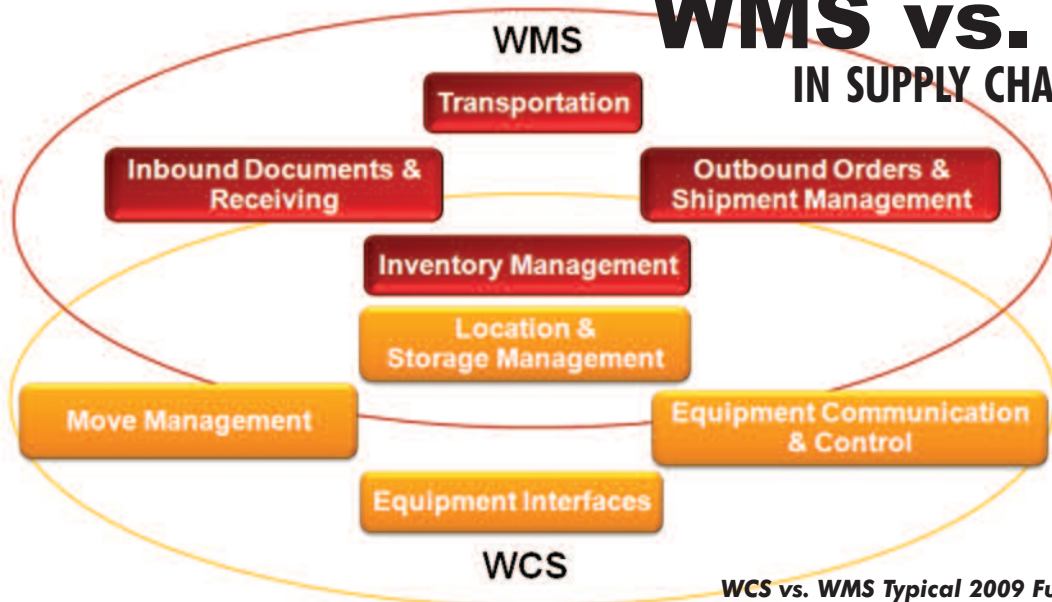


# WMS vs. WCS IN SUPPLY CHAIN CONTROL



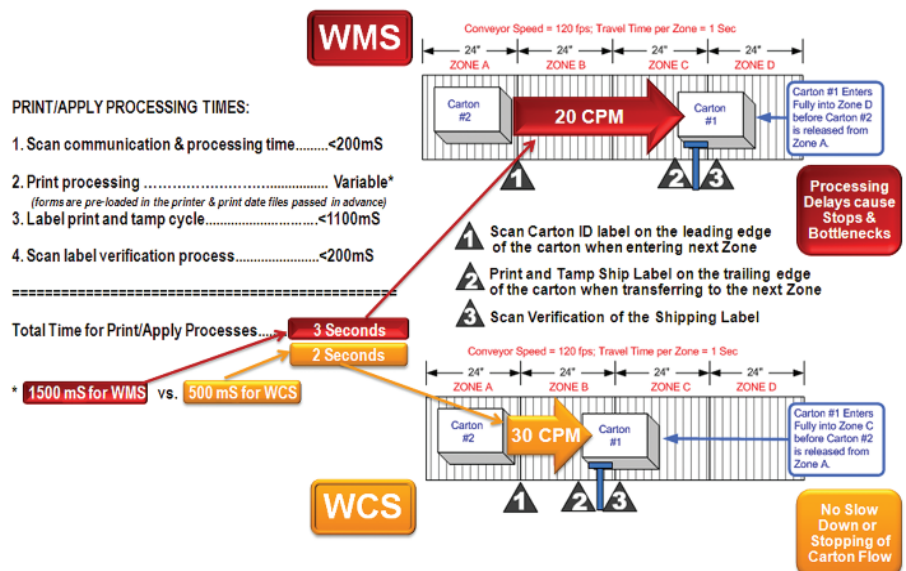
WCS vs. WMS Typical 2009 Functional Boundaries

An order fulfillment center's Warehouse Management System (WMS) is an enormously valuable workhorse, but one that is not easily adaptable to new Supply Chain automated technologies. Typically, a separate supervisory control system is provided to manage and control a case conveyor/sorter system or a basic picking subsystem. Likewise, changes and upgrades to WMS implementations – new and old – have proven to be extremely costly and worrisome due to the issues of long term one-off supportability and the risk of tampering with legacy WMS applications. Thus, the Warehouse Control System (WCS) evolved from the industry's need for a new breed of bolt-on WMS software functions for the management of real-time communication and the integrated control for many types of automated equipment.

The speed and nimbleness of the WCS is attributed largely to the fact that it isn't burdened with a huge database of orders and inventory management functions or the heavy processing tasks of matching demand with other software products and labor. The WCS is uniquely designed to intently focus on the exchange of real-time communications, command processing, discrete equipment signals, and the optimization of material movement and traffic control tasks where response is measured in milliseconds.

**Example #1** – A real-world comparison between WMS and WCS is an in-line barcode label print-and-apply application, as shown in the diagram on the right. Although there is only a one second difference in WMS vs. WCS print processing time, the elimination of that WMS delay creates a 50% increase in the Carton rate Per Minute (CPM) or 20 CPM for WMS vs. 30 CPM for WCS.

**Tech Tip:** The "Best Practices" solutions for continuous carton flow with in-line print and application functionality applies when the WMS provides label data or image files in advance to the WCS. When the Carton ID license plate is scanned by the WCS, it is processed and passed to the label printer, printed, applied, and verified with no interruption or stop to the continuous carton flow.

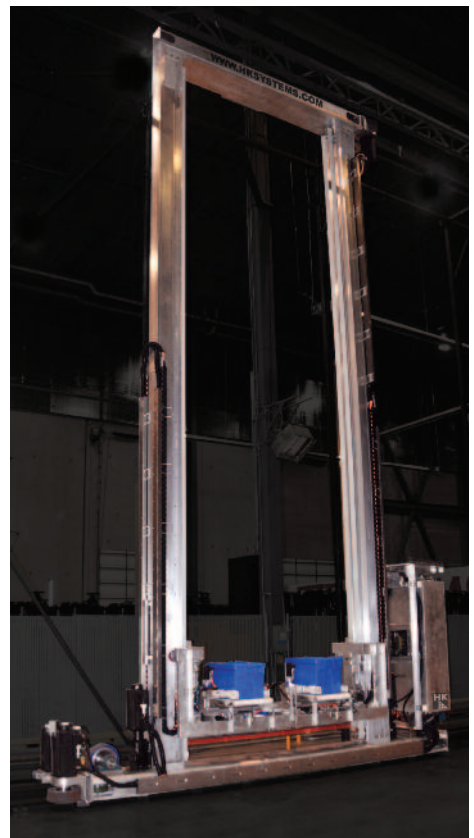


WCS and WMS Print/Apply Time Comparison and Affect on Carton Rates

**Example #2** - Automated Picking Systems (APS) are add-on order picking solutions that come in a variety of different technologies and configurations. All basically offer Automated Storage/Retrieval System (AS/RS) features for case and tote handling with hyper-drive pick performance (500-1000 pick lines per hour per operator). High speed case handling Storage/Retrieve Machines (SRM) for APS applications are the latest in break-through thinking at automated material handling shows. These new APS systems feature multiple SRMs in a single aisle, multiple carriages, multiple shuttles, single and double deep carton accessibility, rack optimization software, dynamic pick face product changes, outbound carton sequencing, and SRMs motion at double the speeds of those from the previous decade (horizontal speed can exceed 1000 fpm and acceleration at 10+ fps<sup>2</sup>).

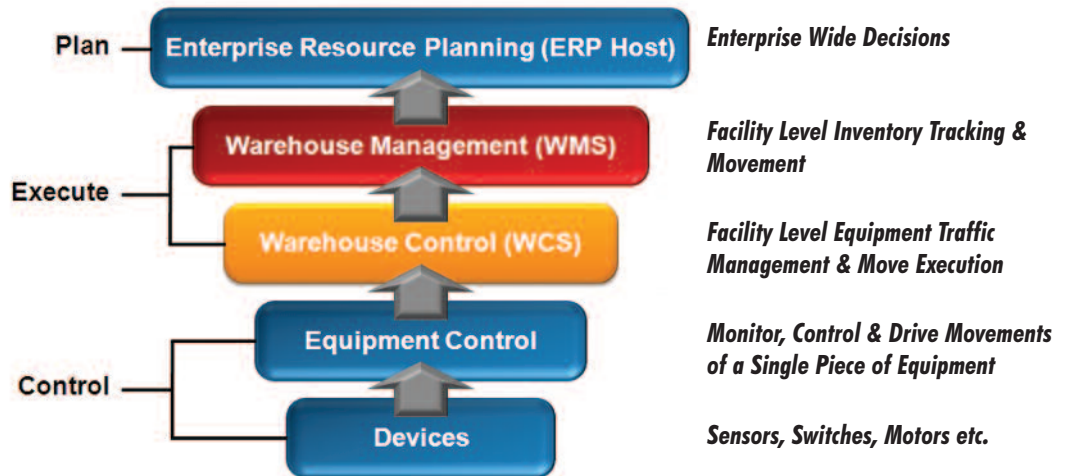
For small carton APS applications, the WMS typically maintains the overall facility inventory while the WCS provides storage management algorithms, location level inventory and the execution of the highly mechanized carton putaway process using product attributes associated with each load/carton. For order processing, the WMS downloads a pick order while the WCS executes carton selection and delivery, including the real-time interface to SRMs and all overlooked tasks associated with managing automated equipment. SRMs can be out of service and require special error recovery, which is best performed by a WCS. At pick stations, the WMS provides the User Interfaces for picking dialogs and quality functions while the lean WCS prioritizes, optimizes and sequences. The typical component-based systems architecture diagramed below should look familiar to those who currently use WMS and WCS.

A WCS will provide integration architecture and pre-built move and storage management functions to allow Order Fulfillment Centers to add new automation. Look to system integrators like HK Systems for the best in time-proven WCS integration solutions. HK Systems is North America's leading integrator for interfacing and controlling large, complex automated material handling systems. The HKEMS software products family offers productized WCS Supply Chain Control solutions for the most challenging of automation including a variety of interface options for WMS integration.



**HK75/x Microload SRM for High Speed APS Applications**

### TYPICAL COMPONENT-BASED SYSTEMS ARCHITECTURE FOR ORDER FULFILLMENT OPERATIONS



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