

TECHNICAL NOTES

VASFT002



AWMS™ Principles Applied to Order Fulfillment



Order fulfillment operations can be greatly benefited through the application of Adaptive WMS principles and associated features. An Adaptive WMS or AWMS™ has an inherent inclination to accept new information to establish its current image of reality and to use that information in determining subsequent action. This principle, when applied to order fulfillment operations yields immense operational flexibility allowing work to be organized as the current situation dictates. This paper describes VAS' Smart Order Fulfillment Technology (SOFT™) and Mandate® AWMS features and principles as they apply to order fulfillment and provides examples of how they provide nearly unlimited operational flexibility.

At VAS we are passionate about some seemingly trivial concepts and the words used to describe them. One word for which we have a passion is “Plan” or “Planning”. To us, a “Plan” is something that is prone to doom or failure – our mothers taught us this while we were young (i.e. the best laid plans of mice and men...) and Murphy continues to demonstrate that our mothers were absolutely right! At VAS you will notice that when we use the word “plan” or “planning” we preface it with an adjective such as “adaptive”, “incremental” or “dynamic”. The definition of a plan is “HOW to get somewhere”.

The driving or motivating force of an AWMS is not in “planning”, it is in “objectives”. An objective specifies “where we want to go” or “what we wish to achieve” and does not include the notion of “how to get there”.

We also have a passion for the terms “warehouse” and “distribution or fulfillment centers”. We view these facilities as “production facilities”, where the word production denotes action or work not storage or product flow. Likewise we feel the use of the “bucket brigade” metaphor is a poor choice because that metaphor focuses only on

movement along a single path and does not address the actions that must be executed.

With that said, does SOFT and the Mandate AWMS plan? It absolutely does, and it plans all over the place and all the time. VAS Postulate #1: the most efficient method of planning is to create a “plan” only to the point at which a failure to complete an action specified in the plan could impact future actions. We call this “incremental planning”. VAS Postulate #2: the most efficient means of reaching an objective is to create incremental plans based solely on current conditions and determination of the single, most efficient next action to reach the final objective. We call this “dynamic optimization”. Within SOFT, many times a single subsequent action is pre-planned. This action is planned based on the assumption that the current action will complete successfully. SOFT does this to mask or hide the planning calculation time so that an order selector or worker has no delay in the presentation of the next action prior to completion of the currently assigned task.

The creation of an adaptive order fulfillment with dynamic optimization begins with defining the order fulfillment objective(s). The most basic fulfillment objective is to “deliver completed orders for shipment as quickly and efficiently as possible”. Other objectives are stated as rules that limit how the operation may be accomplished. Some examples of rules are definitions of order fulfillment (sequence), how cartonization is preformed, SKU mixing in cartons, shortage handling, fulfillment zone sequencing, carton flooding etc. VAS does not use “canned rules” from which one must choose.

Consideration should be given regarding of the establishment of order fulfillment rules. It should be recognized that rules might be established through both operational procedures and internally by the software. The fewer the

internal rules the more flexibility the AWMS has in determining how to complete orders. The more flexibility available, the greater the productivity that can be achieved due the freedom available in making incremental plans. Rules defined by operational procedures are easier to change providing greater flexibility.

A few examples of how an AWMS provides operational flexibility will now be discussed. An AWMS normally does not plan any work other than that which may be executed at the current time. Because future work is not pre-planned, great operational flexibility is provided by the AWMS order fulfillment process to add, delete and reprioritize orders.

Another example of flexibility is demonstrated in how AWMS order fulfillment systems sequence orders through completion zones. Normally an order (or an order carton) is moved from one pick zone to the next only when the current pick zone has completed all the items (work) within that zone. However, with an AWMS based order fulfillment system, if there are no rules prohibiting it, a partially completed order carton in one zone may be moved to another zone for work. Once in the new zone subsequent work will be completed in that zone. The AWMS has not forgotten the primary objective of completely filling the order so at some later time, the carton would be re-routed back to the zone where there was work remaining for completion. This feature provides great operational flexibility for a number of circumstances such as a temporary out of stock situation where workflow must be maintained, and workload balancing.

There are other examples of flexibility of the AWMS based order fulfillment system in the completion of work within a single zone. Normally the sequence of item completion is in the sequence of stock locations within the zone. Workers are directed to the next nearest

location. However, if a worker goes on break or moves unexpectedly to another position in the zone, the suggested work location could require additional travel time. The AWMS based system allows a worker to identify their current location and a new most efficient action will be planned for the worker. Among other more obvious benefits, this feature provides a means of avoiding aisle congestion by allowing workers to move past congested areas.

Another example of the benefits of an AWMS based order fulfillment system is the way an AWMS handles the completion of an item and avoids shortages. An AWMS order fulfillment system does not normally have rules that prevent it from filling an order with an item regardless of where the item is currently located. This feature provides an operational means to complete orders with stock normally considered un-accessible such as in transit stock. In the Mandate AWMS, this includes filling orders from stock “falling from heaven” that had been lost and is newly found.

There are many other benefits of using an AWMS based order fulfillment system that become evident as one comes to understand the basic nature of an AWMS. Find out how the principles of SOFT and AWMS systems can improve your operations.

AWMS™ is a trademark of Vargo Adaptive Software. The term AWMS™ may be freely used by any party to describe a WMS that has an inherent inclination to adapt to and accept new information to establish current conditions.