

Cost Avoidance for Lean Operations

White Paper



Cost Avoidance: A Means to Justify Automation Equipment Capital Expenditures for Ultra-Lean Operations

How to calculate your return on investment by identifying areas for cost avoidance—rather than cost savings—in your Lean facility

Introduction

The economic realities of the past few years have forced most companies to make cuts, frequently in personnel headcount, to accommodate the downturn in business as they fought hard to survive. Indeed, many facilities—including manufacturers, warehouses and distribution centers—find themselves today to be as lean as possible, even as business has slowly begun to pick up. Yet, there remains a reluctance to increase staffing in order to support that slow growth.

One answer to this dilemma can be found in the implementation of process automation, specifically via automated storage and retrieval systems that can simultaneously save floor space while boosting employee productivity. Because an investment in any automation technology can require significant capital, it's important to validate that expenditure through a series of calculations to justify the cost.

Traditionally, automation equipment cost justification has been calculated solely on cost savings, meaning a reduction in **current** costs. But with many operations having cut back as much as they can, there's likely very little left to remove without a significant impairment to productivity.

In any scenario that addresses additional capacity, the additional profit resulting from the growth and added capacity should also be taken into consideration when calculating the ROI. The reason is simple: if capacity is not added, then additional sales cannot be realized.¹

Therefore, it has become necessary to examine how the automated system will contribute to cost avoidance, or reducing the possibility of **future** costs.

This white paper will demonstrate how to calculate your return on investment in automated storage and retrieval equipment as a means to accommodate slow growth in an already lean organization, as well as detail examples of potential areas of cost avoidance that can be addressed by its implementation.

Profit and Loss Calculations Justify Automation Investment

Two tools for determining the impact of a potential investment in automation, Net Present Value and Internal Rate of Return are based on anticipated future cash flows generated by the investment. These calculations are designed to include the effect of time value of money to determine the long term impact of the investment.

Net Present Value (NPV) takes into account the economic return after the initial automation investment is made, so calculating the NPV offers an assessment of the equipment's potential long-term profitability

¹ John T. Phelan, Jr., P.E., "Fitting Automation into a Lean Environment," *Material Handling Management*, (July 1, 2011).

in current dollar value. The NPV is the cumulative sum of anticipated cash flows in a given set time period, discounted to allow for time value of money. To determine the NPV, establish the anticipated future cash flows generated by the investment (including the initial cost of the project, cost savings, cost avoidance and anticipated profits), then discount each cash flow to a present value based on the investment's cost of capital. The sum of all discounted cash flows yields the NPV.

Microsoft Excel offers an NPV function to help simplify the calculation, which looks like this:

$$\text{NPV} = \left[\frac{\text{FCF}_1}{(1+r)^1} + \frac{\text{FCF}_2}{(1+r)^2} + \frac{\text{FCF}_3}{(1+r)^3} + \frac{\text{FCF}_4}{(1+r)^4} + \frac{\text{FCF}_5}{(1+r)^5} \right] - \text{Initial Project Cost}$$

2

In the above formula, a five-year NPV is shown, with "r" representing the company's cost of capital and "FCF_n" designating Future Cash Flow in each future year, "n." This formula assumes that the initial project cost occurs in year zero. A positive NPV means that the investment will add value to your company's operations.

The Internal Rate of Return (IRR) estimates a potential investment's percentage return based on the company's cost of capital. As the discount rate that produces a zero NPV for future cash flows, the IRR makes the sum of the future cash flows calculated in the NPV equal to the investment's current market value. Its importance lies in helping to determine if a project will be beneficial based on the company's cost of capital.

Microsoft Excel also offers an IRR function to help simplify the calculation, which looks like this:

$$\text{NPV} = \left[\frac{\text{FCF}_1}{(1+\text{IRR})^1} + \frac{\text{FCF}_2}{(1+\text{IRR})^2} + \frac{\text{FCF}_3}{(1+\text{IRR})^3} + \frac{\text{FCF}_4}{(1+\text{IRR})^4} + \frac{\text{FCF}_5}{(1+\text{IRR})^5} \right] - \text{Initial Project Cost} = 0$$

3

The above formula shows how to determine the IRR over a five year period, with "r" again representing the cost of capital and "FCF_n" designating Future Cash Flow at each specific year, "n."

It should be noted that a company's cost of capital is a true variable here, and is a number that will differ from one company to the next. It can be impacted by a number of factors, including (but not limited to) corporate debt and equity positions, the current prime rate, the corporate tax rate and/or the rate of inflation. Note that the higher the company's cost of capital, the harder a project will be to justify with an NPV analysis, as future cash flows will be discounted at the higher rate.⁴

² Ibid.

³ Ibid.

⁴ Ibid.

Potential Areas of Cost Avoidance

Implementing an automated storage and retrieval system—such as a vertical carousels, horizontal carousels or vertical lift modules—is widely accepted as a means to produce cost savings. Historically, those savings have come from a reduction in labor needed to pick product to fill orders or retrieve components necessary for production or manufacturing.

From a cost avoidance perspective, the automated equipment will enable the same operator to **achieve more picks** per given period. This is because the storage module aggregates a large number of items in a single location and delivers them to the picker via the “parts to person” concept. Because the items are delivered to the operator, time spent walking to a location and searching for the appropriate stock keeping unit (SKU) is eliminated.

Likewise, condensing a large selection of products into a small footprint unit (taking advantage of a facility’s vertical space) yields cost savings from a reduction in square footage. In terms of cost avoidance, by compressing item storage into a smaller area, **more inventory can be stored within the same facility** without the need to build out, or the opened up areas can be repurposed for other, more profitable activities.

There may be other, less obvious, areas within your facility and its current storage and handling processes for a potential investment in an automated storage system to enhance cost avoidance. These include:

Inventory Levels: Automated storage systems have integrated software that keeps track of the contents stored within, as well as interfaces with the facility’s warehouse management system (WMS) and enterprise resource planning (ERP) systems. Companies making the best use of this function can closely monitor stock levels in real time—and even eliminate physical counts—to strategically reduce the amount of inventory they must have on hand, thereby avoiding the associated carrying costs.

Accuracy: Because of the picking and inventory tracking technologies associated with automated storage and retrieval systems (including light bars that indicate SKU location and numbers to be picked, delivery of the items directly to the operator, and ongoing monitoring and tracking of items stored within), picking accuracy increases exponentially—often achieving rates in excess of 99%—due to a reduction in errors. In terms of cost avoidance, every picking error that is not made can represent a significant cumulative impact to the bottom line.

Inventory Shrink: As opposed to those placed in open rack storage units, every SKU stored in an automated storage and retrieval system is secure. Because only authorized operators can access contents through a software-traceable personal identification number (PIN) code, missing or misplaced inventory can be easily tracked back to an individual. This enhanced level of accountability and security translates directly into avoidance of inventory shrink and its associated financial losses.

Service Levels: With more and more domestic manufacturers, particularly in the electronics industry, offering enhanced, value-added services to their customers—such as custom surface mount technology (SMT) wiring and personalization services—automated storage and retrieval systems offer a means to



store more “almost finished” goods in large quantities. Items can be picked as needed for small batch, higher value finishing work from a more skilled workforce on a just-in-time basis.

Insurance: Another area of potential cost avoidance through the implementation of an automated storage and retrieval system is insurance premiums for worker’s compensation. Because the automated system delivers the item to the operator within the ergonomic “Golden Zone” (waist-high to eliminate bending down to retrieve an item stored low, or stretching up to grab an item stored high), the chance of a back injury occurring is reduced. The ability to demonstrate a reduction in the possibility of worker injuries can yield lower insurance premiums.

Process Improvements: Profiling inventory to match SKUs to the most appropriate storage method, or slotting, is a big advantage of automated storage and retrieval system installation. Frequently, items are stored in the wrong locations or the wrong types of material handling equipment, either due to a lack of understanding or simply because it’s easier to only install one type of storage medium (all shelving or all flow rack, for example). But increasing efficiency by mixing storage technologies is another cost avoidance technique. Taking the time to determine which items are best stored in an automated system—such as high value, small scale, fast- to medium-movers, and more—will yield picking efficiencies that will add value to your operation.

Production Uptime: With so many large manufacturers now running facilities that are primarily automated with large, expensive, multi-million dollar robotic production equipment, the maintenance and repair (MRO) stockroom has grown exponentially in importance. Should a machine go down and the required part cannot be located quickly, or its condition is sub-par, losses add up quickly. Automated storage and retrieval equipment in the parts room makes it easy and efficient to locate and maintain the parts inventory required to maximize production uptime and avoid the financial losses associated with downtime.

To learn more about how automated storage and retrieval technologies can help your facility increase productivity without adding headcount or square footage, contact your Kardex Remstar representative today. We’d be happy to help guide you through both the Net Present Value and Internal Rate of Return calculations that can demonstrate how our equipment will accommodate your business growth, even in today’s tough economy.

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Sidebar A

Cost Avoidance Scenario: Auto Dealership’s VLM Enables Expansion of Service Bays

Traditionally, a domestic automobile dealership owner whose facility offers maintenance and repair services calculated \$150,000/month in revenue out of a single service bay. The facility currently has 40 service bays and employs 15 service technicians, who each cover 2-3 bays per shift. When the owner looked to increase revenue without adding additional service technicians, he examined the current workflow process and noted the following:



The technician would diagnose the issue of the vehicle in question, then walk to the parts department to request the parts needed to complete the service. The technician would wait at the counter while the parts personnel searched manually for the item. Once found, the technician would walk the item back to the bay and then begin work.

Alternatively, by installing an automated storage and retrieval system (a vertical carousel) with integrated inventory management software tied into the dealership's workflow management software and computer network, the technician could key in the appropriate work order code at his workstation's computer. That code—tied to a specific parts list—would create an order that automatically pings the parts department and directs the carousel to queue up those items. The parts are presented to a runner, who then delivers them to the technician (who, having never left the service bay, continues to be productive).

The resulting speed, accuracy and elimination of walk time all contribute to the cost avoidance justification for the automated equipment. Likewise, the resulting space savings (in excess of 40%) in the parts department would allow the dealership's owner to convert that space into additional service bays, resulting in additional revenue per month.

Sidebar B

Cost Avoidance Scenario: Adding Batch Picking Module to VLM Boosts Productivity

An electronics manufacturer had installed a vertical lift module (VLM) to facilitate compressed storage and more accurate picking. However, they were continuing to use a traditional picking method: picking one order at a time. They wanted to find a means to pick faster.

Management consulted with their VLM's supplier, who recommended a modest investment in an add-on batch picking station with light bar indicators. This additional equipment enables a single operator to pick up to 12 orders simultaneously

Because the every tray stored within the VLM and presented at the access point could now provide items for more than one order at a time, the company was able to quadruple picking speed while maintaining a high level of accuracy. The subsequent increase in throughput more than justified the investment in the additional technology.

About Kardex Remstar

Kardex Remstar, LLC, a company of the Kardex Group, is a leading provider of automated storage and retrieval systems for manufacturing, distribution, warehousing, offices and institutions. For information about the company's dynamic storage solutions, call 800-639-5805 or visit www.KardexRemstar.com.