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—the underlying platform that ensures automation technologies and workers can work in tandem within a distribution center and, eventually, with systems outside it.
The goal of automation is to keep traffic moving as swiftly and efficiently as possible, which requires workflow visibility and workflow logic to expand from 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.

- The WMS is the master planner. It monitors inventory, catalogues orders that need to be processed, creates tasks for the warehouse floor to execute, and manages the execution function. However, WMS was never built to manage real-time execution of automation that requires decision-making measured in milliseconds, and at the high level required today. While some WMS systems have evolved to take on more execution, this often requires some level of customization. Today, WES is taking on more of the execution tasks.

- The WCS takes orders from the WMS and translates them into commands the machines on the floor can understand. Traditionally, the WCS has focused on the management of equipment, decisions related to routing, and other low-level controls. Today, these functions can be managed as part of a WES or with a stand-alone WCS.

- The WES has evolved from the need to drive real-time optimization. It can integrate control of automated equipment and expand the optimization capabilities of the 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 reallocate resources and work on the fly, 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.

“The WES acts as an ‘efficiency engine’—balancing out the peaks and valleys of the integrated process.”
Historically, the WMS has been responsible for planning and executing the work at distribution centers, up to the point of managing the material handling system. It largely ran the show. The WCS has been more focused on controls such as automated equipment like conveyors, as well as traditional control logic like routing containers on the actual material handling system.

In today’s increasingly dynamic order-streaming environment, the WMS is not the ideal system to work in conjunction with 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, the WES has real-time visibility into everything happening in the distribution center and can pull planning and execution together into an integrated solution.

The WES can also look at the full picture of the distribution center to optimize processes. For example, keeping the building flowing in an automated environment is paramount. In a static environment, picking is executed with no thought to downstream impacts. On the other hand, the WES can monitor downstream volume and change the picking prioritization to avoid funneling too much work down any one lane. This ultimately keeps the flow moving in the most optimal manner.

Other features, like predictive maintenance and predictive analytics, can 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. The WES can also show managers how to increase utilization of existing investments, which allows them to reduce equipment needs and capital investment.

The WES acts as an “efficiency engine”—balancing out the peaks and valleys of the integrated process to keep the flow of the entire distribution center steady—while increasing speed and output. While the WMS and WCS are unlikely to disappear completely, the WES will continue to grow in capabilities and importance to the supply chain.

To read more about the growing importance of the WES, read the next article in our series: WES as a Platform for Flexibility.

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For over 70 years, Fortna has partnered with the world’s top brands to transform their distribution operations into a competitive advantage. Fortna helps Clients make and keep bold promises to their customers—fast, accurate and cost-effective fulfillment consistently at every touchpoint, across every channel. Fortna’s expertise spans distribution strategy, distribution center operations, material handling automation, supply chain systems and warehouse execution software systems. We built our firm on a promise—we develop a solid business case for change and hold ourselves accountable for results. For more, visit www.fortna.com.