EXECUTIVE SUMMARY

With today’s turbulent economic climate, manufacturing and distribution companies can thrive, not just survive. The packaging value chain offers an opportunity to reduce total system costs, while improving quality and customer service. One multinational manufacturer with products across personal grooming, food and beverage and household tackled a $40 million packaging spend across just three product families with demonstrated savings of 20%, and achievable savings of up to 30%. The company’s original goal was to achieve an 8% savings in corrugate packaging.

Their success was due to cross-functional collaboration to improve the packaging value chain and create operational efficiencies.
KEY TERMS

**Packaging value chain** – the elements that combine to impact the total cost of packaging: material, labor, equipment, transportation and logistics, warehousing, quality, return claims, supplier performance, and other direct and indirect cost components that impact the supply chain.

**Packaging optimization** – the synchronization of all packaging elements that impact the packaging value chain: product package design, shipping container specifications and layout, warehousing, carton void, packing material, and storage and handling.

**Sourcing and logistics optimization** – analyzing and discovering the optimal number of suppliers, the right blend of cooperation and competition, supplier performance, innovation and collaboration, and transportation.

INTRODUCTION

Manufacturing and distribution companies have a unique set of value chain challenges that are often compounded by department and divisional silos. Most firms view packaging as a process driven largely by marketing or engineering. Supply is likewise the domain of sourcing or procurement, and logistics, that’s yet one more team that must juggle a wide variety of demands and needs, both upstream and downstream. When process and packaging analysts look beyond the operational silos, what they begin to see is a value chain ripe with opportunity for cost, quality, service, and margin improvement.

The packaging value chain is made up of all the elements that combine to impact the total cost of packaging. When all stakeholders (engineers, packaging specialists, marketing, sourcing and logistics professionals) contribute to the requirements planning and execution of this critical value chain, the result is an efficient solution that does not sacrifice one variable for any other. Using a systematic approach to reduce cost and remove inefficiencies, these cross-functional teams give careful consideration to upstream and downstream factors that enhance value, quality and service. They become creators of a strategic value chain that can have an impact on overall enterprise performance.

**Fast Facts**

Packaging value chain costs usually break down as...

- 10% ≈ secondary packaging materials
- 20% ≈ warehousing
- 65% ≈ freight

Most companies focus primarily on shipping container design without regard to logistics impact – “saving nickels by spending quarters.”

“A tactical business plan for supply chain improvements that only addresses a subset of segments across the enterprise clearly leads to sub-optimization of the entire value chain.”
Throughout an enterprise, every division and each department likely has cost-savings initiatives underway or in place. These may include reducing supply costs, cutting labor hours, avoiding capital expense, or limiting transportation. While commendable, disparate efforts may in fact create conflicting priorities, or even worse, negate improvements in other areas, by other groups. The only sensible solution then is to integrate and balance all aspects of the upstream and downstream packaging supply chain, quantify and realize real savings, and ultimately improve overall system performance.

To achieve balance throughout the supply chain, best-in-class manufacturers and distributors focus on end-to-end packaging, supply chain and logistics optimization. With this holistic approach, they take into consideration engineering aspects, but with a clear focus on impacts to the total supply chain through the “3 Ds”:

- **Design** – improve load utilization by optimizing cubes, packaging design, pallet configuration, and container strength
- **Density** – design to maximize volume of shipping cases, handling, and warehousing, while limiting product damage
- **Distance** – impact of density on freight costs

**Leaders in packaging optimization:**

- Eliminate carton void and use less packaging material
- Lower material, handling and storage costs with more cases per pallet, pallets per truck
- Improve freight cost with higher density
- Reduce product cost with increased box strength

To discover the right balance between efficiency and complexity, they ask questions like, “What is the optimal number of boxes for 10,000 items?” Taking an end-to-end optimization approach, they synchronize the relationship of all elements and costs, and transcend individual department targets to achieve lowest total system cost.

Consider this: packaging material typically has about a 10% impact on overall supply chain cost. Warehousing and freight have an impact of 20% and 65% respectively. It’s easier to understand the overall impact of savings efforts by examining one global company’s experience in tackling packaging costs.

Their sourcing team achieved an 11% improvement in packaging by designing shipping cases that were stackable 1 pallet high with an area and cube utilization.

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**Case Brief: Specialty Retailer**

47% – Total Supply Chain Improvement

- 66% more products on ocean containers
- reduced freight costs 40%
- reduced warehousing by 40%
- reduced packaging costs 64%

**Case Brief: Pick & Pack Distributor**

23.2% – Total Supply Chain Improvement

- reduced freight 19.8%
- reduced packaging material 22.4%
- reduced # of cartons shipped 12.5%
- reduced weight 8.5%
- reduced cube by 35%
tion of the pallet at 97% and 96% respectively, holding 31,360 units of product. However, they did not take into consideration the impact new containers would have on logistics.

After an optimization project, a new case configuration with same corrugate strength allowed stacking to 2 pallets high, with area and cube utilization of the new pallet at 100% and 95% respectively. Each pallet now holds 42,120 units (a 34% improvement). This resulted in additional freight savings of 20% and warehousing savings of 25% with an overall savings of an additional 23%. Because the company took an integrated value chain approach to cost reduction and supply chain and packaging optimization, they had instead enhanced customer relationships, reduced system costs, and made a tangible impact on the enterprise operating margin.

Consider the case of one consumer goods company that successfully transformed corrugated packaging design, sourcing and logistics activities into a systematic business process. Overall, they reduced supply chain costs by 30%. A number of elements contributed to the success of the initiative:

- Increased individual truck loads 26%
- Improved warehouse space utilization by 20%
- Reduced material handling costs by 34%
- Reduced material costs by 8%

The CPG company achieved breakthrough results by taking a holistic, transformational approach to balancing all aspects throughout the entire value chain.
BREAKING DOWN SILOS

There are many elements that contribute to package value chain success. Each one has unique cost components, and each has an effect on efficiency and productivity. Best-in-class companies tackle the packaging value chain through two relational disciplines: packaging optimization and sourcing and logistics optimization.

Packaging optimization focuses on design and engineering elements of product packaging, cartons and shipping containers, packing material, handling, and warehousing. Sourcing and logistics optimization centers on direct and indirect materials, suppliers, and transportation. Together, these disciplines represent a holistic approach to operational and supply chain excellence, and is characterized by active participation among suppliers, shippers, receivers and makers.

Many companies already have resources and talent to conduct these types of activities. Where they usually fall short is orchestrating the processes and techniques necessary for truly integrated packaging optimization and sourcing and logistics optimization. They typically cannot analyze and discover solutions that do not sacrifice some variables for others. While this approach requires powerful optimization models, deep domain expertise, and a proven methodology, the results have a material impact on enterprise performance.

PACKAGING OPTIMIZATION

When manufacturers and distributors start to focus on packaging optimization, they typically achieve quick wins to build momentum and sustain operational efficiency. They begin to see a reduction of waste and “nonsaleables”, which translates to system savings, higher quality and better customer service. They can pass along savings to customers or improve margins. Either way, it has a significant impact on enterprise financial performance. In its simplest form, packaging optimization means reduced filler and air in a package, best use of cases and pallet loads, and maximized shipping loads.

Packaging optimization begins with an analysis of primary and secondary packaging: box design, specification, quantities, sizes, weights, “stackability”, damage specs, and storage time. Analysis continues by layering on SKUs, order volumes, and packaging mix. Then, it is important to study and analyze on site logistics processes for impact or potential improvements. The cost of operational processes and changes should always be considered in the final analysis. Throughout packaging analysis, all engineering as-
pects are considered within context of overall impact to the value chain. For example, how does box design and packing patterns impact density, carton void, and packing material? How does a configuration with more cases per pallet impact product damage and loss? What are the trade-offs of stronger product packaging versus stronger case packaging? Armed with a detailed analysis and expected cost reductions, testing and validation begins. At the same time, preliminary packaging recommendations become part of the sourcing and logistics analysis in order to balance and weigh supplier and transportation cost impact.

**SOURCING & TRANSPORTATION OPTIMIZATION**

When packaging testing and validation is underway, it is time to begin building sourcing and transportation models. Optimal solutions take into consideration direct and indirect materials, supplier and carrier capabilities and performance, inbound and outbound freight lanes and volumes, and handling and storage costs. It is often difficult to build this kind of sourcing and transportation model without the assistance of an appropriate technology solution. Furthermore, it is advantageous to leverage supplier and carrier innovation and Expressive Commerce™ techniques for even greater system savings.

To build a sourcing and transportation model, begin with preliminary packaging findings and recommendations, including specifications and volumes. Continue building the model with expressive supplier and carrier bidding, capturing custom proposals, volume offers, substitutions, contract terms, and payment terms. Capture and apply all stakeholder business rules, such as supplier and carrier performance criteria, quality, customer service, minimum number of suppliers and carriers, and all others. Use the sourcing and transportation model to perform scenario analysis for optimal allocation across the supplier and carrier network. Throughout the sourcing process, alternate and modified packaging and transportation mode options should be given consideration within the packaging optimization analysis.

**CONCLUSION**

When companies break down operational silos to analyze and discover optimal packaging value chain solutions, they experience transformational results. They create alignment across divisional and departmental silos and stakeholders, correlating requirements rather than sacrificing variables and needs. Furthermore, they have a significant impact on overall enterprise performance with lowest system cost and best value, not just lowest packaging or freight prices.
ABOUT THE AUTHORS

Jack Ampuja
A citizen of USA, Canada and Finland, Jack has over 30 years of supply chain management experience with five Fortune 500 firms. His career has included stints in consulting, manufacturing and third party logistics; jobs ranging from direct supervision of Teamsters and Longshoremen to Senior Vice President of Operations at a multi-billion dollar international company. Jack has extensive knowledge of the food industry, working 25 consecutive years for member firms of the Grocery Manufacturers Association. He also serves as Executive Director of the Center for Supply Chain Excellence at Niagara University.

Jay Reddy
Jay Reddy is the Chief Marketing Officer of CombineNet with extensive background in helping companies transform their purchasing organizations to centers of strategic sourcing excellence. Jay has been working in the sourcing industry for the last 15 years, helping companies improve margins through strategic sourcing initiatives. In 1999, Jay founded MindFlow Technologies with the vision of delivering technology enabled solutions that provided a quantum improvement in sourcing productivity and quality for global 1000 companies. Jay brings many years of strategic sourcing expertise, vision, and knowledge to the CombineNet team, along with extensive hands-on experience, having managed a $450 million purchasing spend for a Fortune 500 company.

Peter J. Sterling
Peter Stirling has over 30 years of supply chain experience in the food and beverage industry and 18 years of experience in the systems area as the Director of Applications supporting supply chain operations with both the Wm. Underwood Company and Ocean Spray Cranberries, Inc. Most recently, Peter was Corporate Director/Divisional Vice President of Ocean Spray Cranberries where he oversaw the international supply chain, customs compliance, tax structure compliance, and grew the Latin American Business Unit by over 300%.

ABOUT COMBINENET
CombineNet, the advanced sourcing technology company, helps companies achieve the absolute best value and lowest total cost of ownership for goods and services. CombineNet’s Advanced Sourcing Application Platform enables companies to engage in Expressive Commerce™, the strategic sourcing initiative that allows buyers and sellers to communicate supply and demand more expressively, collaboratively and strategically. The result is a win-win for both buyer and supplier, where greater innovation and efficiency are driven into the supply chain. CombineNet’s ASAP consistently produces 10, 15, even 20 percent greater actual cost savings than other e-sourcing solutions, and has delivered billions of dollars in savings for the largest businesses in the world including General Mills, PepsiCo, Procter & Gamble, Siemens and others. For more information, visit www.combinenet.com.

ABOUT SUPPLY CHAIN OPTIMIZERS
Supply Chain Optimizers is a management advisory firm founded upon the principle of taking waste out of the supply chain. Our solutions have traditionally delivered savings in the 10-20% range of total supply chain cost. We have also delivered dramatic improvements in our client’s sustainability through our recommendations. We are the undisputed category leader in packaging optimization where we have completed more than 400 projects over a 24 year period.