

Beverage Manufacturer: Generating \$30M in Incremental Margin using Machine Learning for Promotion Planning

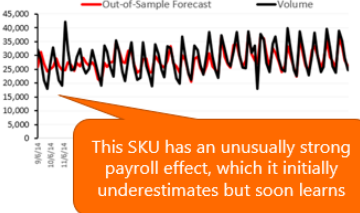
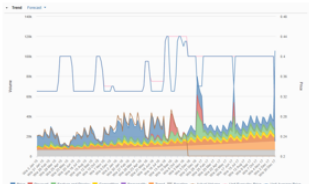
Solution & Implementation Case Study

- **Trade promotional management (TPM) process dispersed between hundreds of decision-making sales people.**

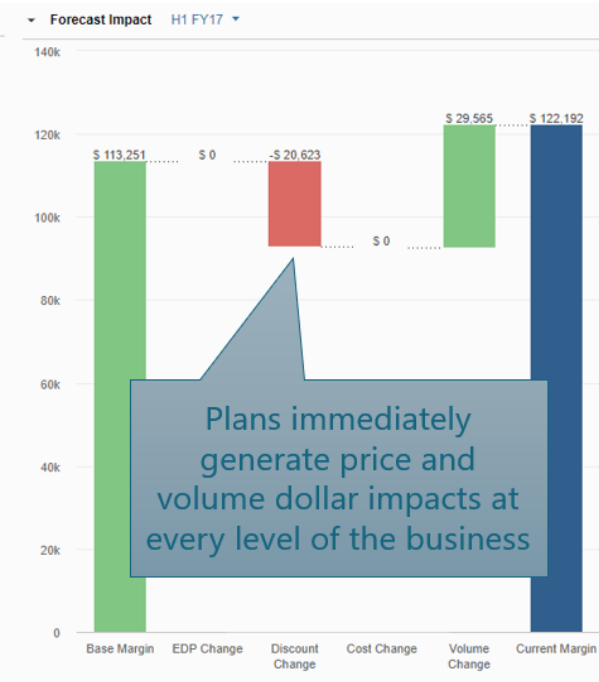
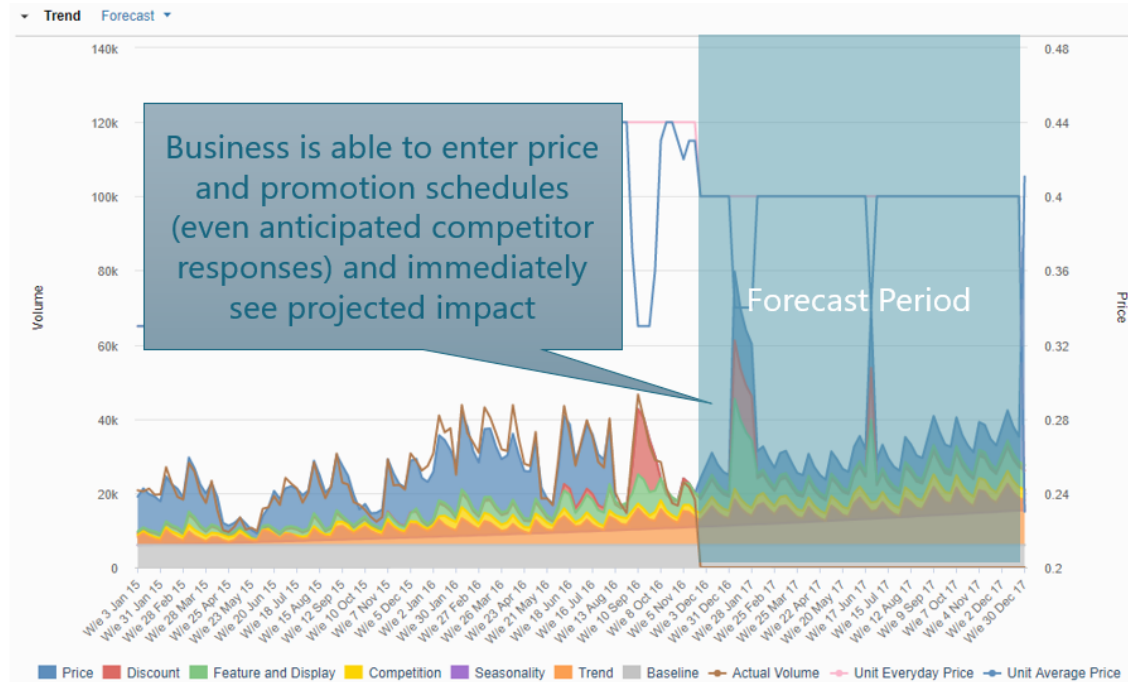
A large beverage manufacturer was having issues getting real value out of their promotion planning and execution. The return on investment (ROI) of historical and future promotions were not well understood (price elasticities purchased from point-of-sale data vendors produced non-credible results) resulting in promotions being made by copying prior year or by a health dose of gut feel. Increases in promotional spend were not yielding expected corresponding incremental revenue and margin

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- Leverage machine learning to predict demand based on core data elements and drive the right analytical decision making process**

Our extended team developed a custom Bayesian machine learning model that predicted demand based on key business factors such as price, promotion, seasonality, payday week, competitive factors, etc. Key metrics and dashboards were developed to show and explain ROI on historical and future promotions providing the proper analytics for decision making. This resulted in the team developing and deploying a custom TPM application with surrounding processes and roles to optimize promotional spend that maximized margin while maintaining target volume requirements

Goals	Our Approach	Benefits	Execution (In Anaplan!)												
<ul style="list-style-type: none"> Develop a credible model that predicts demand based on a variety of business factors: <ul style="list-style-type: none"> Everyday Price (including dollar threshold effects) Discount ACV Distribution, Feature, and Display Competitor price, discount, and promotional activity Payroll effect Seasonality Output is a collection of demand elasticity coefficients 	<ul style="list-style-type: none"> Begin with realistic values for the coefficients, determined by our prior experience or adjacent products with clear elasticities Use machine learning to iteratively update these values with new data, learning as time goes on 	<ul style="list-style-type: none"> Works on new products: traditional regression analyses require a large number of data points (i.e. history) to fit Smoothly adapts to new information: other machine learning models can change the coefficients drastically when rerun with new information Much more accurate than standard models! 	<ul style="list-style-type: none"> Demoad at NRF 2017 Machine learning implemented in R/Python and loaded <i>only</i> coefficients into Anaplan User able to design a promotion and immediately see the projected ROI and impact on volume, revenue, and margin Appropriate for a production implementation 												
		<table border="1"> <thead> <tr> <th>Model</th> <th>wMAPE</th> </tr> </thead> <tbody> <tr> <td>Our custom Machine Learning</td> <td>13.9%</td> </tr> <tr> <td>Default sklearn Decision Tree</td> <td>28.7%</td> </tr> <tr> <td>Optimized Decision Tree</td> <td>24.2%</td> </tr> <tr> <td>Default sklearn Random Forest</td> <td>22.0%</td> </tr> <tr> <td>Optimized Random Forest</td> <td>20.2%</td> </tr> </tbody> </table>	Model	wMAPE	Our custom Machine Learning	13.9%	Default sklearn Decision Tree	28.7%	Optimized Decision Tree	24.2%	Default sklearn Random Forest	22.0%	Optimized Random Forest	20.2%	
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- Data driven machine learning techniques driving dollars right to the bottom line**





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