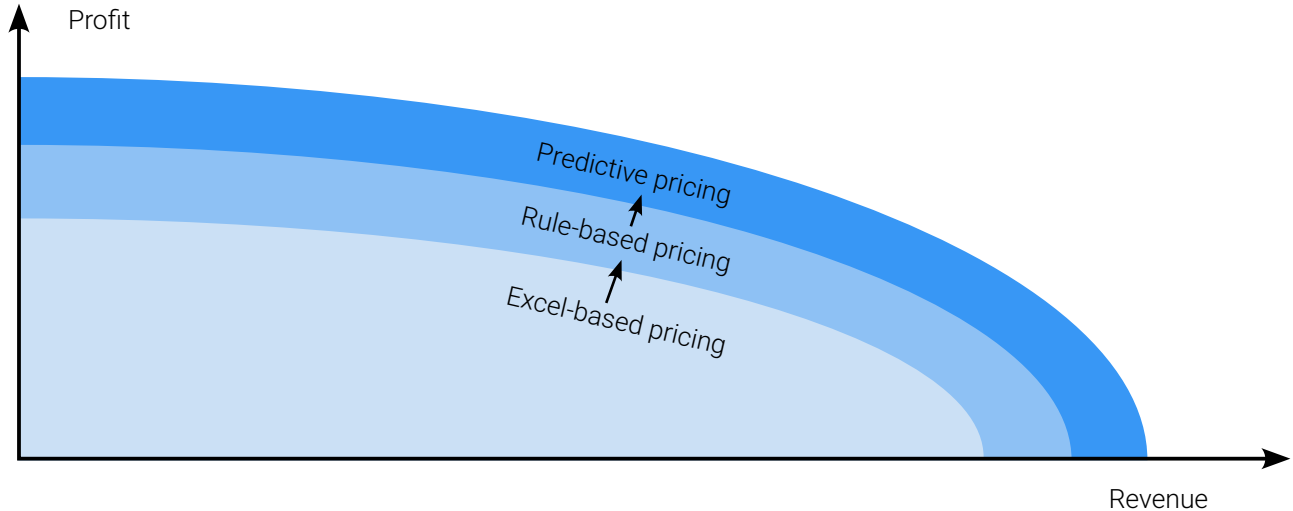


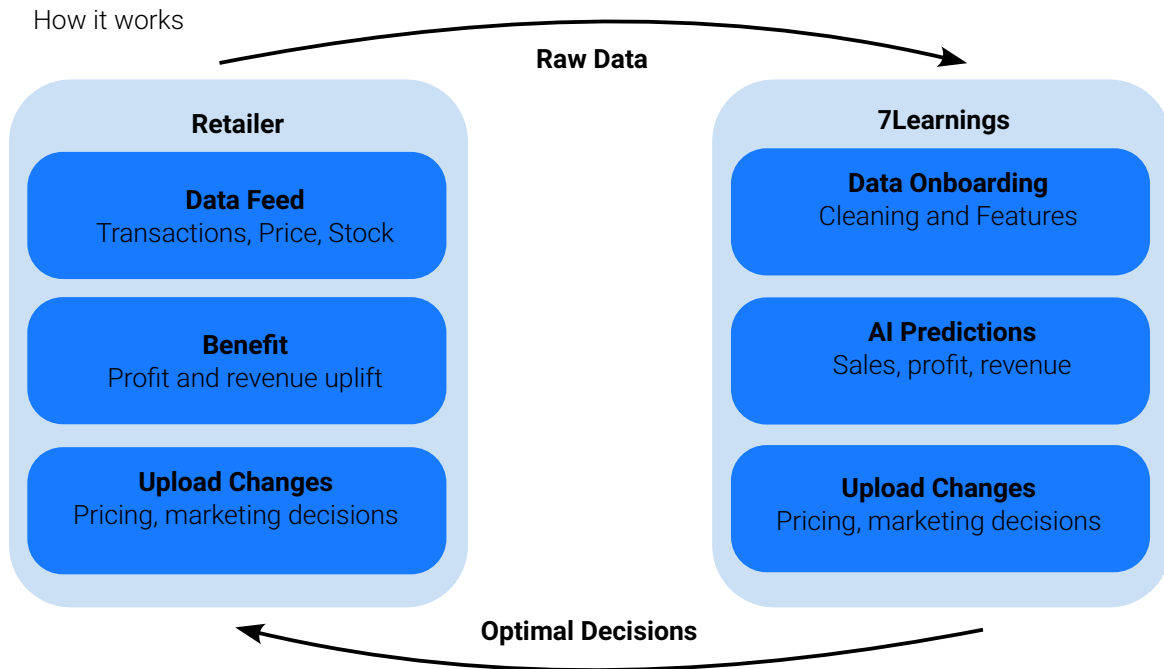
7Learnings Documentation

1 Introduction

Thank you for your interest in the most advanced optimization service for retailers. This document introduces you to our predictive pricing service and provides you with initial information on data transport and data definitions:



Before we get to the details of data format and API, we show how we optimize your pricing and marketing decisions:



More specifically, we provide the Input Data Specification (description of the data we consume, next section 2) and the Output Data Specification (description of the data we produce, section 3).

2 Input Data Specification

Our input data comprises the following tables:

Table 1: Input Data Tables

Table name	Short description
Transactions	Historical product sales
Price Periods	Historical prices of products
Product Attributes	Product information for each product
Stock	Historical stock information
Traffic	Historical customer activity & marketing cost on website
Competitor Prices	Historical competitor prices

Info: Tables colored **blue** are **required**. Tables colored **gray** are **optional**.

The following table lists which input APIs we support:

Table 2: Supported Data Integration APIs

No.	Source	Tables	Format	Target
1	BigQuery	All	BigQuery table	Client owned BigQuery project
2	Snowflake	All	Snowflake table	Client owned Snowflake project
3	Google Analytics	Traffic	Google API query	7Learnings owned Google Cloud/AWS bucket
4	Amazon Ads	Traffic	Amazon Ads query	7Learnings owned Google Cloud/AWS bucket
5	Amazon	Transactions	Amazon API query	7Learnings owned Google Cloud/AWS bucket
6	Other BI system	All	CSV/parquet files	7Learnings owned Google Cloud/AWS bucket
7	Other BI system	All	CSV/parquet files	Client owned SFTP server
8	Other BI system	All	CSV/parquet files	Client owned HTTPS server

2.1 Transactions

Table of historical sales. It should ideally have two to three years of history.

Table 3: Transactions

Column	Possible Types	Data	Description
market	text		Country where the product was sold using ISO 3166 format (e.g. DE for Germany)
channel	text		Sales domain where the product was sold (e.g. amazon.de for Amazon sales channel)
product_id	text, integer		Unique identifier of the product or SKU
time	time stamp		Date and time of transaction, UTC timezone (e.g. 2020-06-06 22:54:51+00:00)
order_id	text, integer		Unique identifier for the order to which the product belongs
sales_before_returns	integer		Amount of items that were purchased of a product (e.g. 4 if 4 items were purchased)

Continued on next page

Table 3: Transactions (Continued)

Column	Possible Data Types	Description
revenue	decimal, integer	Sum of net product revenue in main currency without the shipping revenue the customer paid
profit	decimal, integer	Sum of net profit in main currency
conv_fkt_to_main_currency	decimal, integer	Factor the foreign currency has to be multiplied with in order to get to values in the main currency (e.g. 1.2 to get from GBP to EUR)
tax_rate	decimal, integer	Rate of sales tax (e.g. 0.19)
basket_position	integer, decimal	Rank that SKU has in the basket
returns	integer, decimal	Number of items of SKU that were returned
voucher_spending	decimal, integer	Sum of net voucher spending after returns in main currency (e.g. 5 EUR voucher for newsletter)
red_price_discount_spending	decimal, integer	Sum of additional discount spending in main currency on top of vouchers and discounts (e.g. 4 EUR customer specific rebate)
outbound_cost	decimal, integer	Cost of sending the product from the warehouse to the customer minus any shipping revenue payed by the customer. Outbound cost can include logistic cost, shipment cost, call center cost and payment cost
inbound_cost	decimal, integer	Sum of net logistic & discard cost linked to handling returns
commission_cost	decimal, integer	Sum of net commission cost paid for selling these articles on a third party platform (e.g. Zalando, or Amazon) in main currency
marketing_cost	decimal, integer	Sum of net marketing cost after returns (SEA, Price comparison commissions, other advertising)
other_cost	decimal, integer	Sum of other cost you would like to include into your profit KPI in main currency
purchase_cost	decimal, integer	Sum of net cost (after tax) the products were bought for including shipping cost to the warehouse (e.g. landed cost)

Info: Columns colored **blue** are **required**. Columns colored **gray** are **optional**.

2.2 Price Periods

Table of historical prices of products. Ok if the history starts on the project start date.

Table 4: Price Periods

Column	Possible Data Types	Description
market	text	Country where the product was sold using ISO 3166 format (e.g. DE for Germany)
channel	text	Sales domain where the product was sold (e.g. amazon.de for Amazon sales channel)
product_id	text, integer	Unique identifier of the product or SKU
active_since	date, time stamp	Date from which the period was active, ideally, it comes in an ISO 8601 format (e.g. 2022-04-24)

Continued on next page

Table 4: Price Periods (Continued)

Column	Possible Data Types	Description
gross_red_price	decimal, integer	Gross price for the product before vouchers and after discounts in local currency (you can use the net price for non-VAT countries)
gross_black_price	decimal, integer	Gross price for the product before vouchers and discounts in local market currency including sales taxes
gross_recom_price	decimal, integer	Recommended Retail Price (RRP) provided by the supplier of the product in local market currency including sales taxes
is_active	truth value	Information if the product is online in the webshop and can be bought by the end customer

Info: Columns colored **blue** are **required**. Columns colored **gray** are **optional**.

2.3 Product Attributes

Table of product information for each product ID. It contains descriptions and properties of the products.

Table 5: Product Attributes

Column	Possible Data Types	Description
product_id	text, integer	Unique identifier of the product or SKU
product_group_id	text, integer	Marks products belonging together (e.g. across sizes) - can be used for prices to move in the same direction
purchase_price	decimal, integer	Average net price (after tax) the product costs including shipping cost to the warehouse (e.g. landed cost)
name	text	Name of the product
brand	text, integer	Name of the brand of the product
is_own_brand	truth value	True if retailer owns the brand
product_category_1	text	Product category the products fits in (ideally less than 20 distinct category values)
product_category_2	text	Product category the products fits in (Ideally less than 20 distinct category values)
product_category_3	text	Product category the products fits in (Ideally less than 20 distinct category values)
product_url	text	URL where the product can be found
color	text	Main color of the product
size	decimal, integer, text	Size of the product
producer	text, integer	Manufacturer of the product
season	text	Main sales period of the product (e.g. summer 1984)
start_liquidation_date	date	Date from which the Sell Through Rate of the product is calculated (e.g. Season Start Date)
end_liquidation_date	date	Date until which the product should reach the Target Sell Through Rate (e.g. Season End Date)
sell_through_rate_target	decimal	Share of Stock that should be sold out at Liquidation End Date
customer_specific_kpi	text, integer, decimal	Any other KPI you consider relevant for pricing

Info: Columns colored **blue** are **required**. Columns colored **gray** are **optional**.

2.4 Stock

Table of stock and availability information. Ok if the history starts on the project start date.

Table 6: Stock

Column	Possible Data Types	Description
product_id	text, integer	Unique identifier of the product or SKU
active_since	date	Date from which the period was active, ideally, it comes in an ISO 8601 format (e.g. 2022-04-24)
stock_start_of_day	integer	Number of items available for sale in the beginning of the day
market	text	Country where the product was sold using ISO 3166 format (e.g. DE for Germany)
channel	text	Sales domain where the product was sold (e.g. amazon.de for Amazon sales channel)
stock_type	text	Type of stock e.g. available in warehouse, order confirmed, ordered

Info: Columns colored blue are required. Columns colored gray are optional.

2.5 Traffic

Table of marketing information for the traffic/clicks per product (one entry for each marketing period).

Table 7: Traffic

Column	Possible Data Types	Description
market	text	Country where the product was sold using ISO 3166 format (e.g. DE for Germany)
channel	text	Sales domain where the product was sold (e.g. amazon.de for Amazon sales channel)
product_id	text, integer	Unique identifier of the product or SKU
active_since	date	Date from which the period was active, ideally, it comes in an ISO 8601 format (e.g. 2022-04-24)
clicks	decimal, integer	Number of visitors per product (can be decimals if several products are sharing traffic as they are sold on the same website page)
marketing_cost	decimal, integer	Sum of net marketing cost after returns (SEA, Price comparison commissions, other advertising)
marketing_option_float	decimal	Marketing steering that led to the clicks/traffic in the period
marketing_option_explanation	text	Description of the marketing steering strategy

Info: Columns colored blue are required. Columns colored gray are optional.

2.6 Competitor Prices

Table historical competitor prices. Ok if the history starts on the project start date.

Table 8: Competitor Prices

Column	Possible Data Types	Description
market	text	Country where the product was sold using ISO 3166 format (e.g. DE for Germany)
channel	text	Sales domain where the product was sold (e.g. amazon.de for Amazon sales channel)
product_id	text, integer	Unique identifier of the product or SKU
active_since	date, time stamp	Date from which the period was active, ideally, it comes in an ISO 8601 format (e.g. 2022-04-24)
comp_red_price_competitor_1	decimal, integer	Gross red price (after discount) by date and competitor in local currency excluding shipping
comp_red_price_competitor_2	decimal, integer	Gross red price (after discount) by date and competitor in local currency excluding shipping
comp_red_price_competitor_3	decimal, integer	Gross red price (after discount) by date and competitor in local currency excluding shipping

Info: Columns colored blue are required. Columns colored gray are optional.

3 Output Data Specification

For delivering optimized prices and marketing decisions, we can connect to the following APIs and provide the data in the following formats:

3.1 Data APIs

Optimizations and predictions can be shared in multiple ways.

Table 9: Supported Data Output format

No.	Source	Tables	Format	Target
1	7Learnings	Price/Marketing Changes	BigQuery table	BigQuery project
2	7Learnings	Price/Marketing Changes	Snowflake table	Snowflake project
3	7Learnings	Price/Marketing Changes	CSV file	User computer
6	7Learnings	Price/Marketing Changes	CSV/parquet files	Google Cloud/AWS bucket
7	7Learnings	Price/Marketing Changes	CSV/parquet files	SFTP server
8	7Learnings	Price/Marketing Changes	CSV/parquet files	HTTPS server
9	7Learnings	Price/Marketing Changes	API Call	Commercetools
10	7Learnings	Price/Marketing Changes	API Call	Custom API

We output price/marketing changes as well as customized tables. The following tables show how this output data looks like:

3.2 Price Changes

Table of optimized prices changes by market, channel, and product ID. We can fully customize this table to the need of the retailer.

Table 10: Price Changes

Column	Possible Data Types	Description
market	text	Country where the product was sold using ISO 3166 format (e.g. DE for Germany)
channel	text	Sales domain where the product was sold (e.g. amazon.de for Amazon sales channel)
product_id	text, integer	Unique identifier of the product or SKU
opt_gross_red_price	decimal, integer	Optimal Gross Price in local currency for the given rules and targets

3.3 Marketing Changes

Table of optimized marketing changes by market, channel, and product ID. We can fully customize this table to the need of the retailer.

Table 11: Marketing Changes

Column	Possible Data Types	Description
market	text	Country where the product was sold using ISO 3166 format (e.g. DE for Germany)

Continued on next page

Table 11: Marketing Changes (Continued)

Column	Possible Data Types	Description
channel	text	Sales domain where the product was sold (e.g. amazon.de for Amazon sales channel)
product_id	text, integer	Unique identifier of the product or SKU
opt_marketing_option	decimal, integer, text	The recommended marketing steering to be used

3.4 Forecast

This table uses all models and generates a daily forecast that is then picked up by the customer specific front-end. It also takes care of stock capping. Each product for each market, channel has predictions for all price options (from price points) for the next X days (X = prediction length, default 14).

Table 12: Forecast

Column	Possible Data Types	Description
market	text	Country where the product was sold using ISO 3166 format (e.g. DE for Germany)
channel	text	Sales domain where the product was sold (e.g. amazon.de for Amazon sales channel)
product_id	text, integer	Unique identifier of the product or SKU
date	date	Date of the prediction within the prediction length
*_sales_before_returns	date	Predicted Sales Before Returns
*_returns	decimal, integer	Predicted Items to be returned by the customer
gross_red_price	decimal, integer	Gross price for the product before vouchers and after discounts in local currency (you can use the net price for non-VAT countries)
gross_black_price	decimal, integer	Gross price for the product before vouchers and discounts in local market currency including sales taxes
*_revenue	decimal, integer	Predicted Net Revenue in main currency
*_profit	decimal, integer	Predicted Net Profit in main currency
tax_rate	decimal, integer	Rate of sales tax (e.g. 0.19)
conv_fkt_to_main_currency	decimal, integer	Factor the foreign currency has to be multiplied with in order to get to values in the main currency (e.g. 1.2 to get from GBP to EUR)
purchase_price	decimal, integer	Average net price (after tax) the product costs including shipping cost to the warehouse (e.g. landed cost)
**_voucher_spending	decimal, integer	The EUR value you spend per (sales_before_returns - returns) for vouchers like newsletter vouchers.
**_red_price_discount_spending	decimal, integer	The EUR value you spend per (sales_before_returns - returns) for volume discount for example, 10% less if you buy 20 items or more, 3% sconto for paying cash, aftersale discount on red price to avoid a return, customer specific discount for a large customer (e.g. Siemens).
**_inbound_cost	decimal, integer	Predicted cost if customer returns one product in main currency

Continued on next page

Table 12: Forecast (Continued)

Column	Possible Data Types	Description
**_outbound_cost	decimal, integer	Cost of sending the product from the warehouse to the customer minus any shipping revenue paid by the customer by product. Outbound cost can include logistic cost, shipment cost, call center cost and payment cost
**_marketing_cost	decimal, integer	Predicted Marketing Cost / Predicted Sales Before Returns in main currency
**_other_cost	decimal, integer	Predicted other costs per sold item before returns. This cost has similar behavior as avg_outbound_cost and avg_marketing_cost
**_commission_cost	decimal, integer	Predicted cost paid to a third party platform for selling the item on the platform per sold item after returns
marketing_option	text	Marketing steering that led to the clicks/traffic in the period
*_clicks	decimal, integer	Predicted Clicks on the product
prediction_length_in_days	integer	Number of days the forecast predicts sales, profits, and other KPIs

Info: Columns starting with * or ** are shortened **predicted** or **predicted_avg** respectively.

4 7Learnings Optimization Rules

These are the rules we support by default in our frontend:

Table 13: Default Rules

Name	Purpose	Example
Discount = value (in %)	Limit discount to a particular value	Discount = 20%
Profit Margin \geq value (in %)	Limit minimum profit margin	Profit margin \geq 50%
Profit Margin \leq value (in %)	Limit maximum profit margin	Profit Margin \leq 20%
Optimal Price \geq Purchase Price * value (in %)	Avoid falling below the purchase price in case of revenue maximizing optimizations	Purchase price = 40 EUR, Value = 1 → Optimal Price \geq 40 EUR
Optimal Price \leq Purchase Price * value (in %)	Avoid very high margins	Purchase price = 40 EUR, Value = 3 → Optimal Price \leq 120 EUR
Price Change \leq value (in %)	Limit maximum price change	Value = 0.1 → Price Change \leq 10%
Min Price Change \geq value (in %)	Change prices by at least a certain percent or keep the current price	Value = 0.1 → Price Change \leq 10%
Optimal Price \geq value	Set minimum current price	Value = 20.00 → Optimal Price \geq 20.00
Optimal Price \leq value	Set maximum current price	Value = 50.00 → Optimal Price \leq 50.00

Continued on next page

Table 13: Default Rules (Continued)

Name	Purpose	Example
$ \text{Marketing Option Change} \leq \text{value}$	Limit change of marketing steering	Value = 0.1 \rightarrow $ \text{Marketing Option Change} \leq 0.1$
Marketing Option \geq value	Set minimum marketing option	Value = 0.3 \rightarrow Marketing Option \geq 0.3
Marketing Option \leq value	Set maximum marketing option	Value = 0.5. Rule \rightarrow Marketing Option \leq 0.5
Optimal Price \geq Current Price * value (in %)	Set minimum price to current price multiple	Current Price = 60.00, Value = 1 \rightarrow Optimal Price \geq 60.00
Optimal Price \leq Current Price * value (in %)	Set maximum price to current price multiple	Current Price = 60.00, Value = 1 \rightarrow Optimal Price \leq 60.00
Optimal Price = Current Price * value (in %)	Set optimal price to specific price	Current Price = 60.00, Value = 1 \rightarrow Optimal Price = 60.00
Optimal Price \geq Min Comp Price * value (in %)	Set minimum optimal price to minimum competitor price multiple	Min Comp Price = 20.00, Value = 1 \rightarrow Optimal Price \geq 20.00
Optimal Price \leq Min Comp Price * value (in %)	Set maximum price to not price too far away from competition	Min Comp Price = 100.00, Value = 1.2 \rightarrow Optimal Price \leq 120.00
Optimal Price = Min Comp Price * value (in %)	Set optimal price to minimum competitor price multiple	Min Comp Price = 20.00, Value = 1 \rightarrow Optimal Price = 20.00
Predicted Sales \leq Target Sales * value (in %)	Avoid overselling a product	Target Sales = 10.00, Value = 1.2 \rightarrow Select price where predicted sales \leq 12
Predicted Sales \geq Target Sales * value (in %)	Avoid high overstock at season-end	Target Sales = 10.00, Value = 0.8 \rightarrow Predicted Sales \geq 8
$ \text{Price Distance to Min Comp Price} \leq \text{value (in %)}$	Limit maximum price distance to competitor price	Min Comp Price = 20.00, Value = 0.1 \rightarrow 18.00 < Optimal Price < 22.00
Discount \geq value (in %)	Set minimum discount	Value = 0.4 \rightarrow Discount \geq 40%
Discount \leq value (in %)	Set maximum discount	Value = 0.5 \rightarrow Discount \leq 50%
Stock Reach in Weeks \leq value	Sell-off a product in a specified number of weeks	value = 2, current stock = 20 \rightarrow Select Optimal Price where predicted sales/week > 10 items
Stock Reach in Weeks \geq value	Adapt prices so that we will still have stock available after a specified number of weeks	value = 2, current stock = 20 \rightarrow Select Optimal Price where predicted sales/week < 10 items
Min days after last price change = value	Wait a specified number of days after the last price change	Value = 7, Last Price Change 3 days ago \rightarrow Price Change = 0%

5 Frontend Outlook

The images below highlight the many features of our Frontend Tool and what you can do with it to achieve full control over your pricing strategy.

Status	Id	Name	#Products	From Till	#Rules	Steering	Targets	Predicted Revenue	Predicted Profit	Predicted Sales	Profit Margin
✓	884	test	10800	31.01.2023 13.02.2023	2	Max Profit Min Revenue Max	All products	+13.98%	+44.19%	+21.14%	17,3 %
✓	883	test	10800	28.01.2023 09.02.2023	2	Max Profit Min Revenue Max	Electronics All products Total	+7.87% +8.02% +8.02%	+46.98% +46.58% +46.58%	+13.31% +12.78% +12.78%	18,6 % 18,8 % 18,8 %
✓	882	test	10800	27.01.2023 09.02.2023	2	Max Profit Min Revenue Max	Electronics All products Total	+0.01% +0.14% +0.14%	+46.47% +45.68% +45.68%	+0.94% +0.87% +0.87%	20,0 % 20,2 % 20,2 %

Figure 1: Optimizations summary

Keep an overview of your optimizations by quickly looking at the steering strategy and a summary of basic KPIs like profit, revenue and sales (see Figure 1).

Name
Fashion

Filters

Attribute Operator Values
= abc Brand = Marc O'Polo

Attribute Operator Values
= abc Color = purple

OR

SUBMIT

Figure 2: Scope definition

You can easily create scopes containing products with specific attributes that you want to optimize (see Figure 2).

Rule Template Value
Profit Margin >= 0.6

Scope
Fashion

SUBMIT

Figure 3: Rule creation

Assign custom rules that you want to apply for the desired group of products (see Figure 3).

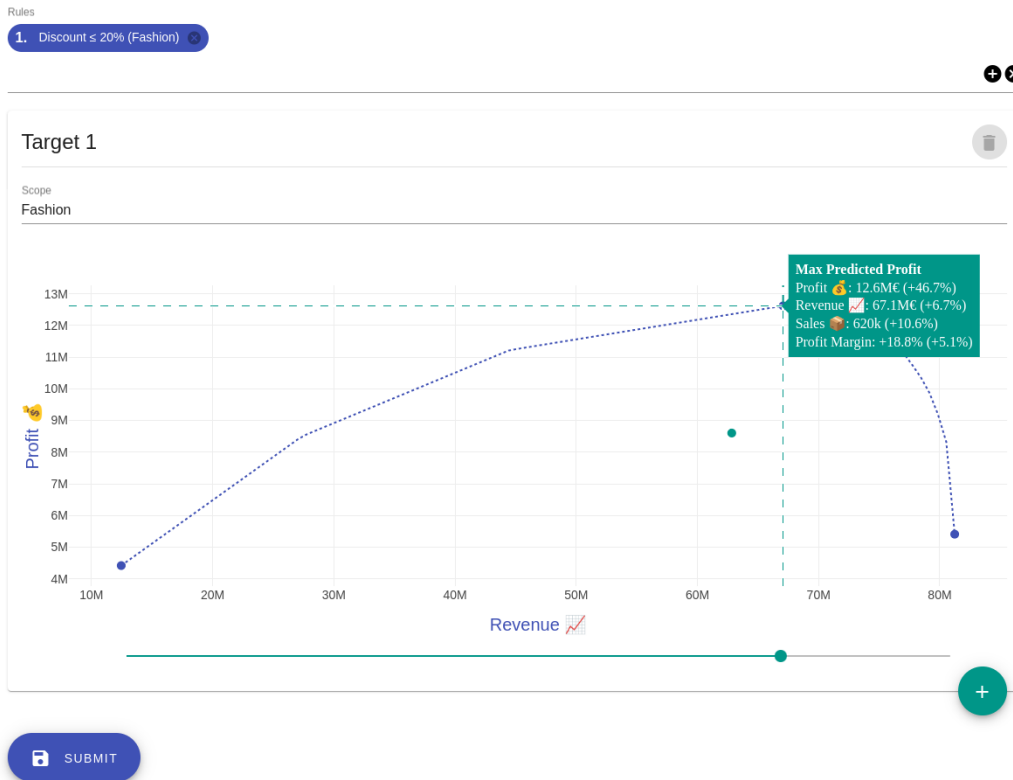


Figure 4: Optimization preview curve

Choose a pricing strategy for the group of products (scope) you want, apply the corresponding rules and create an optimization (see Figure 4).

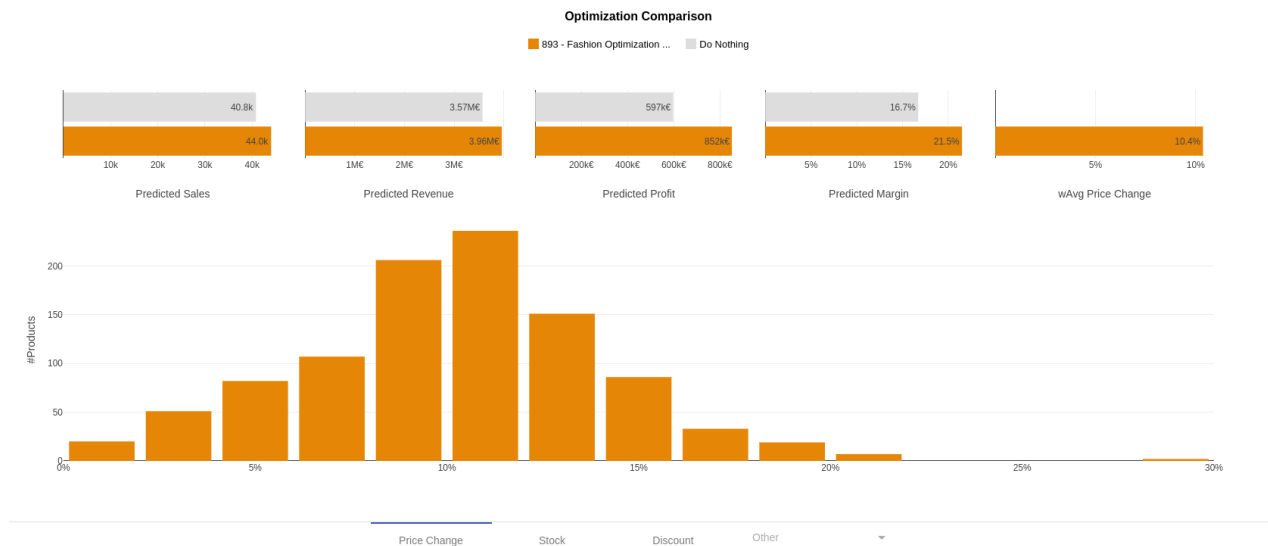


Figure 5: Optimization comparison view

Get a more detailed insight on the overall impact of your strategy by comparing the optimization to a “Do nothing” scenario (see Figure 5).

You can even compare two or more optimizations with each-other and see which pricing strategy is more suitable for your purposes (see Figure 6).

Go into product-level predictions and perform an in-depth inspection by looking at wide range of pricing, inventory or marketing KPIs (see Figure 7).

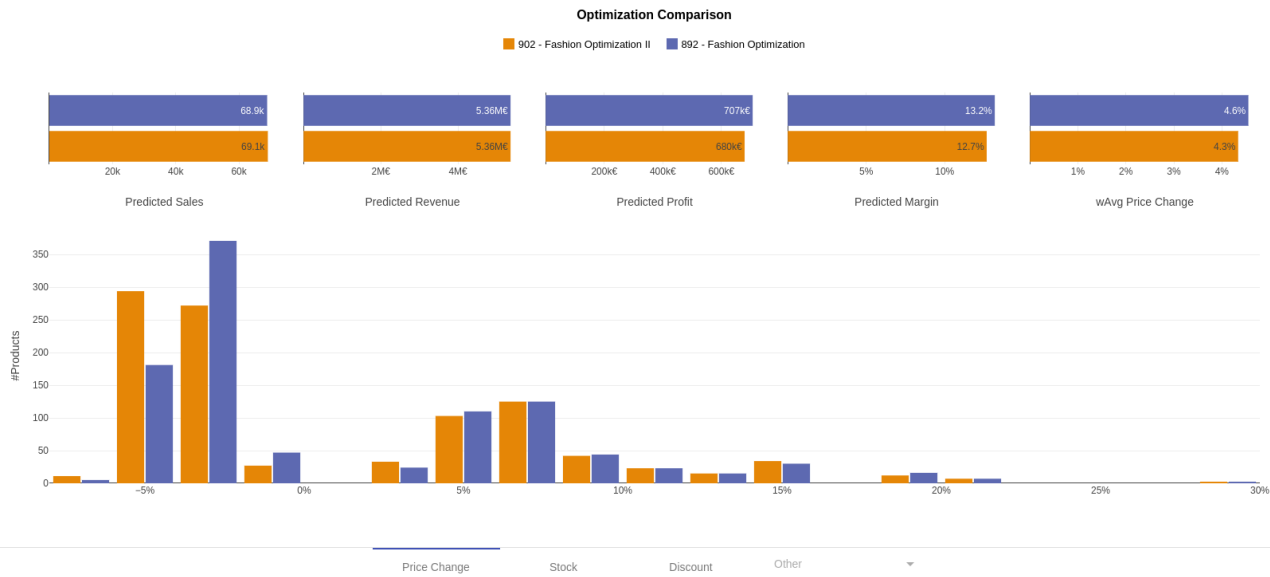


Figure 6: Comparing two optimizations

Search 667 Search values

Optimization ID	Market	Channel	Product ID	Pricing +				Financials +			Inventory +	Marketing +		Custom +
				Price Change ×	Explain ×	Current Price ×	Optimal Price ×	Profit ↓	Revenue ×	Profit Margin ×	Sales Before Returns ×	Current Marketing Option ×	Optimal Marketing Option ×	No columns selected
902	US	myshop.com	667941	7 %	0 Rules	145,00 \$	155,49 \$	2.446,78 €	12.233,16 €	20 %	100.66	Max CpC: 0.5	Max CpC: 0.6	↑ ↓
902	US	myshop.com	667970	7 %	0 Rules	145,00 \$	155,49 \$	2.446,78 €	12.233,16 €	20 %	100.66	Max CpC: 0.5	Max CpC: 0.6	↑ ↓
902	US	myshop.com	667911	5 %	0 Rules	146,00 \$	153,49 \$	2.319,48 €	12.425,96 €	19 %	103.58	Max CpC: 0.5	Max CpC: 0.6	↑ ↓
902	US	myshop.com	667891	5 %	0 Rules	146,00 \$	153,49 \$	2.319,18 €	12.424,76 €	19 %	103.57	Max CpC: 0.5	Max CpC: 0.6	↑ ↓
902	US	myshop.com	667711	5 %	0 Rules	146,00 \$	153,49 \$	2.318,74 €	12.423,00 €	19 %	103.56	Max CpC: 0.5	Max CpC: 0.6	↑ ↓
902	US	myshop.com	667709	5 %	0 Rules	146,00 \$	153,49 \$	2.318,37 €	12.421,56 €	19 %	103.54	Max CpC: 0.5	Max CpC: 0.6	↑ ↓
902	US	myshop.com	667847	5 %	0 Rules	146,00 \$	153,49 \$	2.317,96 €	12.419,93 €	19 %	103.53	Max CpC: 0.5	Max CpC: 0.6	↑ ↓
902	US	myshop.com	667967	13 %	1 Rules	125,00 \$	141,49 \$	2.148,18 €	8.754,54 €	25 %	79.17	Max CpC: 0.4	Max CpC: 0.5	↑ ↓
902	US	myshop.com	667997	13 %	1 Rules	125,00 \$	141,49 \$	2.148,18 €	8.754,54 €	25 %	79.17	Max CpC: 0.4	Max CpC: 0.5	↑ ↓
902	US	myshop.com	667819	13 %	1 Rules	125,00 \$	141,49 \$	2.148,18 €	8.754,54 €	25 %	79.17	Max CpC: 0.4	Max CpC: 0.5	↑ ↓
902	US	myshop.com	667721	7 %	0 Rules	143,00 \$	153,49 \$	1.906,99 €	10.184,01 €	19 %	84.89	Max CpC: 0.4	Max CpC: 0.6	↑ ↓

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Figure 7: Product level prediction summary

Know the reason behind our optimizer's decisions by observing the explain curve and rule applications from the current price to the optimal price (see Figure 8).

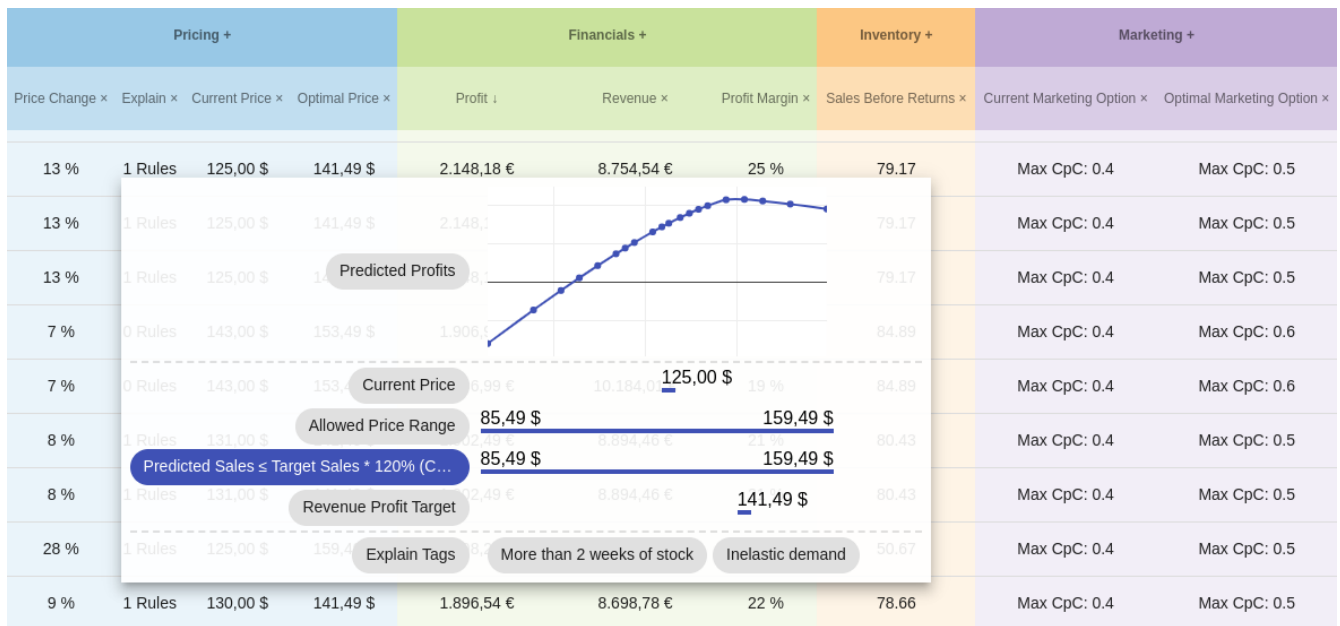


Figure 8: Product level decision explanation