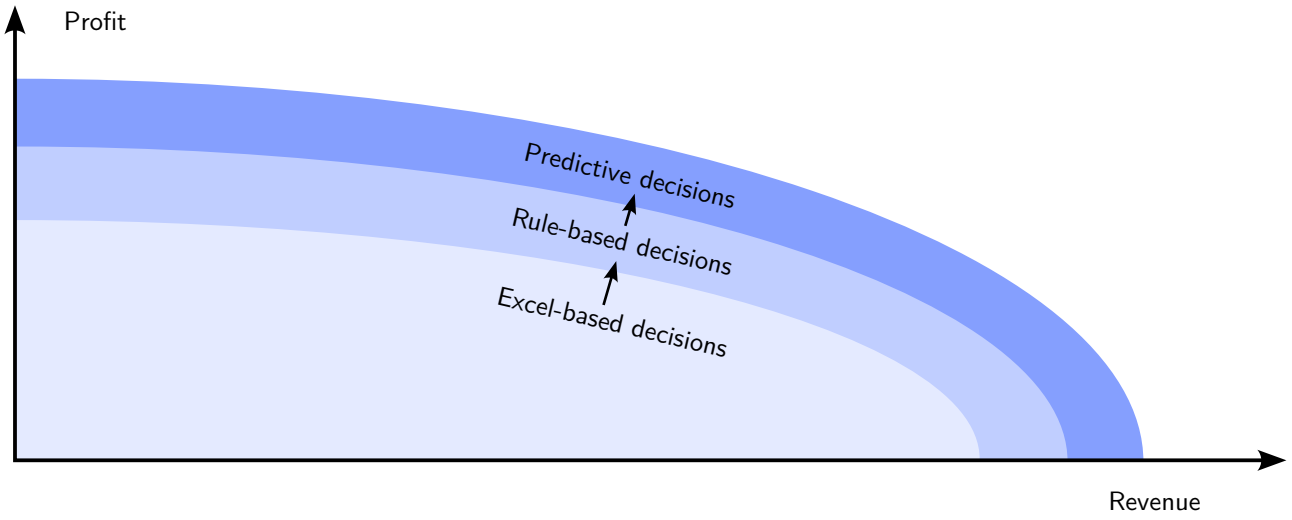
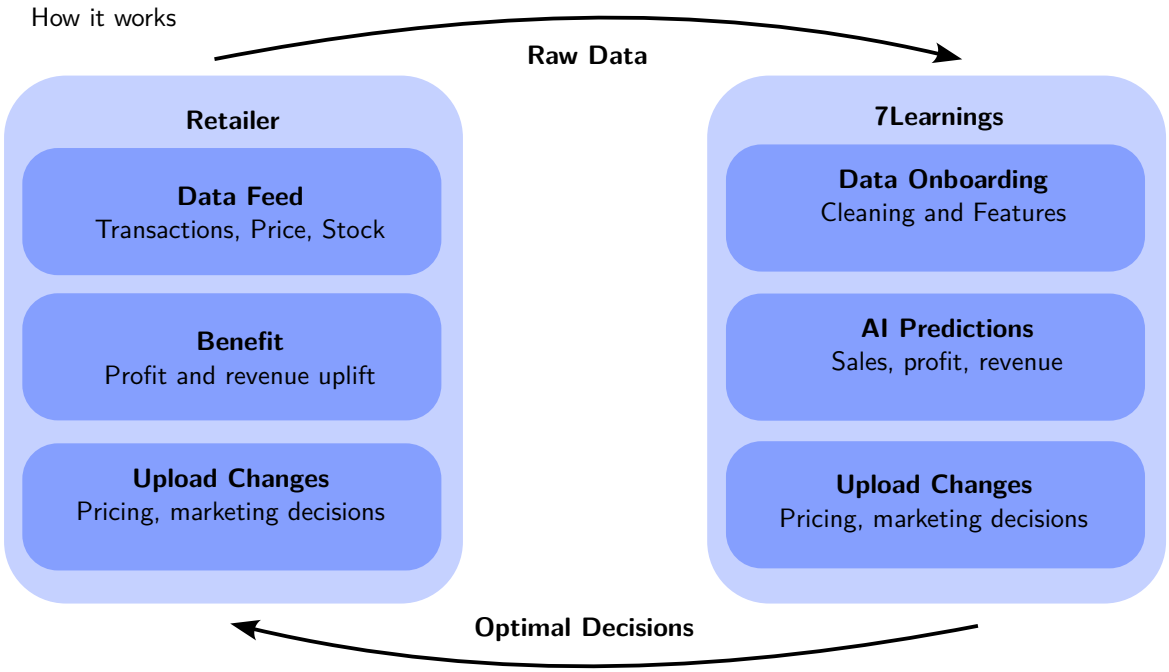
7Learnings Documentation

1 Introduction

Thank you for your interest in the most advanced optimization service for retailers. This document introduces you to our 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 decisions for you:



More specifically, we provide the Input Data Specification (description of the data we consume, next section 3) and the Output Data Specification (description of the data we produce, section 5).

2 Data Integration APIs

The following table lists which input APIs we support:

Table 1: Supported Data Integration APIs

No.	Source	Tables	Format	Recommended
1	BigQuery	All	database table	+++
2	Snowflake	All	database table	+++
3	Microsoft Fabric	All	database table	+++
4	Google Cloud Storage	All	CSV/Parquet files	++
5	AWS - S3	All	CSV/Parquet files	++
6	Azure Blob Storage	All	CSV/Parquet files	++
7	SFTP	All	CSV/Parquet files	+
8	FTPS	All	CSV/Parquet files	+
9	HTTPS	All	CSV/Parquet files	+
10	Tradebyte	Prices, Stock, Attributes	Tradebyte API	+++
11	Shopify	Prices, Stock, Attributes, Transactions	Shopify API	+++
12	Google Shopping	Traffic	Google Merchant API	+++
13	Google Ads	Traffic	Google Ads API	+++
14	Google Analytics	Traffic	Google Analytics API	++
15	Amazon - Selling Partners	Competitive Data	Amazon SP API	+++
16	Amazon Ads	Traffic	Amazon Ads API	+++

3 Input Data Specification

Our input data comprises of required tables that are needed for our service to run and optional additional tables. The optional tables can also be added to the project at a later stage.

Table 2: Input Data Tables

Table name	Short description	Transfer
Channels	Current list of sales channels	initial
Purchase Prices	Current purchase prices of your products	automated
Transactions	Sales data of products with revenues, profits, and costs	initial and automated
Prices	Current price information	initial and automated
Product Attributes	Current and historical product information	automated
Price Points	Lists of price points	initial and automated
Stock	Current stock information	automated
Promotions	Promotion activity	initial and automated
Traffic	Organic and paid activity information	initial and automated
Competitor Prices	Current competitor prices	automated
Bundles	Table containing the mapping of bundles and its composition.	automated
Commission Rate	Current list of commission rates for products.	automated
Minimum Order Quantity	Minimum order numbers required	automated

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

3.1 Channels

Table 3: Channels: Contains current list of the sales channels for which you would like to optimize prices. To reduce channel complexity and cost, you can send us virtual channels from which optimization results get replicated into several actual channels (e.g., the prices for the market EU will be replicated into the markets DE, FR, IT, and ES).

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)
conv_fkt_to_main_currency	decimal, integer	Factor the foreign currency has to be multiplied with to get to values in the main currency (e.g. 1.2 to get from GBP to EUR)
channel_currency	text	Three letter code for local channel specific currency according to ISO 4217 (e.g. EUR for Euro currency)
upload_market	text	The country code according to ISO 3166 format (e.g., DE for Germany). This is used to differentiate the market ISO code from any additional sub-channel definitions.
upload_currency	text	The currency code according to ISO 4217 format (e.g., EUR for Euro). This is used to differentiate the channel currency from any additional sub-channel definitions.
upload_channel	text	The sales domain where prices will be uploaded (e.g., amazon.de for Amazon sales channel). This is used to distinguish the primary channel in the optimization process from any additional sub-channel where prices are uploaded (e.g., zafr for Zalando France if optimized prices should be sent via an API call to tradebyte).
upload_conv_fkt_to_main_currency	decimal, integer	The factor by which the foreign currency has to be multiplied to convert to values in the main currency (e.g., 1.2 to convert from GBP to EUR). This is used to differentiate conversion factors from any additional sub-channel definitions.

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

3.2 Purchase Prices

Table 4: Purchase Prices: Contains the current purchase prices of the products you would like to optimize. If the same product has a different purchase price depending on the market or channel, then please provide the corresponding markets and channels as well. Monetary values such as purchase prices should be sent as net values in the main accounting currency, while other prices should be sent as gross values in the local market currency.

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	Unique identifier of the product or SKU
`purchase_price`	decimal, integer	Net landed cost of a single unit sold, including freight cost from the production facility to the warehouse, customs duties, tariffs, insurance, handling fees, and any other import-related expenses in main currency (i.e., COGS or cost of goods sold).

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

3.3 Transactions

Table 5: Transactions: Contains your sales data, including revenues, profits, and costs for the past two to three years. Our system either handles daily updated snapshots of the full history. Or our system receives the full history once and then daily snapshots of new transactions of the last three months or if previous transactions were changed. Monetary values such as purchase costs, outbound costs or voucher spendings should be sent as net values in the main accounting currency.

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	Unique identifier of the product or SKU
sales_before_returns	integer	Number of non-cancelled items ordered (e.g. 2 if two items were ordered)
revenue	decimal, integer	Net revenue in main currency after returns, vouchers, and discounts
profit	decimal, integer	Net profit in main currency after all delivered costs
purchase_cost	decimal, integer	The sum of net landed cost of all products sold in the transaction, including freight cost from the production facility to the warehouse, customs duties, tariffs, insurance, handling fees, and any other import-related expenses in main currency (i.e., COGS or cost of goods sold).
conv_fkt_to_main_currency	decimal, integer	Factor the foreign currency has to be multiplied with 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. For markets where prices are displayed to customers before tax (e.g., North America), set this value to 0. For all other markets where prices include tax, provide the decimal rate used to calculate net revenue from the gross price (e.g. 0.19 for 19% for most products in Germany)
voucher_spending	decimal, integer	Sum of net voucher spending after returns in main currency (e.g. 5/(1+0.19)=4.2 EUR voucher for newsletter).
order_id	text, integer	Unique identifier for the order to which the product belongs
returns	integer, decimal	Number of items returned
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)
red_price_discount_spending	decimal, integer	The total net value of extra discounts (e.g., customer-specific rebates) in the main currency, other than voucher spending.
basket_position	integer, decimal	Rank that SKU has in the basket
inbound_cost	decimal, integer	Net logistic and discard costs in main currency linked to handling these returns.
outbound_cost	decimal, integer	Net 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 paid by the customer.
marketing_cost	decimal, integer	Net marketing costs (SEA, price comparison commission, other advertising) linked to these sales after 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)

Continued on next page

Table 5: Transactions: Contains your sales data, including revenues, profits, and costs for the past two to three years. Our system either handles daily updated snapshots of the full history. Or our system receives the full history once and then daily snapshots of new transactions of the last three months or if previous transactions were changed. Monetary values such as purchase costs, outbound costs or voucher spendings should be sent as net values in the main accounting currency. (Continued)

Column	Possible Data Types	Description
other_cost	decimal, integer	Other net costs in main currency you consider in your profit calculation for these sales
upload_market	text	The country code according to ISO 3166 format (e.g., DE for Germany). This is used to differentiate the market ISO code from any additional sub-channel definitions.
upload_channel	text	The sales domain where prices will be uploaded (e.g., amazon.de for Amazon sales channel). This is used to distinguish the primary channel in the optimization process from any additional sub-channel where prices are uploaded (e.g., zafr for Zalando France if optimized prices should be sent via an API call to tradebyte).
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.

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

3.4 Prices

Table 6: Prices: Contains a snapshot of current product prices, with the option for an initial ingestion of full historical price data. Later as an optimization, you can switch over to sending only price changes. All prices must match the exact value displayed to the customer in the shop and be submitted in the local market currency. To ensure alignment with local commerce standards, exactly one of either gross_red_price or net_red_price must be provided per record, depending on the market. Use net_red_price for North American and pre-tax markets (excluding sales tax) and gross_red_price for all other markets (including VAT, GST, or sales taxes).

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	Unique identifier of the product or SKU
gross_black_price	decimal, integer	Price before vouchers in local currency.Price should include taxes if a non-zero tax rate is set for the project.
gross_red_price	decimal, integer	Price after discounts and before vouchers in local currency including sales taxes
net_red_price		Price after discounts and before vouchers in local currency excluding sales taxes
gross_recom_price	decimal, integer	Recommended Retail Price (RRP) provided by the supplier of the product in local currency. Price should include taxes if a non-zero tax rate is set for the project.
active_since	time stamp	Time at which the values in this row changed as an ISO 8601 UTC timestamp (e.g. 2022-04-24T22:54:51Z)
tax_rate	decimal	Rate of sales tax used to calculate net revenue. For markets where prices are displayed to customers before tax (e.g., North America), set this value to 0. For all other markets where prices include tax, provide the decimal rate used to calculate net revenue from the gross price (e.g. 0.19 for 19% for most products in Germany)
is_active	truth value	Indicator that determines if the product is available for purchase in the specified period, regardless of stock levels or other factors you are already sending.

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

3.5 Product Attributes

Table 7: Product Attributes: Contains product information. Besides current products, it should also include products you do not sell anymore (i.e., products in the transaction history). The optional and recommended columns for this table are exemplary. Please send attributes in your naming convention.

Column	Possible Data Types	Description
product_id	text	Unique identifier of the product or SKU
product_group_id	text	Marks products belonging together (e.g. across sizes) - can be used for prices to move in the same direction
product_category_1	text	Top-level category the product belongs to (ideally less than 20 distinct category values)
product_category_2	text	Product sub-category the product belongs to
product_category_3	text	Product sub-sub-category the product belongs to
name	text	Name of the product
producer	text, integer	Manufacturer of the product
season	text	Main sales period of the product (e.g. summer, winter, ...)
brand	text, integer	Name of the brand of the product
product_url	text	URL where the product can be found
ean	text	13 digit International Article Number (also known as European Article Number)
upc	text	12 digit Universal Product Code
color	text	Main color of the product
size	decimal, integer, text	Size of the product
is_own_brand	text, truth value	True if retailer owns the brand
picture_url	text	URL to a Thumbnail of a product picture. Common thumbnail sizes include 75x75, 100x100, 150x150, and up to 300x300 pixels. Typical sizes ranging from 10 KB to 50 KB.
shelf_location	text	Row in an offline shelf where product is usually placed

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

3.6 Price Points

Table 8: Price Points: Contains lists of price points that the optimizer will use for pricing. Here, you can send all possible price points on a granularity level of your choosing. To be able to assign the possible price points to each SKU, please define the level of granularity using columns also sent in product attributes.

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	Unique identifier of the product or SKU
product_group_id	text	Marks products belonging together (e.g. across sizes) - can be used for prices to move in the same direction
product_category_1	text	Top-level category the product belongs to (ideally less than 20 distinct category values)
brand	text, integer	Name of the brand of the product
upload_currency	text	The currency code according to ISO 4217 format (e.g., EUR for Euro). This is used to differentiate the channel currency from any additional sub-channel definitions.
allowed_price	decimal	A price option that the optimizer can select

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

3.7 Stock

Table 9: Stock: Contains current stock and availability information. Here, you can also send future stock changes (e.g., restocking, write-offs, and other inventory adjustments). If you wish to use the end liquidation optimization feature, please include start_liquidation_date, end_liquidation_date, and end_liquidation_value as mandatory columns.

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	Unique identifier of the product or SKU
active_since	time stamp	Time at which the values in this row changed as an ISO 8601 UTC timestamp (e.g. 2022-04-24T22:54:51Z)
stock_start_of_day	decimal, integer	Number of items available for sale in the beginning of the day
start_liquidation_date	date	Date from which the Sell Through Rate of the product is calculated (e.g. season start date) in ISO 8601 format (i.e YYYY-MM-DD; e.g. 2025-03-01)
end_liquidation_date	date	Date by which the product should reach the Target Sell-Through Rate (e.g. season end date) in ISO 8601 format (i.e. YYYY-MM-DD; e.g. 2025-06-30)
end_liquidation_value	decimal	Product's net value in main currency at liquidation end date to calculate the write-off for the seasonal profit calculation. The purchase price is the default value if not specified.
stock_change	decimal, integer	Changes to your inventory in the future (e.g. restocking, write-offs, and other inventory adjustments)
sell_through_rate_target	decimal	Share of Stock that should be sold out at Liquidation End Date

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

3.8 Promotions

Table 10: Promotions: Contains promotion and campaign activity like voucher, e-mail and other promotions. Please don't include pure performance marketing campaigns which should go to the traffic table. It should contain current activity, and optionally past data.

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	Unique identifier of the product or SKU
active_since	time stamp	Time at which the values in this row changed as an ISO 8601 UTC timestamp (e.g. 2022-04-24T22:54:51Z)
active_till	time stamp	Timestamp until which a KPI had a certain value (ISO 8601 UTC 2022-04-24T22:54:51Z)
promotion_name	text	Name of the promotional activity
voucher_rate	decimal	Share of net revenue after returns spend on vouchers/coupons in percent

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

3.9 Traffic

Table 11: Traffic: Contains organic and paid activity information on your website. It should contain current activity, and optionally past data.

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	Unique identifier of the product or SKU
active_since	time stamp	Time at which the values in this row changed as an ISO 8601 UTC timestamp (e.g. 2022-04-24T22:54:51Z)
marketing_cost	decimal, integer	Net marketing costs (SEA, price comparison commission, other advertising) linked to these sales after returns
total_clicks	decimal, integer	Total number of visitors to the product's dedicated detail page from paid and unpaid sources (decimal in case several products share traffic)
paid_clicks	decimal, integer	Number of visits from paid sources
marketing_option_explanation	text	Description of the campaign type used to steer the marketing intensity. We support "CpC" in which case marketing_option_float is the Cost per Click steering, "tROAS" in which case marketing_option_float = 100 / tROAS (e.g. 0.25 for a 400% tROAS), "ACoS" in which case marketing_option_float is Advertising Cost of Sale = Marketing Cost / Revenue (e.g. 0.25 for a 25% ACoS)
marketing_option_float	decimal	The intensity of the marketing steering (e.g. 0.7 for 70 cent max cost per click campaigns OR 0.25 for 25% ACoS OR 0.25 for 400% tROAS)
active_till	time stamp	Timestamp until which a KPI had a certain value (ISO 8601 UTC 2022-04-24T22:54:51Z)

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

3.10 Competitor Prices

Table 12: Competitor Prices: Contains current prices of competing offers.

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	Unique identifier of the product or SKU
active_since	time stamp	Time at which the values in this row changed as an ISO 8601 UTC timestamp (e.g. 2022-04-24T22:54:51Z)
ean	text	13 digit International Article Number (also known as European Article Number)
upc	text	12 digit Universal Product Code
comp_name	text	Name of the company selling the crawled product
comp_gross_red_price	decimal	Gross Red Price after discount including taxes in local currency excluding Shipping Price
comp_shipping_price	decimal	Price for shipping the product from the competitor warehouse to the end customer in local currency
comp_is_active	truth value	True if the product is online in the webshop and could be bought by the end customer in that period
comp_url	text	Link where the Competitor Price was crawled from
comp_delivery_days	integer	Number of days the competitor needs for shipping the product to the end customer

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

3.11 Bundles

Table 13: Bundles: Table containing the mapping of bundles and its composition.

Column	Possible Data Types	Description
product_id	text	Unique identifier of the product or SKU
bundle_id	text	Unique identifier of a bundle of products. Is mapped as product_id in all other tables (i.e. transactions, prices).
product_qty	integer, decimal	Amount of products within a bundle e.g. a table tennis bundle contains 4 balls

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

3.12 Commission Rate

Table 14: Commission Rate: Table containing the commission rate for each product based on its price range. Each product has its own set of price limits, and a specific commission rate is applied depending on where the gross red price falls within those limits.

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	Unique identifier of the product or SKU
commission_start_gross_red_price	decimal	Gross Red Price in local currency from which the corresponding commission rate should be applied. The corresponding commission rate will be applied up to the next highest Start Gross Red Price. If no higher Start Gross Red Price is specified, the corresponding commission rate will be applied to all prices higher than that price.
commission_rate	decimal	Share of the gross red price spend on commission cost for selling these products on a third party platform (e.g. Zalando, or Amazon)

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

3.13 Minimum Order Quantity

Table 15: Minimum Order Quantity: Optional mapping table to specify supplier Minimum Order Quantity (MOQ) requirements by category, brand, or SKU.

Column	Possible Data Types	Description
product_id	text	Unique identifier of the product or SKU
order_hierarchy_1	text	Primary grouping category for ordering constraints.
moq_hierarchy_1	integer	Minimum Order Quantity requirement for Hierarchy 1. We are adjusting the original MOQ limitation to make sure it complies with the Order batch size for Hierarchy 1.
order_batch_size_hierarchy_1	integer	Order batch size for Hierarchy 1 is the multiple on which we need to order the products (e.g. multiple of 6)
order_hierarchy_2	text	Secondary grouping category for ordering constraints.
moq_hierarchy_2	integer	Minimum Order Quantity requirement for Hierarchy 2. We are adjusting the original MOQ limitation to make sure it complies with the Order batch size for Hierarchy 2.
order_batch_size_hierarchy_2	integer	Order batch size for Hierarchy 2 is the multiple on which we need to order the products (e.g. multiple of 6)

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

4 Formula specification

This section defines the mathematical formulae and logic used for the calculation of core Key Performance Indicators (KPIs) within the platform.

Important Notice on Profit Formulation

It is important that you define and align on your business's profit formulation before starting the project. To avoid integration delays and ensure maximum accuracy, we *strongly recommend* including the following columns from day one:

- **`returns` and `inbound_cost`:** Essential if your business experiences returns, to account for return logistics, re-stocking, and discard costs.
- **`outbound_cost`:** Essential to factor in shipping, packaging, and warehouse dispatch costs.
- **`other_cost`:** Essential for any other overhead or platform-specific variable costs.

Defining these metrics early ensures that the optimized prices output by 7Learnings are aligned with your true financial margins and yield the highest possible profitability.

4.1 Revenue

To determine revenue, we first compute the net price of a unit and find the actual volume of kept sales.
The net retail price per unit is calculated by converting the gross red price to the main accounting currency and removing sales taxes:

$$\textbf{net_price} = \frac{\text{gross_red_price} \cdot \text{conv_fkt_to_main_currency}}{1 + \text{tax_rate}}$$

The actual kept sales volume is the number of ordered units minus any returned items:

$$\textbf{sales} = \text{sales_before_returns} - \text{returns}$$

The final transaction revenue is then computed by subtracting average voucher spendings and average discount spendings per unit from the net unit price, and multiplying by the kept sales volume:

$$\begin{aligned}\textbf{revenue} = \Big(&\text{net_price} \\ &- \text{avg_voucher_spending} \\ &- \text{avg_red_price_discount_spending}\Big) \\ &\cdot \text{sales}\end{aligned}$$

4.2 Profit

The profit is computed by subtracting COGS, ordered-item logistics, and return logistics from the revenue. Because our cost columns are defined as average unit-level values, they are multiplied by their respective transaction volumes:

1. **Cost of Goods Sold (COGS):** Includes the unit purchase price and third-party platform commissions, applying only to kept items:

$$\begin{aligned}\textbf{cogs} = &(\text{avg_purchase_price} + \text{avg_commission_cost}) \\ &\cdot \text{sales}\end{aligned}$$

2. **Fulfillment & Marketing Cost:** Includes outbound shipping, marketing, and other overhead costs (offset by the positive customer lifetime value contribution). These are incurred for all dispatched items:

$$\begin{aligned}\textbf{fulfillment_and_mkt} = \Big(&\text{avg_outbound_cost} + \text{avg_marketing_cost} \\ &+ \text{avg_other_cost} - \text{avg_customer_lifetime_value}\Big) \\ &\cdot \text{sales_before_returns}\end{aligned}$$

3. **Return Cost:** Includes return shipment and logistics processing costs, applying only to returned items:

$$\textbf{return_cost} = \text{avg_inbound_cost} \cdot \text{returns}$$

Combining these elements yields the final profit equation:

$$\begin{aligned}\textbf{profit} = \text{revenue} \\ &- \text{cogs} \\ &- \text{fulfillment_and_mkt} \\ &- \text{return_cost}\end{aligned}$$

4.3 Predicted KPIs and Frontend Optimization

In the 7Learnings frontend (Steering App), we use advanced machine learning models to project these metrics into the future, enabling proactive decisions.

4.3.1 Demand & Return Predictions

Using historical transactions and competitive data, our machine learning models estimate consumer price elasticity:

- **Predicted Sales (predicted_sales_before_returns):** The forecasted quantity of ordered units at a given price point.
- **Predicted Return Rate (predicted_avg_return_rate):** The forecasted proportion of ordered units that will be returned.

4.3.2 Predicted Revenue and Profit Curves

By feeding the forecasted values into our revenue and profit formulas, we map out full prediction curves for different options.
We first calculate the expected volume of returns and kept units:

$$\begin{aligned}\textbf{predicted_returns} = \text{predicted_sales_before_returns} \\ &\cdot \text{predicted_avg_return_rate}\end{aligned}$$

$$\begin{aligned}\textbf{predicted_sales} = \text{predicted_sales_before_returns} \\ &- \text{predicted_returns}\end{aligned}$$

The predicted revenue curve is formulated as:

$$\begin{aligned}\textbf{predicted_revenue} = \Big(&\text{net_price} \\ &- \text{predicted_avg_voucher_spending} \\ &- \text{predicted_avg_red_price_discount_spending}\Big) \\ &\cdot \text{predicted_sales}\end{aligned}$$

The predicted profit curve is formulated as:

$$\begin{aligned}\textbf{predicted_profit} = &\text{predicted_revenue} \\ &- (\text{purchase_price} + \text{predicted_avg_commission_cost}) \\ &\quad \cdot \text{predicted_sales} \\ &- \Big(\text{predicted_avg_outbound_cost} + \text{predicted_avg_marketing_cost} \\ &\qquad + \text{predicted_avg_other_cost} - \text{predicted_avg_customer_lifetime_value}\Big) \\ &\quad \cdot \text{predicted_sales_before_returns} \\ &- \text{predicted_avg_inbound_cost} \cdot \text{predicted_returns}\end{aligned}$$

Where the `predicted_avg_commission_cost` is dynamically calculated from the predicted commission rate (obtained via commission-rate models or tier tables) and the item price converted to the main currency:

Gross Retail Price in Main Currency:

$$\textbf{gross_red_price_main} = \text{gross_red_price} \cdot \text{conv_fkt_to_main_currency}$$

Dynamic Predicted Commission Cost:

$$\textbf{predicted_avg_commission_cost} = \text{predicted_avg_commission_rate} \cdot \text{gross_red_price_main}$$

4.3.3 Goal-Based Price Steering

In the steering frontend, retailers can visualize how changing prices shifts the expected volume along the profit and revenue curves. Retailers can set high-level goals (e.g., maximize overall profit, maximize total revenue, or set minimum/target margin boundaries), and the 7Learnings engine automatically calculates and pushes the corresponding optimal prices.

4.3.4 End-of-Season Stock Liquidation

For seasonal or retiring inventory, the frontend showcases the *predicted average liquidation end profit*. This KPI accounts for the predicted salvage value of any remaining units at the end of the liquidation period, net of inventory depreciation costs (purchase_price − end_liquidation_value), helping users balance quick sell-through with margin retention.

5 Output Data Specification

For delivering optimized prices and marketing decisions, we can connect to the APIs listed in the following table and provide the data in the corresponding formats. Other formats or connections to other APIS are possible as customizations.

5.1 Data APIs

Optimizations and predictions can be shared in multiple ways.

Table 16: Supported Data Output format

No.	Tables	Format	Target	Recommended
1	All	Table	BigQuery	++
2	All	Table	Snowflake	++
3	All	CSV/Parquet files	User computer	+
4	All	CSV/Parquet files	Google Cloud Storage	++
5	All	CSV/Parquet files	AWS - S3	+
6	All	CSV/Parquet files	Azure Blob Storage	+
7	All	CSV/Parquet files	SFTP server	+
8	All	CSV/Parquet files	HTTPS server	+
9	Price Changes	Salesforce Commerce Cloud Pricebook	Salesforce Commerce Cloud	++
10	Price Changes	API Call	Commercetools	+++
11	Price Changes	API Call	Tradebyte	+++
12	Price Changes	API Call	Plentymarkets	+++
13	Price Changes	API Call	Shopify	+++
14	Price Changes	API Call	Scayle - Commerce Engine	+++

6 7Learnings Optimization Rules

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

Table 17: 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 $\times$ 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 $\times$ value (in %)	Avoid very high margins	Purchase price = 40 EUR, Value = 3 $\Rightarrow$ Optimal Price $\leq$ 120 EUR
|Price Change| $\leq$ value (in %)	Limit maximum price change	Value = 0.1 $\Rightarrow$ Price Change $\leq$ 10%

Continued on next page

Table 17: Default Rules (Continued)

Name	Purpose	Example
Price Change $\geq$ value (in %)	Limit minimum price change	Value $= 0.1 \Rightarrow$ Price Change $\geq 10\%$
Price Change $\leq$ value (in %)	Limit maximum price change	Value $= 0.1 \Rightarrow$ Price Change $\leq 10\%$
Current Price OR $\lvert$Price Change$\rvert \geq$ value (in %)	Change prices by at least a certain percent or keep the current price	Value $= 0.1 \Rightarrow$ Price Change $= 0$ OR price_change $\geq 10\%$
Current Price OR $\lvert$Price Change$\rvert \geq$ value	Change prices by at least a certain amount or keep the current price	Value $= 1.0 \Rightarrow$ Price Change $= 0$ OR price_change $\geq 1€$
Optimal Price $\geq$ value	Set minimum current price	Value $= 20.00 \Rightarrow$ Optimal Price ≥ 20.00
Optimal Price $\leq$ value	Set maximum optimal price	Value $= 50.00 \Rightarrow$ Optimal Price ≤ 50.00
Marketing Cost Change $<$ value (in %)	Limit change of Marketing Cost	Value $= 40\% \Rightarrow$ Only options allowed, where product specific Marketing Cost are predicted to change by less than 40%
$\lvert$Marketing Intensity Change$\rvert \leq$ value	Limit change of Marketing Intensity to avoid strong marketing steering changes on product level	Value $= 0.1 \Rightarrow \lvert$Marketing Intensity Change$\rvert \leq 0.1$
Marketing Intensity $\geq$ value	Set minimum Marketing Intensity to avoid very low marketing spending on specific products	Value $= 0.3 \Rightarrow$ Marketing Intensity ≥ 0.3
Marketing Intensity $\leq$ value	Set maximum Marketing Intensity to avoid very high marketing spending on specific products	Value $= 0.5$. Rule $\Rightarrow$ Marketing Intensity ≤ 0.5
Optimal Price $\geq$ Current Price $\times$ value (in %)	Set minimum price to current price multiple	Current Price $= 60.00$, Value $= 1 \Rightarrow$ Optimal Price ≥ 60.00
Optimal Price $\leq$ Current Price $\times$ value (in %)	Set maximum price to current price multiple	Current Price $= 60.00$, Value $= 1 \Rightarrow$ Optimal Price ≤ 60.00
Optimal Price $=$ Current Price $\times$ 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 $\times$ value (in %)	Set minimum optimal price to minimum competitor price multiple	Min Comp Price $= 20.00$, Value $= 1 \Rightarrow$ Optimal Price ≥ 20.00
Optimal Price $\leq$ Min Comp Price $\times$ value (in %)	Set maximum price to not price too far away from competition	Min Comp Price $= 100.00$, Value $= 1.2 \Rightarrow$ Optimal Price ≤ 120.00
Optimal Price $=$ Min Comp Price $\times$ value (in %)	Set optimal price to minimum competitor price multiple	Min Comp Price $= 20.00$, Value $= 1 \Rightarrow$ Optimal Price $= 20.00$

Continued on next page

Table 17: Default Rules (Continued)

Name	Purpose	Example
|Price Distance to Min Comp Price| $\leq$ 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	Value = 0.4 $\Rightarrow$ Discount $\geq$ 40%
Discount $\leq$ value (in %)	Set maximum discount relative to the gross black price	Value = 0.5 $\Rightarrow$ Discount $\leq$ 50%
Stock Reach in Weeks $\leq$ value	Reduce the price to sell-off a product after a defined number of weeks	value = 2, current + expected stock = 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%
Reach Max Liquidation End Profit $\times$ value (in %)	Consider long-term profitability	Value 70%, If the highest possible Liquidation End Profit is 100€, only options where Liquidation End Profit is bigger than 70€ will be allowed
Liquidation End STR $\geq$ value (in %)	Make sure to reach a defined Sell Through Rate at the Liquidation End for the whole Optimization Group. Please also set a minimum margin when you use this rule will reduce prices to reach the desired STR not checking the profit impact.	Value 80%, Liquidation End STR $\geq$ 80%
Min Salvage Value $>$ value (in %)	Set a product specific lower price boundary as share of purchase price after inbound/outbound cost consideration	Value 50%, Inbound/Outbound cost 3, Purchase Cost 12 $\Rightarrow$ Net red price $>$ 9
Optimal Price $\leq$ RRP $\times$ value (in %)	Limit Optimal Price to be smaller or equal RRP	Value = 1, RRP = 49.99 $\Rightarrow$ Optimal Price $\leq$ 49.99
Optimal Price = RRP $\times$ value (in %)	Ensure that Optimal Price is equal RRP	Value = 1, RRP = 49.99 $\Rightarrow$ Optimal Price = 49.99
Filter allowed Marketing Intensities	Make sure to select a limited set of Marketing Intensities that correspond to your marketing campaign settings.	You have an Amazon Campaign with 5 Ad Groups with ACoS of 3%, 5%, 7%, 9%, 11% and want to limit the optimizer to select only one of these

Continued on next page

Table 17: Default Rules (Continued)

Name	Purpose	Example
Optimal Price = Baseline Price × value (in %)	Set optimal price to specific price in ordering optimization. Can be used to disable the pricing-optimization by setting value to 1.	Baseline Price = 10.00 EUR, Value = 1 ⇒ Optimal Price = 10.00 EUR
STR Order Hierarchy 1 >= value (in %)	Only order if we predict to achieve the required Sell Through Rate for the Order Hierarchy 1 within the order period	Value = 50% ⇒ Order Hierarchy 1 STR > 50% OR don't order anything
Bundle Price = Product Prices × value	Make bundle prices follow the price of the products they contain	nan
Bundle Price ≤ Product Prices × value	Make bundle prices follow the price of the products they contain	nan
Optimal Price = value	Limit optimal price to a particular value	Value = 30.00 EUR. Rule ⇒ Optimal Price = 30.00 EUR
Optimal Price ≥ End Liquidation Value × value (in %)	Limit minimum optimal price to end liquidation value multiple	nan
Liquidation End STR ≥ Target STR * value (in %)	Make sure to reach a percentage of the defined Sell Through Target Rate at the Liquidation End for the whole Optimization Group. Please also set a minimum margin when you use this rule will reduce prices to reach the desired STR not checking the profit impact.	Value 100%, STR Target 80% → Liquidation End STR ≥ 80%
Liquidation End STR ≤ Target STR * value (in %)	Make sure to limit the Sell Through Rate to a percentage of the defined Sell Through Target Rate at the Liquidation End for the whole Optimization Group.	Value 100%, STR Target 80% → Liquidation End STR ≤ 80%
Promotion Rank Top 5% Discount = value (in %)	Set 5% of optimization groups most recommended for a promotion to a certain discount	Value = 0.4 ⇒ Discount = 40% for 5% of the optimization groups most recommended for a promotion
Promotion Rank Top 10% Discount = value (in %)	Set 10% of optimization groups most recommended for a promotion to a certain discount	Value = 0.4 ⇒ Discount = 40% for 10% of the optimization groups most recommended for a promotion
Promotion Rank Top 15% Discount = value (in %)	Set 15% of optimization groups most recommended for a promotion to a certain discount	Value = 0.4 ⇒ Discount = 40% for 15% of the optimization groups most recommended for a promotion
Promotion Rank Top 20% Discount = value (in %)	Set 20% of optimization groups most recommended for a promotion to a certain discount	Value = 0.4 ⇒ Discount = 40% for 20% of the optimization groups most recommended for a promotion

Continued on next page

Table 17: Default Rules (Continued)

Name	Purpose	Example
Promotion Rank Top 25% Discount = value (in %)	Set 25% of optimization groups most recommended for a promotion to a certain discount	Value = 0.4 ⇒ Discount = 40% for 25% of the optimization groups most recommended for a promotion
Min days after last gross black price change = value	Wait a specified number of days after the last gross black price change	Value = 10, Last Price Change 3 days ago ⇒ Price Change = 0%
Discount ≥ value (in %) OR No Discount	Set minimum discount relative to the gross black price OR do not offer a discount	Value = 0.2 ⇒ Discount ≥ 20% OR No Discount