SKU Max: Inventory Assortment Optimization
Managing inventory correctly isn’t Easy

Technology provides solutions to existing and emerging problems

Keeping up with rapidly changing customer preferences feels out of reach with my current forecast methods

I need to be able to meet demand anywhere, on any channel, but I’m hindered by disconnected processes

I want products to delight customers, but we lack up-to-date insights into consumer baskets

Providing more personalized, relevant offers to clients would require mobile analytics that I don’t have

I want technology to be a growth engine for the business, but legacy systems hold me back

18.5% growth in the number of SKUs stored in distribution centers in 2015¹

4.2% increase in US manufacturers’ and trade inventories from 2017-2018³

143% of inventory per total sales is the amount of stock US retailers are sitting on¹

44% of CPGs don’t have adequate resources to interpret analytics outputs²

³ [https://www.ons.gov.uk/ons/qualifications/online-examinations/online-examination-questions/2018]
SKU Max: Optimum shelf

Challenges

• Understanding customer preferences
• Limitations on traditional assortment
• Managing rapidly changing portfolios
• Ensuring the right SKUs are stocked

Analyze past SKU performance by market segment
Leverage latest market trends and SKU insights

Capabilities

• Identify best-fit products for markets
• Ensure the right distribution of SKUs
• Manage SKU lifecycles to reduce bloat
• Equip sales teams with SKU insights

Tailor store/outlet product assortment
Optimize category management, store and shelf space

Outcomes

Right products on shelves
Increased sales volume and revenue
Unique and dynamic store assortments
Interpretable proposals for end users
Solution Charter

- Deliver immediate business value through advanced analytics
- Reduce excess inventory and match products with each market
- Build analytics into operations

Leverage proven modeling techniques for immediate operational business value.

Tap into Azure Synapse cloud analytics capabilities without worrying about integration and operations.

Ensure each outlet has the best portfolio of products to maximize sales and profit.
Sales are not equally distributed across SKUs

80-90% of SKUs generate nominal sales volume

Even when filtered to only Core SKUs, sales are still very skewed!
SKU Optimization Classifies SKUs into 4 Groups

Sales Distribution by SKUs

- **Undersold SKUs**: Low distribution, high performing SKUs
- **Unprofitable SKUs**: Low distribution, low performing SKUs
- **Core SKUs**: Widely distributed, high volume SKUs
- **Winning SKUs**: Moderate distribution, high performing SKUs

80% of sales occur in the top 10-20% of SKUs. These are the Core SKUs. We use models to find the rest!

Unprofitable SKUs:
SKUs that are underperforming and have low revenue/volume. They can likely be removed.

Core SKUs:
High volume, commonplace SKUs that have marginal sales lift but should not be replaced.

Winning SKUs:
SKUs that are excellent performers in every market they are present, and penetration should be further increased.

Undersold SKUs:
SKUs that significantly increase sales when present, but have low penetration and are crying out to be distributed more.

Four SKU Categories

- **Core SKUs**: Widely distributed, high volume SKUs
- **Winning SKUs**: Moderate distribution, high performing SKUs
- **Undersold SKUs**: Low distribution, high performing SKUs
- **Unprofitable SKUs**: Low distribution, low performing SKUs
SKU Sales Effects Identify SKU Categories

SKU Effects on Weekly Sales Per Store

Example SKU Portfolio for Large Convenience Stores in California
SKU Optimization using Machine Learning

...It’s common to optimize SKUs using sales analysis and Business Intelligence, but many SKU portfolios are too large and complex to be effectively managed using traditional methods, so we segment sales outlets using a variety of traits, then use Machine Learning to measure SKU performance.
SKU Optimization using Machine Learning

- All Sales Data
- Territory B
- Grocery
- Large Outlet
- Territory C
- Bulk Retailer
- Extra Large Outlet
- Conv. Stores
- Medium Outlet
- Small Outlet
- Micro Outlet

Sales Data for Large Grocers in Territory B
10101
01010
00100

Machine Learning Model

Ordered List of the Best and Worst SKUs for Large Grocers in Territory B
Insights from analyst dashboards

Analytics teams are equipped with new tools for decision making

6 Pack Cans of Root Beer

6 Packs are Significantly Outperforming Other Packages in Thousands of Stores
Dive into product DNA

Now that the buyer knows which product attributes are trending, they can work with their suppliers to order products that meet the criteria.

This product has some of the top performing attributes in that product segment.

Product with the some of the top performing attributes in that product segment.

Now that the buyer knows which product attributes are trending, they can work with their suppliers to order products that meet the criteria.
Low performer SKUs are ideal removal candidates
These SKUs may just be a bad fit for customer preferences in that market, and are better stocked elsewhere or less frequently.

Dashboards in the hands of sellers

Each seller is equipped with a new tool to encourage sales

1. Quickly identify top performing SKUs
   The dashboard provides an ordered list of the average effect on weekly sales for each SKU across the stores in each sales outlet group.

2. Know exactly which good SKUs are missing
   The seller can quickly identify which SKUs are good candidates to replace underperforming products on the shelf.

3. The customers for each day are easily selected
   With dashboards refreshed each day, the seller need only select from among the customers they are going to visit that day. (IDs are used here for anonymity)

4. Low performer SKUs are ideal removal candidates
   These SKUs may just be a bad fit for customer preferences in that market, and are better stocked elsewhere or less frequently.

The SKU Sales Effect shows the average impact on weekly sales if that product is stocked and selling normally.

These SKUs can be replaced to better tailor products to each outlet’s customer preferences.
Weekly Sales Effects

Every attribute combo provides an estimated sales impact if SKUs with those attributes are sold in the store, identifying winners, losers, and indicating recommended purchase volumes.

Dashboards for buyers and merchandisers

Retail buyers can quickly identify trending products to order

1. Quickly Analyze Each Market and Department
   The dashboard equips buyers with the ability to drill into each market or product segment with tailored Machine Learning recommendations.

2. Identify Optimal Product Attribute Combos
   SKUs in Retail may come and go, but by analyzing product attribute combinations, we sequence the DNA of successful products so new items with trending DNA can be ordered.

3. The Best Products Drive Recommended Buys
   Successful products have common attributes, which can be grouped and modeled against other groups over time, recommending what is trending in a given market or department.

4. Weekly Sales Effects
   Every attribute combo provides an estimated sales impact if SKUs with those attributes are sold in the store, identifying winners, losers, and indicating recommended purchase volumes.
North American beverage bottlers drive value by equipping sellers with Machine Learning

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
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<tbody>
<tr>
<td>CONA needed to optimize historical SKU sales and derive the influence of market conditions on SKU</td>
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<td>CONA wanted to empower CONA’s field sellers to make SKU decisions and make expert product recommendations</td>
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<thead>
<tr>
<th>TACTICS</th>
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<tr>
<td>Created a cloud-based analytics platform</td>
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<td>Created AI-optimized product portfolios</td>
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<td>Created a BI environment available analytics for sellers on-the-go via mobile</td>
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<th>RESULTS</th>
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<tr>
<td>Identified high and low performance SKUs to boost and replace</td>
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<tr>
<td>Quantified which variables led to variances in sales</td>
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<tr>
<td>Determined where business operations could be optimized to increase profits</td>
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“Our SKU Optimization tool has given us better visibility into our market availability opportunities, but, even more importantly, we have been able to present the information in easily accessible mobile application that gives our field sales representatives the information they need on why the products are important for our retailers. For us, enabling the dialogue at the outlet level is business critical.”

- Beeland Nielsen, Director of Commercial Leadership, Coca-Cola Bottling Company United
When we started with this project, we were searching for new and improved ways to serve our clients and consumers while boosting profitability. We needed to better use the data we already had and gain a more comprehensive understanding of sales variations and correlations between multiple variables.

**SOLUTIONS**

- Consolidated data from dozens of sources
- Unified data in a single data model for testing the influence of hundreds of potential factors
- Recommended SKUs based on models

**RESULTS**

- Identified the top influencers of sales in each region, channel, down to the customer level
- Improved SKU assortments in key channels
- Week to week adjustments and interventions possible through powerful reporting and granular pulse of the business analysis in each market

“When we started with this project, we were searching for new and improved ways to serve our clients and consumers while boosting profitability. We needed to better use the data we already had and gain a more comprehensive understanding of sales variations and correlations between multiple variables.”

- Lizeth Refugio Salas, Revenue Growth Management Chief, Arca Continental

“Over time, this advanced analytics solution with its statistical approach to big data will transform the way we take business decisions through all business processes.”

- Ruben Dario Torres Martinez, IT Manager, Arca Continental
How SKU Max differs from the competition

JDA’s Value Proposition:
A retail focused platform for data and customer management, with various modules for analysis and specific workloads.

RichMix
Product Whitespace
Other Retailer’s Data

JDA
End to End Retail Platform
Retail ERP & SFA

Neal’s Value Proposition:
Using empirical analysis of your sales data, we can make recommendations of SKUs that have proven to increase sales in the stores in that market.

Kantar RichMix’s Value Proposition:
Using “Transferrable Demand Curves” from other retailer’s data, we can forecast the effect of a SKU change in your market.

SKU Max
Analysis of your SKU Sales Performance
Detailed Store Segmentation
Why is better SKU optimization needed?

<table>
<thead>
<tr>
<th>Business Challenges</th>
<th>Key Questions</th>
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<tr>
<td>Managing SKU portfolios is typically done at a high level, on intervals, allowing</td>
<td>Are there simple SKU decisions that can increase profits?</td>
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<td>for dog SKUs to sit on shelves not performing, and star SKUs to sit on trucks</td>
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<td>unable to shine.</td>
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<td>Retailers often have little insight into what about their products makes them</td>
<td>How can we see if each SKU “pulling its own weight?”</td>
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<td>desirable in a particular market. Our understanding of Product DNA allows retailers</td>
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<td>to make more informed purchasing decisions for each market.</td>
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<td>Organizations simply do not have the time or the manpower to model for every market</td>
<td>Do slow moving SKUs hurt, do nothing to, or help, total sales?</td>
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<td>and provide their sellers with up to date information on what products are trending</td>
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<td>and performing well with their customers.</td>
<td>Is there a better way to measure SKU performance than looking at historical</td>
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<td>sales by SKU?</td>
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### Data Questions

**Q:** How much data do I need for this solution to work?

**A:** We look for at least 2 years of sell-in sales data, but beyond that, less data only means less segmentation.

**Q:** I’m a retailer and all my stores are the same, why would I want to segment them? Does this still work?

**A:** Yes, we may use clusters of stores compare markets to see which products are preferred in that market, but the real answer is that we will tailor the data to you!

**Q:** I only have a few customers because I don’t sell direct to the stores where consumers purchase them, how is this solution valuable for customers like me?

**A:** Our key goal is to generate enough data for our algorithm to segment your data and still work. That can be done even with as few as 10 customers.

### Methodology Questions

**Q:** How does this solution compare to JDA or other providers?

**A:** SKU Max is not a complete platform, but addresses a specific, high business value problem in a differentiated manner.

**Q:** Under the hood, what sort of algorithm do you use?

**A:** We use a multivariate regression model to analyze the presence and absence of various SKUs in each sell-in transaction.

**Q:** What sort of information do you need from my team?

**A:** We need the overall size of the data, and to know how you would like to segment the data into peer groups for analysis.

**Q:** What is the estimated timeline for implementation?

**A:** Could range from a few hours to a few weeks depending on customizations requested. Basic configurations are fast!
TRANSFORMING YOUR BUSINESS WITH DATA

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