

Advanced Analytics Solutions

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## Harnessing Advanced Analytics to Optimize SKU Management in Industrial Distribution

The industrial distribution landscape is dynamic, complex and rapidly evolving. Whether focusing on specific sectors or serving broadline customer needs across numerous industrial end markets and product sectors, industrial distribution companies typically offer tens of thousands, if not millions, of product SKUs, generating a high volume of transactions. Over time, industrial distribution businesses tend to offer more SKUs in order to leverage the core platform they already have in place. Although SKU expansion drives overall growth, it also makes it more challenging for businesses to understand their entire SKU portfolio's performance and optimize them accordingly.

Some industrial distribution companies are finding ways to gain insights into SKU performance and optimization by applying advanced analytics tools to their data-rich transaction records. With better access to more data and improved analytics tools that make it easier to mine the data efficiently, companies are using insights from advanced analytics to sharpen their sales and marketing strategies and manage inventory more effectively.

### The power of product associations

Retail marketers know the importance and value of product associations — the tendencies for certain products to be purchased together or separately — in optimizing merchandise stocking and impacting promotions. A common example is the peanut butter and jelly sandwich: In grocery stores, the probability that a shopping cart with bread and peanut butter in it also contains jelly is far greater than the probability that any given basket will contain jelly.

For industrial distribution companies, there are also numerous product associations that exist across a given SKU/transaction data set. While some may be intuitive, such as underlayment with roofing shingles or filters with pumps, most are nonintuitive and may be very hard to detect on the surface. The sophisticated algorithms within advanced analytics tools, however, offer a powerful way for distribution companies to identify and quantify both intuitive and nonintuitive product associations in their

sales data. These insights, in turn, enable industrial distribution companies to make better decisions about the products they carry and their optimization of sales and marketing strategies.

To understand the true value of each product in their portfolios, industrial distribution companies must recognize that product associations aren't just a metric for SKU management. Most distribution companies measure sales performance and gross profitability at the individual SKU level, but this view doesn't provide a complete picture of the value of each SKU to the entire portfolio. Though product-level value is crucial when a company undertakes a SKU rationalization exercise to determine which SKUs to keep, delete or reprice, it views each product in a vacuum, independent of its associations with other products. With the added information that product associations provide, distribution companies can build assortments, price products, and manage portfolios more effectively, capitalizing on interproduct attraction and repulsion.

Algorithms can be used to find and measure how likely it is that a certain item set (one or more products) will be found in a basket containing some other item set. The outputs of these algorithms are robust and can be illuminating, but even for a distributor with just several thousand SKUs, the number of possible combinations of products can be unfathomably high and become nearly impossible to analyze.

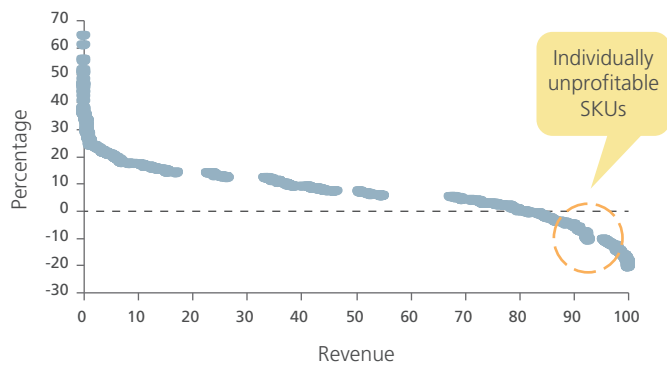
### Role of data analytics

To surmount this obstacle, L.E.K. Consulting's advanced analytics team has devised a standardized process to limit the analysis to pair-wise associations only. In other words, we analyze only the associative properties of item pairs, ignoring larger sets of items. A set of 10,000 SKUs has just under 100 million pairs — or half that if we view each pair as a combination rather than as a permutation. This is still a large number, but it is well within the reach of modern computing. Once the value of each item pair is quantified, the results can be layered into each item's nominal value to add another dimension to the true value an item provides within the context of the entire portfolio.

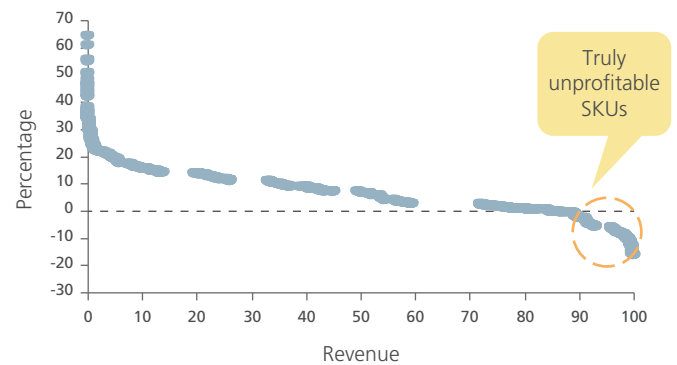


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Operating margin by SKU - Individually



Operating margin by SKU - Including pair-wise associations



Source: L.E.K. analysis

We accomplish this by following a straightforward calculation process:

1. Use a transaction table and supporting data to create a list of unique SKUs and aggregated metrics, such as:
  - a. Transaction count
  - b. Quantity sold
  - c. Revenue and profit earned
2. Self-join SKU lists to create all pair permutations
3. Use a series of joins between SKU pairs and the transaction table to aggregate metrics for each item of the pair when that pair exists in a transaction
4. Calculate a variety of metrics for each pair to determine a variety of association values and each pair's statistical significance, dependence, etc.
5. Calculate the financial value of each SKU's pair-wise associations

This added information can make the difference between value-creating SKU rationalization and elimination of significant profit dollars. For example, we recently worked with a distributor of industrial explosives that had identified nearly a third of its SKUs

as losing money. This initial SKU profitability review would have suggested cutting most of these SKUs. Similar to many types of industrial customers, however, explosives customers purchase explosives packages by component. This means that many SKUs that appear individually unprofitable are actually necessary to drive high-margin transactions on other components within purchased packages. We applied pair-wise product association analysis to quantify the strength of product associations across all SKUs in this client's portfolio. This analysis allowed individually low-value products with high-value associations to be retained in the portfolio, saving substantial associated product profit that otherwise would have been lost.

L.E.K. works with industrial distribution companies to optimize their commercial success. Our advanced analytics process helps our clients examine their expanded product portfolios, drive superior profitability through SKU optimization, and enhance their sales and marketing strategies.

How can we help you? For more information about optimizing SKU management in industrial distribution, please contact [industrials@lek.com](mailto:industrials@lek.com).