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Thought Leadership Series

The Pareto Principle in the Warehouse

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In 1896, a French economist, Vilfredo Pareto, published a textbook that contained a concept he named the Pareto Distribution, which examined the distribution of wealth in Paris, France. Over a hundred years later, this concept has been adapted to modern times and is better known as the Pareto Principle or the 80/20 rule. It is a statistical model that suggests that 80% of all outcomes come from 20% of the effort.

Across the distribution landscape, this principle can be applied to many segments, including inventory, order fulfillment and the allocation of resources. In this FORTNA insight, we will examine how the principle relates to warehouse processes and design, the operational data needed and how to apply the principle to optimize inventory and operations.

Gathering Data

Before applying the Pareto Principle, gathering and analyzing warehouse performance data is essential. Warehouse-driven key performance indicators (KPIs) to consider include:

- Order fulfillment time

- Order accuracy rate

- SKU velocity

- Inventory turns

- Stockouts

- Delivery lead times

Knowing these KPIs will allow an organization to analyze data, make data-backed business decisions and assist in conducting a Pareto Principle analysis. A warehouse management system (WMS) or warehouse execution system (WES) can help analyze and visualize real-time data, anticipate fluctuations in demand and identify inventory trends.

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Classifying Inventory

Another step to take before using the Pareto Principle is classifying inventory. This step can help gain critical insights into demand, value and velocity. A broad spectrum of factors can be used in the classification, such as item priority, storage needs and cost per order.

Inventory classification types:[1]

- **ABC Classification:** This method assigns a value or an importance level to SKUs, with the most valuable inventory as A, the next level as B and the least valuable as C.

- **XYZ Classification:** Like the ABC method, this system classifies inventory into three tiers based on their demand variability, with the X tier being the most variable demand, Y being the next level, and Z being the least variable demand.

- **FSN Classification:** This classification method values the rate at which SKUs are consumed. They are placed in three categories: fast moving (F), slow moving (S) and non-moving (N).

- **HML Classification:** This method places its emphasis on the monetary cost of the SKU: high value (H), medium value (M) and low value (L).

The Pareto Principle lends itself to any inventory classification method; however, it will be up to the operation to set the priorities and objectives that are the best fit.

1 https://www.linkedin.com/pulse/inventory-basics-types-classification-supplychain-metaverse/

Applying the Pareto Principle to Drive Productivity

In our example, we will use the FSN inventory classification to determine the SKUs that fall into each category, then leverage the operational KPIs to recognize the top 20% of total SKUs. By prioritizing these fast-moving SKUs and understanding their demand patterns and replenishment cycles, an operation can begin to optimize inventory levels and reduce inventory carrying costs.

By applying this data, an operation can reconsider warehouse layout, slotting practices and picking methodologies.

- **Warehouse layout:** By taking the SKUs in the top 20%, an organization can create an operational design that maximizes the SKUs' velocity for on-the-floor placement, picking travel time and order fulfillment speed.

- **Slotting opportunities:** Slotting SKUs from a Pareto Principle analysis can slot inventory in the best-optimized spaces, creating faster fulfillment and throughput.

- **Picking optimization:** Employing a picking methodology to match the findings of the Pareto Principle analysis can reap productivity gains. For example, an organization employing FSN classification can use a zone-picking concept to place its SKUs in the top 20% into one zone where SKUs are easily accessible and can be picked quickly, ensuring that the fastest-moving items get priority.

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Using the Pareto Principle to Drive Automation Decisions

The Pareto Principle is not just an inventory concept; it can help drive decisions on the types of automation and operational processes needed. A clear understanding of inventory value and velocity can highlight the technology and automation an organization will need to grow and continue to satisfy customer demand.

For instance, if an organization is genuinely 80/20 regarding its inventory and its SKUs can fit into a tote or a bin, a high-density solution like AutoStore or an automated storage and retrieval system (AS/RS) could be worth investigating.

Other automated solutions could be more appropriate if an operation has SKUs that fall into the 70/30 to 60/40 area of value and velocity.

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FORTNA CAN HELP

Whether it is defining the data within the four walls of your warehouse operation or applying the Pareto Principle to inventory, FORTNA has the industry experts and data scientists to start your transformation from manual, labor-intensive practices to a fully optimized and automated operation.

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