Accelerate Price Waterfall Optimization

Version 1.1

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The PWO Accelerator provides a fast implementation of a standard waterfall simulation.

In this section:

To understand the optimization results and to query them from outside of the Optimization Engine module, please refer to Optimization Results.

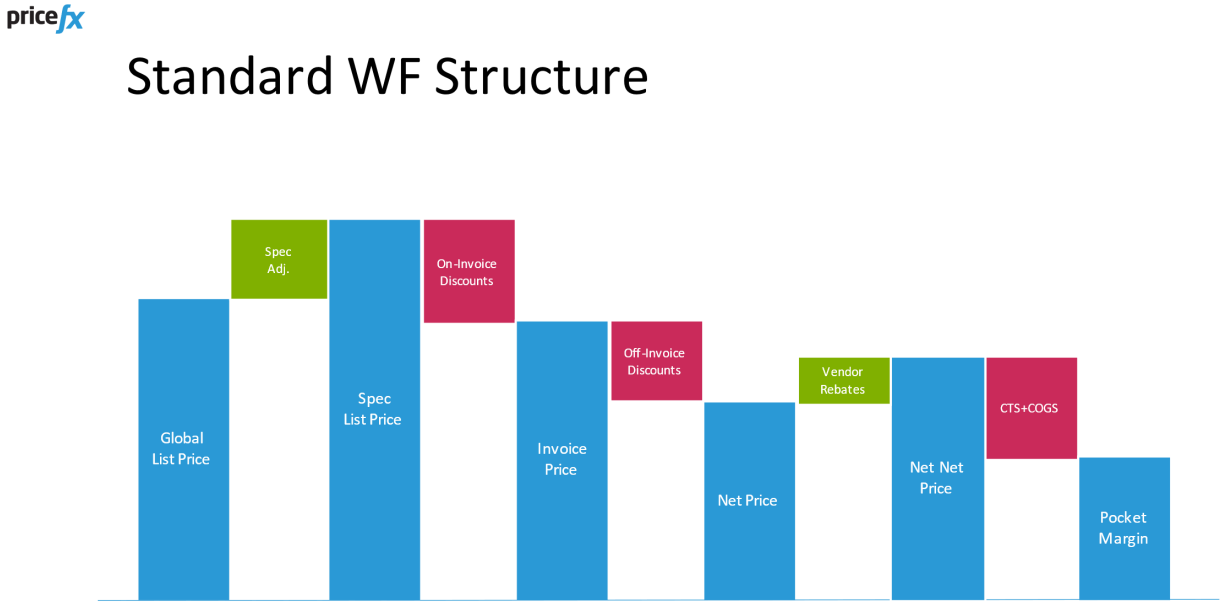
Overview (PWO)

PWO Accelerator deploys a standard Optimization Engine model that optimizes elements of a waterfall.

> ⚠ This Accelerator is a proof of concept meant only **waterfall optimization** use cases.

Optimization Engine can do other things, of course, but this is the main use case and any other custom requirements cannot be achieved via this Accelerator.

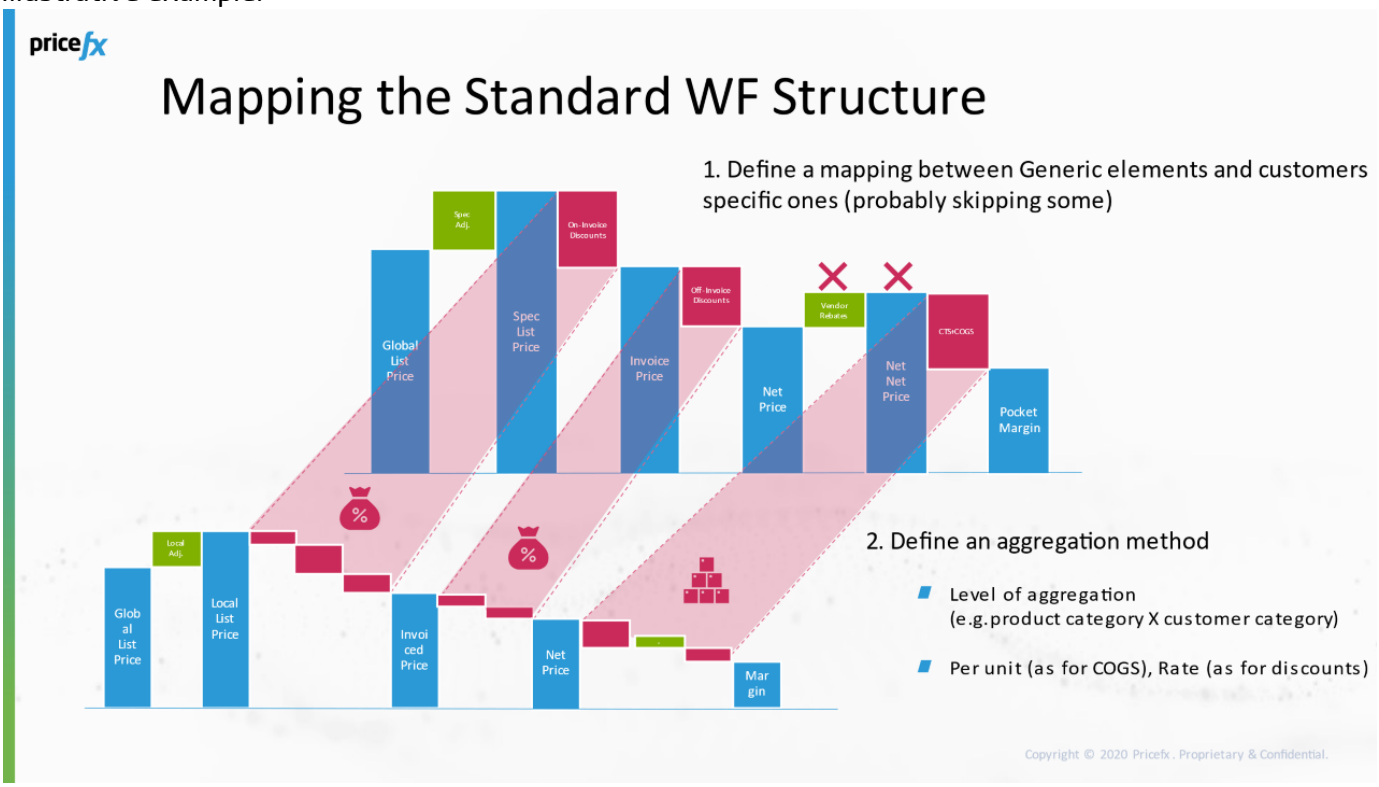
To be as fast and generic as possible, a standardized waterfall is built into the Accelerator and is designed to cover most of the customer needs. This waterfall looks like this:



Built down to the level of Product X Customers

A key part of the setup is mapping the actual customer waterfall columns to this standard one. This could mean that some of the elements of the customer waterfall will be aggregated within a single element of the standard waterfall and that some elements may not be used at all.

Illustrative example:



As a result:

- Customers need to be aware of the fact that the **results will not reflect their exact waterfall**.
- We can standardize most things – mainly the way we consume results (Optimization Realization Dashboards, Price Setting, Agreements & Promotions, etc.).

Business User Reference (PWO)

This section explains how to run a waterfall optimization and how to understand its results. Before you can run the waterfall accelerator, you must have it deployed on the partition. See Installation (PW) for details. A model for the elasticities must be run before the waterfall optimization (covered in the Prepare Elasticity Model section).

- Prepare Elasticity Model (PWO)
- Usage (PWO)
- Results Description (PWO)

Prepare Elasticity Model (PWO)

To retrieve the elasticity factor calculated from transaction data, the PWO model deployed by the Accelerator depends on another Negotiation Guidance model. Below is the simplest way to configure such a model on the partition; for details see the complete documentation for Negotiation Guidance models.

In this section:

- Deploy
- Prepare Transaction Source
- Create Model
- Run the Model

Deploy

⚠ Note that if the Negotiation Guidance Model Class & Logics have already been deployed on the partition, deploying them again might override specific changes done by a pricing scientist. Also if the Negotiation Guidance Model Class is already present in Optimization > Model Classes, you can directly use it without doing the deployment again.

The deployment can be done by PlatformManager, see Accelerate Negotiation Guidance for more details.

Prepare Transaction Source

The Negotiation Guidance model runs using a transaction source. The transaction source must meet the following prerequisites.

- The transaction source must contain the following fields (create them if needed):
  - **Customer** field – ID of each customer. Be careful: it cannot be a source key. If it is, duplicate the field to be able to access it.
  - **Customer Group** field – ID of each customer group. Be careful: it cannot be a source key. If it is, duplicate the field to be able to access it. It must be defined as a dimension.
  - **Product** field – ID of each product. Be careful: it cannot be a source key. If it is, duplicate the field to be able to access it.

    - **Product Group** field - ID of each product group. Be careful: it cannot be a source key. If it is, duplicate the field to be able to access it. It must be defined as a dimension.
    - **Quantity** field - Number of products in each transaction.
    - **Revenue** field - Also named Invoice Price in the PWO Accelerator waterfall (extended to quantity).
    - **Margin** field - Also named Pocket Margin in the PWO Accelerator waterfall (extended to quantity).
    - **Optimization Metric** field - Margin percentage field, containing the quotient of *Margin* divided by *Re venue*.
- The user will define some segmentation levels.
    - These fields must be defined as dimensions in the transaction source.
    - Avoid null values because the corresponding transaction rows will be ignored in the segmentation model and will cause an error in PWO models. If necessary, create a new field by using an expression that replaces empty values with a text (e.g., "Not provided").

Create Model

1. In **Optimization** > **Models (MO)**, use the **Add Model** button.
2. Set a **Name** and a **Label**.
3. Select *Negotiation Guidance* as **Model Class**.
4. Click the **Create** button.

Run the Model

For a basic negotiation guidance, it is pretty straightforward to run a model. If needed, please refer to Usa ge to run exactly what you need.

In the end, you need to have a sigmoidal elasticity defined for each pair of *product_group*, *customer_group* . It is important to set the parameters in order to reach this goal. In particular, in the **Configuration** step:

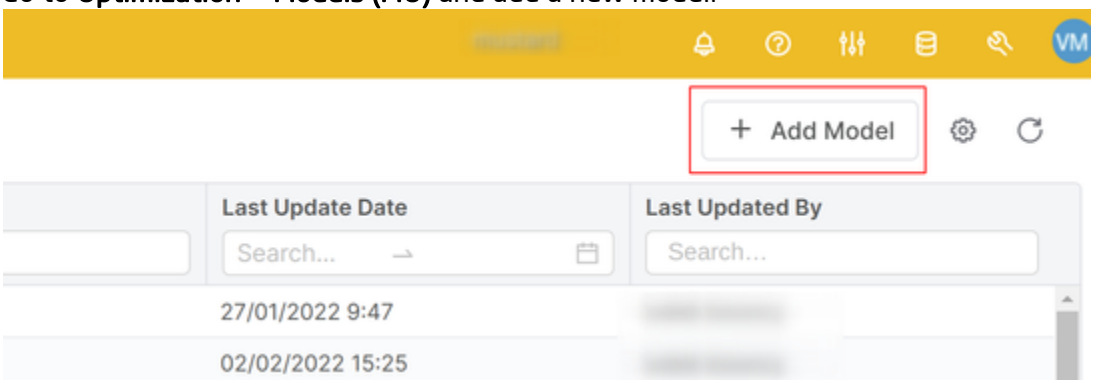
- Define the product_group field and the customer_group field as levels of segmentation.
- Set the segmentation thresholds suitably with this goal.
- Set the elasticity model to *sigmoidal*.
- The customer group and product group levels of segmentation cannot be so deep in the segmentation levels so the elasticity is not calculated at their level of granularity (parameter *Min depth of leaves for elasticity calculation*).
- Take care of the parameter *Max #Transactions in segment for elasticity calculation* to ensure the elasticity is calculated for all the product group x customer group pairs.

Usage (PWO)

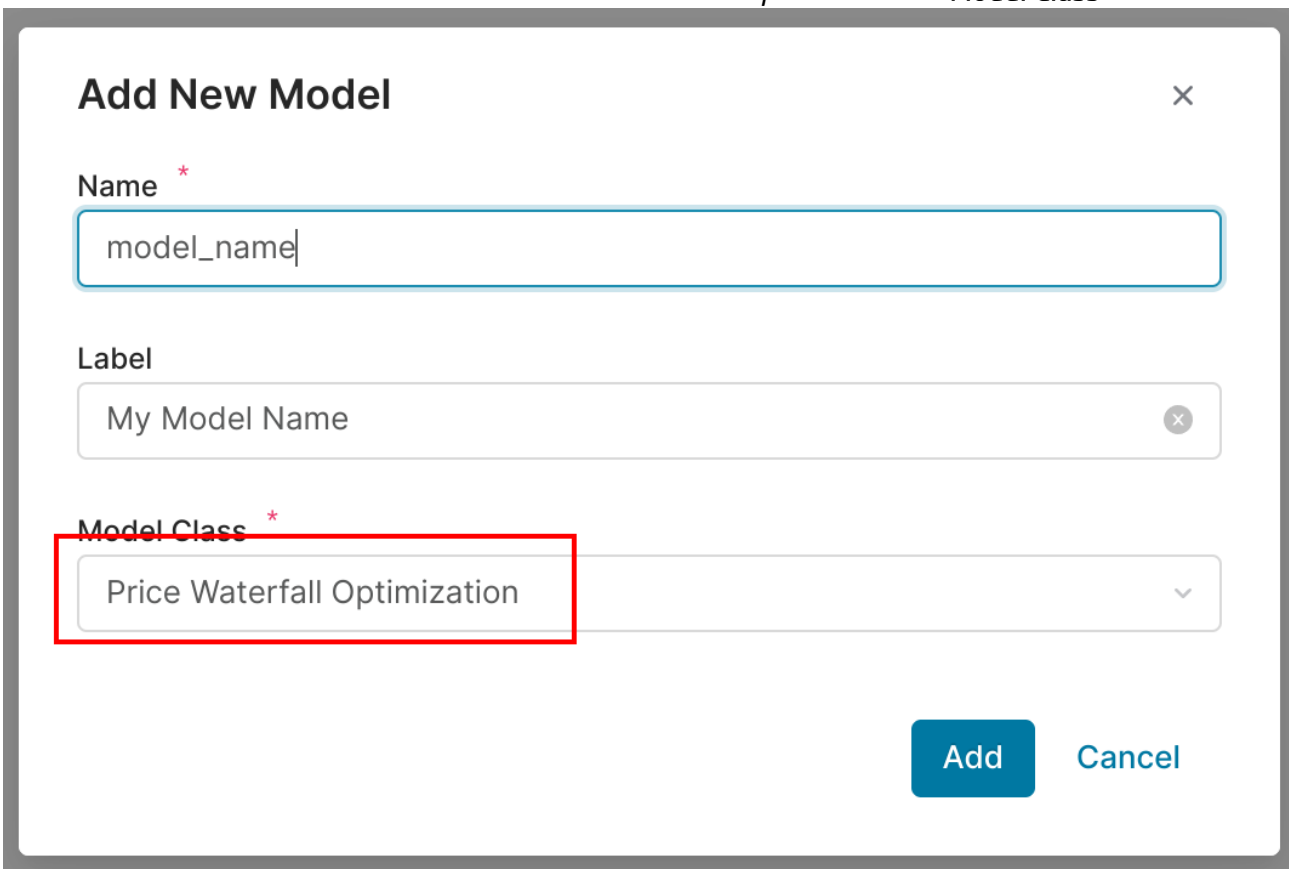
To run the Price Waterfall Optimization Accelerator, you need to create a new Model Object from the **Optim ization** > **Models (MO)** menu, using the PWO logic to instantiate the optimization model and give it the required parameters. The model will then be added to the list and will be editable.

- New Model
- Definition Step
- Scope Step
- Configuration Step
    - Boundaries Tab
    - Objectives Tab
    - Advanced Parameters Tab
- Results Step

New Model

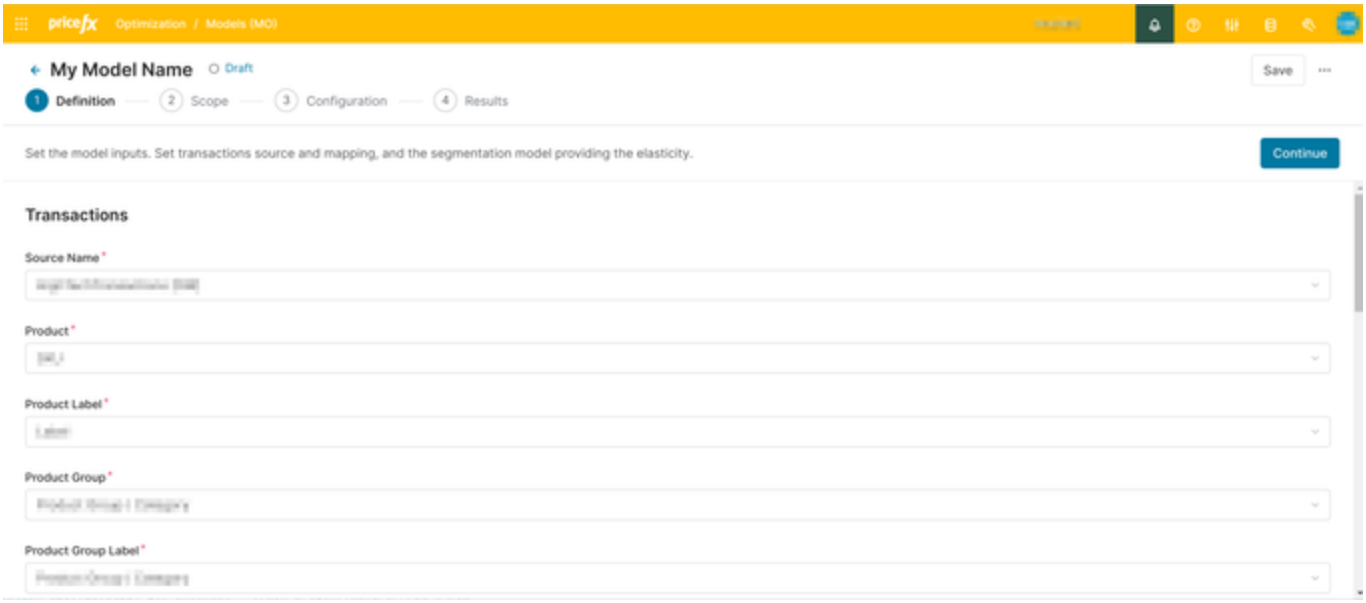
1. Go to **Optimization** > **Models (MO)** and add a new model.
2. 

   Define the name of the model and choose *Price Waterfall Optimization* as **Model Class**.



3. The new model opens. It is based on the data you defined when deploying the Accelerator.

The interface is:



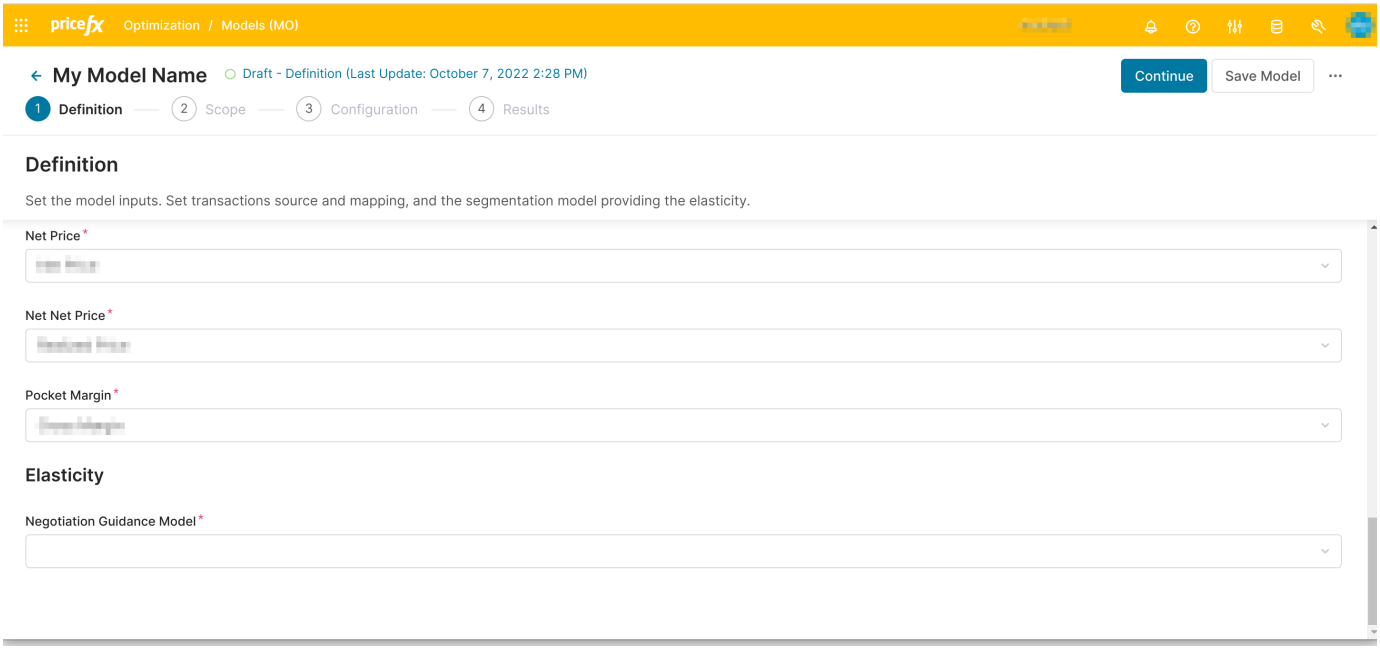
Definition, Scope, Configuration, and Results are the steps of the model and will be explained below. When you are in your model in the partition, you are always guided by the short description provided just below the name of the step.

Definition Step

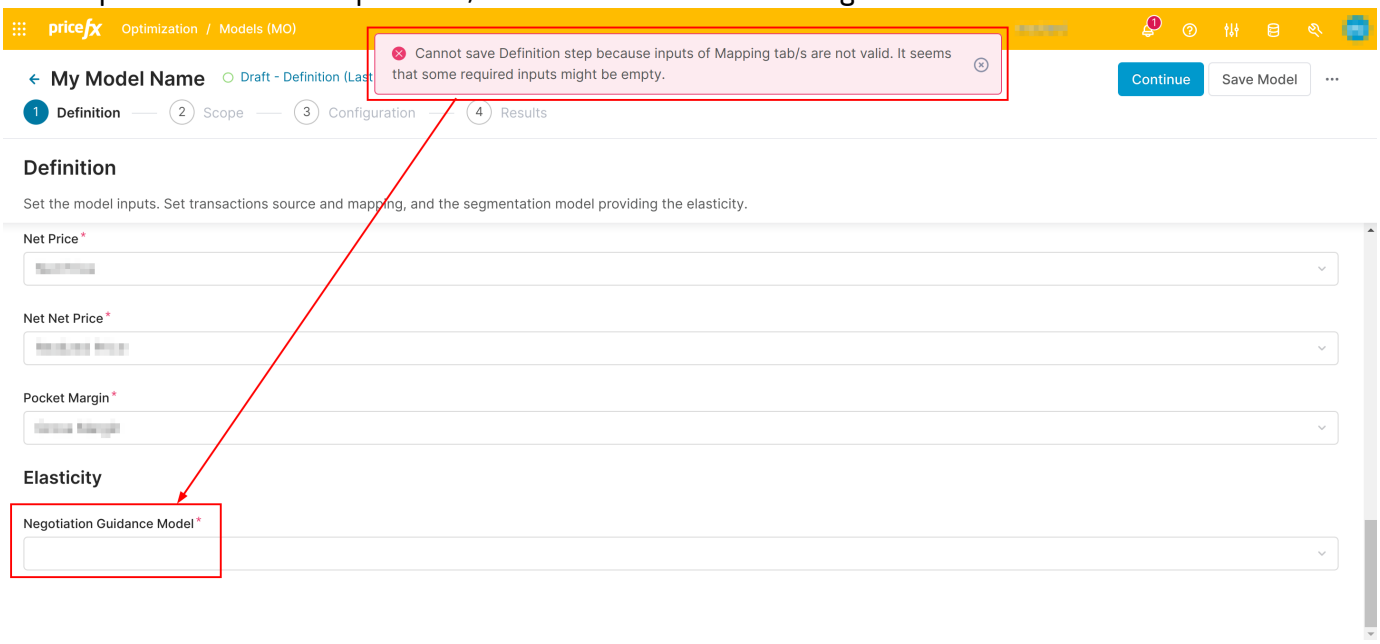
This is the first step of the model. When you open it for the first time, the user inputs of the first section, called *Transactions*, are prefilled with the default values. It is the mapping of the data. You can change it if needed. You can also apply a filter to your transactions, for instance, if you want to work with only a specific period of time.

The second section is called *Elasticity* and you define there the negotiation guidance model to use in the optimization (see Prepare Elasticity Model (PWO)).
⚠ *Until version 1.0.x of this Accelerator: You can choose only a negotiation guidance model among those on the partition whose levels match the Customer Group and Product Group fields you mapped during the deployment. If no model meets the requirements, the interface will ask you to create and run such a model.*

When the Definition step is done, you can go to the Scope step. For this, use the Continue button at the top right.



If all required fields are not provided, there will be an error message.



The Continue button will automatically run the calculation that starts the next step. After the calculation, which can take a few minutes, you can access the Scope tabs.

Scope Step

The Continue button at the Definition step will automatically run the calculation that starts the Scope step. This calculation mainly performs the aggregation of the transactions by product and by customer which is used to perform the optimization itself. At the end of the calculation, the tab is available and there is a table called *Aggregated* in the model tables (accessible through the menu in the top right corner).

In the Scope step, you define which products and customers the optimization will apply to. This step works on already aggregated data, i.e. all the historical transactions have been aggregated by product and customer.

- **Included Customer Groups** and **Included Product Groups**: they rely on the customer group field and on the product group field which was defined during the PWO Accelerator deployment. If nothing is provided, there is no filter.
- **Customer Minimum Revenue**, **Customer Minimum Margin (%)**, **Product Minimum Revenue**, and **Product Minimum Margin (%)** are filters related to the global values.
- You can add as many custom filters as you want with **Data - Advanced Filters**.
  ⚠ Remember that these filters apply to the already aggregated data (at a customer x product level), only on the fields that exist in the Aggregated table. You can filter on any transactions field in the Definition step.

In the right panel, there is an overview of the data which will be taken into account in the optimization. It is refreshed to reflect your filters when you click the **Apply Settings** button.

Note that data shown in portlets are limited to scope, while filters are applied on the Aggregated table level. It might result in counter-intuitive behavior of the Product list and Customer list portlets.

Configuration Step

The Continue button at the Scope step will automatically run the calculation that starts the Configuration step. After a calculation, which can take a few minutes, you can access the configuration tabs. The calculation creates some model tables: Segmentation contains the elasticity values which will be used for each segment, and the Problem tables define the coordinates of the data for the optimization engine at different levels of granularity.

In the Configuration step, you define your optimization configuration.

- **Boundaries** tab defines how much you accept a change in the key variables of the model.
- **Objectives** tab defines the business objectives of the optimization (see below).
- **Advanced Parameters** tab defines the parameters of the optimization run itself.

Boundaries Tab

These entries define how much you allow the model to change each row value. Specific Adjustments, On Invoice Discounts, and Off Invoice Discounts boundaries are defined in points, as these variables are percentage values; Invoice Prices boundaries are defined by a relative change in percent from the historical values.

Objectives Tab

- **Revenue/Margin Optimization** takes a value between 0 and 1. The objective of the model is to maximize a mix between global revenue and global margin (profit). If the input is 0, it will maximize the global revenue; if the input is 1, it will maximize the profit; intermediate values allow to mix and weigh these two goals.
- **Revenue** objective is to define a revenue target for selected customer groups. You need to add a customer group to the input matrix. Then the current revenue of the customer group is displayed. You can enter a variation percentage to define the target revenue of the customer group; this value is displayed in the Target Revenue column. You can also define different priorities (low, medium, high) for each customer group's revenue target objective. Only the customer groups in the input matrix have a revenue target objective. If you do not create any row in this input matrix, there is no revenue target objective in the model.
- **Volume** objective is to define a volume target for selected product groups. You need to add a product group to the input matrix. Then the current volume (sold quantity) of the product group is displayed. You can enter a variation percentage to define the target volume of the product group; this value is displayed in the Target Volume column. You can also define different priorities (low, medium, high) for each product group volume target objective. Only the product groups in the input matrix have a

volume target objective. If you do not create any row in this input matrix, the model has no volume target objective.

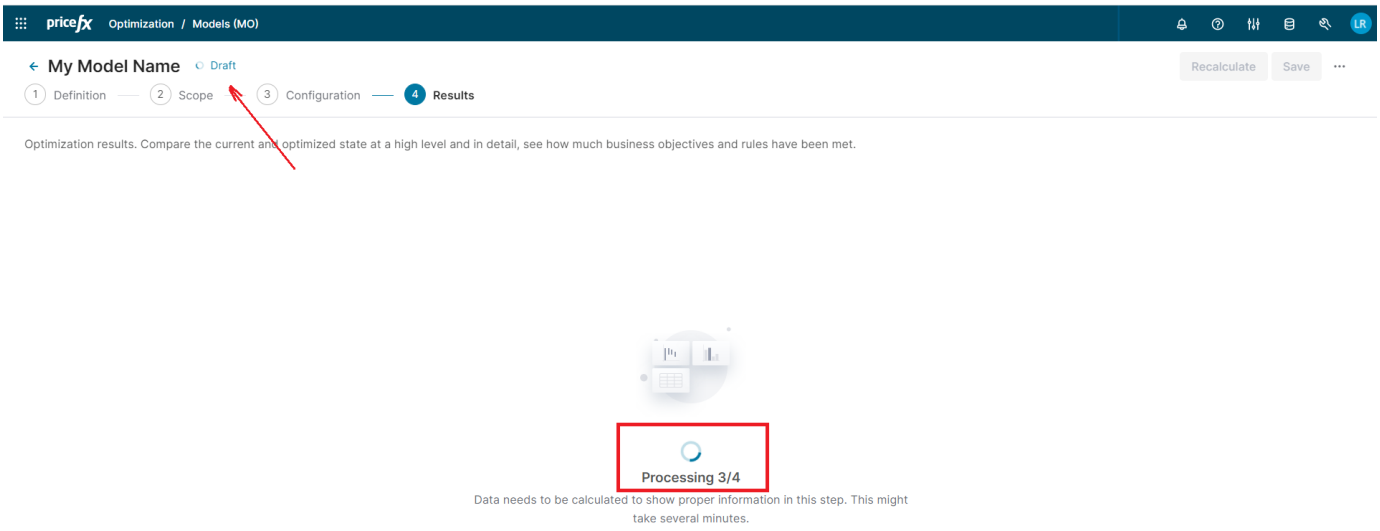
Advanced Parameters Tab

By default, the optimization will run a maximum of 500 steps, with no time limit and it will stop if it is stabilized. You can change the number of steps, in particular, if, after a run, the results logs show that the model was not stabilized yet. You can also set a maximum running time in minutes, or disable the stop when stabilized.

The Profiling checkbox can help you understand how the agents reach their optimum but it increases the need for memory and the optimization run time.

Results Step

When the Configuration step is done, you can go to the Result step, using the Continue button. It will first run the longest calculation of the model. This calculation is a sequence that you can follow in the job tracker:



Calculation run: to track the jobs click the blue text (arrow)

First, the model runs some preparations. Then, two optimization engines are launched, one named Simulation, which defines the initial state of the optimization, and one named Optimization which performs the real optimization. In the end, the postprocessing is run. The duration of the run depends mainly on the size of the input data in the scope and on the number of optimization steps.

Once the calculation has run, some other tables are available through the table link, but normally the user does not need to access them. If needed, go to Optimization Results to understand what these tables are. The most important ones are the *Current* and *Optimized* tables that reflect the state of all the values before and after the optimization and have the same structure, and *Glassbox* tables that are used to dig into the way the optimization engine reached the optimized state.

The Results step tabs are:

- **Impact** tab - Displays comparisons between the current state (before optimization) and the optimized one.

- **Details** tab – Displays tables that compare the current to the optimized values at different levels of granularity.
- **Glassbox** tab – Displays charts that provide the state of the values finders and the criteria at the end of the optimization. It is useful to understand how the model reached its optimized state.
- **Evaluation** tab – Displays the relevant optimized values for user inputs.

For more details see Result Description (PWO).

Results Description (PWO)

Once a model has been run, the Results step contains fours tabs:

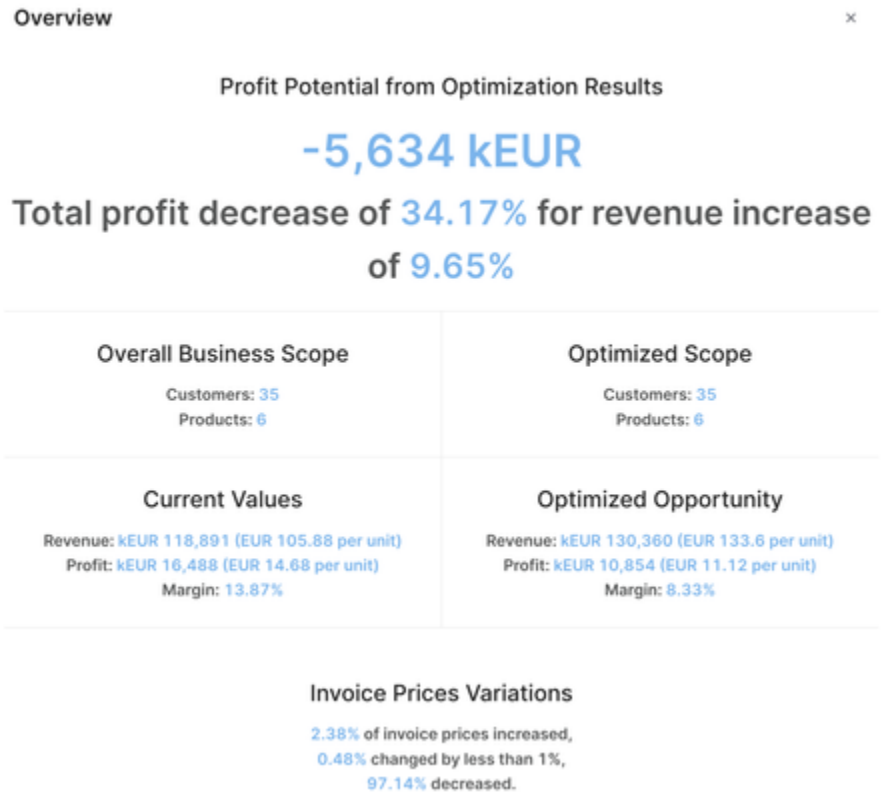
- Impact Tab
- Details Tab
- Glassbox Tab
- Evaluation Tab

Impact Tab

This tab displays comparisons between projections with the current pricing and projections with the optimized one. So, be careful, the "current" charts represent the initial state of the Optimization Engine and not historical values from the past. They show what the Optimization Engine thinks would happen if the historical prices and discounts would be kept as they are. There are eight portlets in the dashboard, described below.

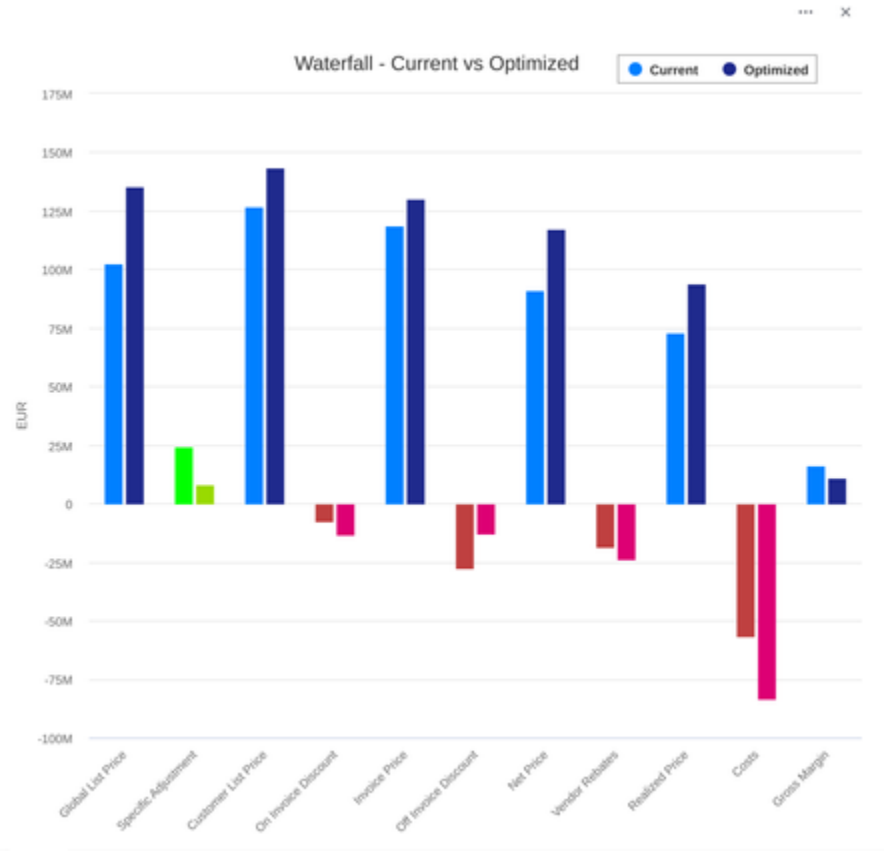
Overview

The overview provides a summary of the difference between the projections from current pricing and the projections from optimized pricing: global revenue and profit, but also the count of increased, stable, and decreased prices.



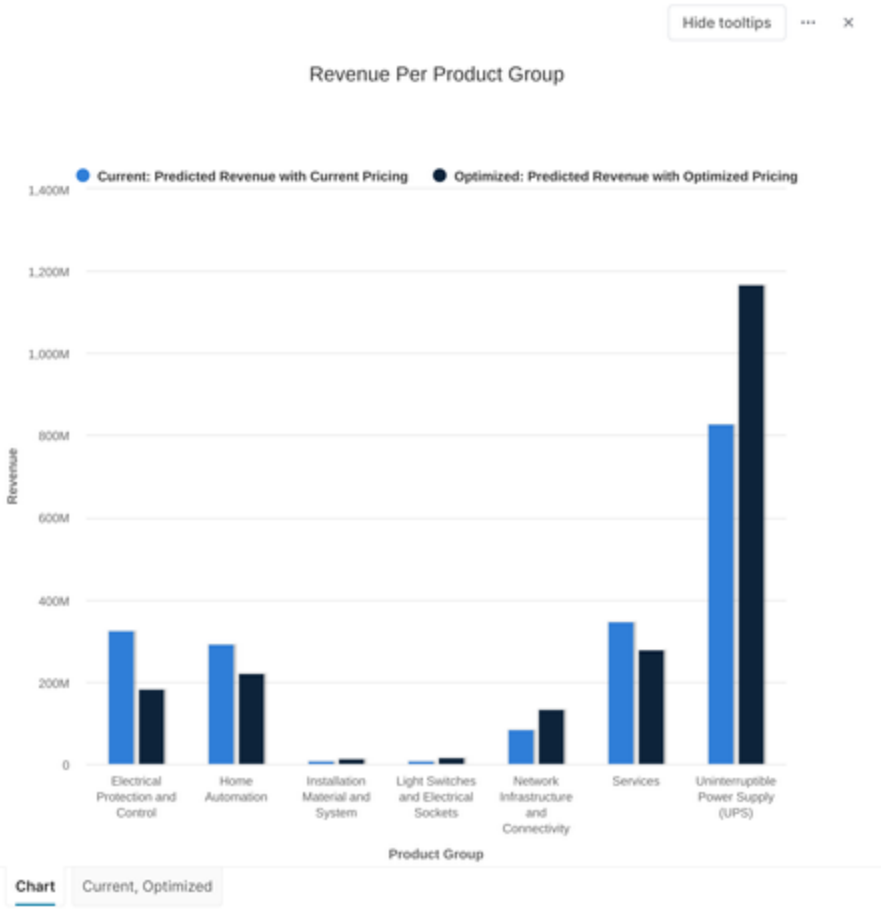
Waterfall

The waterfall displays both the current and the optimized waterfall (in parallel). All the values are extended ones, within the scope of the optimization. They are presented in a bar chart, hence negative values like discounts are below the X-axis.



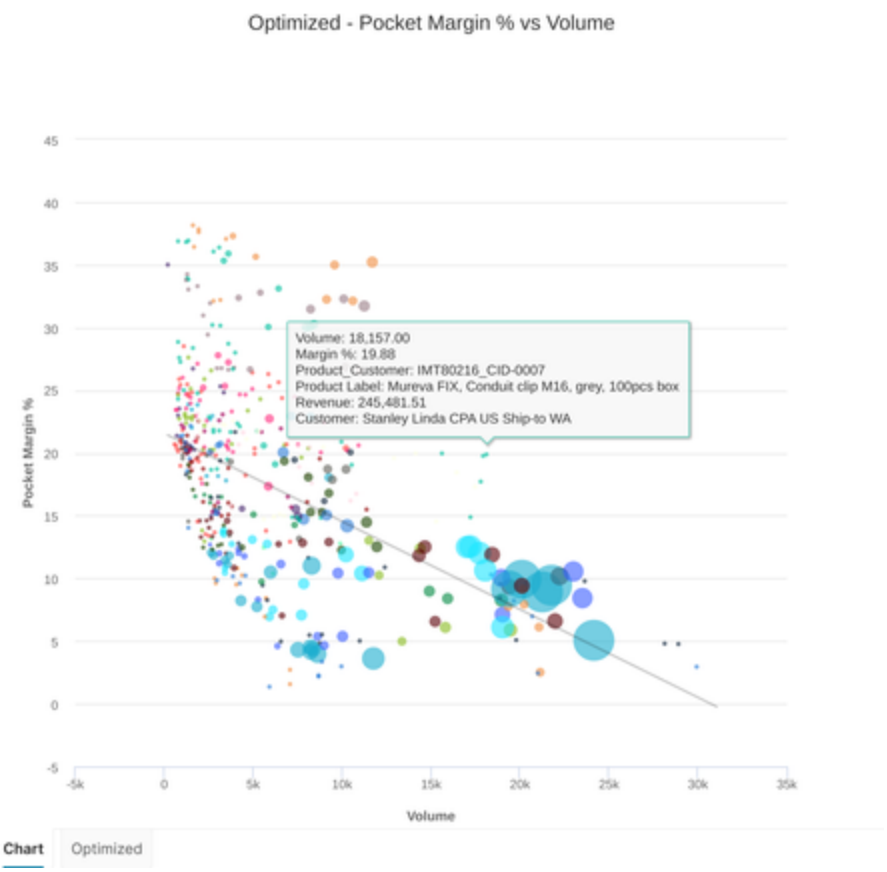
Revenue and Margin by Product and Customer Groups

These four portlets display the extended values of revenue and profit, aggregated by product and customer groups, to allow the end user to see where the optimization had more or less impact on the results.



Pocket Margin % vs. Volume

Two portlets display bubble charts, one with the current values and one with the optimized ones. Each bubble is a pair (product, customer). The size of the bubble is the revenue, the position of the bubble is the sold quantity on the X-axis, and the margin % on the Y-axis. A regression line shows the tendency. The color of the bubble of a given pair is the same in both portlets.

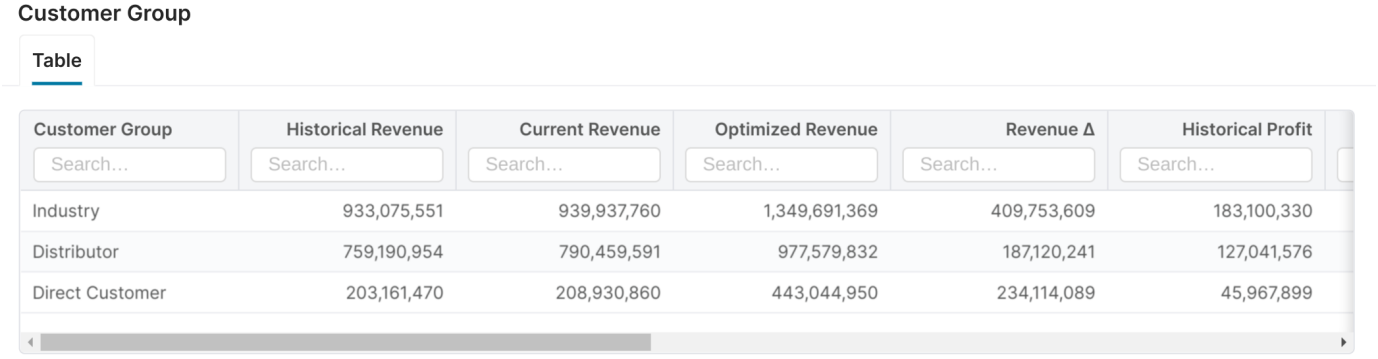


Details Tab

The Details tab displays the results tables in an easy way for the user to interact with. Different aggregations are provided: by product, by customer, by product and customer, and by customer group. Each table provides values for all the fields that *are calculated at this level of granularity*. The values provided are the historical, current, and optimized ones, plus the delta between the current and the optimized value. If needed, you can export these tables to Excel.

For the record:

- *historical* means the aggregated value coming from the source Datamart;
- *current* means the initial state of the Optimization Engine;
- *optimized* means the final state of the Optimization Engine.



Glassbox Tab

This tab's target audience is Configuration Engineers, Business Analysts, and team members working on improving a new optimization model. The tab provides insights to understand how the Optimization Engine reached its final state. One needs to understand the main concepts of the Optimization Engine to benefit from this dashboard. Two interesting pages to help users are OE Glossary and Explainability (Glassbox).

There are the following portlets in this dashboard:

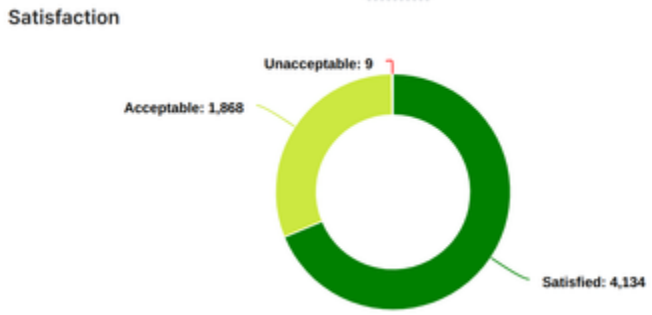
- three portlets about criteria satisfaction (Satisfaction, Criteria Comparion, and Satisfaction by Criteria Type),
- two bar charts about the interactions between value finders and criteria (Impact vs. Satisfaction and Impact vs. Influence),
- two bubble charts about the value finders' influences and the criteria impacts,
- two boxplot charts about the value finders' variations and two others about the initial movements of the value finders,
- a portlet comparing satisfaction of criteria between the current and optimized scenarios (in form of a Sankey chart),
- and optionally a chart of the evolution of the criteria agents during the optimization process.

The data for some of these charts are grouped by "agent key". An agent key depicts the nature of the agent within the waterfall. For instance, `UnitGlobalListPrice` is a key. In the Accelerator, the agent representing the unit global list price for any specific product is a value finder, so we call it a "value finder key". Criteria also have keys, like `RevenueTarget` for instance.

Criteria Satisfaction

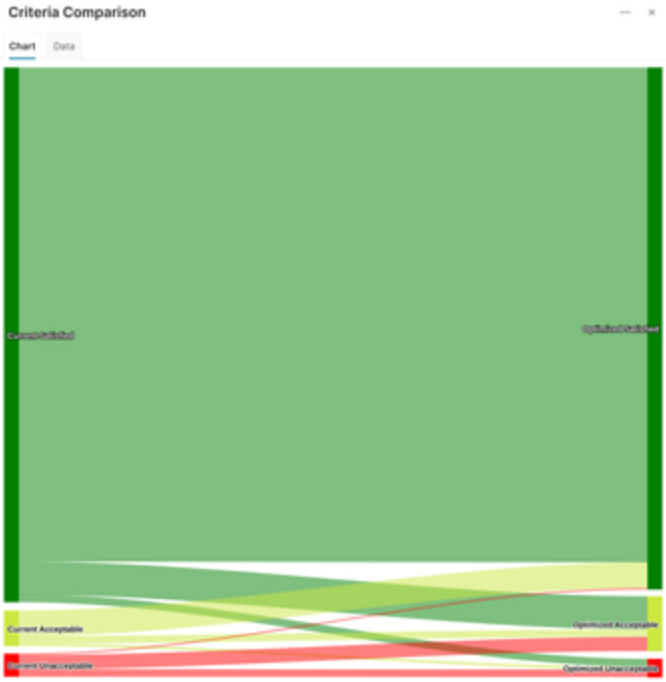
The whole goal of the Optimization Engine is to satisfy criteria. These charts enable the user to assess at a glance whether or not the engine was successful at it.

The Satisfaction pie chart displays the total number of criteria by satisfaction status (satisfied, acceptable, unacceptable). The meaning of this status is explained in Criteria Description.

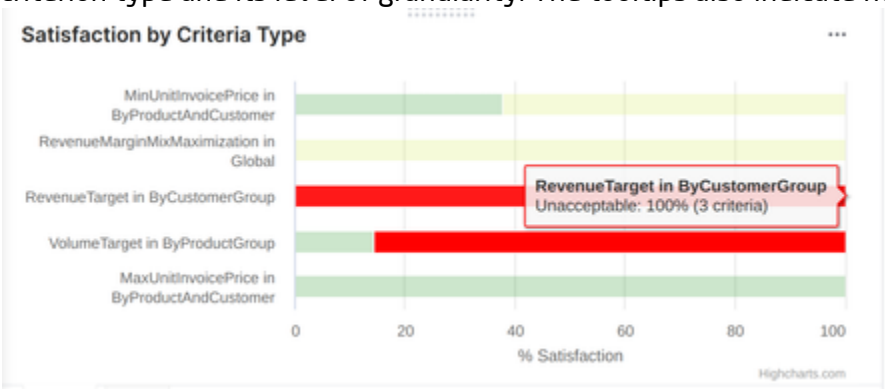


This count itself is not sufficient, the two next charts provide more clarity about the criteria satisfaction.

Because some criteria could be satisfied in the current state end less acceptable after the optimization, to compensate for other criteria that go from an unacceptable state to an acceptable or satisfied one, the tab provides a Sankey chart. This chart shows the global journey of the satisfaction state of all the criteria.



Because some criteria may be much more important than others, the criteria satisfaction is also displayed by criteria type. For instance, the global `RevenueMarginMixMaximization` criterion is only a single criterion but it impacts the whole scope of the optimization, whereas there is the `MaxUnitInvoicePrice` criterion for each of product x customer pair but each one is individually of lesser importance. This is why a bar chart provides more details, by displaying the satisfaction status by criteria key and space, i.e. by criterion type and its level of granularity. The tooltips also indicate how many criteria are instantiated.



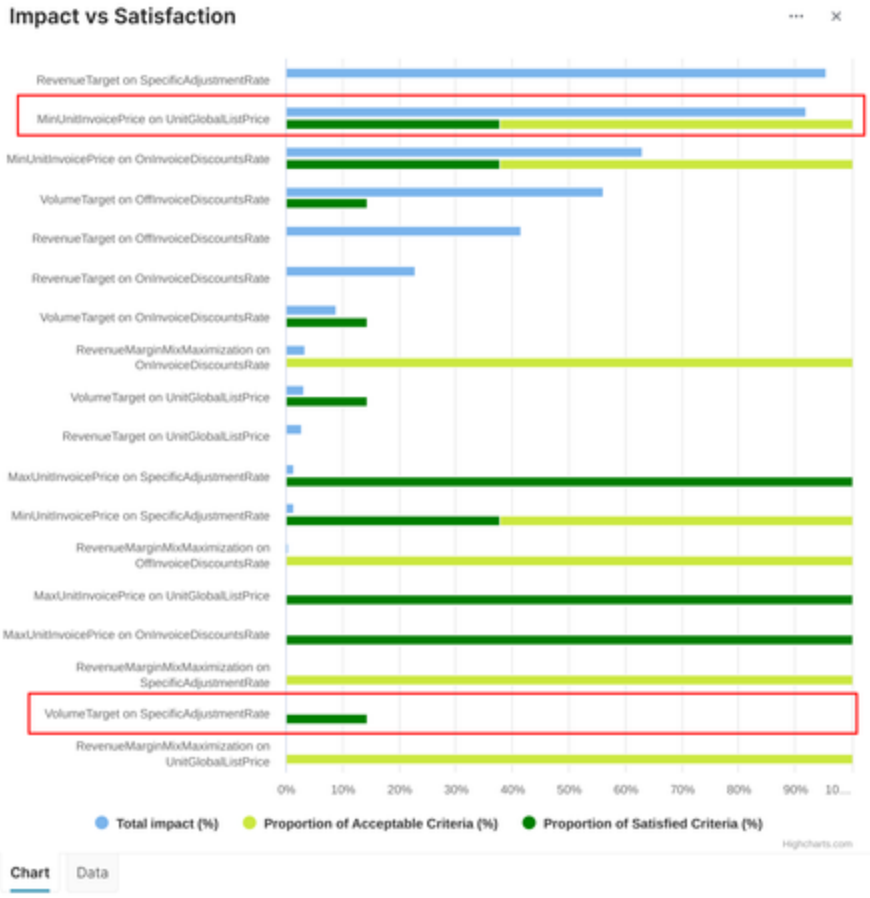
Interaction Between Value Finders and Criteria

Value finders and criteria are both ends of a feedback loop, their interactions are fundamental to the convergence of the system towards a solution. These charts provide insights about these interactions.

The first bar chart displays data per criteria keys x value finders keys. Each criterion has an impact on some value finders and is more or less satisfied at the end of the run. The satisfaction is not related to any specific value finders, it is only related to the criteria. The *Impact vs. Satisfaction* bar chart is sorted by total impact amount. The more a criterion is impactful on a value finder, the higher it is in the chart. The expected output is to have more satisfied criteria at the bottom of the chart: these criteria do not impact the value finders because they are satisfied.

Questions one may want to ask:

- Why does a criterion have not much impact if it is not totally satisfied? It could be because the criterion has an impact mostly on another value finder key. Does it make sense for this customer or this model?
- Why does a criterion have much impact on a value finder that is already mostly satisfied or acceptable? It may be because of its importance or because of interactions.

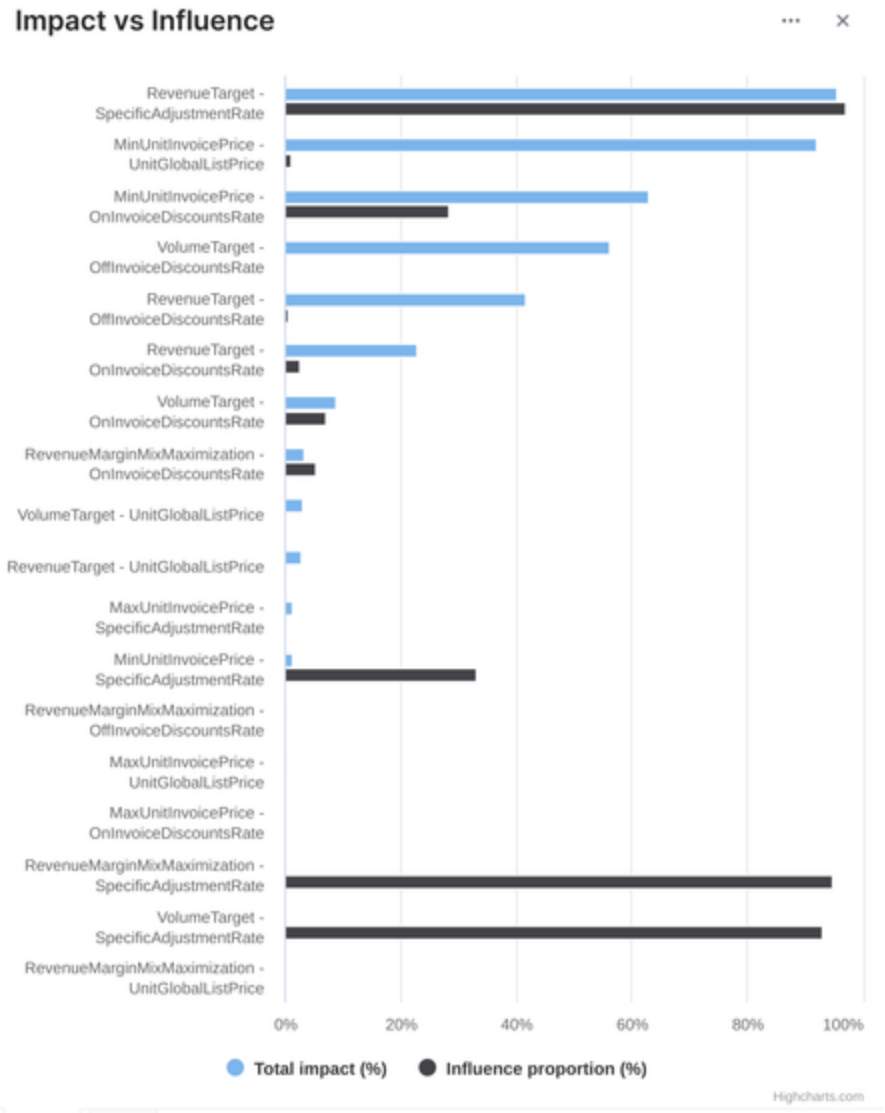


While the criteria have an impact on the value finders, the value finders also influence the criteria. The second bar chart, which is also at a granularity level of criteria key x value finders key, compares the criteria's impact (on value finders) to the value finders' influence (on criteria). The Y axis indicates the pairs *criteria keys - value finders key*. It is also sorted by impact in descending order, hence it is the same order as the previous chart. You can check that high impact is generally correlated with high influence, although that may be scrambled by the various priorities and levels of granularities handled by the model.

Questions one may want to ask:

- Which criteria have more impact on which values finders?
- Which value finders have more influence on which criteria?

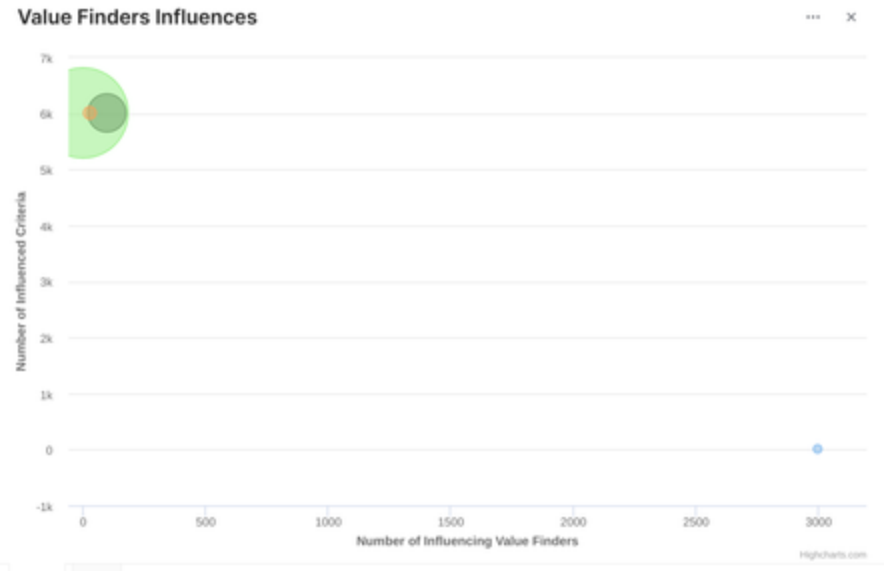
It can help tune the priorities of the criteria.



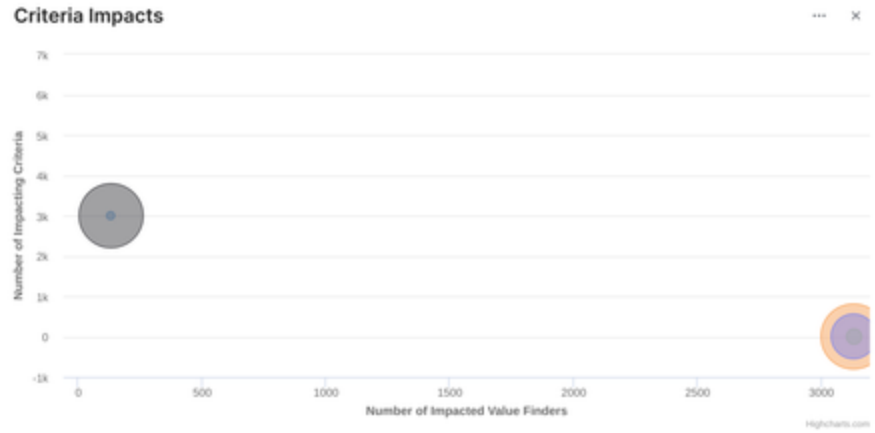
Bubble Charts

Two bubble charts are displayed, offering a quick view of the scale of value finders and criteria, both in raw quantity and in terms of impact/influence. They both have the same axis but they do not use the same data. The X axis represents the number of value finders, and the Y axis the number of criteria. The first bubble chart is aggregated by the value finders keys, the second one by the criteria keys.

The *Value Finders Influences* bubble chart displays a bubble for each value finder's key, whose size represents the overall influence of the value finders with this key on the criteria of the model. The coordinates represent how many value finders provide this influence and how many criteria they act on. For instance, in the example above, few value finders have much influence on many criteria and many value finders (blue bubble) have not much influence on few criteria.



The *Criteria Impacts* bubble chart displays a bubble for each criteria key, whose size represents the overall impact of the criteria with this key on the value finders of the model. The coordinates represent how many value finders are impacted by this criterion and how many criteria act.



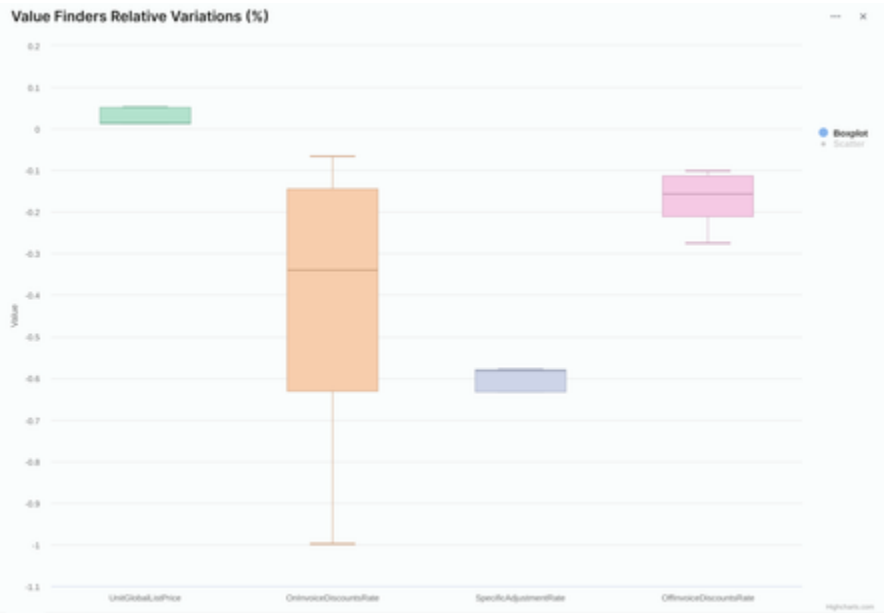
Boxplot charts

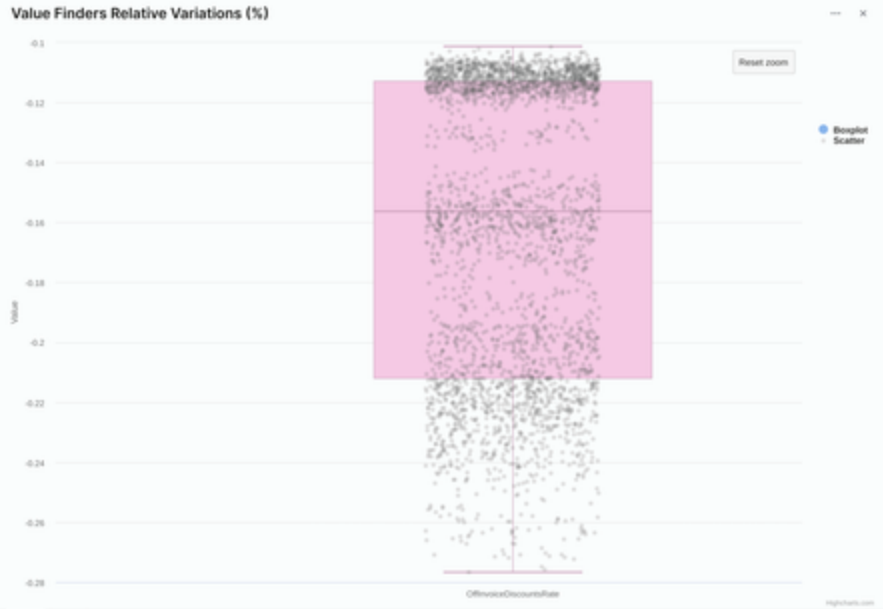
The boxplot charts are represented by the value finder key. A single box is a rectangle starting from the first quartile and ending in the third one, with a horizontal line representing the median. The whiskers have a maximum length of 1.5 times the difference between the median and the quartile it starts from. Moreover, each point of data is represented by a gray dot, slightly jittered horizontally. Hence, if some dots are beyond the whiskers, it means that the data has outliers. For all the boxplot charts, some useful information:

- There is a legend on the right of each chart, that separates boxplots from the scatter plot. Some value finder keys represent many points of data. Clicking on the legend "Scatter" will remove the dots and let the user see the box better.
- There is a tooltip for each box on mouse-over. It provides the minimum value, the three quartiles, including the median, and the maximum value. The minimum and maximum values may not be the extremities of the whiskers (if there are outliers).
- Sometimes the boxes have very different heights, for instance when a value finder key represents some prices or even revenues, and another one represents some percentages like discounts or margins. It is always possible to zoom in on the charts. The user has to simply grab a rectangular with their mouse.

The first two boxplot charts represent the variations of the value finders. Each box represents a value finders' key and the scatter plot represents the density of the values. The tooltip provides the quartiles of the data, from minimum to maximum, and the space where the value finders' key is defined. The color code is shared by all the boxplot charts (but not with the previous bubble charts). I.e. a given value finder's key is represented by tame color in all the boxplot charts but may be represented by another bubble color in the value finders bubble chart.


Value Finders Relative Variations (%)
Boxplot
Scatter
OninvoiceDiscountsRate in ByCustomer
Max: -6.76%
Q 3: -14.46%
Median: -33.94%
Q 1: -63.08%
Min: -100%
Value
UnitGlobalListPrice
OninvoiceDiscountsRate
SpecificAdjustmentRate
OffinvoiceDiscountsRate


Value Finders Relative Variations (%)
Boxplot
Scatter
Value
UnitGlobalListPrice
OninvoiceDiscountsRate
SpecificAdjustmentRate
OffinvoiceDiscountsRate



The *Value Finders Variations* boxplot chart shows the raw variation of the value finders. It tells the user which value finders move more and if there is a pattern in their variations.

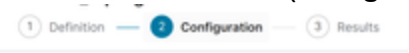
The *Value Finders Relative Variations* boxplot chart shows the same variations but in percentage. It is useful mainly to focus on small values, like the discount rates, that could have moved a lot relative to their initial value.

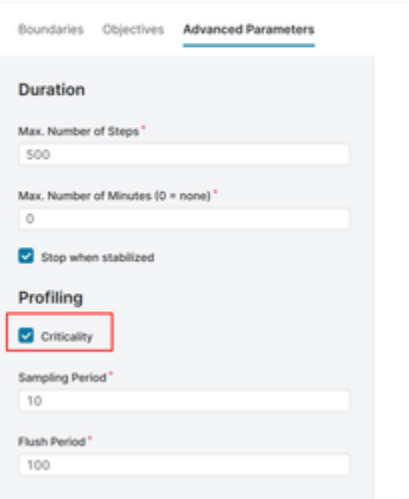
The *Initial Movements* boxplot chart represents the variation caused by the "probe" of the value finders, i. e. the initial action the value finder does on its own, without being pushed by any neighbor. This chart allows engineers to check if these probes are small enough not to disrupt the convergence.

The *Initial Movements Relative Weights* boxplot chart represents how prevalent the probe-induced movement is, compared to the overall variation of the value finder. Hence the users can assess whether the value finder has been mainly pushed by its criteria or disrupted by its probe.

Evolution of Criteria Satisfaction (Option)

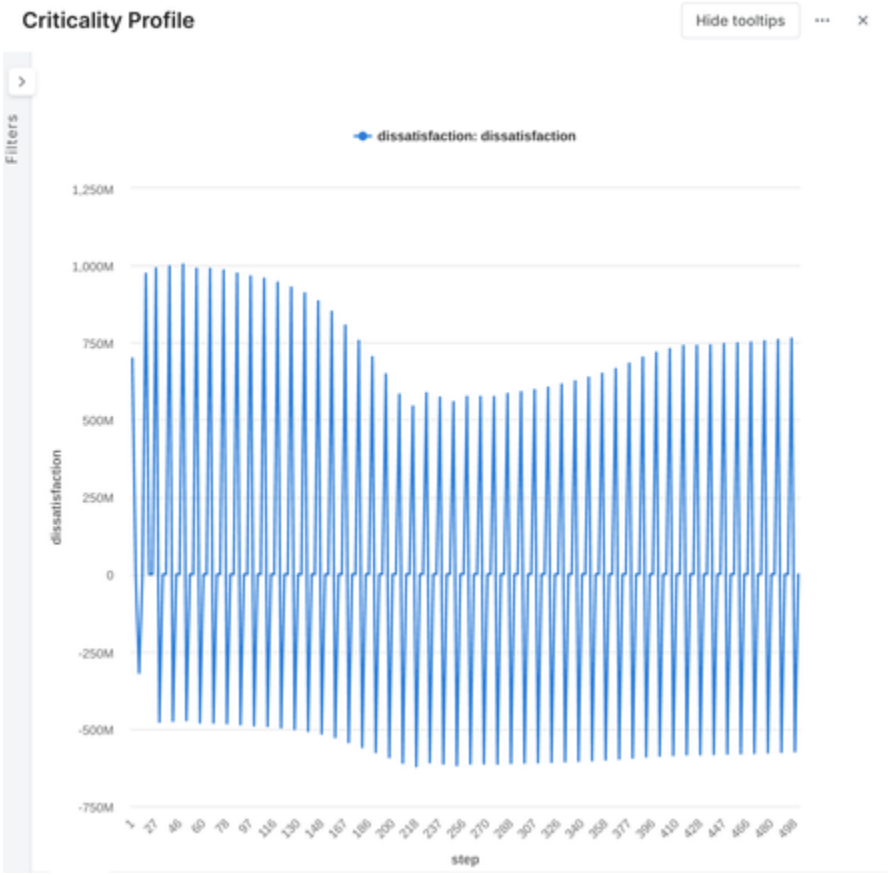
As it involves a large amount of data, the last portlet is only created if the "Profiling" option in the Advanced Parameters (Configuration step) is checked.



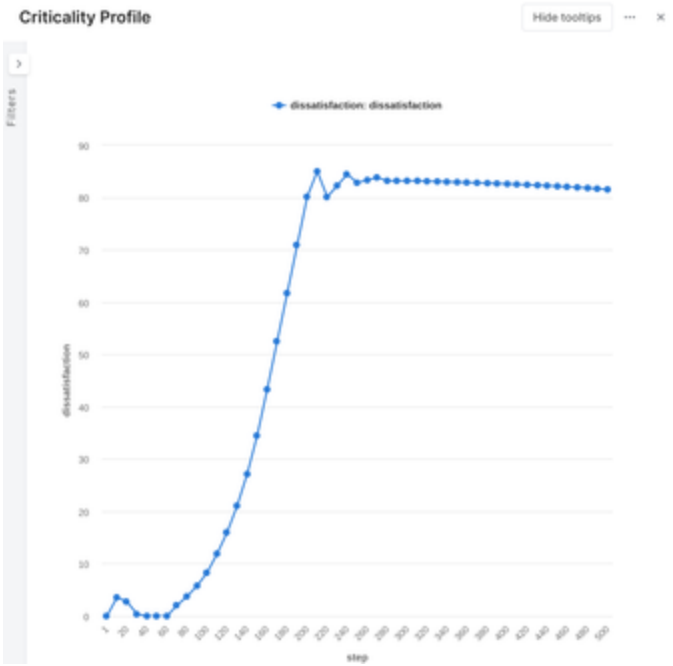


This chart displays the evolution of `max(dissatisfactions_in_the_sample)` during the run, but not all criteria are present in each sample. Hence, each value may correspond to a different criterion. This curve lets the user know whether the convergence is finished or it still needs some more steps. It is also a good tool to tune the various value finders parameters (for details see Parameters (Pricefx staff only)).

It is not a really good tool if maximization criteria are present in the problem. These criteria work in a special way and often have a negative dissatisfaction, making the profile curve hard to read. For instance, in the image below, the chart alternates between a highly dissatisfied criterion (in the 500M-1000M range), a moderately dissatisfied one (near zero) and a maximization one with negative dissatisfaction.



The user can filter this chart, for instance, by groups of criteria. In the chart below, we can see the evolution of the criterion which corresponds to the "near-zero values" on the overall scope chart above. We see that this criterion's dissatisfaction increased (probably the system was helping other criteria at that time), but it decreases by the end of the run and probably needs more steps to settle.



Evaluation Tab

This tab simulates the evaluation logic that can be called from any other module. One portlet represents one visible element of the logic. The query that can be done from any other module of the partition is:

```
api.model("myModelName").evaluate(
  "query_results",
  [
    product: "myProductId",
    customer: "myCustomerId",
    product_group: "myProductGroup",
    customer_group: "myCustomerGroup"
  ]
)
```

Any of the second parameter keys are optional. The outputs depend on the provided keys. See the details.

Admin User Reference (PWO)

- Installation (PWO)
- Data Mapping (PWO)
- Architecture Components (PWO)

Installation (PWO)

Price Waterfall Optimization Accelerator deploys a standard Price_Waterfall model that optimizes the elements of a standard waterfall.

In this section, you will find all information to deploy and run a standard waterfall optimization. More details on data mapping, elasticity model creation, and optimization results evaluation are given on the sub-pages.

- Prerequisites
- Version Compatibility
- Deployment

Prerequisites

Before you start the installation of the Accelerator, ensure you have a **transactions Datamart**. The Accelerator deployment requires fields mapping to define the price waterfall levels. You need a transactions Datamart with all required waterfall fields. For details see Data Mapping (PWO).

To use the Accelerator, you will need:

- **Negotiation Guidance Model** – To create and run an optimization model, you need to generate a Negotiation Guidance Model which will provide the price elasticities of the waterfall elements. To run a Negotiation Guidance Model, see Prepare Elasticity Model (PWO). To learn how to ensure compatibility between the Negotiation Guidance Model and the price waterfall optimization, see the next paragraph.
- **Optimization Engine (Image)** – To run an optimization model, your partition needs to be allowed to use the Optimization Engine. Please contact Pricefx Support (create a helpdesk ticket) and ask them to enable the image `cregistry.pricefx.eu/engineering/pricefx-optimization-engine` for your partition, if it is not enabled yet. You will be asked for the number of CPUs and memory size to run the model.
  - In terms of CPUs, 2 is enough; you can ask for 4 if you need to make the jobs faster.
  - In terms of memory, you can start with 4 Gi and ask for increase if it is not enough.
- **Pricefx Hurricane 9.2.0 or later** – The Accelerator can only be deployed on a partition with at least Hurricane 9.2.0 version of Pricefx.

Version Compatibility

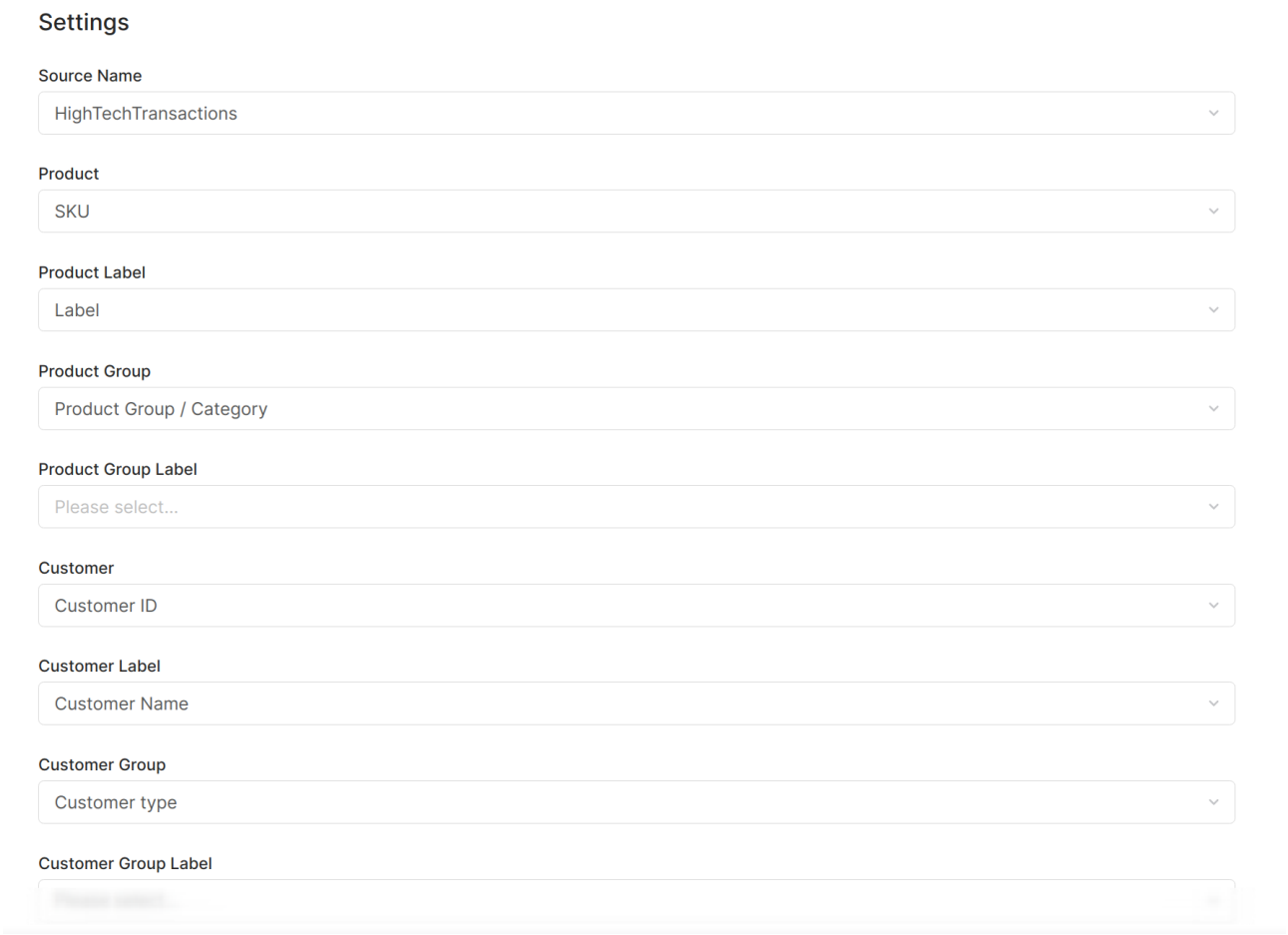
There are some specific compatibility limits to be aware of. They depend on the accelerator version.

PWO Accelerator Version	Pricefx Platform	Associated Negotiation Guidance Model
1.0.1 and before	Minimum 9.2.0 Hurricane	The model must meet these requirements: • It is based on a Model Type (Price Optimization Package Accelerator, any version). • It is of the kind Segmentation. • It has calculated elasticity. • If the user can choose the elasticity function, the choice must be *Exponential* (for the oldest versions, it is the only available elasticity function).

		• The first two levels of segmentation must be the customer group and the product group fields of the PWO model (in any order).
Since 1.1	Minimum 10.0 Bee's Knees	The model must meet these requirements: • It is based on a Model Class (Optimization - Negotiation Guidance Accelerator). • It has calculated elasticity. • The elasticity function must be of the type *Sigmoidal*. • The segmentation levels have to be of type string/text.

Deployment

1. Access PlatformManager at https://platform.pricefx.com/ and log in with your account or using O365. If you do not have an account yet, contact Pricefx Support.
2. Go to **Marketplace** and find the *Optimization - Price Waterfall* accelerator.
3. Click the accelerator tile, select the partition where you want to deploy the accelerator package and confirm the deployment dialog to start.
   For detailed description of all deployment options, see PlatformManager documentation.
4. Set up Datamart mapping.



- Some rules apply in the mapping:
  - Labels are not mandatory. If not filled, a related name field will be used.

    - Product Group and Customer Group fields must *match the segmentation model* used by the optimization.
    - Numerical Datamart fields must be configured as *extended*.
  - More details, particularly if your waterfall does not match the standard Accelerator one, are in Data Mapping (PWO).
5. Click **Continue** and wait until the deployment is complete.

Data Mapping (PWO)

This section details how to create the data structure needed if you want to use the PWO Accelerator and how to configure it during the deployment.

Objectives of Data Mapping

By default, the Accelerator generates an "aggregation" table containing data in a format understood out-of-the-box by the deployed logics. For this, the Accelerator needs to have the raw transactions lines available in a Datamart. Then, the Accelerator will ask for a mapping between the fields of the transactions Datamart and the ones that will be used in the Accelerator.

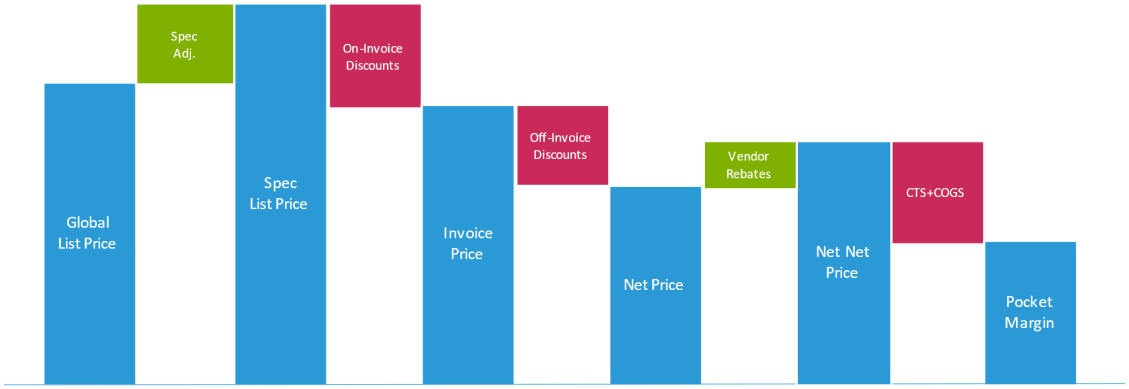
This approach ensures that the expected fields are correctly aggregated and that their names are compatible with the deployed logics.

Standardized Waterfall

To be as fast and generic as possible, a standardized waterfall is built into the Accelerator and is designed to cover most of the customer needs. This waterfall looks like this:

pricefx

Standard WF Structure



Built down to the level of Product X Customers

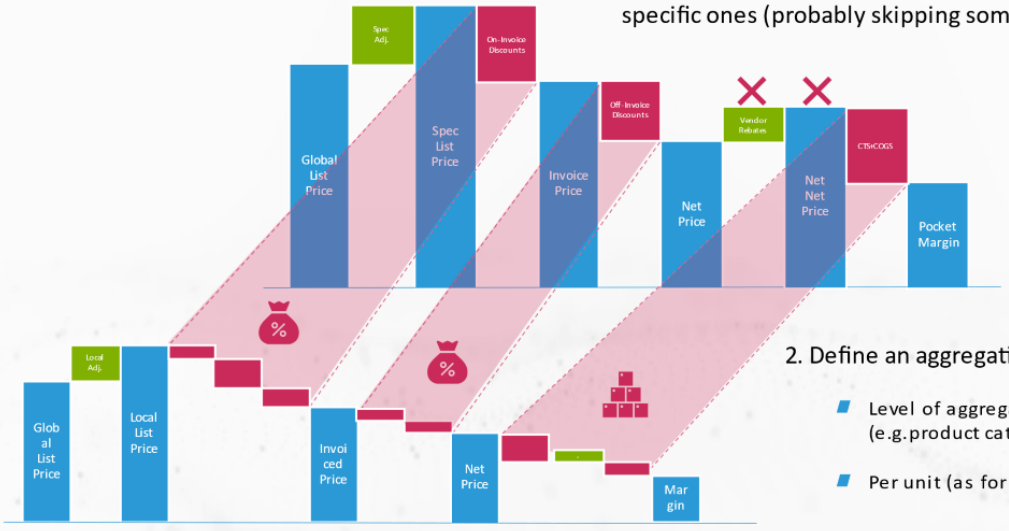
A key part of the setup is mapping the actual customer waterfall columns to this standard one. This could mean that some of the elements of the customer waterfall will be aggregated within a single element of the standard waterfall and that some elements may not be used at all.

Illustrative example:

pricefx

Mapping the Standard WF Structure

1. Define a mapping between Generic elements and customers specific ones (probably skipping some)



2. Define an aggregation method

- Level of aggregation (e.g. product category X customer category)
- Per unit (as for COGS), Rate (as for discounts)

As a result:

- Customers need to be aware of the fact that the **results will not reflect their exact waterfall**.
- We can standardize most things – mainly the way we consume results (Optimization Realization Dashboards, Price Setting, Agreements & Promotions, etc.).

What to Map and How

The prerequisite to the Accelerator deployment is the availability of a Datamart containing the transaction data and the fields listed below. You may need to create such a Datamart if the existing data are not directly available or integrate information from several distinct sources (e.g. Master Data + Data Source + Price Extension).

Transactions Datamart Prerequisites

- The transaction source must contain the following fields (create them if needed):
  - **Product** field – ID of each product. Be careful: it cannot be a source key. If it is, duplicate the field to be able to access it.
  - **Product Group** field – ID of each product group. Be careful: it cannot be a source key. If it is, duplicate the field to be able to access it. Must be defined as a dimension.
    - It must be a segmentation level of the segmentation model you will use in the optimization.
  - **Customer** field – ID of each customer. Be careful: it cannot be a source key. If it is, duplicate the field to be able to access it.
  - **Customer Group** field – ID of each customer group. Be careful: it cannot be a source key. If it is, duplicate the field to be able to access it. It must be defined as a dimension.
    - It must be a segmentation level of the segmentation model you will use in the optimization.
  - **Quantity** field – Number of products in each transaction.
  - **Global List Price** field – Global list price in each transaction (extended to quantity, PWO does not expect unit prices). It is a price defined at a product level.
  - **Specific List Price** field – extended to quantity. List price after applying a specific adjustment (defined at the level of the customer group) to the global list price in each transaction. If it doesn't exist in your waterfall, you can map it with the Global List Price field again.
  - **Invoice Price** field – extended to quantity. It is the price after applying the on-invoice discount (defined at the customer level) to the specific list price in each transaction. If it doesn't exist in your waterfall, you can map it with the Specific List Price field again.
  - **Net price** field – Price after applying an off-invoice discount to the invoice price in each transaction (extended to quantity, PWO does not expect unit prices). If it doesn't exist in your waterfall, you can map it with the Invoice Price field again.
  - **Net net price** field – Price after applying a vendor rebates to the net price in each transaction (extended to quantity, PWO does not expect unit prices). If it doesn't exist in your waterfall, you can map it with the Net Price field again.
  - **Pocket Margin** field – extended to quantity. The master unit cost of each product will be inferred from Pocket Margin, Net Net Price, and Quantity.
- **Avoid null values** in the first level of segmentation used to calculate the elasticities, because the corresponding transaction rows will be ignored by the elasticity model and will cause an error in PWO models. If necessary, create a new field by using an expression that replaces empty values with a text (e.g., "Not provided").

There are also some label fields asked during the mapping. If not provided, the model will use the corresponding id field (product field for the product label field, and so on.)

Dealing with Missing Fields

In some cases, you will want to instantiate a waterfall without all of the discounts. However, the fields are still required by the Accelerator to do its mapping, meaning that it will expect values you cannot give

from a Data Source as they are not available in your problem. In this case, you can simply provide the same fields several times to simulate two sequential values separated by a discount of 0.

Example:

In this example, the column of the Datamart "Invoice Price" is used twice to compensate a missing "Net Price". The "Net net price" exists and the discount between it and the "Net Price" will be computed with the "Invoice Price" instead. The discount between the column "Invoice Price" and "Net Price" will always be 0, as they refer to the same value.

Architecture Components (PWO)

The PWO Accelerator has its own components and also depends on another accelerator. Make sure you review these components and dependencies before the installation.

> This page contains only a components list. For detailed description of the components, see Technical User Reference (PWO).

Dependencies

This accelerator depends on other accelerators whose components will be deployed during the installation too.

- poai-accelerator-library (see below)
- dashboard-accelerator-library

PWO Accelerator Components

The PWO accelerator consist of following components, which will be deployed to your partition:

Advanced Properties

- **poai-accelerator-settings** - Contains mapping of Datamart fields made by admin during the installation process.

Model Class

- Price_Waterfall

Calculation Logic

- PW_1_Def_Eval_Mapping_Configurator
- PW_2_Sco_Calc_Wrangling
- PW_2_Sco_Eval_Scope
- PW_2_Sco_Eval_Scope_Configurator
- PW_3_Conf_Calc_FilterScope
- PW_3_Conf_Eval_Boundaries_Configurator
- PW_3_Conf_Eval_Objectives_Configurator
- PW_3_Conf_Eval_AdvancedParameters_Configurator
- PW_4_Res_Calc_RunOptimization
- PW_4_Res_Calc_PrepareResults
- PW_4_Res_Eval_Impact
- PW_4_Res_Eval_Details
- PW_4_Res_Eval_Glassbox
- PW_4_Res_Eval_Query

Groovy Library Logics

- PW_InternalLibrary

poai-accelerator-library

This library is not provided as a standalone package in PlatformManager Marketplace, it is included during deployment of this PWO Accelerator.

Groovy Library Logics

- PW_Library

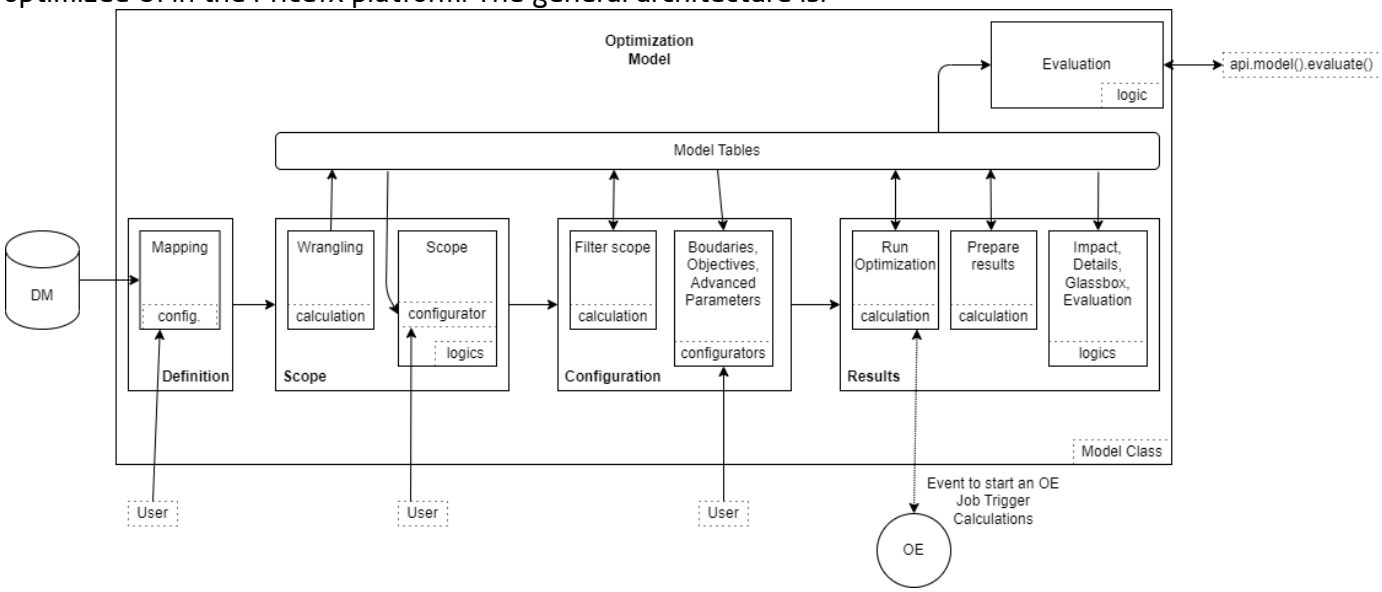
Technical User Reference (PWO)

This section details the ModelClass and the logics that the Price Waterfall Optimization Accelerator deploys. For each step, its aim, its outputs, and the main reasons to modify the logics are explained. If there is a need to modify the logics, refer to the process in PWO Accelerator Customization and to documentation in Problem Modeling, Problem Description, and Problem Tables.

In this section:

Price_Waterfall ModelClass

PWO ModelClass organizes a list of logics to create the model architecture. It is transformed into an optimized UI in the Pricefx platform. The general architecture is:



There are two types of logics: `calculation`, which writes tables in the model, and `evaluation`, whose purpose is only to display some results. The standard Model Class definition is documented in Model Class (MC).

All the logics of the PWO Accelerator follow a standard naming convention: first *PW_* prefix, then the number of the step and the first letters of its name, then *Calc* or *Eval*, depending on the formula nature, then the name of the tab. In the end, there are two library logics named PW_Library and PW_InternalLibrary.

Libraries

The logics are **PW_Library** and **PW_InternalLibrary**.

Aim of the logics

PW_Library is used in nearly all the other logics deployed by the Accelerator and defines a set of generic OE-related functions to facilitate the model's tables reading and writing and to deal with parameter definition in the UI. It is accessed via the calls on `libs.PW_Library.XXX` in the code. *It is preferable to keep this code unmodified* to facilitate the maintenance and readability of the project.

PW_InternalLibrary contains some functions needed specifically for this Accelerator, such as reading its configuration from the application settings, applying the user filters in each part of the model, preprocessing the data for the charts, and many small helpers for the charts rendering.

- Common reasons to modify the logics
  If a specific function is needed for the project, it should be added in *PW_InternalLibrary*. It will be accessed then via `libs.PW_InternalLibrary.XXX` in the code.

Definition Step

There is no calculation logic run in this step. The tab is **Mapping** and its related logic is `PW_1_Def_Eval_Mapping_Configurator`.

Mapping Tab

The logic is **PW_1_Def_Eval_Mapping_Configurator**.

- Aim of the logic
  When users deploy the accelerator, they define the Data Source and the mapping of the entries. But in some cases, they could want to change the source or the mapping for some models. This tab displays the Datamart source and the mapping deployed by the accelerator and allows the user to change it. It is also the place where the model for elasticity is defined.
- Outputs of the evaluation
  It declares the mapping of fields to be used in the model.
- Common reasons to modify the logic
  If the optimization model needs fewer or more fields than the ones which are preset by the accelerator, then it is the place to update the mapping.

  You can also remove the *Elasticity* user input if no elasticity is used in the optimization.

Scope Step

The calculation logic is **PW_2_Sco_Calc_Aggregating** and there is one tab called **Scope**.

Calculation: Aggregating

The logic is **PW_2_Sco_Calc_Aggregating**.

- Aim of the logic
  This logic aggregates the transaction Datamart, which was confirmed or changed in the previous step. The optimization is *done at a product x customer level*, not at the transaction level.
- Outputs of the calculation
  A Datamart table called *Aggregated* is created in the model. It is a product x customer Datamart. This is the main connection to external data.
- Common reasons to modify the logic

This calculation is the main connection to the external data and most often requires to be modified to accommodate the specifics of the customer data, such as mandatory filters. If the waterfall structure is not the standard one, maybe some columns should be added to the Aggregated table. In this case, you may also change the user inputs to define this mapping, too (see https://pricefx.atlassian.net/wiki/spaces/ACCDEV/pages/3850928345#Mapping-Tab).

The Aggregated table is a result of an aggregation. In some cases, the aggregation can change; for example to replace an average with a median.

Scope Tab

The logic are **PW_2_Sco_Eval_Scope** and **PW_2_Sco_Eval_Scope_Configurator**. An evaluation logic that takes the user inputs and displays also a dashboard needs a corresponding configurator, called in the first element.

- Aim of the logics

  This logic lets the end user choose the filters to scope the optimization, through the configurator *PW_2_Sco_Eval_Scope_Configurator*. It means, for example, creating a model with a scope filtered on a product group or a set of customers. On the right, it displays some charts to evaluate how the scope is defined.

- Outputs of the evaluation

  A map of filters which are called later in the code by `model.inputs('definition', 'scope').Scope`.

  A dashboard with information, charts, and tables that summarize the scope taken into account according to the user filters.

- Common reasons to modify the logics

  The main reason to modify these logics is to retrieve data from other sources (PX, DS, DM...) or with different filters. The filtering options that we expose to the user are modified here.

Configuration Step

Calculation: Filtering

The logic is **PW_3_Conf_Calc_FilterScope**.

- Aim of the logic

  The goal of this calculation is to transform the Aggregated table into a collection of tables stored in the model and to present the data efficiently for the Optimization Engine. It involves mainly SQL requests, used with Pricefx API functions, as well as shortcut functions to filter the data and read the Accelerator settings from the library PW_InternalLibrary. This step also extracts the elasticities from the Segmentation Model in a table.

- Outputs of the calculation

  This step writes a collection of tables; the most important ones are:

  - Segmentation table - Produced from the selected Segmentation model.
  - Problem_nameOfTheSpace_nameOfTheScope tables - Data manipulation to prepare the last tables needed by the Optimization Engine. These logics are prefixed by "Store_" and create the model tables that act as an endpoint for the Optimization Engine. Be careful, *their names follow a strict format*. Only the problem tables that do not contain user input values, like objective and constraints, are created here. The other ones are created during the RunOptimization calculation.

- Common reasons to modify the logic

The complexity of the data preparation needed in this step depends on the problem to solve. The main reason to modify this logic is to expose different Problem tables to the optimization engine if some spaces or some scopes are changed in the problem.

Boundaries and Objectives Tabs

The logics are **PW_3_Conf_Eval_Boundaries_Configurator** and **PW_3_Conf_Eval_Objectives_Configurator**.

- Aim of the logics
  The Boundary and the Objectives tabs are used to retrieve the user objectives and as such, are configurators. They contain all the information needed to guide the optimization process by setting the constraints and the goals to reach. The separation into two tabs is mainly for UI purposes.
- Outputs of the evaluation
  The user inputs are stored to be aggregated in the following steps with the rest of the data. In general, it means computing some target and threshold values at different levels of granularity.
- Common reasons to modify the logics
  It is quite common to change these logics by adding or modifying the constraints and objectives in the problem; for example, adding targets at some levels or setting thresholds to keep some values in check. These modifications are *needed but not sufficient* as the problem modeling itself must be changed to take them into account. It is possible to change the number of the tabs where these objectives and constraints are defined, but then the Model Class definition has to be modified too.

Advanced Parameters Tab

The logic is **PW_3_Conf_Eval_AdvancedParameters_Configurator**.

- Aim of the logics
  This tab is used to retrieve the optimization run parameters and as such, is a configurator.
- Outputs of the evaluation
  The user inputs are stored to be used in the RunOptimization calculation. The most important values are the following three that define when the optimization engine will stop:

  - **Max. Number Of Steps** - For how long, in a number of steps, the optimization will run before considering it has reached a "good" state. The default value should be enough, but remember that this value can be increased if the optimization logs many values as "still converging".
  - **Max. Number of Minutes** - For how long, in a number of minutes, the optimization will run before considering it has reached a "good" state. The default value is 0 (= no limit), but for some large models it may be useful to define a default limit;
  - **Stop when stabilized** - Allows an early stop if the model is stabilized.

  There is also a Profiling group of parameters but it is more for a development purpose.
- Common reasons to modify the logics
  The most common reason to change the logic is to set different default values. All the outputs of this logic are used in the PW_4_Res_Calc_RunOptimization logic.

Results Step

Calculation: RunOptimization and PrepareResults

The logics are **PW_4_Res_Calc_RunOptimization** and **PW_4_Res_Calc_PrepareResults** and they are run in this order.

RunOptimization Calculation

Aim of the logic

The goal of this calculation is to create a simulation and an optimization run and retrieve their results. To do so, we need to create a Problem Description that details the structure of the problem to solve by the Optimization Engine and to give endpoints for the OE to get the data of the problem. The previous steps will change the problem by altering its scope and changing the objectives, and the data will be fed directly to the OE thanks to the model tables.

This step consists of:

- **Data manipulation** to prepare the last tables needed by the OE. These logics are prefixed by *Store_* and create the model tables prefixed by *Problem_* that act as an endpoint for the OE. Be careful, *their names follow a strict format*: These endpoints must be named according to the `Problem_nameOfTheSpace_nameOfTheScope` present in the *ProblemDescription.groovy* and return the corresponding data. The behavior of the OE and its way of reading data from endpoints highlight the need for a well-thought-out Scope step. Creating tables of the needed data, already computed and aggregated, implies being well aware of "where is the data I need" and "how do I need to transform it". Due to computations depending on user inputs from business rules and objectives, some tables have to be created in later steps, explaining why even the RunOptimization calculation can have some *store* logics. That is why it is normal to refactor and improve scope logics and the other store logics during the development of *ProblemDescription.groovy*.
- **ProblemDescription.groovy** element – Returns the problem description in a map. The content of the problem description is detailed in Problem Description.
- **GlassboxConfig.groovy** element – Parses the problem description to automate the post-processing.
- **Run.groovy** element – Contains the code that handles the problem description. It takes the description of the problem and the advanced parameters user inputs, and triggers the two optimization jobs thanks to `model.startJobTriggerCalculation`. Each run will return prefixed tables of similar structures. The jobs will run in parallel. The first one is the optimization itself and its outputs are prefixed by "*Optimized*". The second one is a simulation: it simulates the first state of the optimization and will be a reference to compare before/after values in the results dashboards. Its outputs are prefixed by "*Current*". The job type (optimization vs. simulation) is indicated by the input parameters of the `model.startJobTriggerCalculation` function.

Once the problem description is created, it is sent via a Kafka message to trigger the instantiation of a job running an OE configured by this file. The OE has to have access to the correct endpoints to get the data and to know where to write back the results when the computation is finished.

Outputs of the calculation

The Groovy code does some preparation work. It creates Problem_nameOfTheSpace_nameOfTheScope tables – data manipulation to prepare the last tables needed by the OE. These logics are prefixed by "Store_" and create the model tables that act as an endpoint for the OE. Be careful, *their names follow a strict format*. Only the problem tables that contain user input values, such as objectives and constraints, are created here. The other ones are created during the PW_3_Conf_Calc_FilterScope calculation.

A Groovy element also reads the problem description to retrieve a list of parameters used during the postprocessing step to reformat the Glassbox data.

At the end of its run, the OE will write a set of model tables containing its results and the Glassbox information needed to understand why this solution was used. This writing is done directly by the OE and is *not related to a Groovy logic*. This job is done by the two OE jobs, the simulation one and the optimization one.

- The Glassbox table provides optimization indicators for each pair of instantiated value finder – criterion. The simulation job does not create any Glassbox table.
- The tables prefixed by *Results_* present the state of the objectives and constraints at the end of the optimization.
- The tables prefixed by *Solution_* present the raw values that the system was *meant to find* (declared as Value_Finder in the Problem Description). The simulation job does not create any Solution table.
- The tables prefixed by *Simulation_* present the value of computed variables marked as exposed in the description, typically including *values of interest* such as forecasted quantities.

Common reasons to modify the logic

Any modification of the problem modeling and type of constraints to apply or objectives to reach implies a modification of the Problem Description, thus *ProblemDescription.groovy* should change accordingly.

⚠ If the problem description changes, do not forget to check if it is necessary to change or create some Problem tables, either in the Configuration step, PW_3_Conf_Calc_FilterScope logic, or here in the Results step, PW_4_Res_Calc_RunOptimization logic.

In some cases, it could be useful to change the OE image and/or the OE tag that the job trigger refers to. Their values are in the element *Run.groovy*.

PrepareResults Calculation

Aim of the logic

This calculation retrieves the outputs of the RunOptimization logic and reformats them to provide tables that can be used to show user-friendly optimization results. Each element stores one model table or some similar tables.

- Store_Optimized and Store_Current logics create the Optimized and Current tables that mirror each other. The Current table details the state of the system before the optimization; the Optimized one is the state after the optimization. Therefore a lot of visualizations will directly use these two tables to highlight the evolution of key values and the impact of the optimization. They are both created the same way, using the function defined in `AggregationUtils.groovy`.
- Store_Details_ logics write tables whose goal is to clearly show, for each type of variable adjusted by the OE, the optimized value, the reference value (what would that value be if the OE did not optimize anything), their difference, and the needed data to know what is impacted by this value (for example, returning the SpecificAdjustmentRate, but also the revenue and the margin rate, by customer group in the Customer Groups table). This way, the user can see the impact of the optimization on every adjusted value.
- Store_Glassbox_ logics calculate aggregated metrics on the optimization agents criteria and value finders.

Outputs of the calculation

This calculation writes a collection of tables:

- Current table – Details the state of the system before the optimization.
- Optimized table – Details the state of the system after the optimization. Its architecture mirrors the Current table one.
- Details tables – There is one table for each type of variable adjusted by the OE, and it contains the optimized value, the reference value (what would that value be if the OE did not optimize anything), their difference, and the needed data to know what is impacted by this value (for example, returning the customer_id and the customer_type for the Detail_CustomerAdjustment table). This way, the user can see the impact of the optimization on every adjusted value.

- GlassboxVF_ tables - Their names are built as GlassboxVF_NameOfTheSpace_NameOfTheValueFinder, there is one table by value finder key (i.e. type of value finder). These tables store the overall values of each value finder.
- GlassboxProbe_ tables - Their names are built as GlassboxProbe_NameOfTheSpace_NameOfTheValueFinder, there is one table by value finder key (i.e. type of value finder). These tables store the initial movement of each value finder.
- GlassboxCriteria_ tables - Their names are built as GlassboxCriteria_NameOfTheSpace_NameOfTheCriterion, there is one table by criterion key (i.e. type of criterion). These tables store the overall values of each criterion.
- Glassbox_AggregatedMetrics table - Summarizes the global interaction indicators between each value finder key and each criterion key.
- Glassbox_VFs_by_Key table - Summarizes the global overall indicators of each value finder key.
- Glassbox_Criteria_by_Key table - Summarizes the global overall indicators of each criterion key.
- Glassbox_Spaces table - Summarizes the total number of criteria and value finders in each space.

Common reasons to modify the logics

If the problem description has been changed, then the parameter set that helps to create the Current and the Optimized tables has to be changed too. It is in the element `AggregationUtils.groovy`.

The other most common reason to change the logic is to reformat some data to ease the work of providing charts in the Result step tabs.

Impact Tab

The logic is **PW_4_Res_Eval_Impact**.

Aim of the logic

This tab exposes the results of the OE execution in an HTML summary and some complex graphs. It is a comparison of the optimized values and the current ones (what would that value be if the OE did not optimize anything).

The charts are created with the usual method:

```
api.newChartBuilder(...)
```

Outputs of the evaluation

There are eight portlets:

- HTML summary to write explicitly the main variations.
- Waterfall comparison.
- Four bar charts that compare the revenue and margin, before and after the optimization, by product group and by customer group.
- Two bullet charts, one for the current state and one for the optimized one. They show the volume, the revenue, and the margin percentage for each pair of product x customer.

For details see https://pricefx.atlassian.net/wiki/spaces/ACCDEV/pages/3992879122/POAI+Accelerator+Results#Impact-Tab.

Common reasons to modify the logic

Add, modify or remove visualizations. This step is one of the most straightforward ones and its modification should not impact the previous steps.

Details Tab

The logic is **PW_4_Res_Eval_Details**.

- Aim of the logic
  This tab clearly shows, for each type of variable adjusted by the OE, the optimized value, the current value (what would that value be if the OE did not optimize anything), their difference, and the needed data to know what is impacted by this value. This way, the user can see the impact of the optimization on every adjusted value.
- Outputs of the evaluation
  Some data tables. For details see https://pricefx.atlassian.net/wiki/spaces/ACCDEV/pages/3992879122/POAI+Accelerator+Results#Details-Tab.
- Common reasons to modify the logic
  Add, modify or remove table outputs. In practice, if the list of the value finders or their definition in the problem description change, the detail tables would change and thus these outputs would be modified.

Glassbox Tab

The logic is **PW_4_Res_Eval_Glassbox**.

- Aim of the logic
  This tab exposes the technical state of the OE execution at the end of the process. It is a development tool to help tune the model.
- Outputs of the evaluation
  This logic displays charts that show the satisfaction, influences, impacts of the value finders and the criteria, initial movements of the value finders, and evolution of the criticality during the process of optimization. For details see https://pricefx.atlassian.net/wiki/spaces/ACCDEV/pages/3992879122/POAI+Accelerator+Results#Glassbox-Tab.
- Common reasons to modify the logic
  In general, there is no reason to change this dashboard.

Evaluation Tab

The logic is **PW_4_Res_Eval_Query**.

- Aim of the logic
  This logic is used to access model results from outside of the model itself; for example in another logic. The first step is to use `api.model("ModelName")` to get the model and then use the function `evaluate` on it to retrieve an answer depending on the nature of the given parameters. The code needed to get these results is:

```
def model = api.model(“The Model Unique Name”)
def results = model.evaluate(
  “query_results”,
  [
    product: "someProductID",
    customer: "someCustomerID",
  ]
)
def unitNetPrice = results['unit_net_price']
```

The accepted inputs and the corresponding returned results are:

Inputs	Results
product	• unit global list price • product group
customer	• specific adjustment rate • on invoice discounts rate • customer group and all from customer_group
customer_group	• specific adjustments rate
product and customer_group	• unit specific list price • all from product • all from customer_group
product and customer	• unit specific list price • unit invoice price • off invoice discounts rate • unit net price • vendor rebates rate • unit net net price • unit costs • unit pocket margin • and all from above

Outputs of the evaluation

The evaluator provides all the optimized waterfall values. For details see Result Description (PWO).

Common reasons to modify the logic

If the optimization model depends on new fields and if it provides new values, the evaluator should be changed to take them into account.

Release Notes (PWO)

- Price Waterfall Optimization 1.1

Price Waterfall Optimization 1.1

This document summarizes major improvements and fixes introduced in the Price Waterfall Optimization Package release version.

Version	1.1
Release Date	Feb 16, 2023

Table of contents:

- New Features and Improvements
- Fixed Issues

New Features and Improvements

Description	ID
You can set a boundary for Price List change.	PFUN-15024
Visual comparison of the satisfaction of the criteria between the current and optimized scenarios is available now.	PFUN-15588
It is possible now to filter the original data before the aggregation - by using an advanced filter in the Definition step.	PFUN-16310
Query tab has been renamed to Evaluation tab. In addition, its results display now as a table (instead of a dashboard).	PFUN-16756
There is a possibility to set a boundary for list price change for specific Price List to be able to properly steer the change of list price and adjust the price waterfall.	PFUN-16820
Drop-down lists with selectable values are available for inputs in the Evaluation tab.	PFUN-17028
Quantity is now computed directly with elasticity on the unit price defined by the revenue measure.	PFUN-17100
PWO Accelerator uses a faster and more flexible way to batch query the elasticities of every pair of product - customer (implemented in NG Accelerator).	PFUN-17161
The following elements have been renamed to reflect the current name of this accelerator: • Model class: from POAI to Price_Waterfall • Logics prefix: from POAI to PW_<step number> • Gitlab repository: from poai-accelerator to Optimization - Price Waterfall • package-definition files • pom.xml references • text in the readme file	PFUN-17988
In the Impact step, bubble charts have been removed as they were slow to load and were of limited use.	PFUN-18712

Fixed Issues

Description	ID
Deltas for UnitInvoicePrice value finder thresholds are too large.	PFUN-16891
PO AI accelerator: User is unable to change mapping from the default setting if there is no segmentation model corresponding to the product group and customer group.	PFUN-16934
It is possible to choose any model for as an elasticity model. After the fix, only models fulfilling these conditions are available for selecting.	PFUN-16935

• No condition on the MC name. • The model must contain a table called Segments. • The table Segments must contain a field called ElasticityParameters.	
Product and Customer filters are not applied correctly when used together.	PFUN-18180
"Wrangled Data" has been renamed to "Aggregated".	PFUN-18186