-order, i.e., production is carried out on customer order
- In pull system, there is smooth cash flow, since over production is not done under market demand predictions.
- Pull system operates on the basis of customer's need, i.e, pull system is customer centric. With this system, companies manufactures the products as per customer's requirements.
- The objective is to keep inventory levels to lowest by only having sufficient inventory, not more or less, to meet customer's requirement.
- Pull system helps to minimize the risk of product obsolesce.

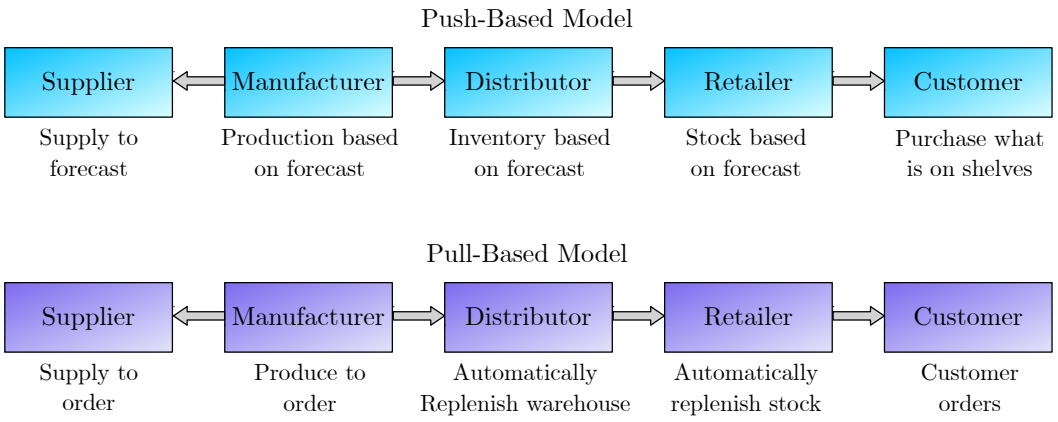

Fig. 1. Push and Pull based Model

B. Disadvantages

- Pull system lacks in making advantage of huge volume production, which leads to low margins earnings for suppliers and higher cost of products for consumers.
- It requires proper balance at all stages of suppliers chain, hence more attention is required.
- Frequent set up of machines will consume huge man and machine hours which leads to increase in production cost.
- If supplier chain faces any problem this makes customer unhappy.
- Since customers demand has higher priority there is always "high Stress" rush order for manufacturing.
- A company will run into ordering dilemmas, such as a supplier not being able to get a shipment out in time. This leaves the company unable to fulfill the order and contributes to customer dissatisfaction.

VI. Advantages and Disadvantages of Push System

A. Advantages

- Push system requires high inventory which makes profit in procuring the items at discounted prices due to price fluctuation in the market.
- Producers make more production not really not to customers order hence it is producer centric.
- Push system follows a system make-to-stock, i.e, production is carried out based on sales predictions
- The push system of inventory control includes forecasting inventory needs to meet customer demand.
- Firm is fairly assured it will have enough product on hand to complete customer orders, preventing the inability to meet customer demand for the product.
- Push system takes the advantage of low cost production due to high volume production and sales in long term quantity.

B. Disadvantages

- Push system requires maintenance of large and complex records.
- Push system requires careful and sustained work to maintain effective production in firms.
- Inaccurate as sales can be unpredictable and vary from one year to the next.
- Push system generate large quantities of scrap before errors are identified which increases the company's inventory carrying cost.

VII. Conclusion

This study proves that all the practices in a supplier chain fall into two groups either push/pull system depending on the scheduling of their functioning in relation to the customer demand. Although in some cases they might use push-pull based system, it depends on the type of industry. This study offers the various factors which help the business in deciding whether to go for a push/pull strategy. Thus, this study can help producers to decide whether they should choose for push/pull approach or the mixed. Some firms initially having push system may move from push to pull system with rapid progress in technology. This study can be further extended to the firm specific study on use of push/pull system.

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