IDEA
rethinking retail

Key Performance Improvements in a Pull System

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There is a significant advantage in using a Pull system in a supply chain. Specifically, Pull systems are based on actual consumption rather than much less accurate forecast consumption. However, most companies would define their supply chain as a Push system. Why do more companies use a Push than a Pull system? Does that mean the advantages of a Push system outweigh those of a Pull system? Are most people crazy? That can't be it. This paper describes both Push and Pull systems and compares their relative merits and disadvantages.

Push Systems

The central basis for a push distribution system is a predicted or forecast demand. In some instances, forecasts are made months in advance. Predicting what and how much customers will purchase is difficult; especially the further into the future you go. The manufacturer develops a production plan based on these predictions. Once the product is manufactured there is little choice but to Push inventory into the distribution channel and hope that the prediction was correct.

From what we have said so far, Push systems are wrong by the amount that the forecast is wrong. Is that the extent of the problem? In fact, there is another major contributor to outages and surpluses. Each link in the supply chain is typically measured independently from the rest of the supply chain, even in the case where several links are part of the same company. Links do their best, sometimes at the expense of the whole system. As long as local measurements exist, links will seek to demonstrate their operational efficiency.

Plants produce large, efficient batches to minimize production loss due to set-ups. Set-ups occur when a manufacturer stops a production line to reconfigure it to make a different product. While the production line is down, no product is made. If no product is made the plant's efficiency decreases, making the plant look worse according to its measurements. "If you tell me how you measure me, I'll tell you how I'll behave." Therefore, excessive batch sizes create inventory for which there is no demand. If the predicted demand is more than the actual consumption the extra inventory created by batching adds to the forecast error. The result is too much inventory, which is passed to the next link in the supply chain.

Downstream links in the supply chain are encouraged, through quantity discounts to purchase large, economic order sizes. If all of the next links order enough, it may leave a big hole in the plant's inventory, causing another big production batch. To the plant these orders look like an increase in demand. But, has the end user actually bought more? If not, the extra production simply becomes a glut of inventory down stream in

the supply chain. The reason for batching has nothing to do with demand. We would, therefore, expect that inventories are generally too high.
In turn, each link in the supply chain Pushes product to the next link, over and over. Retailers, at the end of the chain, purchase large inventories to cover predicted demand and to limit stock outs. There is nowhere for the excess inventory to go, except to be Pushed on to the consumer. Retail uses advertising, promotions and discounts to move product for which demand has not materialized.

Throughout a Push supply chain, margin is lost through discounting in virtually every link. Discounting exists in order to move inventory in excess of the normal consumer demand. Other consequences of excess inventory are cash tied up, obsolescence, carrying costs, disposals, slow response to market shifts and competitive initiatives.

As we wondered above, if Push systems are so fraught with disadvantages, why are they used predominantly across most industries? We are forced to stock high levels of inventory unless we can find solutions for three difficulties: it takes a relatively long time to replenish what is sold, there is uncertainty in demand and replenishment time is not reliable. To protect sales, a decision is made to push large inventories to points of sale.

Push systems are used to protect sales. It is true that discounting and extra costs are consequences of a Push system. Most companies agree that accepting lower margins and higher costs is a reasonable compromise in order to protect sales. Hence, most companies adopt Push systems for solid logical reasons.

Pull Systems

Pull distribution systems rely on actual consumption to drive production. Inventory replenishment, therefore, is controlled by end user purchases. For the most part, predictions of what a consumer is going to purchase at sometime in the future are eliminated. In a Pull environment forecasts are only used to introduce new products to the market and to cover special promotions that would otherwise deplete inventory buffers.

Some of the key improvements in an IDEA pull system include:

Fewer Inventories

One improvement of a pull system is that less inventory is needed in the supply chain. Inventory levels are based on demand, replenishment time, and the variability of both. Replenishment time is made up of order lead time, transportation lead time, and production lead time. The Pull system recognizes the need to pool inventory where there is the greatest predictability. At the supply point (plant warehouse) the aggregated consumption helps to even out the statistical fluctuations in demand and increases predictability. If inventory is held at the supply point, production lead time is eliminated. The plant warehouse stocks all items and the plant simply produces to stock.

If inventory levels can be reduced by reducing production lead time, doesn't it seem likely that we can reduce inventory levels further by reducing the other factors that make

up replenishment time? Yes. If we reduce replenishment time further we can carry less stock. A computer system can track daily sales and order replacements, thus reducing the time and batching time associated with human order preparation. Order lead time can be further reduced if min-max parameters and economic order size requirements are eliminated.

With much of production lead time removed from the retailer's replenishment time, replenishment occurs more quickly. That means the amount of inventory the retailer needs to hold is greatly reduced. With less shelf space required, there is an additional beneficial opportunity to increase the variety of items at the retailer.

Reduce Stock-outs

If inventory levels at retail are reduced, how can the amount of stock-outs be reduced? Replenishment occurs over a shorter period, daily or weekly, in exactly the amount that was consumed over the previous period. Fast replenishment reduces the risk of stock out, even with much lower inventory levels. Customers don't have to go looking for alternate or competitive products. When stock-outs do occur, fast replenishment reduces the reason for customers to resort to competitors products.

Operational Expense

With fewer inventories in the system, there is less obsolescence, less disposals, less labor, less carrying costs and less overhead. Keeping the bulk of the inventory at the supply point reduces the amount of transfers of inventory between regional warehouses and between retail locations.

Sales

Customers are not wasted. Service levels increase. Buyers find items they seek and buy them. Reduced inventory at the retail level produces extra cash flow and shelf space needed to increase the variety of products offered. When greater variety is available, new buyers find and buy items that were not stocked before. Customer satisfaction and sales are increased.

Margin

Fewer inventories in the system reduce the need for sales and discounts maintaining revenues and margin. Less sales of old product avoids eating into the market and margin of new and improved products.

Conclusions

Pull systems reduce batching, decrease replenishment time, minimize demand and replenishment uncertainty. "With these changes, total inventory is the supply chain decreases by two-thirds, while customer service increases."[1] Increase sales volume with lower operating expenses and two-thirds less finished goods inventory. How will that affect your return on investment?

IDEA'S WAY OF THINKING

- *Neither an accurate forecast nor changing vendors is required for success*
- *There is a way to both increase sales and reduce inventory*
- *Supply chains sell less when clogged with inventory*
- *In the long term, unless the supply chain sells more no link can sell more*
- *We must help clients gain buy-in internally and with supply chain partners*
- *The majority of our fees are based on improved return on inventory*

IDEA'S METHOD

- *Verify the existence of inventory imbalances and the benefits of moving from a "Push" to a "Pull" system*
- *Gain top management buy-in to the assessment and support of the approach*
- *Build knowledge and understanding across the supply chain, at all levels*
- *Utilize systems that deliver actionable information, integrated with existing software*
- *Work with you until expected results are achieved*
- *Share the tools and know-how to continually improve results*

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[1] *Viable Vision Transforming Total Sales into Net Profits* Gerald I. Kendall, PMP