

Distribution Center MANAGEMENT

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Managing people, materials and costs in the warehouse or DC

From the Golden Zone

Rethinking the ROI of warehouse automation investments

By Fred Kimball

Competing material handling equipment vendors offer a range of different technologies. But determining which one is actually worth the investment can be a challenge.

Fortunately, there is a technique that will help you choose the right technology for improving productivity and at the same time, give your project an internal competitive advantage to get the necessary funding. It's called Design for Payback (DFP).

DFP involves using payback analysis on every element of an improvement plan. It is not good enough to measure ROI on the entire project. By doing so, you are almost certain to spend more money than you need to. However, with DFP, you'll be able to show a more accurate ROI and your project will be more likely to win approval with decision-makers.

Here's how it works.

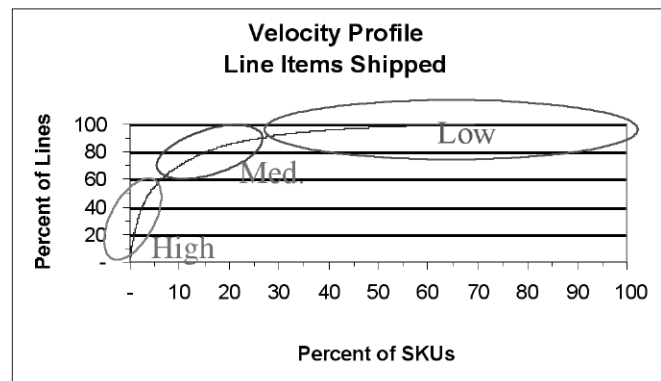
Invest in your fastest moving products

DFP steers your investment into the parts of your operation that have the greatest potential for savings — areas where there have been increases in productivity, accuracy, space utilization, and throughput.

DFP focuses on the velocity of your products. The faster moving SKUs can justify the greatest

investment, while the slowest moving ones might not justify any investment at all.

The following graph shows a typical distribution center's stock velocity profile. The curve represents the cumulative percent of line items shipped (Y-axis) by the cumulative percent of SKUs (X-axis). The profile shows each SKU's relative consumption of labor in a facility since the fastest moving SKUs consume the most labor. A similar analysis also works for units or cases shipped.



Pareto's Law: The 80/20 principle

Pareto's Law, when applied to distribution centers, says 20 percent of SKUs represent 80 percent of the lines shipped. As such, warehouse designers recommend technology that improves picking productivity for these typically fast-moving SKUs. But simply assuming that 20 percent of SKUs are fast moving can be misleading.

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In this case, the graph shows high-velocity SKUs are just 6 percent of the total SKUs representing 61 percent of the lines shipped. Medium-velocity SKUs are 16 percent and represent the next 26 percent of the lines shipped, and low-velocity items — 78 percent of the SKUs — are the last 13 percent of the lines shipped.

A closer look at the data shows less than 3 percent of SKUs average more than one pick a day. How much would you be willing to invest in technology to improve productivity when 97 percent of your SKUs have a pick frequency of less than one pick per day? There is no ROI for productivity improvement if there is no frequency of pick. If you don't analyze the velocity at the SKU level, you'll probably overspend, especially when investing in material handling automation.

In other words, it is not enough to look at some fixed percentage of SKUs. You must also consider typical daily volumes. If there are items in the top 20 percent that have low daily volumes, you are wasting money on technology to improve productivity.

Here is an example:

A large apparel company wanted to automate full case picking with pick-to-belt technology. Using Pareto's 20 percent, it needed 900 pick slots in the module. The cost was budgeted at \$2.9 million and it required over 35,000 sq. ft. of floor space. Using DFP, the company found that only the first 200 SKUs had the volume to justify the investment. The entire module for the 200 SKUs cost about \$450,000 with a 1.4-year payback. It also occupied less than one fourth of the space that was originally estimated.

Naturally, vendors claim their respective technologies offer a solid ROI. Yet, what's likely right for you is a combination of design elements, each applied to the extent that they are justifiable with a payback of two to three years. DFP does not suggest what types of technology are right for your operation, but it does guide you in the evaluation of different technologies.

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