## (1) 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 |
| :--- | :--- |
| Channels | Channels |
| 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 |
| :--- | :--- | :--- | :--- |
| 1 | BigQuery | All | BigQuery table |
| 2 | Snowflake | All | Snowflake table |
| 3 | Azure Blob Storage | All | CSV/parquet files |
| 4 | SFTP | All | CSV/parquet files |
| 5 | HTTPS | All | CSV/parquet files |
| 6 | FTPS | All | CSV/parquet files |
| 7 | Amazon | Transactions | Amazon API query |
| 8 | Google Analytics | Traffic | Google API query |
| 9 | Amazon Ads | Traffic | Amazon Ads query |

### 2.1 Channels

Table containing information about the sales channels

Table 3: Channels

| Column | Possible Data <br> Types | Description |
| :--- | :--- | :--- |
| market | text | text |
| channel | text | Country where the product was sold using ISO <br> 3166 format (e.g. DE for Germany) |
| channel_currency | Sales domain where the product was sold (e.g. <br> amazon.de for Amazon sales channel) |  |
| Conv_fkt_to_main_currency | decimal, integer letter code for local channel specific currency |  |
| according to ISO 4217 (e.g. EUR for Euro |  |  |
| currency) |  |  |
| 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) |  |  |

Table 3: Channels (Continued)

| Column | Possible Data <br> Types | Description <br> upload_market <br> upload_currency |
| :--- | :--- | :--- |
|  | text | The country code according to ISO 3166 format <br> (e.g., DE for Germany). This is used to <br> differentiate the market ISO code from any <br> additional sub-channel definitions. <br> The currency code according to ISO 4217 format <br> (e.g., EUR for Euro). This is used to differentiate <br> the channel currency from any additional <br> sub-channel definitions. |
| upload_channel | text | The sales domain where prices will be uploaded <br> (e.g., amazon.de for Amazon sales channel). This <br> is used to distinguish the primary channel in the <br> optimization process from any additional <br> sub-channel where prices are uploaded (e.g., zafr <br> for Zalando France if optimized prices should be |
| sent via an API call to tradebyte). |  |  |

Info: Columns colored blue are required, gray are optional, and red are recommended.

### 2.2 Transactions

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

Table 4: Transactions

| 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 |
| time | time stamp | Date and time when the items were ordered as an ISO 8601 UTC timestamp (e.g. 2024-02-06 22:54:51+00:00) |
| order_id | text, integer | Unique identifier for the order to which the product belongs |
| sales_before_returns | integer | Quantity of non-cancelled items that were purchased of a product (e.g. 4 if 4 items were purchased) |
| revenue | decimal, integer | Sum of net product revenue in main currency after returns (if available) without customer payments for the delivery/return of the product |
| 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 used to calculate net revenue from gross price (e.g. 19\% for most products in Germany) |

Table 4: Transactions (Continued)

| Column | Possible Data Types | Description |
| :---: | :---: | :---: |
| basket_position | integer, decimal | Rank that SKU has in the basket |
| returns | integer | 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 | Costs in main currency of sending these products from the warehouse to the customer. You can add logistic cost, shipment cost, call center cost, and payment cost. And you can subtract shipping revenue payed by the customer. |
| inbound_cost | decimal, integer | Logistic and discard costs in main currency linked to handling these returns. |
| commission_cost | decimal, integer | Net commission costs in main currency paid for selling these products on a third party platform (e.g. Zalando, or Amazon) |
| marketing_cost | decimal, integer | Net marketing costs (SEA, price comparison commission, other advertising) linked to these sales after return. |
| other_cost | decimal, integer | Other costs in main currency you consider in your profit calculation for these sales |
| customer_lifetime_value | decimal, integer | Incremental future profit increase driven by the transaction in main currency. Is typically higher for new customers and customers with higher repurchase rates. |
| purchase_cost | decimal, integer | Sum of net cost (after tax) the products were bought for in main currency including shipping cost to the warehouse (e.g. landed cost) |

Info: Columns colored blue are required, gray are optional, and red are recommended.

### 2.3 Price Periods

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

Table 5: Price Periods

| Column | Possible Data Types | Description |
| :--- | :--- | :--- |
| market | text | Country where the product was sold using ISO 3166 format (e.g. <br> DE for Germany) |
| channel | text | Sales domain where the product was sold (e.g. amazon.de for <br> Amazon sales channel) |
| product_id | text, integer | time stamp |
| active_since | Unique identifier of the product or SKU <br> Timestamp from which a period was active (ISO 8601 UTC <br> 2022-04-24T22:54:51Z) |  |
| gross_red_price | decimal, integer | Gross price for the product before vouchers and after discounts in <br> local currency (you can use the net price for non-VAT countries) <br> Gross price for the product before vouchers and discounts in local <br> market currency including sales taxes |
| gross_black_price | decimal, integer |  |

Table 5: Price Periods (Continued)

| Column | Possible Data Types | Description |
| :--- | :--- | :--- |
| gross_recom_price | decimal, integer | Recommended Retail Price (RRP) provided by the supplier of the <br> product in local market currency including sales taxes |
| is_active | truth value | True if the product is online in the webshop and could be bought <br> by the end customer in that period |

Info: Columns colored blue are required, gray are optional, and red are recommended.

### 2.4 Product Attributes

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

Table 6: Product Attributes

| Column | Possible Data <br> Types | Description |
| :--- | :--- | :--- |
| product_id | text, integer | Unique identifier of the product or SKU <br> product_group_id <br> text, integer <br> Marks products belonging together (e.g. across sizes) - <br> can be used for prices to move in the same direction |
| purchase_price | decimal, integer | Average net price (after tax) the product costs including <br> shipping cost to the warehouse (e.g. landed cost) |
| name | text | Name of the product |
| text, integer | Name of the brand of the product |  |

Info: Columns colored blue are required, gray are optional, and red are recommended.

### 2.5 Stock

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

Table 7: Stock

| Column | Possible Data Types | Description |
| :--- | :--- | :--- |
| market | text | Country where the product was sold using ISO 3166 format (e.g. <br> DE for Germany) |
| channel | text | Sales domain where the product was sold (e.g. amazon.de for <br> Amazon sales channel) |
| product_id | text, integer | Unique identifier of the product or SKU <br> active_since |
| time stamp | Timestamp from which a period was active (ISO 8601 UTC <br> 2022-04-24T22:54:51Z) <br> stock_start_of_day | integer |

Info: Columns colored blue are required, gray are optional, and red are recommended.

### 2.6 Traffic

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

Table 8: Traffic

| Column | Possible Data <br> Types | Description |
| :--- | :--- | :--- |
| market | text | Country where the product was sold using ISO 3166 <br> format (e.g. DE for Germany) |
| channel | text | Sales domain where the product was sold (e.g. <br> amazon.de for Amazon sales channel) <br> product_id <br> active_since |
| text, integer | Unique identifier of the product or SKU <br> time stamp <br> Timestamp from which a period was active (ISO 8601 <br> UTC 2022-04-24T22:54:51Z) |  |
| total_clicks | decimal, integer | Total number of visitors per product from paid and <br> unpaid sources (decimal in case several products share <br> traffic) |
| paid_clicks |  |  |
| marketing_cost | decimal, integer | Number of visits from paid sources <br> Net marketing costs (SEA, price comparison <br> commission, other advertising) linked to these sales <br> after return. |
| marketing_option_float | decimal | Marketing steering that led to the clicks/traffic in the <br> period <br> Description of the marketing steering strategy |
| marketing_option_explanation | text |  |

Info: Columns colored blue are required, gray are optional, and red are recommended

### 2.7 Competitor Prices

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

Table 9: Competitor Prices

| Column | Possible Data <br> Types | Description |
| :--- | :--- | :--- |
| market | text | Country where the product was sold using ISO 3166 <br> format (e.g. DE for Germany) |
| channel | text | Sales domain where the product was sold (e.g. <br> amazon.de for Amazon sales channel) |

Table 9: Competitor Prices (Continued)

| Column | Possible Data <br> Types | Description |
| :--- | :--- | :--- |
| product_id | text, integer | Unique identifier of the product or SKU |
| active_since | time stamp | Timestamp from which a period was active (ISO 8601 <br> UTC 2022-04-24T22:54:51Z) |
| comp_red_price_competitor_1 | decimal, integer | Gross red price (after discount) by date and competitor <br> in local currency excluding shipping |
| comp_red_price_competitor_2 | decimal, integer | Gross red price (after discount) by date and competitor <br> in local currency excluding shipping <br> Gross red price (after discount) by date and competitor <br> in local currency excluding shipping |

Info: Columns colored blue are required, gray are optional, and red are recommended.

## 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 10: Supported Data Output format

| No. | Tables | Format | Target |
| :--- | :--- | :--- | :--- |
| 1 | Price/Marketing Changes | BigQuery table | BigQuery project |
| 2 | Price/Marketing Changes | Snowflake table | Snowflake project |
| 3 | Price/Marketing Changes | CSV file | User computer |
| 6 | Price/Marketing Changes | CSV/parquet files | Google Cloud/AWS bucket |
| 7 | Price/Marketing Changes | CSV/parquet files | SFTP server |
| 8 | Price/Marketing Changes | CSV/parquet files | HTTPS server |
| 9 | Price/Marketing Changes | API Call | Custom API |
| 10 | Price Changes | API Call | Commercetools |
| 11 | Price Changes | API Call | Salesforce |
| 12 | Price Changes | API Call | Tradebyte |

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 11: Price Changes

| Column | Possible Data Types | Description |
| :--- | :--- | :--- |
| market | text | Country where the product was sold using ISO 3166 format <br> (e.g. DE for Germany) |
| channel | text | Sales domain where the product was sold (e.g. amazon.de for <br> Amazon sales channel) |
| product_id | text, integer | Unique identifier of the product or SKU <br> opt_gross_red_price <br> Optimal Gross Price in local currency for the given rules and <br> 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 12: Marketing Changes

| Column | Possible Data Types | Description |
| :--- | :--- | :--- |
| market | text | Country where the product was sold using ISO 3166 format <br> (e.g. DE for Germany) |
| channel | text | Sales domain where the product was sold (e.g. amazon.de for <br> Amazon sales channel) |
| product_id | text, integer | Unique identifier of the product or SKU <br> opt_marketing_option |
| decimal, integer, text | The recommended marketing steering to be used |  |

## 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 relative to gross black price | 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 $\leq 20 \%$ |
| Net Optimal Price $\geq$ Purchase Price * value (in \%) | Avoid falling below the purchase price in case of revenue maximizing optimizations | Purchase price $=40$ EUR, Value $=1 \Rightarrow$ Optimal Price $\geq$ 40 EUR |
| Net Optimal Price $\leq$ Purchase Price * value (in \%) | Avoid very high margins | Purchase price $=40$ EUR, Value $=3 \Rightarrow$ Optimal Price $\leq$ 120 EUR |
| $\mid$ Price Change $\mid \leq$ value (in \%) | Limit maximum price change | $\begin{aligned} & \text { Value }=0.1 \Rightarrow \text { Price Change } \\ & \leq 10 \% \end{aligned}$ |
| Current Price OR $\mid$ Price Change $\mid \geq$ value (in \%) | Change prices by at least a certain percent or keep the current price | $\begin{aligned} & \text { Value }=0.1 \Rightarrow \text { Price Change } \\ & \leq 10 \% \end{aligned}$ |
| Optimal Price $\geq$ value | Set minimum current price | $\begin{aligned} & \text { Value }=20.00 \Rightarrow \text { Optimal } \\ & \text { Price } \geq 20.00 \end{aligned}$ |
| Optimal Price $\leq$ value | Set maximum current price | $\begin{aligned} & \text { Value }=50.00 \Rightarrow \text { Optimal } \\ & \text { Price } \leq 50.00 \end{aligned}$ |
| $\mid$ Marketing Option Change $\mid \leq$ value | Limit change of marketing steering | $\begin{aligned} & \text { Value }=0.1 \Rightarrow \mid \text { Marketing } \\ & \text { Option Change } \mid \leq 0.1 \end{aligned}$ |
| Marketing Option $\geq$ value | Set minimum marketing option | $\begin{aligned} & \text { Value }=0.3 \Rightarrow \text { Marketing } \\ & \text { Option } \geq 0.3 \end{aligned}$ |
| Marketing Option $\leq$ value | Set maximum marketing option | Value $=0.5$. Rule $\Rightarrow$ <br> 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 $\geq 60.00$ |

Table 13: Default Rules (Continued)

| Name | Purpose | Example |
| :---: | :---: | :---: |
| 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 $\geq 8$ |
| $\mid$ Price Distance to Min Comp Price ${ }^{\text {a }} \leq$ 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 relative to the gross black price | $\begin{aligned} & \text { Value }=0.4 \Rightarrow \text { Discount } \geq \\ & 40 \% \end{aligned}$ |
| Discount $\leq$ value (in \%) | Set maximum discount relative to the gross black price | $\begin{aligned} & \text { Value }=0.5 \Rightarrow \text { Discount } \leq \\ & 50 \% \end{aligned}$ |
| Stock Reach in Weeks $\leq$ value | Reduce the price to sell-off a product after a defined number of weeks | value $=2$, current stock + expected stock from returns $=$ $20 \Rightarrow$ Select Optimal Price where predicted sales/week > 10 items |
| Stock Reach in Weeks $\geq$ value | Increase the price, so that there still is stock available after a specified number of weeks | value $=2$, current stock + expected stock from returns $=$ $20 \Rightarrow$ 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\% |
| Optimal Price $\geq$ Seasonal Profit Max Price * value (in \%) | Avoid discounts that reduce seasonal profitability | Value 100\%, Seasonal Profit Max Price $16.99 \Rightarrow$ Optimal Price > 16.99 |
| Optimal Price $\leq$ Seasonal Profit Max Price * value (in \%) | Avoid large write-offs for products that don't sell well at Liquidation End | Value 150\%, Seasonal Profit Max Price $19.99 \Rightarrow$ Optimal Price $<29.99$ |

Table 13: Default Rules (Continued)

| Name | Purpose | Example |
| :--- | :--- | :--- |
| Seasonal Profit $\geq$ Highest Seasonal Profit * value (in \%) | Avoid moving too <br> far away from price <br> that maximizes your <br> seasonal profitability | Value $70 \%$, Highest Seasonal <br> Profit $100 € \Rightarrow$ Optimal Price |
| Min Salvage Value $>$ value (in \%) Profit $>70 €$ |  |  |

## 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.


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

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


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


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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).

|  |  | 68.9k |
| :---: | :---: | :---: |
|  |  | 69.1 k |
| 20k | 40k | 60k |


|  |  |
| :---: | :---: |
|  |  |
| 2M€ | 4M€ |


|  |  | 707ke |
| :---: | :---: | :---: |
|  |  | 680 kE |
| 200kE | 400ke | 600kE |


|  |  |
| :---: | :---: |
|  |  |
| 5\% | 10\% |




Price Change
Stock
Discount
Figure 6: Comparing two optimizations

- 667 Search Search values


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

