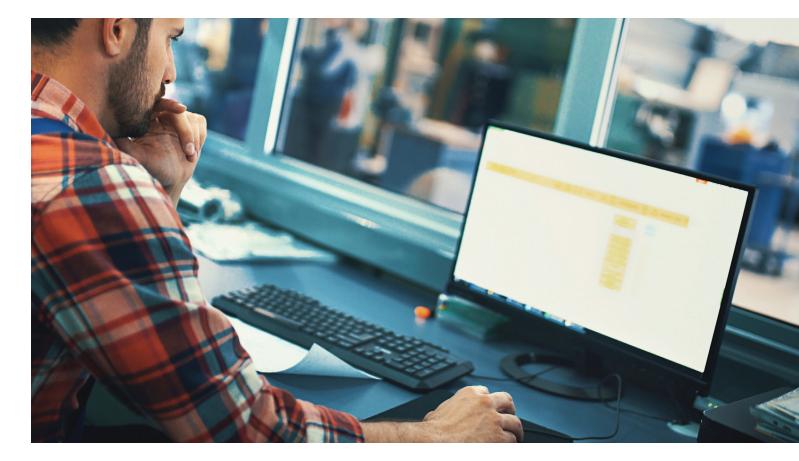FORTNA

Thought Leadership Series

Unlock the Value of Digital Fulfillment: The Evolving Warehouse Tech Stack

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The transition to digital fulfillment has many business executives looking to automation in the distribution center to help streamline processes, increase productivity and create a competitive advantage However, automation is simply one piece of the larger transformation puzzle. Distribution center operators must begin to rethink the underlying systems that run inside a distribution center, especially in relation to the broader systems to which they interconnect.

In today's real-time streaming environment, distribution leaders are placing a greater emphasis on Warehouse Execution System (WES) software—a robust platform that orchestrates people, machines, processes, and orders in today's automated DCs.

The goal of automation is to keep orders continuously moving as swiftly and efficiently as possible, which requires workflow visibility and logic to expand scope beyond what's being received in the building to what's shipping out the door. This can be accomplished with the right workload balance between the three systems that govern the modern distribution center: The Warehouse Management System (WMS), the Warehouse Control System (WCS) and the Warehouse Execution System (WES).

In a typical distribution center, each system holds specific roles and responsibilities.

- WMS manages the flow of goods and orders in and out of a warehouse. It manages inventory, batches orders to be processed, creates order fulfillment tasks, and tracks work execution. However, WMS was never built to manage real-time execution of automation that requires decision-making measured in milliseconds, and at the velocity required today. While some WMS systems have evolved to manage more of the execution, these enhancements often require some level of customization. WES not only manages automated work execution but is taking on more of the manual order fulfillment processes using real-time automated workflows.

- WCS takes orders from the WMS and translates them into actions for the automated systems to execute. WCS has focused primarily on the management of automation, decisions related to routing, and other low-level controls. Today, these functions are an integral part of WES.

- WES has evolved from the need to execute in real-time while harmonizing automated and manual processes to achieve millisecond decision making for ultra-efficient order fulfillment execution. It integrates control of automated equipment and expands the optimization capabilities beyond WMS and WCS. Unlike the WMS, the WES can coordinate what is happening downstream on material handling equipment (MHE), such as what resources are available or logjammed, with what is entering the execution work stream. It can then dynamically reallocate resources and redistribute work in real-time, all while following business rules that support service requirements. This is something that WMS is not designed to do, but paramount when heavily investing in automation solutions.

> WES is a real-time orchestration and optimization 'engine'— balancing out the peaks and valleys of the integrated process.

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Historically, WMS has been responsible for planning and executing order fulfillment within the distribution center, up to the point of managing the material handling system — It largely ran the show. WCS has been more focused on controls such as automated equipment like conveyors, as well as traditional control logic like routing containers through the actual material handling system.

In today's increasingly dynamic order-streaming environment, WMS is not the ideal system to manage automation. The WMS may have a clear picture of workflow and inventory, but it does not have a real-time view of what is happening in the building, outside of things like picking execution progress, and will always be hindered as to how much it can optimize. By contrast, WES has real-time visibility into everything happening within the four walls of the DC and can pull planning and execution together into a single integrated solution.

WES can also view the distribution center holistically to optimize real-time processes. For example, keeping the work balanced and orders continuously streaming in an automated environment is paramount. In a static environment, picking is executed with no thought to downstream impacts. On the other hand, WES can manage incoming volume while monitoring downstream capacity to change picking and order prioritization to avoid funneling too much work into an area. This real-time workload balancing keeps the flow moving in the most optimal manner.

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Other features, like predictive maintenance and predictive analytics, can help prevent problems before they happen. Companies can reduce the resources spent on trouble-shooting problems with insights such as what piece of equipment is likely to wear out soon. WES also enables increased efficiency and utilization of capital investments helping to maximize the ROI.

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FORTNA CAN HELP

WES is a real-time orchestration and optimization "engine"— leveling the peaks and valleys of integrated processes to keep the flow of the entire distribution center steady—while increasing speed and output. While WMS is unlikely to disappear completely, WES will continue to add enhanced capabilities and will grow in importance to the supply chain because of its unique ability to manage real-time automated processes and material handling equipment.

Contact us today at **www.FORTNA.com**