

Cartonization

Packaging *decision* automation

Freight savings
Material savings
Labor savings
Better picking
Higher throughput
Satisfied customers



Integration made easy[™]

What is cartonization?

Cartonization is the method of using SKU and order data with business rules to make improved packaging decisions.

These decisions are often in the hands of operators at pack stations with no more than several seconds to take a large number of factors into consideration. This pressure, combined with the natural occurrence of human error results in excessive material costs from using non-optimum packaging materials. Additionally, the lack of foresight about each order's packaging needs is a major stumbling block to efficient picking and packaging. GRSI's cartonization program is a software solution proven to remove these barriers to achieve speedy and cost effective packaging.

Packaging forecasting

Balancing workload is more efficient when each order's packaging requirements are known. Based on a workload analysis, the software can recommend the proper number of pack stations needed to handle specific packaging types. Material inventory data and outstanding orders are used to generate material requirement and replenishment reports.

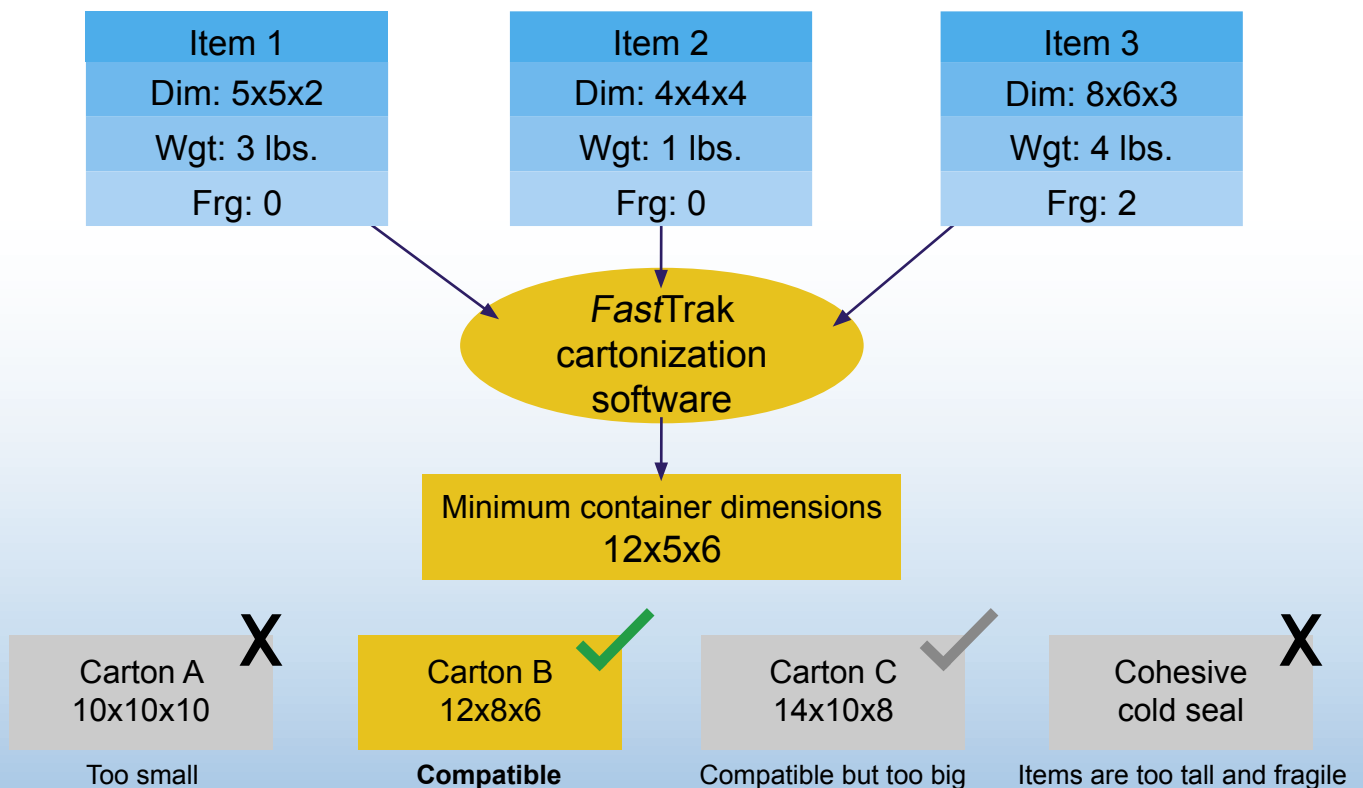
FastTrak[®] 3.0 WES

FastTrak cartonization is a modular order management system add-on that is part of GRSI's versatile FastTrak warehouse execution suite (WES). FastTrak solutions are highly scalable from total warehouse coordination to coordination for last-100-feet operations. A powerful host interface allows FastTrak to integrate with any WMS or ERP host system.

Cartonization

- Saves money
- Increases throughput
- Improves consistency

Order evaluation



GRSI's *FasTrak* cartonization software examines the dimensions, fragility, weight, position, and special needs of each item in an order and the interaction of items in the order to determine the orders packaging requirements. Using material inventory data, the software selects the best suited packaging available.

Dimensions

The dimensions of each item are analyzed to stack and arrange the order for placement in the smallest possible container.

Fragility

Data about each item's fragility influences what type of materials in which it can be packed. The additional volume added by protective packaging such as bubble wrap, is taken into consideration when determining the required size container. Fragility considerations are determined using a scale:

- 0** Shippable container: Items in this category do not require cartonization.
- 1** No protection necessary: Items in this category can be shipped in polybags, envelopes, or cartons with no void fill.
- 2** Some protection necessary: Items in this category require that they are shipped in a carton with void fill or padded envelope.
- 3** Moderate protection necessary: Items in this category require a product protection solution such as bubble wrap.
- 4** Maximum protection necessary: Items in this category require a highly protective packaging solution such as protective foam, and based on analysis of other items in the order may require a nested container.

Weight

The software strives to put all the heaviest items on the bottom of containers, and will not stack an item onto another item lighter by a given differential. Items in upper fragility levels never have objects stacked on top of them.

Position

The software accommodates items that can only be placed upright and organizes other items that can be rotated around it for maximum space utilization and protection.

Special handling

Items may be flagged with additional business rules. Examples include big-ticket items that require special packaging or items that must always ship in a separate container.

Order data

Information specific to the order is also taken into consideration. Examples include priority customers or special requests such as gift wrapping.



To make client goals come to life, GRSI uses cartonization software to perform a comprehensive analysis of packaging utilization for large samples of past and present orders. The software is used to generate multiple models of packaging scenarios and subject them to aggressive testing. Based on the analysis, GRSI is able to provide clients with highly informed recommendations about packaging that have already been tested and shown to meet and exceed expectations.

Get the *best* prices from suppliers

Through intense study of order data and statistical methods, GRSI is able to establish key carton sizes that accommodate large numbers of orders without exceeding a threshold of excessive void fill. Clients are able to reduce the number of carton sizes in their warehouse and operate with a small set of carefully selected, streamlined sizes. By only ordering a select set of optimum carton sizes, clients are often able to achieve discounted 'economies of scale' rates from suppliers that quickly amount to significant savings.

Receive the *greatest* benefit from carton alternatives

By combining dimensional data with additional information about weight and fragility, GRSI is able to model how effectively carton alternatives such as polybags and envelopes will affect packaging costs. When GRSI identifies a large population of orders compatible with an alternative, the associated costs for automation, labor, and materials are carefully analyzed to evaluate the money saving opportunities. Introducing carton alternatives can potentially generate significant material, labor, and freight savings.

Get the *maximum* potential out of automation

Careful workload analysis allows GRSI to identify key opportunities for automation. Through multiple models and aggressive testing, GRSI can study the effects on throughput, labor, and material costs from fully automated solutions and blends of automation with traditional pack stations. GRSI identifies large populations of orders compatible with a highly automated solution such as cohesive cold seal wraps and examines the impact from automation. After the analysis, GRSI is able to present solutions to clients with accurate data on throughput increases and returns on investment from material and labor savings.

Use the optimum carton every time

When every inch counts, GRSI analyzes orders for their space utilization within cartons to establish a program that makes sure cartons are as small as possible. Creating tighter, more efficient cartons quickly adds up to significant savings on freight billed by dimensional weight. The ensuing carton efficiency is an important first step in reducing waste from excessive paperboard and void fill for a greener supply chain.

Benefits

- Lower material costs
- Simpler consumable replenishment
- Increased pack station efficiency

- Freight savings
- Lower material costs
- Increased throughput

- Maximum return on investment
- Increased throughput
- Eliminate bottlenecks

- Freight savings
- Lower material costs
- Green logistics

Adding a cartonization module to *FastTrak* OMS provides significant functionality enhancements. Packaging becomes a key factor in decision making about batching and routing, providing a crucial level of foresight. The fundamental improvements to warehouse operations offered by the cartonization module can often make clients wonder how they managed for so long without it.

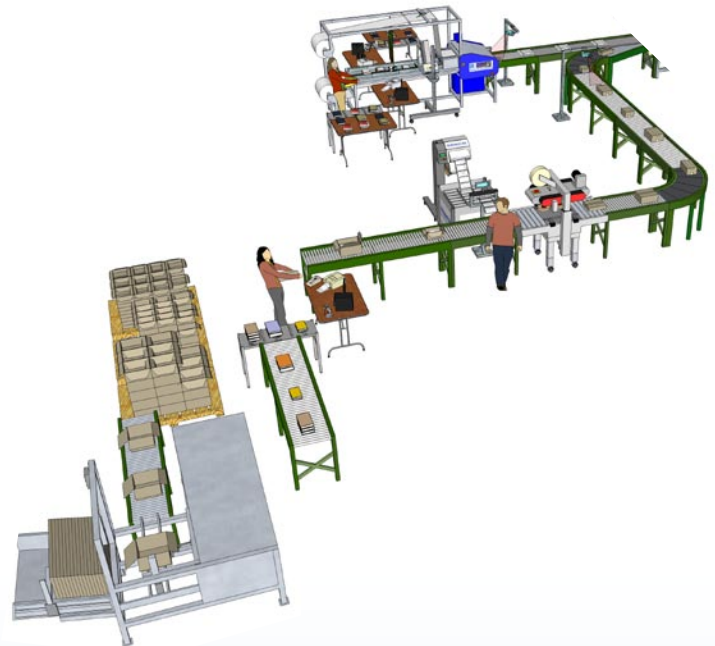
Packaging guidance

The cartonization module allows packaging requirements to be part of an order's data. When a picked order arrives at a pack station the operator is instructed to use a specific material and size. Instead of requiring operators to make important packaging decisions in a matter of seconds, decision making is automated by *FastTrak*. The ensuing consistency increases throughput, saves money on materials, and reduces damage claims.



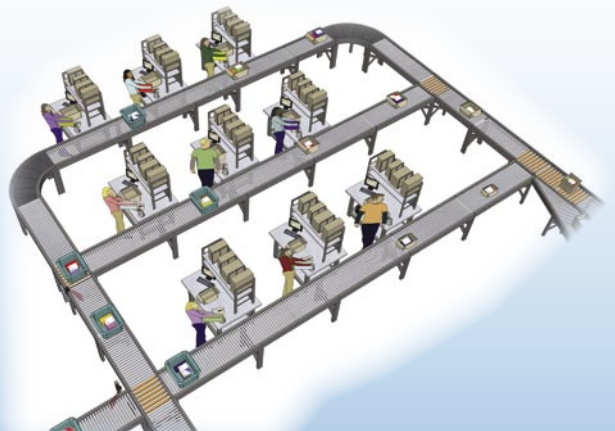
Batch by packaging

The cartonization module makes it possible to generate batches based on orders' packaging needs. Batches of orders requiring a single carton size or selection of carton sizes can be generated and allocated to specific packaging lines for those sizes. Orders with special packaging needs can be separated and batched to a specialty pack station, allowing all other packaging lines to streamline the handling of regular orders.



Route by packaging

Picked orders can be allocated to packaging stations tailored to their specific packaging needs. Orders can be easily separated between automated and manual lines, and divided among pack stations with the required materials. This maximizes efficiency by routing each order to the line that can most effectively package it. In addition, the required amount of void fill is automatically calculated and dispensed for each order. As a result, void fill costs and damage claims are greatly reduced.



Optimal carton sizes

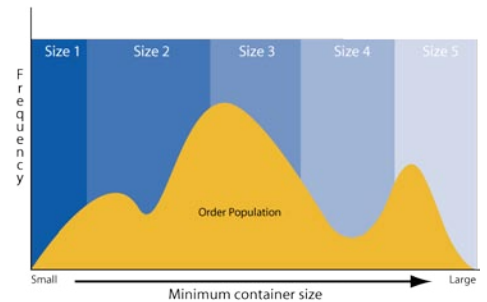


When orders arrive at the appropriate pack station, *FasfTrak* cartonization directs the operator to choose the appropriate carton size. This process greatly reduces material and freight costs but is not fully utilized if the warehouse is using inefficient carton sizes. To significantly lower packaging costs, each order must use the smallest suitable carton size and the least amount of void fill. GRSI analyzes the current carton sizes and order population then suggests the most efficient, proper sized cartons.

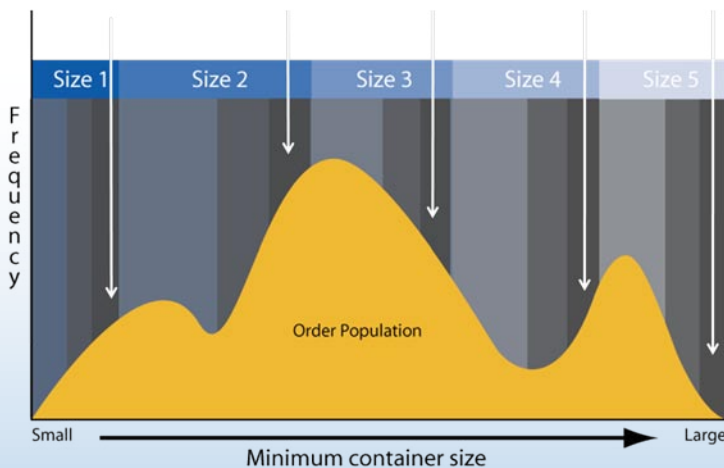
Analyzing carton sizes and order population

Initially, GRSI creates an order population and carton size chart (“Graph before 1”).

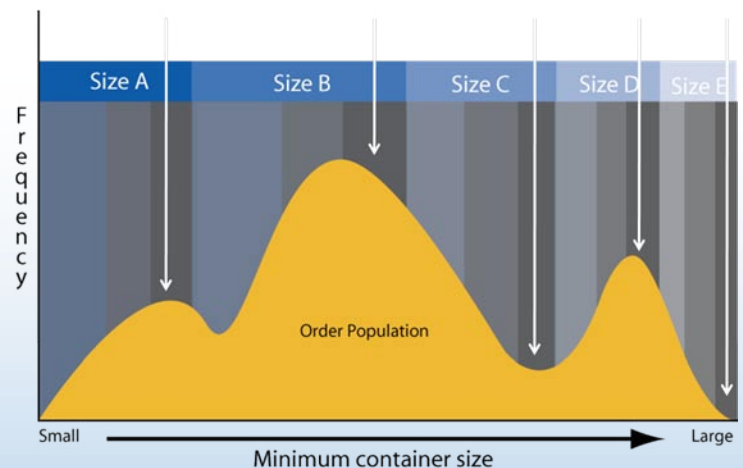
The cube of each order is gathered and their frequencies are calculated. In this example, the majority of orders fall within three distinct cube sizes, which appear as peaks in the gold region. The blue areas represent five carton sizes currently used from the smallest to largest, left to right respectively. If the order cube falls within the “Size 1” region, it is packaged in “Size 1” carton. In the chart below (“Graph before 2”), each carton size is divided into three areas. The dark gray area represents orders that are near the maximum size limit for that carton size. These orders require the least amount of void fill. Orders in the medium gray area require medium void fill and orders in the light gray area require the most amount of void fill. The goal is to have the order population peaks in the dark gray areas. This ensures the majority of orders receive the least amount of void fill. The next chart (“Graph after 1”) represents the optimal sized cartons determined by *FasfTrak* cartonization for this specific order population. As a result, the order population peaks are now in the dark gray areas which, drastically reduces void fill costs.



Graph before 1



Graph before 2

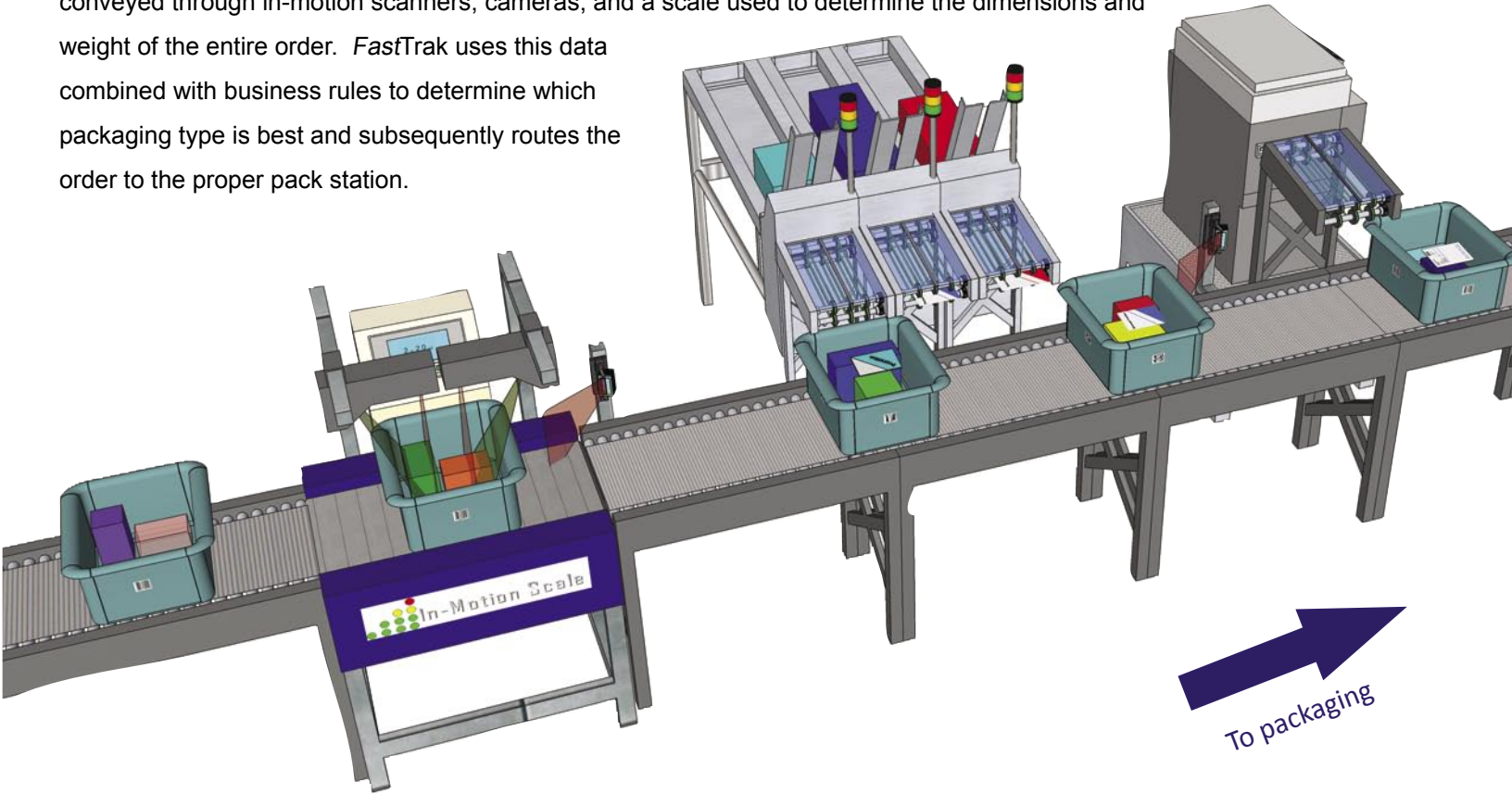


Graph after 1

In-motion cartonization



DIMSCAN™ is an in-motion dimensioning system capable of analyzing orders traveling in totes to packaging. Orders are conveyed through in-motion scanners, cameras, and a scale used to determine the dimensions and weight of the entire order. FastTrak uses this data combined with business rules to determine which packaging type is best and subsequently routes the order to the proper pack station.



Sustainability

Cartonization is an important part of any effort to make supply chains greener. In a waste hierarchy, the most preferred methods are to prevent and minimize consumption. A cartonization system pays extra attention to material consumption making sure the packaging used is truly necessary and will provide the maximum benefit. For the packaging that is used, the next best possibilities are to reuse, recycle the material. GRSI works with clients to choose packaging solutions that are made from recycled materials and can be easily recycled by the end user.



Using one ton of recycled corrugated cardboard saves:

3 tons of trees

2,400 kW of energy

1,400 lbs. of landfill waste

9,000 gallons of water

1 ton of CO₂

Recycled corrugate and recycling versus virgin corrugate and waste management
Source: Duke University, Paper Task Force: White Paper No. 3 Feb. 2002

Contact us for more information:

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Founded in 1987, Glen Road Systems, Inc. has spent more than twenty years positioning itself as a premiere systems integrator. Solutions are designed with the pervasive belief that a warehouse system is only as good as it is reliable and supportable. As a result, GRSI's top priority is to design systems for which it can offer superior support. Novel, value added features and a large install base in diverse warehouses has molded GRSI's core software offering, **FastTrak**® 3.0, into an essential tool for optimizing warehouse operation and automation.



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