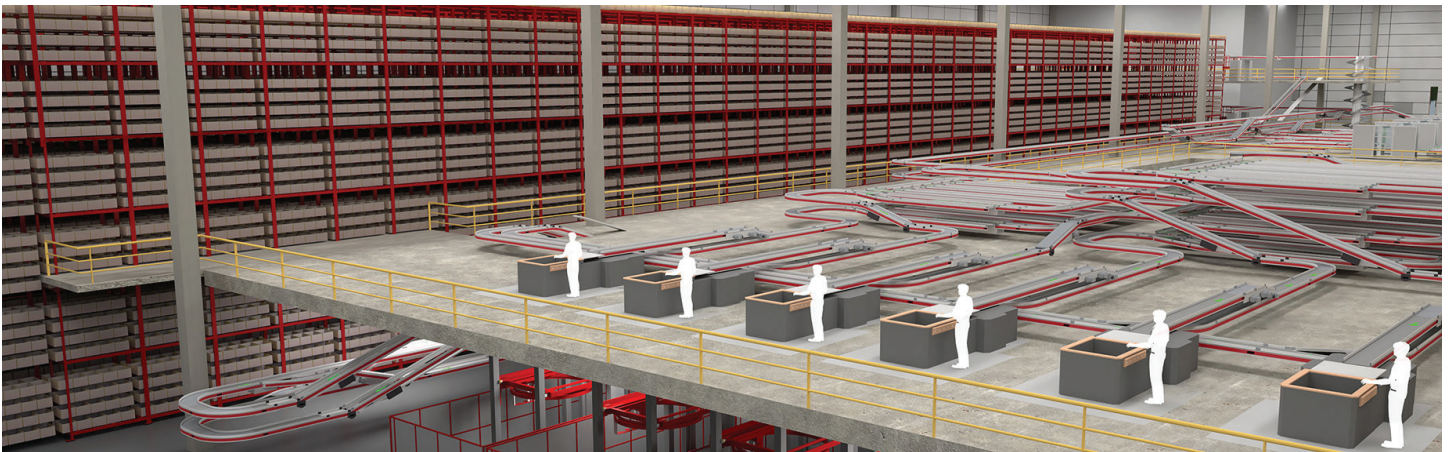


# Analyzing Today's Data for Tomorrow's Distribution and Fulfillment Center Success

By Adam Shupe

Merging advanced analytics and technologies is essential to stay competitive in supply chain management. By clearly understanding the specific industry requirements in which distribution and fulfillment centers operate, optimal automation technology and strategy can be developed to meet the demands of modern commerce.



Supply chains and logistics have embraced and incorporated new technologies to improve operating performance for decades. Today, the tremendous growth in online commerce, as well as software and hardware solutions, is spurring distribution and fulfillment centers to consider the next level of investment in automation. The warehouse automation market is predicted to grow to \$44 billion by 2028.

While automation is valuable, identifying and developing optimal strategy for different business models and industry needs is challenging.

## Smart Automation

Distribution and fulfillment center automation can deliver tremendous efficiencies and advantages. However, while data can be plentiful and will serve as the foundation for improvement, it can also be overwhelming.

The upfront evaluation of the business and industry in which a facility operates provides clarity on the optimal automated solution. Without examining existing data and insights,

operators can head in the wrong direction, implement automation projects poorly, or feel unsure of where to begin.

Framing the technology decision around a continuous improvement model can serve as a helpful guide:

- **Define.** Characterizing the business, unique industry operating requirements and working processes will highlight the challenges and opportunities ahead. Take the time to evaluate and define the business.
- **Measure.** Identify and collect the data that best indicates how the business is functioning.
- **Analyze.** Evaluate and analyze the data to highlight areas of success, challenge, deficit and improvement.
- **Improve.** The insight gained will reveal the process opportunities and the optimal automation technology to implement.
- **Control.** Reap the discovered insights and automation data to control and further improve the operation.

Using a continuous improvement framework to simplify and organize the automation technology decision process helps to define business direction and reinforce a culture of tracking performance.

## Decoding Data Types

Whether tracking inventory, identifying pick pathways, understanding worker productivity or reducing equipment downtime, data must be identified, captured, organized and analyzed.

All appropriate technology relies on correctly identifying and classifying the data types needed for automation.

### Master Data

Although master data can vary by industry, it is the essential core data required and used across an organization. Serving as an accurate source of operational information, master data consistency helps standardize reliant processes. Managing master data helps with inventory planning and can eliminate data silos.

For distribution, fulfillment and warehouse operations, master data types can depend on the product handled or the industry supported. Examples include:

- Item number
- Classification
- Description
- Quantity, size, and weight by unit of measure
- Supplier information
- Customer information
- Service level agreement

### Time-Series Data

By capturing data over time, operators can model sales, inventory, productivity and more for improved forecasting and planning. Time-series data can condense otherwise complex information into an intuitive view of historical results. Using time-series analysis with statistical models allows operators to understand better and prepare for the future.

In logistics planning for distribution and fulfillment centers, time-series data collected can include:

- Inventory levels
- Seasonal demand changes
- Production output
- Item velocity

- Order profile
- Order volume
- Historical growth

Acquiring the correct data is critical to the success of an automation strategy. Although not a component in logistics, staffing data can also add value to highlight workforce levels, labor and turnover rates, costs and productivity. Use your existing data to determine a path forward for the business.

### Automated Fundamentals

It's easy to get swept up in the sheer number of technologies without objective guidance. The goal of all automation is the same: Create efficiency in the warehouse, distribution and fulfillment supply chain. Using equipment, technology, software or robotics to streamline repetitive tasks makes a safer, more efficient and more profitable operation.

Automation technologies, systems and approaches aim to eliminate labor-intensive, manual duties using a wide range of solutions while considering the entire value stream:

- **Automated mixed case pallet distribution** uses computer-controlled systems to receive and store unit load pallets, depalletize pallets, and build and deliver mixed case pallets in sequence to an assigned dock door.
- **Automated piece-pick fulfillment** uses computer-controlled systems to receive cases directly or by the depalletizing of unit load or mixed case pallets, decant cases, and build and deliver packages of single or multi-line orders of units in sequence to an assigned dock door.
- **Automated piece pick store replenishment** uses software-driven systems to receive and store unit load or mixed case pallets, depalletize pallets, decant cases, and build and deliver packages or round-trip totes of multi-line orders in sequence by store or store zone to an assigned dock door.

Successfully designed systems offer the greatest efficiency at the right value with the fewest concessions as defined by the project objectives.

### Getting Underway

To exploit data and develop data-driven strategies that can be realistically followed, operators must stay true to how their business operates and the industry it serves through objective analysis. Operating faster and more efficiently relies on upfront analysis and planning within a continuous improvement mindset that keeps the industry and real-world business objectives in mind.

From inventory management to order fulfillment, mapping out scenarios and goals unique to the operation helps illuminate the true objectives and potential technology requirements. Consider the organization's unique distribution and fulfillment scenarios to explore priorities and automation needs:

- How many pick faces are needed? What technology accommodates a high item count?
- How will steep growth projections and seasonal surges be handled? Are there flexible technology solutions that can be augmented via manual methods?
- What system performance is needed for consistently high order volumes? Do conveyors or autonomous robots support the anticipated order volume?
- Can the number and size of items in inventory affect technology options? Is order consolidation palatable for larger items?
- How will faster-moving inventory be addressed, given the impact on operations? Will sale items be received in bulk and consumed quickly?
- What storage methods are most cost-effective for large inventory quantities? How should storage and pick efficiency be balanced?
- Can insight be gained between replenishment optimization to avoid losing storage and fulfillment efficiency gains?

Distribution and fulfillment center operators can better evaluate the latest automation technologies to determine a customized solution using the facility's actual business and industry framework and operating considerations as a touchstone.

## Conclusion

Automation technology can help enhance operational performance and meet defined business goals. By focusing on existing business and industry operations, distribution and fulfillment centers can determine the appropriate automation technology for the business.

## Automated Storage Retrieval Systems

Automated storage and retrieval systems (ASRS) are commonly used in manufacturing, distribution, fulfillment and e-commerce as the backbone of an automation strategy. Using computer control for storing and retrieving goods, an ASRS offers operators speed, accuracy and consistency.

While ASRS technology is available, to get the most out of these systems and prepare for a smooth startup with long-term results, success resides in the data, including:

- Historical and projected order data
- Required inventory levels
- Physical data for all parts and products
- Velocity classification for all stock keeping units

Working with a partner that offers industry, design and thorough implementation experience is essential. Technology is critical but tremendously more valuable when guided objectively during the project.

## About Burns & McDonnell



Burns & McDonnell is a family of companies bringing together an unmatched team of engineers, construction and craft professionals, architects, and more to design and build our critical infrastructure. With an integrated construction and design mindset, we offer full-service capabilities. Founded in 1898 and working from dozens of offices globally, Burns & McDonnell is 100% employee-owned. For more information, visit [burnsmcd.com](http://burnsmcd.com).