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On paper, a company's inventory is considered an asset, but in practice this may not hold true.

Although inventory costs vary significantly between industries, they are always high. The standard rule of thumb puts **carrying costs at 25 percent of inventory value**.



Two types of storage: a warehouse shelves system and Modula's Vertical Lift Modules.

(Images courtesy of Modula.)

Carrying costs can be broken down into four categories:

- Capital/Financing
- Storage Space
- Inventory Services
- Inventory Risk

Capital/Financing Inventory Costs

The capital or financing costs of inventory make up the largest portion of the carrying costs.

According to an article by Stephen G. Timme & Christine Williams-Timme in [Supply Chain Management Review](#), capital costs reach 15 percent of inventory value for the majority of companies, even though many tend to apply a rate of only 5 percent.

There is also a tendency to overlook the risk attached to inventory, which can be significant in the case of products that are perishable or have a high risk of obsolescence.

Storage Space Costs

These are perhaps the most obvious carrying costs of inventory. Storage space costs include building and facility maintenance (lighting, climate control, etc.), the cost of purchase depreciation or lease and, of course, property taxes.

However, there is also the problematic phenomenon known as storage space saturation, which can lead to unanticipated and non-linear increases in cost. For example, when a warehouse reaches its inventory saturation point, it becomes difficult to navigate, leading to diminished workflows.

Such situations are difficult to remedy quickly, and experiencing even a few such events per year can **reduce operator productivity by 50 percent**.

Inventory Services Costs

Maintaining an inventory involves more than just storage; that inventory needs to be insured. The costs of IT hardware and applications also fall into this category, but physical handling and the associated human resources expenses are perhaps the largest contributor to inventory services costs.

New employees must be trained to use the inventory system, which introduces additional chances for human error. For example, they may unknowingly mislabel parts or store them in the wrong location. The latter scenario is an accountant's worst nightmare: the part has been paid for and continues to incur expenses in storage while being effectively irretrievable.

By the same token, companies that become over-dependent on those veteran operators who "know just where everything is" may find themselves scrambling when those operators are unavailable.

Inventory Risk Costs

Most of the costs of risk associated with inventory vary widely from industry to industry. As indicated above, the risk that items might fall in value over the period they are stored depends on the items. Perishable products are the obvious example, but consumer electronics can lose their value as well due to obsolescence.

Inventory risk costs also include those associated with shrinkage:

- Loss of products caused by administrative errors (shipping errors, misplaced goods, etc.)
- Vendor fraud
- Pilferage and theft
- Damage in transit or during storage

Stock-out/Shortage Costs

In addition to carrying costs, inventories also come with opportunity costs incurred by stock outs or shortages. These are more difficult to estimate, but they include the costs of emergency shipments and the potential loss of reputation or customer loyalty.

As noted above, parts can become lost in inventory as a result of being mislabeled or placed in the wrong location. The scenario is easy to imagine: a trainee takes a part from a box, realizes it's not the one he was looking for, and mistakenly tosses it into the box next to the one he took it from.

Repeat that scenario enough times and you eventually reach a tipping point where the only solution is to manually review your entire inventory. Even if the situation doesn't reach that point, an emergency order for a misplaced part can result in a promise from the sales department that can only be kept by rushing production on a replacement.

Worst of all, the original part is still sitting somewhere in your inventory.

The Solution: Think Vertical

Many manufacturers employ sophisticated machining centers, robotics and measuring devices yet still store their parts and jigs on racks. The costs of doing so are clear, but what's the solution?

Vertical lift modules (VLM) are fully enclosed automated storage units containing trays accessed by a lifting platform with an inserter/extractor. The trays are delivered to operators at an ergonomic height for easy access.

(Image courtesy of Modula.)

Product heights and tray weights are measured automatically by the module's on-board sensors each time a tray is returned to the system. The tray is then assigned an optimal storage location based on the height of its contents.

(Image courtesy of Modula.)

Manufacturers can recover up to 90 percent of their floor space by installing VLMs to reach just a few inches from the ceiling. For example, **Modula's** LIFT series of VLMs offer up to 70,000kg (154,500lbs) of gross unit load capacity, shrinking 9,050 square feet of traditional storage to a mere 150 square feet.

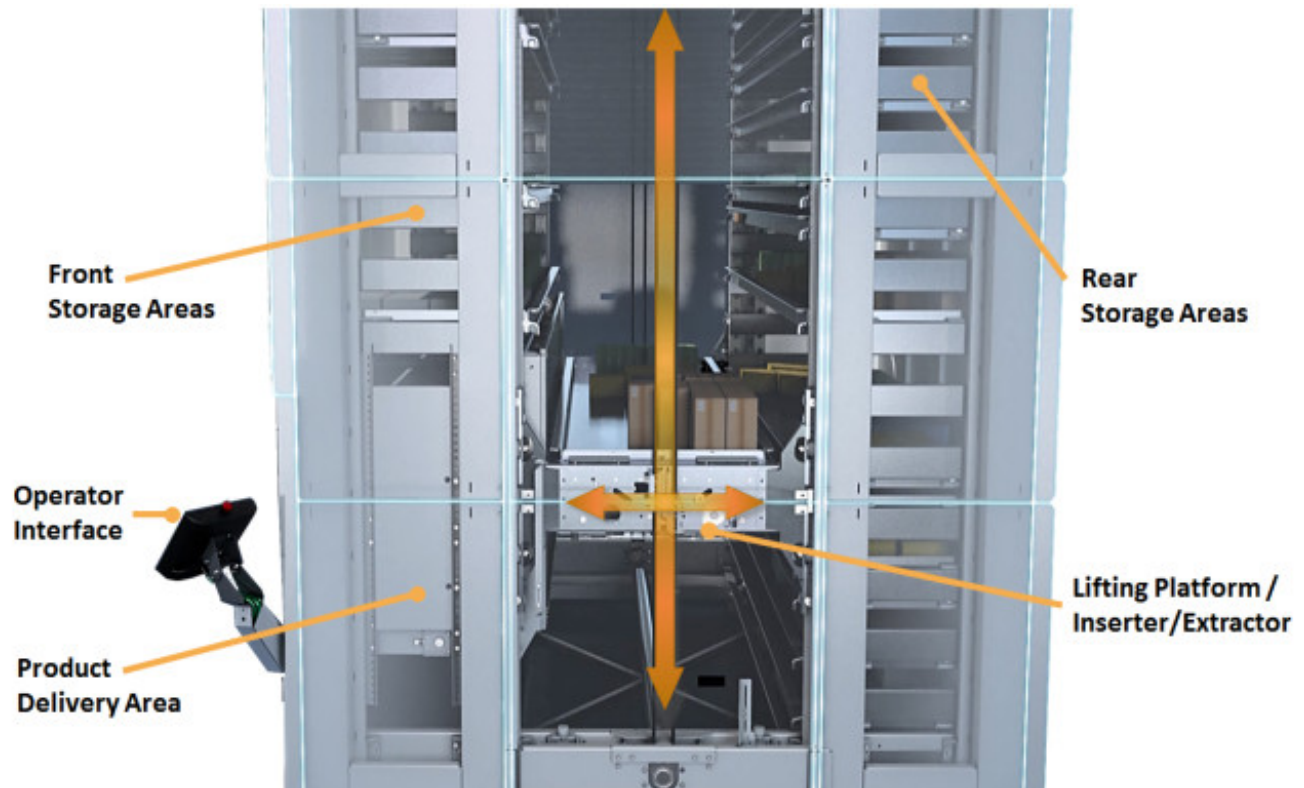
The **LIFT series** uses adjustable storage trays in a vertical axis lifting design driven by two steel-reinforced belts. The lifting system is guided by eight high-density polyethylene (HDPE) rollers for each side of the elevator. Each tray has a net payload capacity of up to 750kg (1,653lbs), and the entire unit has a throughput of up to 120 trays per hour, depending on its configuration.

(Image courtesy of Modula.)

Modula's **Warehouse Management Software** (WMS) further enhances productivity by enabling repetitive tasks to be automated and reducing picking and replenishment errors. The inventory optimization feature continually searches for optimal locations to squeeze space and reduce inventory.

More importantly, the LIFT's operating produces are designed to be intuitive and easy to use, even for lower skilled operators. This reduces the necessary training time as well as dependence on those veteran operators.





Reducing Inventory Costs with Vertical Lift Modules

Some inventory costs—like the capital/financial costs—are unavoidable. Nevertheless, VLMs can significantly reduce the costs of storage space, inventory services and inventory risk.

Reducing the necessary size of inventory storage space by up to 90 percent can lower building and maintenance costs. In addition, the compact design of VLMs means a much higher inventory saturation point.

VLMs can also reduce the costs of physical handling and the associated human resource expenses.

Companies that have installed VLMs have applauded their usability, with operators working comfortably on the units within the first day of their installation.



(Image courtesy of Modula.)

Optional combinations of LED displays, laser pointers and put-to-light solutions can ensure fast and accurate inventory processing, even from novice or low skill operators.

By minimizing walking and climbing distances, VLMs also improve ergonomics and productivity, as well as reducing the risk of lost time accidents due to slips, trips and falls.

Finally, VLMs can reduce the costs associated with inventory risks by increasing inventory security. The units can be configured to admit only authorized operators, and WMS can keep track of every part stored in the unit. This means no more missing parts taking up inventory space until they're hunted down manually.

Maintaining an inventory is expensive, especially considering all the hidden costs. If your inventory seems to be costing more than its worth, it might be time to consider installing vertical lift modules.

For more information, visit Modula's [website](#).

Modula has sponsored this post. It had no editorial input into this post. All opinions are mine. –James Anderton