HOW TO PERFECT YOUR SUPPLY CHAIN FOR NEW CPG TRENDS

E-grocery, new store formats, warehousing, and robotics are forcing manufacturers to rethink supply chain planning.

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INTRODUCTION

The Changing Dynamics for CPG

With consumer demands for faster delivery and lower prices, a ***new era of supply chain optimization*** *moves to the forefront for CPG manufacturers.*

Global e-commerce sales ($3.53 trillion in 2019) are predicted to grow to $6.54 trillion in 2023.[1] How does this hypergrowth affect **Consumer Packaged Goods (CPG)** manufacturers? What are the impacts to physical retail locations? In taking a closer look, we focus on the $840 billion U.S. grocery battle underway where retailers are implementing fast-changing, innovative strategies. As a result, CPG companies are finding they must continually optimize supply chain operations to keep up with the ever-changing demands of consumers.

This industry brief focuses on a largely unexplored form of advanced analytics — known as prescriptive analytics — as the *primary* way to address global e-commerce and retail disruption. More specifically, leveraging prescriptive analytics for end-to-end supply chain optimization enables companies to know the best plans of action across their business to quickly adapt and evolve as new trends arise.

When product mix, channel formats, distribution centers, and logistics changes occur, CPG companies want to know how to reshape plans for constrained capacity, transportation shortages, lost shelf space, squeezed profits, and more.

One current trend influencing CPG is the growth of the online grocery segment. Amazon — without legacy brick and mortar stores — seems to be assured of the lead in online sales, which is predicted to reach $100 billion.[2] However, brick and mortar competitors are using other strategies to compete, such as micro-warehousing and online ordering/store pick-up.

All of these trends are impressive, especially combined with the use of autonomous robotics and self-delivery vehicles. In turn, they also provide added data for two crucial consumer needs: **delivery speed** and **convenience**.

Most grocers are still in the testing and pilot phases, utilizing multiple innovations, for the online market share at stake. These events prompt manufacturers to re-evaluate their strategies.

For CPG, will retailers' format changes be a matter of re-routing distribution and logistics, or is there an opportunity for manufacturers to create or expand direct-to-consumer products?

HOW NEXT-GEN SUPPLY CHAIN OPTIMIZATION FUELS INNOVATION

Underutilized by CPG Manufacturers

The overall advanced analytics category of technologies is predominantly associated with the use of historical data that crunches past actions and predicts “what will happen” in the future. This subset, known as **predictive analytics**, is a useful tool that many CPG manufacturers utilize today.

However, **prescriptive analytics — the only type of advanced analytics that recommends the best action based on business realities —** is primarily underutilized by CPG manufacturers. This lack of use is problematic because **only prescriptive analytics can move companies to next-generation supply chain optimization.**

What Is Next-Gen Supply Chain Optimization?

Supply chain optimization (SCO) has been around for a long time, but it is a term that means many things to many people. Meanings may include:

- “Making a supply chain more efficient,” without regard for the impact on factors like inventory or transportation costs
- “Cutting costs as much as possible,” without regard for the impact on profitability
- “Meeting as much demand as possible,” without regard for the impact on manufacturing costs

SCO enables companies to quickly make smarter, data-driven decisions in response to market shifts. Next-gen SCO keeps CPG companies competitive in the ever-shifting world of e-commerce and retail.

Next-generation supply chain optimization (next-gen SCO) is different*; it considers all variables, constraints, objectives, and processes within a business and then leverages* ***prescriptive analytics*** *(more specifically, mixed-integer linear programming) to understand complex trade-offs across the company and recommend feasible action plans.*

HOW CAN NEXT-GEN SUPPLY CHAIN OPTIMIZATION HELP CPG COMPANIES?

With next-gen SCO, companies can understand the actual dynamics unique to their business. For example, a business may want to know how seasonal demands impact warehousing capacity on a daily basis, using what-if scenarios to weigh significant trade-offs, such as:

- Is it more cost-effective to build and hold product inventory to meet demand?
- Is it more profitable to produce just-in-time inventory using higher, seasonal labor?
- Does either scenario above apply to all timeframes, or is one scenario more optimal during a select period?

In the case of the warehousing trends, next-gen SCO can recommend the optimal procurement of raw materials, inventory production plans, and logistics across multiple periods and distribution centers.

Planning can be as strategic as knowing where to invest capital and as tactical as having a plan for the best way to load pallets. Next-gen SCO can also pivot and recommend ad-hoc plans when market or source disruptions occur, requiring innovative changes to offset thwarted, existing ones.

*Next-gen SCO provides the big picture for companies: **an end-to-end view from sourcing to customer**, leveraging the highest form of advanced analytics to recommend the best action in any and every instance.*

THE E-GROCERY CATALYST

The Online Grocery Catalyst Driving CPG to Innovate

Although Amazon CEO Jeff Bezos downplays its U.S. market dominance, reminding shareholders that it only represents 4% of all retail sales, the company's 47% e-commerce market share is a statistic difficult to ignore.[3]

At the end of 2018, 40% of Americans, ages 18 and over, were Amazon Prime members, paying $119 per year and resetting delivery expectations for the entire grocery industry.[4]

Prime, which started in 2005 as a free two-day shipping benefit for most Amazon products, has evolved to include free two-hour delivery from Whole Foods (Amazon's 400-store acquisition made in 2017), and free same-day delivery in over 5,000 cities and towns.

Although Amazon's e-grocery distribution pushes competitors to make similar offerings, not all retailers have Amazon's advantages when it comes to supporting e-commerce distribution, including mega-warehousing. However, grocers and consumer goods manufacturers are finding other ways to run the e-commerce race in non-traditional ways.

*In the next few years, **online U.S. grocery sales are predicted at $100 billion** of the $840 billion total grocery spending today.*[4]

Warehousing Trends: The Fight for Consumer Proximity

Amazon is expected to sell 12.6 billion items in 2020, according to investment banking firm Piper Jaffray. Specific to groceries, Amazon's U.S. market share in 2017 was 18% — almost double that of Walmart, its closest competitor. **Top categories included beverages, coffee, snack foods, breakfast foods, and candy.[5]**

The surge in online grocery sales is changing the way retailers' and CPG companies' warehouses need to operate, considering:

- Almost 30% of the U.S. warehouse space is devoted to e-commerce[6]
- Amazon now has warehouses within 20 miles of half the U.S. population[6]
- Every $1 billion in e-commerce sales needs 1.25 million square feet of warehouse space – much of it used for the last-mile delivery[7]

These stats may imply that the online grocery share winner is the retailer with the largest warehouse footprint. However, Amazon competitors are countering with strategies that oppose the bigger-is-better format, including:

- Online ordering/customer pick-up supported by micro-warehousing
- Autonomous shopping assistance
- Autonomous delivery
- Other types of experiential concepts like Walmart's delivery straight to the refrigerator

Trending strategies like those listed above take advantage of the competitors' existing physical locations numbering in the thousands.

10 PRESCRIPTIVE ANALYTICS APPLICATIONS FOR FOOD AND BEVERAGE

1. **CAPACITY PLANNING**
   Considers all capacity, throughput, labor, inventory pre-build constraints, and the impact of all these on fixed and variable costs.
2. **PRODUCT ALLOCATION**
   Identifies the optimal production line for a given SKU per month, given the most recent demand.
3. **LONG-RANGE PLANNING**
   Evaluates strategic issues to include capacity, capital expenditures, and product portfolio.
4. **MEDIUM-RANGE PLANNING**
   Determines inventory strategy and tactical issues, plus which plants should make which products.
5. **TRUCK-LOADING & HANDLING**
   Maximizes efficiency and minimizes costs.
6. **DISTRIBUTION STRATEGY**
   Determines the optimal distribution strategy.
7. **DEMAND ALLOCATION**
   Allocates the right demand to the right location at fewer overall hours.
8. **TACTICAL SOURCING**
   Ensures raw materials are deployed to appropriate producers.
9. **ASSET STRATEGY PLANNING**
   Helps determine capital for new plants, equipment, and capabilities, and further aids in the annual operations planning cycle.
10. **OPERATIONAL PLANNING**
    Defines production sequencing and shift scheduling.

BRICK AND MORTAR

Chains Innovate to Capture Online Grocery Spend

Last year, Walmart advanced its online grocery business by providing delivery service in more than 50 markets and more than 2,000 grocery pick-up locations. This year, the company projects that it will cover almost 70% of U.S. households.[8]

The announcement offering free one-day shipping (with no membership fee) shows its intent to beat Amazon with similar strategies.

The ability to make rapid changes, such as fast delivery and pick-up services, also demonstrates how large store chains can use their physical presence to compete — especially with the micro-warehousing trend, creating changes for CPG, too.

Highlighted on the next page are a few retail pilots addressing new consumer behaviors; both show how supply chain complexity is growing exponentially.

*"**E-commerce has created demand for a new type of warehouse** with different dimensions, locations, and capabilities than what most of the existing U.S. supply offers," said David Egan, CBRE Global Head of Industrial & Logistics Research.*[9]

RETAIL INNOVATION EXAMPLES

Pilot 1: Shopping Robots and Select Inventory

Imagine you're picking up snacks at Walmart when a robot zooms by, extends its arm, and grabs a potato chip bag with surgical precision while you're still pondering which brands and sizes to purchase.

Meet Alphabot, Walmart's robotic automation technology, being tested in a store in New Hampshire — not a test for the future, but happening now! Although Alphabot's picking may be contained in the store's adjacent 20,000 square foot warehouse extension, the objective is to supply Walmart's buy-online-pick-up-in-store (BOPIS) and ship-from-store grocery orders. Alphabot needs less elbow room, allowing it to work in more confined areas. Predictions say that by using Alphabot, **inventory accuracy can improve by as much as 30%**.[10]

Pilot 2: Friction-Free Checking and Augmented Reality

Sam's Club, Walmart's membership-only retail warehouse club chain, launched its digital/physical club pilot last fall. Powered by an app, the concept — Sam's Club Now — is near downtown Dallas, Texas.[11] The club's footprint is **one-fourth the size of a regular Sam's Club warehouse**. The location has 700 cameras that work in tandem with the app and relies on consumers placing online orders in advance or physically scanning and buying at the store.

- Don't know where to go? The app's voice technology guides you.
- Iffy about an item? Scan and instantly view an augmented reality promo clip on your phone.
- No check-out lines. No cashiers. Walk in, scan, and walk out.

Studies show that 90% of customers who use the app will use it again.

The traditional Sam's Club experience of being able to buy a mattress and a Nutella twin pack won't be available at this new store format. However, being able to avoid long lines at the register may be the ideal trade-off for online and scan-as-you-go consumers. These formats, similar to Amazon Go, have proved to be so popular that Amazon plans to roll out 3,000 of its Go formats by 2021.[12]

HOW NEXT-GEN SCO BOOSTS PRODUCT PORTFOLIOS

What happened when a company with **20 plants** across the U.S. had constrained capacity for its most profitable product? Logistics included **more than 100 packaging and processing lines**, delivering products to **more than 200 distribution centers**.

This scenario was the challenge for one snack-food giant that used ***next-gen supply chain optimization*** to resolve its capacity constraint issues by better optimizing production allocation.

In this case, the business was unable to meet the demand for its smaller-sized product. One of the constraints was a perceived proximity issue to the nearest distribution center, keeping each plant locked into plans producing the existing product mix. However, by modeling the existing supply chain to include the processing lines, the solution indicated possibilities not previously considered.

The supply chain optimization plans showed that production could be moved to other plants. These plans helped the company meet demand and uncover other product opportunities — **the result: more than $300,000 in weekly savings**.

On an ongoing basis, the solution can run millions of algorithms and **determine the best courses of action in days versus months**. It is this speed in planning that is most valuable when retailers change demand and manufacturers need an almost real-time response.

Supply chain optimization plans (run in days, not months) helped this company example meet demand and realize ***more than $300,000 in weekly savings.***

CPG BATTLES

Lost Shelf Space and Private Label Products

Changes like micro-warehousing and smaller, grocery-style formats mean less retail shelf space for CPG products, especially as retailers expand private-label product offerings. Amazon, for example, has more than 100 of its own brands in food, health and beauty, and household essentials.

Analyst Bill Bishop of Brick Meets Click says, “Supermarkets need to reduce their costs in anticipation of Amazon driving down profit margins. This is going to be a dog fight.”

With retailers diversifying warehousing formats, CPG brands must be prepared for fewer SKUs in-store and more frequent inventory turns. In other scenarios, expansions like those planned by Amazon to be within 20 miles of half the U.S. population could mean fewer products at more locations.

Without sophisticated planning capabilities, manufacturers will need real-time dynamics to meet retailers’ demands, one which predicts that as many as 70% of U.S. consumers will regularly purchase consumer packaged goods online.[2]

The opportunity for CPG brands to innovate is as powerful as it is for retailers.

To avoid falling behind, CPG companies must begin rethinking what it means to have an “optimized” supply chain optimization in order to quickly adapt and evolve processes to better serve trending consumer demands.

With the capability to tap into almost unlimited what-if scenarios, especially across multiple silos, consumer goods manufacturers can identify the business potential. Insights like what capital is required and what the return on investment is anticipated for testing scenarios are crucial to show what is possible.

"The grocery industry, known to operate on thin margins, will look to ***CPG companies to participate in cost reduction strategies****, too."*[13]

- Bill Bishop, Analyst

THE COMPETITIVE ADVANTAGE

Other Ways Next-Gen SCO Offers Advantages

Within the next several years, online grocery spending will equate to every U.S. household spending $850 online for food and beverages. **Millennials are leading this change, accounting for more than 60% of online grocery purchases.**[14]

Smaller retail store footprints for an omnichannel presence place a higher emphasis on smaller product packaging. This kind of disruption, which is happening sooner than anticipated, requires frequent planning changes for manufacturers. New product recipes, in addition to retooling for new packaging designs, could result in lower capacity and, ultimately, lower profits.

Tough trade-off decisions are at the core of planning for companies that want to fully or better utilize capacity while taking advantage of new, profit-driving opportunities.

With four out of five companies using spreadsheets for planning, visibility to trade-offs in a complex supply chain is minimal.[15] It's this realization that has companies looking to expand their supply chain optimization practices. They're beginning to prove value in relying on validated data and prescriptive insights versus clunky spreadsheets and gut feel.

CPG COMPANIES DEPLOYING NEXT-GEN SUPPLY CHAIN OPTIMIZATION

Examples

Utilize capacity for the optimal product mix

When a snack food giant couldn’t meet capacity on its highest-margin product, it turned to prescriptive analytics to optimize the best production lines and disprove previous transportation assumptions, saving hundreds of thousands of dollars in the process. Millions of dollars in additional profit opportunities were discovered in the process, too.

Drastically reduce planning time from months to days while cutting costs

A former division of Unilever's butter, cream, and spreads division was able to reduce overall costs by several percentage points while also reducing their planning time from months to just a few days. The benefit of being able to plan more frequently, with more confidence, brought tremendous value to their decision-making process and their ability to quickly respond to unforeseen events.

15x first-year ROI by optimizing production and transportation processes

A Fortune 1000 snack-food manufacturer wanted to validate planning based on data. With five models, including short-term, medium-range, and long-range planning, in addition to distribution planning and logistics/transportation planning, it continues to achieve significant results ranging from the most profitable production plans to the best transportation routes. The first-year ROI was 15x.

NEXT-GEN SCO: Empowers CPG with Visibility and Financial Gains

The Time Is Now

Consider the meatless meat manufacturer, Beyond Meat (BYND), that went IPO with a $1.5 billion valuation. The meat substitute category will grow 40% in the next few years.[16] Coca-Cola prepares for another disruptive event. A dominant soft drink player is making its foray into the ready-to-drink coffee segment, jumping 31% in sales growth in 2016 and 2017, and making it the fastest-growing segment in the coffee category.[17]

Non-traditional products with remarkable growth like the examples above put direct/indirect manufacturers on alert, causing them to continually ask questions like:

- How does a current trend impact my business?
- What if we offer similar types of products?
- How can we regain market share lost to a new entrant?
- What if we lower prices?
- What if we open sales to other channels?
- What if we sell select brands direct to consumers, bypassing retail, and utilizing micro-warehousing/micro-fulfillment strategies?
- What if we lease warehouse space from a trusted supplier? Could it reduce the amount of working capital we have tied up in raw materials and provide zero lead time while eliminating the excessive costs of delivering goods several times a day?

EMPOWERING MANUFACTURERS

END-TO-END VISIBILITY

The applications for supply chain optimization are almost endless. Successful CPG implementations continue to solve critical problems for the food and beverage industry.

With a reported ***20% of companies in CPG already in financial distress today,*** *CPG companies will need clarity about the price of innovation and its outcomes.*[18]

As retail innovates both physical and online strategies to gain a competitive advantage and maintain market share, CPG must implement next-gen SCO to optimize the supply chain end-to-end and understand the financial impact across the enterprise.

Many retailers and manufacturers are not ready for the age of online grocery.[3]

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ABOUT RIVER LOGIC

River Logic has been a global innovator in prescriptive analytics (optimization) since 2000. Its platform — designed for business users — enables enterprise-wide optimization, collaborative planning and performance management, all delivered through a revolutionary user experience. By understanding how to best utilize cross-functional resources and manage trade-offs, companies can make more impactful decisions.

River Logic goes to market primarily through partner organizations like PwC, Deloitte, Microsoft, and West Monroe Partners, helping them develop high-value solutions that monetize their industry expertise. Recent clients include Unilever, BHP Billiton, the Russian Post, Boise Cascade, McKee Foods, and Yorkshire Water. Typical client value-add ranges from 10% in cost reduction to 2-5% of sales in additional profit. River Logic strives to help every customer achieve at least 10X return on investment, but it is common for customers to see even higher returns.

CONTACT US

+1 214.393.4650
sales@riverlogic.com
www.riverlogic.com