WHITE PAPER

VASFT021

Demand Driven Execution

Demand driven (adjective)

1. Doing something when it is required, but not before that.

2. (computing) Computing a result or reaction when the need arises, but not before that ("demand driven execution").

Over the past few years there has been a widespread objective to develop and operate "demand driven supply chains and networks. The formalization of the concepts and objectives of this type of operation arose from earlier efforts in developing "just-in-time" and "lean processing" for production and manufacturing operations. Today, those same concepts that once applied to production operations are being applied to the entire supply chain or supply network. The application of these principles is not only to reduce inventory requirements but to improve efficiency, predictability, quality, and responsiveness of supply chains. The "distribution operation" is central to the supply chain and distribution operations are becoming more clearly and correctly viewed as production operations. There is an evolution to the application of the earlier developed production process management techniques to the distribution process. The term "Demand Driven Supply Chain (or network)" refers to the nature of the operation. The term Demand Driven Execution refers to "how" the operation functions.

First it is necessary to point out that when looking at the distribution operation as part of a supply chain that they are all demand driven. Nothing is shipped from the distribution operation without a demand. From a "macro" view all distribution operations use demand driven planning. This paper, however, is addressing a "micro-view" or "inside the four walls" view of distribution operations. The paper addresses the nature of, benefits of and challenges in the creation of demand driven fulfillment within the distribution process.

Demand driven fulfillment by definition is a "pull" operation, one were a "demand" pulls product through the process chain. Demand driven operations are "reactive" rather than "predictive". Many times attempts are made to use predictive tools and push methodologies to create and improve distribution operations. While operations using these techniques may meet the "macro" view of a demand drive supply chain element, they do not create a demand driven fulfillment process. Demand driven fulfillment operations function in a "just-in-time" fashion.

An Example

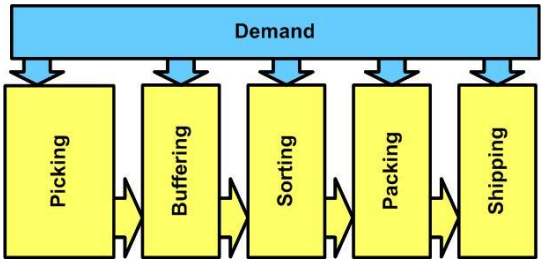
Let's illuminate the limitations of using push methodology and predictive tools and compare that methodology with a demand driven fulfillment methodology. This example is a simple fulfillment process that involves picking, sorting and packing. In the example a buffer is placed between picking and sorting/packing. This is similar to most retail fulfillment operations.

Push Methodology of Operation – Description of Operation

A "demand" for product comes from an external system; the demand is translated into pick requirements that are then picked. The picked product is then buffered for eventual sorting and packing. The product in the buffer is emptied and sorted to pack areas where it is further sorted and packed to meet the demand.

The above description of the operation is the process "design description". However when you ask the operators of such a process for a description of the operation it is usually more like: "The picking system works well until the buffer starts backing up. We are pulling a lot of

product that is not currently needed. The un-needed product is buffered until sorting is able to process it. A larger buffer would help this situation.



The sorting system in dealing with the product not yet needed has a lot of recirculation. That creates an additional challenge with much of the needed product stuck behind the product that is not yet needed. It would be worthwhile to add some wave buffers to hold the future product. The lack of adequate buffer space is impacting both sorting and picking. It would also be very beneficial to have better tools to predict workload to allow for better staffing estimations, reducing buffers and improving efficiency."

Demand Driven Fulfillment Methodology

For a distribution operation that uses a demand driven fulfillment, the concept of demand is applied to each of the individual elements of the process. The entire execution process is "synchronized" or driven by demand. A description of the same operation using demand driven fulfillment is as follows:

Incoming demand is systematically prioritized delivering the most important tasks first. The picking operation batch picks orders from the prioritized demand based on availability of space in the buffer system. The buffer system releases picked goods to sorting based upon the sorting systems demand for goods. Sorting delivers a flow of goods to packing based on the packing systems resource availability. Packing delivers completed packed orders to shipping. Some questions may arise about dynamically creating pick batches and batch pick efficiencies. Other VAS White Papers address these questions in detail, but in summary dynamic batch picking is at least as efficient as wave picking and in many case it is more efficient.

By synchronizing the execution of the entire fulfillment process, a number of very important benefits are realized.

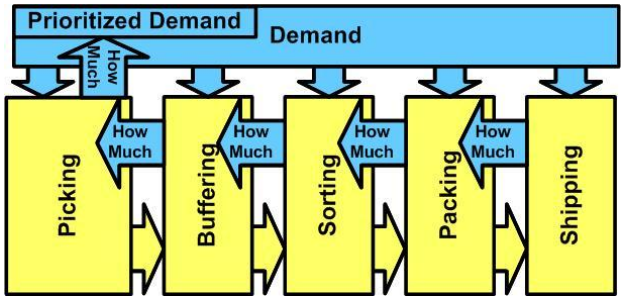
- Workflow becomes managed, therefore resources can be utilized constantly without cyclic behaviors.

- Buffers can be reduced in size since the feeding processes do not fill them with long term needs.

- The impact of exceptions is greatly reduced since their effect is immediately translated into demand changes and incorporated into the workflow.

- Repeatability of process becomes possible using demand driven execution of the fulfillment operation.

To some the paradigm of "getting ahead" may get in the way of understanding "demand driven execution" but an overview of the entire operation must be kept in perspective. Getting ahead at most applies to only half of the processes. Demand driven execution is the future for fulfillment operations.



VARGO® Adaptive Software is the leader in the creation of demand driven execution systems for distribution operations. Consider this statement: "The greatest opportunity for increasing personal productivity in distribution operations lies not in expecting people to work faster, harder, or even more accurately. The greatest opportunity for improvement lies in having people work constantly and independently at their own individual work rate." John Fontanella, Vice President of AMR Research.