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TOP TIPS

Top 10 Ways Big Data Analytics Can Deliver Supply Chain Transparency

Consumers today increasingly demand food and beverage companies offer complete supply chain visibility. Fortunately, big data can deliver that visibility plus fresher products and less waste. From the consumer's decision of what to buy through retail, distribution, processing and back to the farm, big data analytics delivers the complete supply chain transparency people want.

Everyone wants to see where their food comes from, and now we can. Transparency into food and beverage supply chains has long been a goal, but current technology is helping to make it a reality. Specifically, big data and the ability to analyze it effectively allows for meaningful gains with useful insights into every stage of supply, distribution and purchasing food products.

What is new? Food and beverage companies have long analyzed large sets of data. Big data takes it further by not only involving high volume, but also high velocity and variety of data. The dimension of velocity has been coming through point of sale (POS) data for some time. Often the breakthrough comes in adding variety, or additional data streams. Increasingly the additional data streams come from plants, machines and systems connected to the Internet of Things (IoT) as well as consumer sentiment data from on-line sources.

Why the urgency? Consumers are driving this need for greater transparency. Many consumers want to understand their food more deeply, either for health or environmental sustainability reasons. Consumers want complete source, ingredient and manufacturing information, and big data can help at every stage. So, let's look at how digitalization, IoT and big data come together to enable food and beverage companies to offer their consumers supply chain transparency.

1. Farming

Farmers can understand livestock optimum conditions based on monitoring data. This may come from sensors tracking conditions of animals in the field or barn. The farm component is a growing concern for many consumers. Combining that with in-plant characteristics of milk, eggs, poultry, meat, grain or produce is powerful. Increasingly, this can tie back into in-store outcomes and consumer reviews to reveal what farms can do to please consumers. That helps every level of farm customer, from processors to retailers to consumers.

2. Processing

Processors can maximize plant throughput by collecting and analyzing big data about off-spec, downtime and equipment trends. Today's technologies support more effective process tuning by incorporating more of the context. This comes from a variety of data streams via environmental, process, product sensors and automation equipment. Big data is even improving outcomes for new products, as it can incorporate larger volumes of current and historical data to rapidly fine-tune recipes. These tweaks may not only improve production, but also may focus on addressing consumer feedback to improve products faster.

3. Optimizing

Processors also can pinpoint "golden batch" settings in various scenarios of process conditions in the production plant. Companies can radically improve recipe management based on big data. This data set includes more varied data and analysis of longer and broader historical data (from similar products, equipment, etc.). Companies that can consistently produce on-spec product even as conditions change will find more margin as well as happier consumers.

4. Planning

By leveraging trends that come out of big data analysis, processors and brand owners can respond more effectively to changing demand. By seeing patterns early in demand planning software, companies can be prepared as shifts such as weather or regional holidays change buying patterns. Combining more traditional supply chain data with the in-transit and on-shelf IoT tracking data dramatically improves plans as well as marketplace agility.

5. Packaging

Big data can help with both operational and design aspects of product packaging. For example, combining data about micro-stoppages with final package and fill results can illuminate priority upgrades or maintenance needs. On the design side, big data from final product sales can reveal what packaging styles, materials and sizes are trending in various locations. Combine that with each plant's packaging line performance, and both design and operations may offer new ideas to improve collaboration.

6. Shipping

Products can speed through the distribution network if all of the data is available and analyzed with big data analytics. By analyzing locations, hand-offs and routes, shippers can ensure low-cost, appropriate products in each location and freshness at final destination. Analyzing the entire distribution network enables gaining new insights from every stage of the supply chain.

7. Tracking

Real-time product and cargo tracking and condition monitoring deliver visibility through IoT sensors at every stage. By feeding this timely location- and condition-based information into big data analytics, planners can respond. This is especially important in cold chains, where products must always be in a certain temperature range. Further, companies can alert trading partners to exceptions to the plan. This enables rapid, sometimes proactive response to dynamic shifts in the chain.

8. Stocking

Retailers need big data sets about products in each location by arrival and expiration date. This shows goods nearing expiration or products that are not moving in one location, but are in another. This also allows them to act quickly and to stock each location for success. Minimizing discounting and waste from expired goods is one aspect. Selling more of these fresh items further enhances the margin gains.

9. Marketing

Improve engagement with consumers at retail by implementing smart shelves that know what SKUs are low, and use real-time data to guide consumers to available products. This requires not only the inventory data in real-time, but also data on substitute and companion products across the store's current assortment. Smart shopping carts also can track consumer behavior patterns in the store. This can enable customized product offers and on-the-spot coupons or savings on future purchases.

10. Listening

With big data, companies can also put consumer feedback from across social platforms and repeat buying patterns into context. Combining and analyzing different consumer social and buying trends can play back into new product development, recipe testing, packaging design and marketing.

Big data can support transparency in the supply chain in many ways. These are just the top 10. It is easier than ever to collect, contextualize and analyze multiple streams of data, even if they are unstructured. As companies in the food and beverage industry get more comfortable with big data, they find some of the biggest benefits in supply chain transparency.

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